

A Study of the Role of Survey in Mine Action



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The **Geneva International Centre for Humanitarian Demining (GICHD)** works towards a world free of anti-personnel landmines and for the reduction of the humanitarian impact of remnants of war by providing operational assistance, creating and sharing knowledge, and supporting instruments of international law.

Geneva International Centre for Humanitarian Demining

7bis, avenue de la Paix

P.O. Box 1300

CH-1211 Geneva 1

Switzerland

Tel. (41 22) 906 16 60

Fax (41 22) 906 16 90

www.gichd.ch

info@gichd.ch

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This project was managed by Eric Filippino, Head, Socio-Economic Section (e.filippino@gichd.ch).

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Contents

Introduction	1
Problem statement	1
Terms of reference	2
Methodology	2
Report layout	3
Chapter 1. Key lessons, challenges and recommendations for survey in mine action	5
Where are we now?	6
How did we get here? The roots of mine action survey	9
History of survey in mine action	10
Issues faced and lessons learned	14
Use of LIS results in programme management	19
Stakeholders and expectations in mine action surveys	21
Key challenges and future directions	23
Conclusion	25
Chapter 2. The case of Angola	29
The origins of Angola's landmine problem	29
History of mine action in Angola	32
The General Survey of Angola	35
Landmine Impact Survey	38
Conclusions and findings	45
Annex. A chronology of mine action in Angola	47

Chapter 3. The case of Bosnia and Herzegovina	49
General background	49
History of the mine action programme	54
Overview of surveys	60
Technical surveys in BiH	62
The BiH Landmine Impact Survey	66
Task Assessment and Planning	73
Conclusions	78
Recommendations	80
Annex. Chronology of the mine action programme	82
Chapter 4. The case of the Lao People's Democratic Republic	85
The context	85
The history of the mine action programme	90
National Strategic Plan	93
Overview of surveys in the Lao PDR mine action programme	95
Socio Economic Impact Survey "Living with UXO"	101
US Air Combat Data	111
UXO LAO technical surveys	117
Current unmet information needs	121
Conclusions and recommendations	122
Annex 1. Chronology of mine action in Lao PDR	131
Annex 2. Example of a UXO LAO Provincial Work Plan, 2004	133
Chapter 5. The case of Mozambique	135
Introduction	135
History of mine action in Mozambique	137
The HALO Trust/UNOHAC Landmine Survey of Mozambique	140
The Landmine Impact Survey	143
Conclusions and findings	149
Annex. Chronology of mine action in Mozambique	152
Chapter 6. A desk study of Kosovo	153
Introduction	153
The context	153
Overview of the use of survey in the Kosovo mine action programme	157
Mine action surveys in Kosovo	158
Concluding remarks	171
Annex. The history of the Kosovo mine action programme	172
Bibliography	175
Glossary of abbreviations and acronyms	183
Appendix. Study advisory group members	187

Introduction

Problem statement

“In many ways, mine action management is as much about information as it is about landmines.” This statement was one of the central conclusions of the GICHD *Study of Socio-Economic Approaches to Mine Action*. In seeking to obtain the necessary information to plan and manage programmes effectively, mine action has seen a considerable number of surveys carried out.

In particular, a number of surveys have sought to record the location and scale of hazardous areas, and, increasingly, an assessment of their social and economic impact as well as the success of mine clearance projects. However, it is a daunting task to accurately record unexploded ordnance (UXO) and mine contamination, and the outputs of many surveys have seemingly failed to satisfy stakeholders despite the expenditure of millions of dollars during the last 15 years.

Thus, concerns have been voiced that surveys are unnecessarily time-consuming and expensive, that their purpose is not always clear, that data is not integrated effectively with end users and that survey approaches do not yield the results to which they lay claim.

Even definition and terminology in mine action survey is contentious. The first International Standards for Humanitarian Demining, issued by the United Nations in 1997, referred to three levels of survey: Level 1, which was a general assessment of the mine and UXO hazard; Level 2 (technical survey); and Level 3 (post-clearance survey). Informally, some actors later referred to a Level 4 or land use survey.

In accordance with the International Mine Action Standards (IMAS), however, survey is now broken down into two main categories: the general mine action assessment¹

¹ The general mine action assessment is “the process by which a comprehensive inventory can be obtained of all reported and/or suspected locations of mine or UXO contamination, the quantities and types of explosive hazards, and information on local soil characteristics, vegetation and climate; and assessment of the scale and impact of the landmine problem on the individual, community and country.”

and technical survey.² There are also, however, so-called “emergency” surveys that do not fit neatly within either category. Post-clearance survey has been replaced by post-clearance documentation. There have also been more frequent instances of “land use” surveys – to evaluate – months or even years after demining operations have been completed – whether cleared land is being used appropriately and by the intended beneficiaries.

In sum, the role of survey is perhaps the most challenging and most critically debated aspect of mine action.

Terms of reference

Study aim and objectives

This study aimed to define and clarify the role of survey in mine action. The specific objectives of the study were to:

- Review the importance and use of survey in mine action;
- Identify the end users of survey data and review their requirements and expectations;
- Assess the effectiveness and efficiency of surveys in providing end users with the information they need;
- Review the use of survey data in strengthening mine action planning and priority setting;
- Propose, as necessary and appropriate, changes to the IMAS; and
- Elaborate conclusions and recommendations for future survey design and implementation.

Scope and focus of the study

The study reviews the use of survey for mine clearance, mine risk education and victim assistance programmes and projects. It focuses on the use of survey data:

- By the national mine action centre or equivalent;
- Among mine action organisations (vertical or programme coordination);
- With other humanitarian and development actors (horizontal coordination);
- Among levels of government (intra-governmental coordination); and
- By donors.

Methodology

The study draws on mine-action-specific case studies in four countries conducted by consultants to the GICHD: Angola (Nick Cumming-Bruce); Bosnia and Herzegovina (Laurence Desvignes and Jussi Hanhimaki); the Lao People's Democratic Republic (Lao PDR) (Guy Rhodes); and Mozambique (Nick Cumming-Bruce). A workshop was

² A technical survey (previously referred to as a Level 2 survey) is “the detailed topographical and technical investigation of known or suspected mined areas identified during the planning phase. Such areas may have been identified during the general mine action assessment or have been otherwise reported.”

held for the study team to review and finalise the proposed methodology for the case studies and for the study as a whole.

The study's lessons, challenges and recommendations were written by Charles Downs. They also draw on evidence from the case studies as well as a number of other sources, including a literature review and previous evaluations of mine action surveys, especially the evaluation of the Landmine Impact Survey (LIS). A desk study of Kosovo (Alessandro Conticini and Valerie Quéré) is also incorporated into the research.

The conduct of the study is guided by a Study Advisory Group of relevant experts set up by the Study Project Manager, Eric Filippino (*see the Appendix*).

Report layout

Following this introduction, the first chapter describes the Key lessons, challenges and recommendations for survey in mine action. Chapters 2 to 5 contain the four country case studies in (Angola, Bosnia and Herzegovina, Lao PDR and Mozambique, respectively) with annexes at the end of each chapter. Chapter 6 includes the desk study of Kosovo. The report concludes with a bibliography, glossary of abbreviations and acronyms, and an appendix, which contains a list of the members of the Study Advisory Group.

Chapter 1

Key lessons, challenges and recommendations for survey in mine action

Charles Downs

Mine action survey has developed far from its roots and is today an essential component of all mine action programmes, providing both descriptive information about the problem and the essential basis to plan for increased effectiveness of programmes responding to the landmine problem of each country.

The case studies in this book describe the evolution of the survey process carried out in five countries, each within the context of its respective mine action programme.³ Each case describes and discusses issues faced in that country, and includes country-specific recommendations by the respective author. The cases are also valuable for the broader implications of the issues raised and lessons learned from each experience. Some lessons have been learned from experience in more than one country, perhaps indicating insufficient exchange of experience and slow collective learning by the mine action community. In other cases, lessons learned became part of the shared wisdom for the next survey.

This chapter highlights some of the broader lessons, but each case study is worth reading for its richer discussion of specifics. Here follow four sections.

1. *Where are we now?* looks at the current situation of mine action survey.
2. *How did we get here?* considers the broad trends in development of mine action survey from its roots in rapid appraisal approaches of the 1980s and the first mine action programmes in the 1990s leading to the current dominance of the Landmine Impact Surveys (LIS) of the Global Landmine Survey process.
3. *Issues faced and lessons learned* summarises the experiences of utilising survey in mine action, including using LIS results in programme management.
4. *Key challenges and future directions* provides recommendations for discussion and action.

³ This chapter draws upon the case studies contained in this book as well as those in the Scanteam, *Evaluation of the Global Landmine Survey Process*, 2004, and the author's own experience, including discussions with colleagues conducting or using the results of mine action surveys in many countries and organisations around the world.

In summary, the experience of survey in mine action shows that:

- General survey should focus not only on contamination but also on *communities* and the *impacts* they suffer due to landmine-caused blockages;
- Continuing discussion is needed regarding the *factors* and *weights* to be used in scoring landmine impact;
- There is a recognised need for follow-up of Landmine Impact Surveys, both in the *strategic use of survey results* and to obtain *confirmation of blockages and the technical minefield information* necessary to plan operations; and
- Additional challenges include:
 - *integrating up-to-date impact and hazard information into a single comprehensive national database;*
 - *adjusting scores to reflect the results of action undertaken;*
 - *selecting priorities with the community;* and
 - *measuring the impact of mine action* within each programme as well as globally.

Where are we now?

A major evaluation, carried out in 2003, found that the global LIS process could “*after only a few years, point to some very impressive achievements,*” including the production of “*reports, databases, and other outputs that provide a qualitatively better and more accurate description and analysis of the mines/UXO problems, and thus provide a better basis for mine action ... decisions.*”⁴ Regarding the future, the evaluation observed that: “*The GLS is evolving, with more efforts and attention now being paid to areas such as training/capacity building, including the use and updating of the Information Management System for Mine Action (IMSMA) database, follow-up use of the LIS results through Strategic Planning, etc.*”⁵

As of the end of 2005, LIS surveys had been completed in 14 countries and regions,⁶ and surveys are under way in Angola, Casamance, Iraq, Sudan and Vietnam.⁷ Most reports can be found on the SAC website,⁸ but some are only available from the respective government authority. Case studies for Angola, Bosnia and Herzegovina, Laos and Mozambique can be found in this work and for Bosnia and Herzegovina, Cambodia, Chad, Ethiopia, Mozambique, Thailand and Yemen in the Scanteam *Evaluation of the Global Landmine Survey Process*.

The general mine action assessment is defined in IMAS (04.10) as “the process by which a comprehensive inventory can be obtained of all reported and/or suspected locations of mine or UXO contamination, the quantities and types of explosive hazards, and information on local soil characteristics, vegetation and climate; and assessment of the scale and impact of the landmine problem on the individual, community and country.”

⁴ Scanteam, 2004: 1.

⁵ *ibid.*

⁶ Afghanistan, Armenia, Azerbaijan, Bosnia and Herzegovina, Chad, Cambodia, Eritrea, Ethiopia, Lebanon, Mozambique, Northern Iraq, Somaliland, Puntland, Thailand and Yemen.

⁷ The Northern Iraq LIS, although conducted by UNOPS according to SWG protocols, was not subject to UN quality assurance due to difficulties in obtaining visas. The Vietnam LIS focused on socio-economic impact at the level of the commune rather than the community, and the government did not request UN quality assurance.

⁸ SAC website: www.sac-na.org; LIS Explorer website: www.sac-na.org/lisexplorer

Broadly speaking, there are two types of survey: those that focus mainly on the nature and extent of the **suspected hazard** (i.e. the explosive ordnance and the site) and those that focus on the **impact** of that contamination on people, communities and areas. Surveys that focus on the suspected hazardous area (SHA) are essential to prepare operational work plans and require technical expertise among the surveyors. Hazard surveys have gone by a variety of names, including: – General Survey, Level One General Survey, Mine and Danger Area **Surveys, and Emergency Surveys**.⁹ Surveys that focus on impact are essential for strategic planning and work cycle prioritisation, and require social science expertise among the surveyors. Impact surveys have generally been known as Level One Impact Surveys and Landmine Impact Surveys. Hazard surveys tend to view the world from the perspective of the minefield, and lead to prioritisation based on minefield characteristics. Impact surveys tend to view the world from the perspective of the local community, and lead to prioritisation based on reducing the impact of minefields on the community. While the GLS impact surveys define impact as based on victims and **blockage** of community social or economic activities, some earlier impact surveys focused primarily on the proximity of hazardous areas to the community and the resulting **risk** to community members.

The various types of survey collect different types of data and support alternative approaches to data analysis and priority setting. Generally speaking, hazard surveys will lead to a prioritisation of minefields for complete clearance, whereas impact surveys will lead to prioritisation of communities and planning of targeted clearance and marking efforts to eliminate blockages. Depending on their roles, some stakeholders are more interested in some data than others – this is the source of many of the current debates and progress regarding mine action survey. To meet the different needs of various stakeholders, a national programme eventually requires all the information in the various types of surveys.

Priority setting is the most critical process in mine action programme management. Each programme sets priorities on a regular basis, and staff members (both national and international) usually have their own approach and ideas as to what the priorities should be. Experience shows that there is often agreement from different perspectives about specific places. However, the approach to priority setting should identify priorities to support the goals of the respective programme. These include direct mine action goals (rapid reduction of new victims, elimination of all landmines and of all effects of landmines) and support to local and national development (support to local economic development, support to regional road or electrification system rehabilitation). In addition there is a management goal of effective use of resources.

Thus priority setting based on hazard alone will eventually lead to elimination of all landmines and may permit more efficient clearance activities by selection of the minefields most appropriate for the available clearance assets. However, it may not provide much immediate relief to the population nor support government development activities. Priority setting based on community impact will respond to more perceived community needs, although it may not resolve their development difficulties and may not be aligned with national development priorities. Priority setting based on proximity of minefields to communities may better target hazard sites for clearance, but will likely result in greater requirement for clearance rather

⁹ Emergency surveys generally have a security focus rather than a humanitarian focus. For this reason, they are primarily oriented to obtain hazard and risk information related to access points and routes.

than marking areas that do not block community activities. There is simply no formula to select the best priorities in all settings. It is a management process that requires information, consultation and judgement, followed by periodic reviews of the results obtained.

Development of the Landmine Impact Survey shifted attention from *minefield hazards* to *impact* through *blockages* affecting *communities*, with significant weight to recent victims. It provides a logical basis for prioritisation, but collects less information on minefields themselves. Prioritisation will lead to response with greater impact – the response itself will include the necessary amount of clearance to address the problems of priority communities, while it also includes other actions where expensive clearance is not essential to relieve blockage.

Operational planning requires a specific follow-up survey to confirm blockages, determine their causes, decide how to respond (clearance, marking, mine risk education – MRE) and collect site information for task planning. Thus technical survey remains necessary. Furthermore, the decision about which areas may not require clearance to remove blockages should be made in consultation with the community, which will often have a more balanced view of the impact.

The GLS Evaluation summarises what it considers “very impressive” achievements:

- “The mine action community has been able to come together to establish the Survey Working Group (SWG) and GLS through a collaborative and deliberative process unheard of in any other sector of development and emergency action.
- The LIS produces reports, databases, and other outputs that provide a qualitatively better and more accurate description and analysis of the mines/UXO problems, and thus provide a better basis for mine action decisions.
- The LIS has developed a methodology and standards which are recognised and followed by key actors involved in landmine surveying. These are set out in Protocols and Advisory Notes that are easily available and which are subject to a process of continuous discussion and updating.
- The surveys that are carried out become known by the full GLS community and are thus subject to considerable discussion and debate.
- The GLS process has contributed to increasing the profile of mine action in the partner countries. This has partly been done by providing national authorities and mine action stakeholders with information-rich products that are useful for decision making but also useful from an informational and awareness-raising perspective vis-à-vis the population at large. The LIS strengthens the argument for allocating national resources to mine action since the factual basis regarding the mine/UXO problem and what to do about it is qualitatively and quantitatively better, and identifies the problem as manageable/‘bounded’. Finally, the LIS is a major support to national authorities and local mine actors in their own fund raising dialogue with donors.”¹⁰

¹⁰ Scanteam, 2004: 1.

How did we get here? The roots of mine action survey

Mine action survey today has developed from two main roots: experience gained in early mine action programmes in the 1990s; and rapid assessment methodologies widely used in rural community development and public health since the 1980s.

Rapid appraisal

Rapid Rural Appraisal (RRA) was developed in the early 1980s by practitioners working in rural community and watershed development. It solidified through several meetings at the Institute for Development Studies in Sussex, England, and Khon Kaen University in Thailand, and became more widely known through writings of Robert Chambers (e.g. 1981, 1994a, b, c). RRA advocates critiqued the existing approaches to information collection for programme design, arguing specifically that: (i) large scale quantitative surveys took far too long, provided precise information of questionable value and were expensive and wasteful, while (ii) typical field visits were little more than “development tourism”, obtaining superficial biased information from the most accessible and articulate counterparts. This bias favoured the views of those in urban areas, in settlements near tarmac roads, available during “office hours”, represented by government officials and local male leaders; it gave less attention to those less accessible due to distance, gender, time, season or social standing.

Rapid Appraisal Procedures (RAP) were developed by public health practitioners, particularly working to design more effective maternal child health and nutrition programmes. RAP developed coherence and its name through a United Nations University sponsored “16 Country Nutrition Study” in the mid-1980s.¹¹ RAP advocates critiqued existing surveys as providing information too slowly and without the social richness necessary to fully understand the problems, the reasons underlying family nutrition decisions, and possible solutions.

RRA and RAP developed as parallel approaches with occasional exchange. Both groups (RRA most articulately) started from the premise that local people have a very well developed understanding of their environment, that they are continually innovating and adapting, and that the outsider will best understand local reality with and through insiders. They tried to apply methodologies developed in anthropology and marketing – while drastically shortening the normal time for anthropological research – to assure sufficient rigour in what otherwise might have been a “quick and dirty” field assessment. Toward this end they gave prominence to certain techniques of qualitative research based on development of rapport and careful listening, including: key informant interviews, focus groups, triangulation (use of multiple methods and perspectives to confirm critical insights), social and community mapping, transect walks and others. These approaches often obtained richer and more complete understanding of specific communities and problems, as a result of which programmes were (re)designed to be more appropriate and effective.¹²

While very successful in improving understanding and detail in programme design, the rapid appraisal methodologies have been critiqued themselves. While local knowledge is often far greater than previously recognised, its accuracy still is limited

¹¹ Scrimshaw SCM and Hurtado E., 1987.

¹² See Scrimshaw and Gleason, eds., 1992, for many examples.

by local experience. Thus it may be very accurate regarding intra-household food distribution, seasonal rainfall, and current use of plant varieties, but far less accurate regarding introduction of new plant varieties, national electrification plans, and regional flood control programmes. Knowledge and impact vary among social groups (e.g., gender, age, ethnicity), while participatory consultation – particularly if aiming at consensus – tends to reflect local power relations. Availability of people to participate depends on a number of factors in addition to power and social relations, including time of day, day of week, season, location of meeting, etc. Furthermore, respondents may answer what they think an interviewer wants to hear, or in terms of the programme the interviewer may be able to influence (e.g. emphasising landmine problems when talking to a mine action surveyor). These issues have generally been recognised by practitioners, who have suggested approaches to overcome them, although recently the more political aspects of participation have been re-emphasised by critics.¹³

Over time, the advocates of these approaches have moved toward a greater focus on community empowerment. In some cases this reflects concern that the initial approach simply reinforces the existing local power structure. It reflects respect for local knowledge and the belief that the solution of many problems could be carried out by the community, if given the resources. Finally, it also reflects the accumulated experience that the outside resources to resolve problems often come more slowly and in lesser amounts than promised.

RRA from the beginning recognised the importance of providing information back to the community. This was at one and the same time *instrumental* (validating the information and interpretation), *respectful* (recognising the community as partner not simply “source”) and *empowering* (possibly leading to action by the community). Both RRA and RAP have increasingly emphasised the aspect of community learning, thus facilitating a community-based response to the problem. In the case of RRA, advocates had moved by the early 1990s to Participatory Rural Appraisal (PRA), often including community planning,¹⁴ which gives precedence to community learning over outsider data collection.

The LIS developed partly out of the rapid appraisal tradition. Some of the key elements in Rapid Appraisal relevant for mine action survey are:

- Confidence in local knowledge (obtained through focus groups, key informants, community mapping, and visual verification);
- Use of multiple sources (gender, social group, location) for triangulation;
- Recognition of the limits of local knowledge;
- Care to ensure methodological soundness; and
- Feedback to community, support to community analysis, planning and response.

History of survey in mine action¹⁵

The specific history of mine action survey is unique to each country, sometimes building upon but often learning in isolation the lessons learned elsewhere.

¹³ E.g., Kapoor, 2002 and Cooke and Kothari, 2001.

¹⁴ See Chambers, 1994a, b, c; Selener, Endara and Carvajal, 1999; and Freudenberg, 1999.

¹⁵ For more extensive discussion of the history of survey in mine action, see Rhodes, “Mine Action Survey,” in GICHD, (2005b).

Nonetheless, there are certain features shared among the surveys of the 1990s. In each country initiating mine action activity it has been common to begin by conducting a survey of the situation (location and area of minefields/SHAs) while urgent clearance begins. These first surveys, sometimes national but often more localised, were conducted by clearance operators for several purposes: to obtain information on the extent and location of specific threats in order to estimate the extent of the problem; to warn communities of the problems they face; and to plan clearance activities. Among the earliest lessons learned was the importance of good records, of both the suspected contamination and the actual clearance.

The International Standards for Humanitarian Mine Clearance Operations, published by the UN in 1997, reflected the shared understanding of the time, particularly regarding the focus on the minefield. The standards referred to three types of survey:¹⁶

LEVEL ONE (GENERAL) SURVEY

The objective of a Level One (general) survey was to collect information on the general locations of suspected or mined areas including on areas affected by mines and on areas not affected. Areas were supposed to be categorised and the reliability and credibility of data recorded. A Level One Survey was a prerequisite for the planning of a Level Two (technical) Survey.

LEVEL TWO (TECHNICAL) SURVEY

The objective of a Level Two (technical) survey was to determine and delineate the perimeter of mined locations initially identified by a Level One survey. The marked perimeter forms the area for future mine clearance operations.

LEVEL THREE (COMPLETION) SURVEY

The objective of a Level Three (completion) survey was to accurately delineate the perimeter of the area actually cleared, usually conducted in conjunction with the mine clearance teams.

As mine action programmes matured, they typically conducted national surveys to more accurately determine the extent of the problem. The key data collected focused on the nature and size of the SHAs – dimensions, soil, ground cover, type and age of mines – as well as some information regarding access and facilities in the nearby community. This provided a more complete basis for programme planning, resource mobilisation, and allocation of assets among regions in proportion to the distribution of the problem, as well as for setting task priorities according to the technical nature of the contamination.

Among the earliest conclusions was that landmine clearance is a slow and expensive process. If the only goal is to eliminate all landmines from A to Z, then the only important questions in priority setting are technical and logistical. While political factors may enter into consideration, in the long run all minefields must be eliminated. They are distinguished essentially by their hazard and site characteristics, and priority setting should provide for the most efficient use of assets to move forward with total clearance as rapidly as possible.

¹⁶ DHA, *International Standards for Humanitarian Mine Clearance Operations*, 1997.

However, with acknowledgement that mine action will continue for a long time came greater recognition that it does make a difference which minefields are resolved first and which are left for longer. The choice to work in one area is a choice to leave hundreds of other areas for later. The choice to work in one area benefits a specific community and leaves others to face their problem alone for longer. Recognition of these “opportunity costs” increased awareness of the importance of appropriate priority setting. Existing minefield databases generally did not contain information on the impact of the respective minefields on the community or the country – since they implicitly expected that all were equally a problem only resolved by clearance – thus they did not provide a good basis to decide which areas should be dealt with first to provide greater benefit to the people of the country. This in turn led to the need for information on which minefields were causing great (or insignificant) problems, for which the perspective of the local mine-affected community was argued to be the appropriate reference point. Out of this awareness came the proposal that surveys should focus on the impact of suspected hazardous areas on communities.

Thus, in the first decade of mine action, most surveys were of *contamination*, focusing on the presence and nature of minefield hazards. A few surveys began to consider the *impact* of the minefields in terms of the risk they posed to the local population, seeking to identify and prioritise those minefields posing a greater *risk*, particularly on the basis of their proximity to community activities. Early examples of this trend included Laos (1997), Afghanistan (1998-1999) and Kosovo (2000). The next step in the evolution was to focus on the socio-economic impact of suspected hazardous areas (SHAs) through global landmine surveys.

Soon after the signing of the Anti-Personnel Mine Ban Convention in December 1987, a group of NGOs formed the Survey Working Group (SWG) to develop a global landmine survey (GLS) and established the Survey Action Centre (SAC) attached to the Vietnam Veterans of America Foundation (VVAFA) to execute the surveys. The GLS was to be carried out through national Landmine Impact Surveys (LIS) to (a) define the scale and socio-economic impact of landmine contamination, (b) provide a reliable national database to be used in future mine action planning and priority setting to address impact, and (c) establish baseline data for measuring overall performance of mine action programmes individually and worldwide.

One of the main outputs of the LIS is the grouping of communities according to an impact score based on a limited set of indicators from information obtained through interviews with the local population. Although other methodologies were considered, it was decided to maintain a very simple approach, considering all communities without regard to population (thus introducing a “rural bias” to counter “urban bias”), considering blockage by type of resource rather than by number of blockages of each resource, giving high weight to victims (each victim equivalent to two categories of blockage). The survey would identify the approximate location of all minefields, but did not invest much training or effort in narrowing the precise boundaries. Thus, each SHA would need to be re-surveyed for actual clearance.

Over the course of several meetings, decisions regarding scoring included: (a) scores should apply to communities rather than to hazards; (b) each victim during the 24 months preceding the survey visit received two points – this made the number of victims a strong driver of the impact score; (c) presence of minefields warranted two points and unexploded ordnance (UXO) one point, regardless of their numbers or the

total extent of contamination; (d) a total of ten predefined blockage categories were established (e.g., agriculture, water sources, schools, etc.), and five additional user-defined categories were created to capture country-specific issues; (e) blockage of any category would warrant a score of up to three points, regardless of the number or degree of blockage; and (f) a total of ten points were allowed for all blockage categories combined, with the relative weight of each category open to adjustment up to a maximum of three points on a country-by-country basis.

The SWG invested considerable effort to ensure the reliability of the methodology, the significance of the results, and the statistical confirmation of the extent of coverage, which it incorporated into a series of public protocols used to guide all landmine impact surveys and reflected in extensive training and pilot testing for each survey.¹⁷ All LIS follow a standard methodology, record their data in a standard database designed for this purpose (International Management System for Mine Action – IMSMA) and are monitored by a UN Quality Assurance Monitor whose reports provide the basis upon which the UN determines whether or not to “certify” the survey process.¹⁸ This methodology became the basis for all impact surveys, regardless of whether a survey was conducted under the direct auspices of the Survey Action Center (the SWG secretariat) or by other parties familiar with the impact concept and the SWG protocols (e.g. Northern Iraq).

The first LIS effort, conducted in Yemen in 1999-2000, provided a comprehensive view of the landmine problem in the country. Importantly, it highlighted areas of high and medium impact that were not previously recognised as such. It was clear even before the survey was completed that there would need to be further assistance to ensure effective use of the results, for which a “survey utilisation” strategic planning component was added and became a common follow-on to an LIS. The results from Yemen lent themselves to setting programme priorities and the government adapted its programme correspondingly. The progress and results of the Yemen LIS also occurred at the right time to inform the on going discussions leading to the IMAS. This had two very important results: the definition of survey came to include *impact* as an essential component; and the question of whether surveys should focus on minefields or affected communities was debated widely, with the community-impact consensus sinking deeper roots more quickly than would otherwise have occurred.

The LIS approach represented a shift for the humanitarian mine action community from setting priorities based principally on minefield contamination characteristics to setting priorities for responding to greatest impact, in order to eliminate community blockages. This was consistent with the IMAS attention to reducing to an acceptable level the risk to population associated with planned use of land. The IMAS discussions focused on the concepts of *risk to normal activities* and *risk reduction* under uncertainty. The LIS discussions successfully shifted the concern in survey from the characteristics of *minefield contamination* in isolation to the *impact* of minefields on communities, particularly through *blockage/interference* with regular community activities (farming, water collection, schooling, etc.). The qualitative shift in 2000 was not in the details of the SWG methodology, but rather in the focus on community impact through blockages. This reflected the broader shift to viewing mine action effectiveness in terms of delivering benefits to local communities – the single most

¹⁷ SWG protocols on SAC website: http://www.sac-na.org/resources_lisprotocols.html.

¹⁸ The LIS and IMSMA were parallel initiatives, coordinated through proactive work of the two teams.

important step toward strengthening the management and effectiveness of mine action worldwide.

Issues faced and lessons learned

Intense discussions have developed on the methodology, implementation and use of the LIS and its results in various countries. Some discussions have led to clarifications of the methodology itself; others have focused on the effective use of the LIS results; while still others have involved trying to go beyond limitations encountered with the LIS. Several of the more important issues are discussed below.

LIS methodology

Relations with host governments. Surveys are conducted with the full knowledge and agreement of the host government. While a memorandum of understanding is signed with the government as a precondition to the survey, in most cases actual government buy-in was weak at the beginning and only developed as results began to appear and their utility became evident. The relationship to government was also ambivalent from the survey team side, since the implementing NGOs generally sought to protect the survey's integrity from potential government efforts to influence the outcome. Reflecting this, before the first LIS, there was a concern that government briefings be kept to the minimum necessary during the survey period, and that results should only be released when the entire survey was complete in order to avoid efforts at manipulation. The extent to which the survey was integrated with other mine action efforts also varied widely among countries. At the beginning, it was thought better to have the LIS team based in its own facility, rather than with the national agency. Early experience indicated that these should not be major concerns, that good flow of information is crucial, and that co-location can enhance communication.

Selection of implementing partners. Implementing partners initially were picked by SAC from among interested member NGOs of SWG. A more formalised partner selection process was established in 2002, responding in part to VVAF's interest in remaining involved with national LIS surveys after SAC separated from it. In addition, early surveys were done by implementing partners not otherwise active in the country. This was due in part to necessity, but it was also thought to ensure neutrality on the part of the survey implementer. Experience has shown that the methodology and professionalism of partners means the risk of bias is modest, while the benefit of working with implementing partners already in the country brings critical contextual insight and language skills.

Preliminary Opinion Collection. Preliminary Opinion Collection interviews with government officials (general administration, health, military, etc.), NGOs and other actors were the starting point for identification of potentially mine-affected communities. The first surveys sought to interview scores of individuals, while later surveys reduced the outreach somewhat. One potential source of expert opinion – existing mine contamination databases – was not widely used. Preliminary Opinion Collection proved to be neither fully reliable nor comprehensive. The quality of data collected varied widely: nonetheless, it served as the starting point for determining which communities should be visited and the magnitude of the effort.

Questionnaire. The SWG protocols define “minimum data requirements” for all LIS surveys, to be collected through questionnaires designed for each survey. SAC also provided copies of the early survey instruments to serve as models for later questionnaires. Adjusting the questionnaire to the national setting – often primarily an issue of clarity of translation of terms and concepts – is already part of the normal process in SWG protocols, although it tends to be learned anew by each set of implementing partners, partly because of the lack of continuity among survey field managers.¹⁹

Limited information on SHAs. The LIS questionnaire collected less minefield information than clearance operators were accustomed to obtain from minefield surveys. Furthermore, although the LIS teams produced sketch maps of the SHAs, IMSMA did not indicate the SHA location nor boundaries, only providing circles sized in proportion to the estimated area. A follow-on technical survey is thus always required when a given site is tasked. While several operators have complained about this, experience indicates that a follow-on survey would be good practice – even with more information collected the first time around – in order to reconfirm the technical and impact data and plan the specific operation.

Overestimation of total SHA area. The problem of exaggerated size of SHAs as determined by LIS survey teams has been observed in most countries. LIS data tend to overstate the extent of contaminated areas, since the survey teams were not expected nor trained to carefully determine boundaries. Unfortunately, this had the effect of apparently increasing the total contaminated area and reduced somewhat the credibility of the survey in some countries. This creates the risk of a programme expending significant resources to “clear the database” rather than to clear minefields. Recently, increased attention has been given to training and equipping survey teams for better estimation of the boundaries of suspect areas.

Coverage of mine-affected communities and SHAs. All LIS surveys (except Mozambique) were designed to provide complete coverage of all mine-affected communities. However, the LIS is unlikely to provide 100 per cent coverage of mine-affected communities, and SHAs not associated with any community have been identified following nearly all LIS. One of the questions asked in each community seeks to identify further mine-affected communities, which, once identified, were recorded and visited in turn. This process continued until no further communities were identified or until nearly all such identifications proved to be false positives when visited. Systematic sampling of false negatives was included to determine the level of confidence in the results and the likely extent of coverage of the landmine problem in the country. When it became clear in early surveys that the planned review could involve increasing the number of villages visited by as much as 100 per cent, the methodology was reviewed and lower thresholds were sometimes set to ensure a high level of confidence that 90-95 per cent of mine-affected communities were covered.

Scoring. The scoring system has been debated in each country and the methodology allows for national review of the weighting scheme for blockages. Several countries have made adjustments to the weights and concluded that the results were meaningful. Alternative weights can also be applied at the regional level if the

¹⁹ There has been very little carry-over of experience from one survey to another due to lack of continuity of international advisers. In addition, national institutional learning and capacity development have been constrained by turnover of national personnel.

authorities so determine and this may be useful for operational planning. Discussion about the impact scoring system often focused on the significant weight given to recent victims. It is sometimes argued that this distorts the scoring, since an incident involving five or more fatalities on a vehicle transporting people through a given area is enough to raise the nearby community to high impact, even if there was no other problem. Others have asked whether five victims in one incident should weigh the same as five separate incidents with one victim each. To which village should an accident be assigned if it involves an outside traveller passing both villages by more than one kilometre? Is an incident caused by the lack of a traveller's local knowledge the same as one suffered by a local person? Should incidents involving handling UXO be the same as stepping on a landmine? Furthermore, in many countries it is difficult for an area with no recent victims to have sufficient categories of blockage to reach high impact, although in some heavily contaminated countries (e.g. Northern Iraq) about half of the high impact communities had sufficient blockages to qualify as such, even without victims.²⁰ Some countries have therefore decided to keep full attention on the “high” and “medium” impact communities. In any case, the level of impact calls attention to the specific community for further action, not only for clearance, and the appropriate action should be assessed in the follow-up survey.

Ranking of community impact. Design of the scoring system involved a number of simplifications and the SWG sought to maintain a simple system for ranking community impact, settling on three categories – low, medium and high – corresponding to scores of 1-5, 6-10 and 11 and above respectively. This ranking system was to be used in all countries to enhance comparability. The ranking was to provide an overview of the national landmine problem and to direct more intensive analysis and expensive clearance resources to high-impact communities. The ranking system proved very powerful in directing attention to high-impact communities, by highlighting them and their limited number, which presented a much more “bounded” problem and thus an achievable solution. In most countries, the number of high-impact communities proved to be significantly lower than expected by those working in the country. In some cases this has led some stakeholders to question the scoring, with concern that other communities with essentially the same degree of impact were being relegated to a lower category (and thus get less attention) due to artefacts of the scoring system. The SWG and most governments have tried to maintain international attention and support for efforts to resolve both high- and medium-impact situations.

Rapid appraisal bias. LISs were conducted through group interviews, key informant interviews, community mapping and visual verification. These are the typical tools of rapid appraisal and the results have the strengths and weaknesses of the method. The data collected was only as good as the community sources providing it. It was limited in some cases by the fact that many people were still displaced. Some critics expressed concern that a visit of a few hours was too short to establish sufficient rapport to ensure that good information was obtained, and that it was biased against women as well as others who happened to be unavailable during the short visit. There were cases where victims of gunshot wounds and other injuries were identified as landmine victims in order to obtain more assistance. Furthermore, information was sometimes distorted by informants who had their own strategies regarding the survey: problems may be overstated with the hope of obtaining greater assistance, or understated to

²⁰ UNOPS Mine Action Programme, “Northern Iraq LIS”, 2003.

avoid interruption of relief assistance, tourism or travel. While the quality of the questionnaires and data entry were carefully assured, the possibility remained that the information obtained was incomplete or otherwise biased. The possibility that information is biased or provided “strategically” reinforces the need to seek multiple data sources (triangulation) and to reconfirm the accuracy and completeness of the information during any follow-up survey conducted prior to any specific task.

Limits of community information regarding national priorities. There are inherent limits in the impact survey methodology and scoring that reduce its effectiveness in understanding certain types of contamination problems. For example, focus on community impact does not adequately capture blockage data regarding projects that are important beyond the immediate community, such as regional or national roadways, electrification and water systems. These blockages need to be identified by other data collection efforts and should be incorporated into the same mine action database. Similarly, the impact survey methodology does not readily consider future changes in use of land, although changes in land use and population movements may result in new blockages and risks. In such situations, the appropriate first step may be to review the proximity of SHAs in relation to planned movement routes and settlements and identify those situations requiring further investigation.

IMSMA database limitations. The LIS questionnaire was hard-coded into the database system then under development (the Information Management System for Mine Action – IMSMA) which was used to record all responses and compile results. While this was a major step forward, it also brought a number of limitations.

First, the IMSMA database was initially developed as a repository for survey data that could be analysed according to impact and other considerations and has been adopted by virtually all mine action programmes established since 1999. IMSMA was not initially designed as an active instrument for operational management of mine action programmes. As a result, each mine action programme where IMSMA was deployed had to develop its own add-on or parallel software to support operations, some of which have been incorporated into later versions of IMSMA. This fact was a disincentive for existing major programmes to convert to IMSMA from their home-grown databases. This problem was eventually overcome with the external funding of LIS together with development of greater IMSMA operational-support capabilities.

Second, there is a need to integrate other key data sets (e.g. bombing data, previous survey data which may require identification for verification, SHAs not associated with any community) but the LIS was not designed to collect this, nor IMSMA designed to handle it. Thus, there is a need to develop mechanisms for integrating all relevant data.²¹

Third, there is a need to incorporate national development and other concerns along with community impact.

Fourth, there is a need to invest in local staff to manage the database, but funds are not always available for such an open-ended commitment.

Fifth, there is a need to invest in updating the database and revising the national impact report. There sometimes has been a tendency to treat the LIS as a snapshot which should remain as such, rather than as the launch pad for a comprehensive dataset which requires updating.

²¹ See Aldo Benini and Chuck Conley, “Data Fusion for Mine Action Decision Support”, 2003, for one example of such an effort.

Some of these are technical issues and some are organisational – but they are all important to ensuring effective information management for national mine action.

Gender issues in mine action survey. The relevance of gender issues has been recognised in mine action survey and LIS teams usually make specific efforts to incorporate gender concerns. The UN's *Gender Guidelines for Mine Action*²² calls particular attention to: the importance of having women as well as men on the survey teams; conducting interviews at times and places suitable for participation by both women and men; conducting group meetings with women alone as well as with men, depending on the cultural context, in order to obtain information from all; gathering information from both women and men about the location and nature of the landmine threat; collecting data disaggregated by gender for mine victims; and collecting and analysing the data with attention to the different daily experiences and risks of men and women.

Timing of LIS – too late? It has been suggested that the LIS was conducted “too late” in some countries – primarily countries that already had a national minefield database (e.g., Bosnia and Herzegovina). This position has been argued as seeking to avoid waste of funds since the landmine situation was presumed to be already well known, and has been used to rationalise reduced cooperation by some NGOs (e.g. in Cambodia and Mozambique). The existing databases were not generally used in the design of the LIS. Yet none of the existing databases were community-impact based – and once the survey was completed the new database as well as the impact-based approach to planning and priority setting were generally recognised as very positive (with lingering doubts about the Mozambique LIS).

Timing of LIS – too early? In some cases (e.g. Angola, Eritrea) it has been suggested that the LIS was conducted “too early”. This argument was based on the absence of populations displaced by conflict (and thus unable to report on contamination) and the relative weaknesses of central and regional authorities in making use of the results. While these are both limitations, those involved have generally found that the displacement issue affected a limited (though important) part of the country and that the results are welcome whenever they are produced.

Retro-fit LIS. LIS were conducted as *retro-fit* surveys in two countries with extensive minefield databases – Afghanistan and Northern Iraq. While there was some scepticism regarding the usefulness of the survey by staff in both countries (as they believed the problem was well known), management in both cases enthusiastically supported the LIS. Initial SWG discussion had suggested that a retro-fit survey would be simple and fast, but implementers in both countries realised that it required a full survey visit, not only to obtain blockage data but also to update SHA and victim information. The result was a far more complete understanding of the problem, utilising the existing database to identify known mine-affected communities and SHAs, while also searching for more. In both cases the total estimated contaminated area at the end of the retro-fit survey was significantly less than the total estimated area prior to the survey. Because all affected communities and known SHAs were visited, the previous database was superseded by the new one, with earlier contamination estimates validated or disconfirmed by the new survey.

²² UNMAS, 2005.

UN Certification. UN certification of the final survey report, based on UN quality assurance of the process, is a core element of the LIS process. While several UN QA monitors have provided very useful real-time feedback to the LIS implementers, the certification process itself was questioned in the GLS Evaluation Report.²³ Certification was designed to be based on compliance with the SWG protocols, and is thus a confirmation of correct procedure followed rather than an endorsement of the substance of the results. This limitation was highlighted in the certification process for the Mozambique LIS, which was generally felt to not have been of the quality or coverage expected – but which the UN judged to have followed the procedures in the SWG protocols. Many of those involved in the Mozambique certification process sought to distance themselves from the certification given, thus casting doubt on the certification process as a whole.

Use of LIS results in programme management

Impact of impact survey results. The LIS has provided information to complete the profile of the national landmine/UXO problem, and this has to some extent modified the existing understanding in nearly all countries where it has been conducted. Most authorities have reallocated assets among regions and in some cases retrained teams to better match the revised understanding of the problem. In Yemen, YEMAC opened a second regional centre for long-term clearance in a highlands region not previously recognised as so strongly impacted by landmines. In Laos, a socio-economic survey carried out prior to the GLS led UXO LAO to change the regional distribution of clearance teams to better reflect the newly clarified distribution of UXO impact. In Chad, the National Demining Institute (HCND) retrained clearance teams to enhance capacities to address UXO after the LIS revealed a high proportion of injuries from UXO. While not all countries used the survey results in the same manner, virtually all countries have redesigned their mine action programmes in response to the impact information produced by the LIS.

Use of results for strategic and operational planning. As the first LIS survey progressed, it became clear that use of the results for strategic and operational planning was going to require further investment of resources for analysis and planning. A separate survey use project was created, which has since been a standard feature of the approach.²⁴ One view had been that the list of high impact communities – whether ordered by specific score or by geographic region – would provide the task list for clearance. As the first results came in it quickly became apparent that this approach alone was not appropriate: community impact score should be a factor in prioritisation but not the whole story. “High impact” is not the same as “high priority.” “High impact” should lead to focused attention of expensive resources to further analyse and respond to the problem. “High priority” is a possible result of considering communities and SHAs within the framework of national priorities. Other factors are also important: other communities may warrant clearance and marking would respond to more communities more rapidly, as would MRE. Thus, the approach taken was that the set of high impact communities provided a working list of communities

²³ Scanteam (2004: 30) points out that the QAM serving as the basis for external review while also providing operational and management suggestions is not consistent with international standards for quality assurance and certification.

²⁴ Tim Lardner and Matt Craig, “Strategic Planning in Yemen,” *Journal of Mine Action*, 2001, issue 5.3.

warranting priority attention, initially through follow-up survey to confirm the earlier results and to plan the most appropriate response. Although early discussions were oriented largely to the allocation of scarce clearance assets to high impact areas, as results became available they provided the basis for further management decisions. Follow-up surveys sought to confirm blockages of specific communities and to provide more precise boundaries for clearance or marking as appropriate. Clearance assets would go particularly to high impact communities, but also to resolve blockages in the surrounding community cluster. Mine marking resources would be used in high and medium impact communities for those larger minefields that did not create blockages. Mine risk education assets worked with clearance and marking teams, and also addressed broader safety education in low impact communities and with the population as a whole. Implications for planning are addressed in each LIS report, with a more comprehensive approach outlined in Downs and van der Merwe, 2003.²⁵

Impact of blockage removal. Prioritisation of high impact communities for clearance was meant to provide greater benefits for communities and the nation. However, it highlighted a limitation in the approach: while landmine blockage may have a high impact on the community, removing the landmines may not eliminate the effect of the impact: the community may not use the land as it did previously, particularly if complementary resources are required to reactivate the old activity. For example, agricultural land may have been unusable due to landmines, but may not be used when the landmines are removed due to lack of agricultural inputs (fertilizer, seeds, water) or disputed ownership. Thus there was a recognition that the likely impact of clearance should be assessed as part of the planning process, since lack of use for an extended period after clearance would cancel most of the benefits of the clearance effort. This assessment requires involvement of community stakeholders in the operational planning process. This was attempted in the minefield-focused Task Impact Assessments (TIA) of Norwegian Peoples Aid (NPA) and has been carried out most effectively in the Community Mine Action Plans in Bosnia and Herzegovina which BHMIC has developed on the basis of the Task Assessment and Planning (TAP) procedure originally proposed by SAC.²⁶

Measuring the results of mine action programmes. Most mine action programmes continue to report their results primarily in the traditional terms of square metres cleared and landmines/UXO removed. While such indicators may be useful for measuring the efficiency of site operations, they are not adequate indicators of programme results. The LIS approach does suggest other possible indicators of results: blockages cleared; changes to victim incidence rates overall and for places with previous incidents; profiles of victims; numbers of previously impacted communities now free of impact; population freed of impact; number of “high” or “medium” impact communities in current workplan. Furthermore, programmes should monitor the use of land once it has been cleared – is it used for the purpose that justified its original prioritisation for clearance? Knowing the use of land after clearance serves two essential purposes: (a) documenting the actual use of the cleared land and thus the benefits derived from the mine action programme, and (b) validating the planning assumptions that led to the task assignment – if the use is not

²⁵ Downs and van der Merwe, “Prioritisation for Mine Action Programme Effectiveness,” 2003.

²⁶ SAC, *Task Assessment and Planning: A Pilot Project in Bosnia and Herzegovina*, 14 December 2002.

as planned, the programme managers should know, determine the reason for the difference and correct planning assumptions for the future. Very few programmes conduct regular post-clearance impact assessments, although it should be standard practice of good management.

Stakeholders and expectations in mine action surveys

There are a variety of stakeholders to be considered with regard to mine action surveys: local, national and international.

Local stakeholders. Local stakeholders include local populations, mine action operators in the specific area and local government officials. The local population is potentially the most affected by the survey results, but there may be significant lags before the results are known and mine action efforts are initiated. However, the survey process can help the local population become better informed of their risk and potential actions, if so designed.

Local operators have an interest in learning more about the nature of the SHAs, but are unlikely to learn much from the survey (unless these operators are also responsible for establishing priorities).

National stakeholders. National stakeholders include national operators (domestic and external), the national Mine Action Centre, and other national officials responsible for policy or management of sectors affected by landmine contamination. National operators (unless they are survey operators) are interested primarily in the outputs of the survey. Their expectations will rarely be met by the LIS alone, and they will normally have to conduct a technical survey for the specific areas where they work. Officials of the MAC or National Mine Action Authority (including those responsible for MRE and victim assistance) have strong interest in the overall survey outputs and the resulting analysis of the national and local landmine problems. This information gives the MAC and the NMAA the basis to plan and task for work on a cyclical and annual basis, as well as to plan for work and additional assets that may be required over a longer time. It has also become somewhat of a donor expectation that landmine impact surveys will be conducted in most mine-affected countries, and thus a condition for resource mobilisation. Other government officials potentially will be concerned with the survey results indicating mine impact on their areas or sectors of concern, which they need to consider in their own planning.

International stakeholders. International stakeholders include donors, mine action NGOs and UN agencies involved in mine action. The GLS seeks to provide international comparability of results, in response to an initial donor concern to potentially allocate funding taking the threat and progress into consideration. The LIS have improved the clarity of the overall international picture but do not seem to have led to reallocation of donor resources.

Donors have two main interests in mine action surveys: (i) to develop a more accurate and comprehensive picture of the landmine problem worldwide and (ii) to assist governments to more effectively plan and manage their own mine action programmes. To date, donors have primarily supported national governments to obtain LIS surveys and have sometimes monitored to ensure that the national programmes seek to become more effective by using LIS results.

In addition to those conducting surveys, NGOs involved in advocacy or seeking to determine where their operational assistance might be useful are interested in surveys, primarily as an instrument for a more complete understanding of national landmine problems. The UN has been one of the main sponsors of the impact surveys, both to strengthen information and management of national programmes and to obtain an improved, comprehensive picture of the world landmine problem. The UN also uses the information obtained through impact surveys to guide its own policies, technical support and resource mobilisation for national mine action programmes.

Stakeholder interest. The parties most interested in impact surveys are the survey operators, UN and national MAC/NMAA (supported by donors). For most of the other stakeholders, the impact surveys may be nice to have but seem to be a diversion of resources from the direct solution of the problem. This is one of the main strands of current debate, especially when NGO operators have priorities that differ from the LIS impact scores, whether due to limitations in the LIS or limited perspective of the NGOs, based in part on less than comprehensive data.

Key challenges and future directions

The landmine impact survey has become the central component of the General Mine Action Assessment in support of strategy and planning. It has been an important element in the successful shift of focus for general planning from the *minefield* to the *community* and from *hazard/contamination* to *socio-economic impact*. Results are used by governments to obtain a better understanding of their national mine problem and to reallocate resources to better respond to that problem. While this shift has improved the ability to formulate strategic plans and to set priorities for mine action generally, the LIS process still faces a number of challenges. Some of these may be resolved by adapting how an LIS is planned and implemented. Examples here would include partner and stakeholder involvement; estimation of SHA areas; and the application of the LIS protocols, particularly regarding impact scoring. Other challenges relate to: (i) how well the LIS data are updated to reflect socio-economic evolutions in the country as well as the results of actions undertaken; (ii) effective use of the LIS outputs and complementary data for strategic planning and priority setting; (iii) technical survey follow-up for operational planning; (iv) further development of IMSMA as the comprehensive database for mine action programme management; and (v) measurement of progress and impact of mine action programmes nationally and globally.

Host government involvement. The LIS is an important strategic support element for government. Nonetheless, relations with host government often have been difficult during the survey process, although this has improved in some recent surveys. Government agreement is sometimes given in expectation of rapid results and with an eye to additional donations. Even if the survey organisers explain how long the process may take, expectations of quicker turnaround remain. Government commitment to the survey often becomes manifest only when the results begin to be available. Still, it is important to cultivate good relations with the host government, to include in the survey teams personnel who may continue in similar functions once the LIS is completed, and to provide interim reports as provincial or other sub-areas are completed.

Feedback to government and communities. It is important to provide feedback to the

government and to specific communities during the survey process – in some cases the impact score may be known at the end of the visit. Provincial reports should be provided as they are available. Where available, MRE community liaison teams could follow up with high impact communities soon after they have been identified to discuss preventive actions the community can take. This should be followed with community consultation during the operational planning process, to reconfirm the nature of blockages and the availability of the necessary resources for the community to make the intended use of the land once the blockages have been removed.

SHA area estimation. The LIS is not an operational support tool and field operators have generally been dissatisfied with its results, particularly with the lack of accurate boundaries. The expansion of the total hazardous area by surveys is perceived as a significant problem that was not initially given importance by the SWG.²⁷ Once identified as an SHA, an area needs to be “processed” (i.e. resurveyed or cleared) to be declared safe – it is not IMAS-compliant to simply reduce the areas as the result of bad data or improper estimation (unless a new estimation is carried out). Otherwise, the overestimation of SHAs in the LIS will result in scarce resources being spent to “clear the database” rather than clear minefields. Collection of more accurate boundary information should be a standard aspect of all future surveys. To minimise the problem, it is important to improve area estimation by applying the newly developed SWG protocol on “visual inspection”, supported by appropriate training and equipment and by including survey team members experienced in mine clearance. Even with more accurate estimation and careful mapping of SHA polygons, impact surveys will not be sufficient for operational planning. Follow-on technical survey to obtain technical information, confirm blockages and determine the best course of action is a necessary step to plan specific operations in each location. The LIS results can direct resources for these expensive tasks to the more limited number of communities where they are likely to deliver the greatest benefits. There have been proposals for national technical survey projects but in most cases this would be a poor use of scarce resources for low priority areas. Instead, technical survey should be addressed primarily to priority areas to develop specific operational plans rather than for general information collection.

Task assessment and community planning. Removing blockages will not necessarily eliminate the full impact of the landmines. It is important to determine whether other resources required for the blocked area to return to its original use (or better) will be available when the blockage has been removed. If the required resources will not be available, the priority of the respective clearance effort should be lowered. Such an assessment should be conducted with the respective community and could be part of a broader process of community planning, similar to the Community Mine Action Planning TAP process in Bosnia and Herzegovina.

Priority setting. The purpose of priority setting is to identify a limited number of tasks to receive greater attention, in order for the programme to have the greatest impact possible in each operational cycle. Once these priorities have been identified, a follow-up technical survey should be conducted of each location. This would be necessary even if full minefield information were collected during the first visit. The purpose of the follow-up survey, which should involve direct discussion with the community, is

²⁷ Interestingly, in cases where an LIS has been conducted in a country with a well-established mine action programme that had already generated estimates of total areas contaminated (e.g. Bosnia; Afghanistan), the LIS resulted in a decrease in the total SHA area.

to complete the information on the SHAs, confirm the existence of blockages and their cause, and determine the plan of action necessary to eliminate the blockages at the minimum cost. Once approved, the plan should be followed to eliminate the blockage with the necessary combination of clearance and marking.

Impact confirmation in all surveys. Even the field operators of SWG members have sometimes been, at best, neutral to the LIS results. While some SWG members have integrated a focus on landmine impact as a standard part of all their survey activity, including technical surveys, it would be beneficial for each operational SWG member to confirm that their field staff have fully adopted this approach. SWG members should more actively guide their field staff to support and have realistic expectations of the LIS process, and to incorporate collection of LIS-type data as a standard part of their own survey actions. Furthermore, the IMAS chapters related to survey should be reviewed to ensure that they provide sufficient importance to inclusion of impact confirmation as standard.

Updating victim scores. The number of victims is a key driver in the total impact score. Once a high score has called attention to the community and the appropriate response has been taken, the victim information is primarily relevant for on-going regional and national victim assistance programmes. Blockages once removed disappear from the database and no longer enter into the updated impact score. However, victims remain in the impact score until at least 24 months after their accident. This distorts the ability to update the database and impact scores to reflect solution of community problems. The SWG should address the need for rescoring communities to reflect actions taken; the procedure developed would be implemented by national programmes, supported by IMSMA.

IMSMA and overall programme priority setting. Mine action programmes require a single comprehensive database, able to support analysis of further priorities based on community impact and other types of data. This is important to know the situation of the entire country, as well as for use on specific development projects as they arise. For example, while the LIS focuses on community impact, the national mine action programme must deal with a wider range of impacts and needs, including national development programmes and risks caused by hazards. Some of these may be area based (e.g., population resettlement) while some may be linear (e.g. roads and power lines). If IMSMA is to be this database, initially populated by an LIS, then it must also integrate other relevant data, including SHAs not associated with communities, as well as information on national development priorities into the analysis and setting of programme priorities.

Keep the mine action database alive. The database should be maintained so that it contains up-to-date data. Ongoing analysis of the survey results and programme progress requires ongoing investment in the information system staff as well as institutionalisation of the impact survey process to maintain up-to-date data. The initial LIS is sometimes referred to as a “snapshot”, but is better thought of as a starting point – an investment in comprehensive data collection that should be fed and kept as a living tool to reflect changing reality. As new mine-affected communities or SHAs come to attention, or new mine incidents occur, they should be added to the database. The results of mine action to clear or mark areas to eliminate blockages should also be updated into the database. The strategic summary of community impact status should be updated and reported at least annually. Much of the

information to update changes will come from within the programme – clearance reports, follow-up confirmation by MRE teams, etc. – while in other cases data may be obtained through other entities, such as the ministry of health regarding new mine victims, the ministry of agriculture for land use details, or the ministries of roads or electricity for planned expansion of their networks. Survey utilisation and data integration are necessary in each case and should be planned and budgeted as part of the LIS and mine action information projects.

Impact of mine action – local and global. Programme managers, national governments, donors and the local community all wish to see the greatest benefits generated by mine action resources, both at the country and global levels. Post-clearance impact assessments (PCIA) should be conducted following the clearance of blockages in order to determine (a) actual use of the land as an issue in itself and (b) whether the assumptions that led to prioritisation of the site were correct (and, if not, to reconsider those assumptions as applied in other situations). Finally, there remains the challenge of estimating the current status of the worldwide landmine problem and assessing progress towards its solution. The LIS have established meaningful country-specific baselines against which progress can be measured. In addition to general desires to eventually clear all landmines, the international community should maintain particular attention on the “high” and “medium” impact communities identified by the LIS in each country. Among the success indicators to consider are: (a) number of blockages existing/removed; (b) number of “high” and “medium” impact communities in a country; (c) share of “high” and “medium” impact communities in annual work plan; (d) number of high-risk SHAs; (e) number of new mine victims; (f) number of mine-affected communities; (g) number of people living in mine-affected communities; (h) total area contaminated; and (i) traditional output measures. Changes in any of these indicators will reflect progress against national mine problems and they can be aggregated to estimate global progress against the worldwide landmine problem.

Conclusion

Mine action survey has come far in a relatively short period. Mine action survey today – with its focus on community impact – has developed from the minefield surveys of the 1990s and the rapid appraisal approach of other development fields. Landmine Impact Surveys have been or now are being completed in more than a dozen countries and regions. In the process, much has been learned but further challenges remain. The case studies in this book provide a grounded discussion of the individual country and of overall process and advances. The cases provide specific recommendations for the respective countries, which may also be relevant elsewhere. This chapter has sought to highlight the broader themes and to identify several of the remaining challenges and possible solutions.

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Chapter 2

The case of Angola

Nick Cumming-Bruce

The origins of Angola's landmine problem

Angola faces a formidable task of social and economic reconstruction after four decades of almost continuous warfare in which local combatants, supported by external powers, made heavy use of landmines. The incidence of mine casualties during these years is estimated to be one of the highest in the world²⁸ and mine contamination on roads alone still presents a major obstacle to reconstruction, limiting the movement of people and goods in a country whose small population (about 14 million people) are dispersed across an area the size of France and Spain combined.

Angola's mine contamination resulted from four main phases of war, starting in 1961 with the nationalist struggle for independence from Angola's Portuguese colonial rulers. This struggle started with uprisings and massacres of white settlers in northern Angola, provoking ferocious retaliation that sent an estimated 400,000 refugees fleeing across the border into neighbouring Zaire (now the Democratic Republic of Congo) and the Republic of Congo. To stem insurgency from groups across the northern border, Portuguese forces in Cabinda province soon resorted to laying mines.

Over the next decade, various guerrilla factions, initially short of weaponry, responded increasingly by laying their own mines as supplies from foreign backers started to rise. The Popular Movement for the Liberation of Angola (MPLA), active in eastern Angola and supplied from Zaire, resorted to a war of attrition using mobile units that minimised direct engagement with Portugal's forces and used landmines both to inhibit their movement and to demoralise them. The Union of the Angola Peoples and its successor, the National Front for the Liberation of Angola (FNLA), also used some mines in central Angola. The National Union for Total Independence of Angola (UNITA) did not acquire the supplies or skills to be active in mine warfare until the mid- to late-1970s.

By then the conflict in Angola had shifted from nationalist and anti-colonial struggle to internecine struggle between guerrilla armies that drew support from the Cold

²⁸ See for instance Human Rights Watch (1993). In 1997, the International Committee of the Red Cross estimated that there were at least 120 new mine casualties each month in Angola. ICBL (2004: 133).

War's superpower rivals and neighbouring countries. A military coup in Portugal in 1974 paved the way for a hasty withdrawal from all its colonies and set Angola's independence for November 1975. An agreement between the FNLA, UNITA and MPLA signed in January 1975 provided for a joint interim government and integrated army, but by mid-year they were at war, the MPLA receiving support from Cuba and the Soviet Union, the FNLA from the US (and landmines from China), and UNITA from South Africa.

The MPLA controlled the capital, Luanda, but not much else and it seemed in danger of losing even that as South Africa invaded southern Angola to support UNITA and Zairean forces, backed by the US, invaded on behalf of the FNLA. At that point a huge influx of Soviet weapons and Cuban troops shored up the MPLA. The troops from Zaire and South Africa pulled out and the MPLA formed a single-party government that won broad diplomatic recognition, although not from the US. The war, however, continued to spread.

UNITA, with local roots mainly among the Ovimbundu people of central and southern Angola, steadily expanded its area of operations, helped by South Africa, whose troops made repeated incursions into Angola between 1981 and 1983. The South African Defence Forces (SADF) then occupied parts of the south in a bid to create a UNITA buffer against the MPLA-supported South West African People's Organisation (SWAPO), which was battling South Africa's presence in Namibia. Under the Lusaka accords signed in January 1984, South Africa agreed to pull out of Angola if the MPLA ceased support for SWAPO, but in 1985 its troops became active again in Angola supporting UNITA against a government offensive. UNITA in the meantime also benefited from a decision by the US Congress to repeal a ban on covert assistance to the group. Between 1986 and 1991, UNITA ranked second only to Afghanistan in receipt of covert US aid.²⁹

In 1987-88, fierce fighting centred on the MPLA-held town of Cuito Cuanavale, where UNITA, strengthened by a reported 3,000 to 5,000 South African troops, attempted to check an advance by MPLA and Cuban forces, in the process laying dense minefields. UNITA/South African attempts to capture the MPLA-Cuban base in the town failed, however, and that proved to be a turning point in the war. South Africa changed its strategy, withdrawing troops from Angola, although they laid more minefields close to the Namibian border before they left. The Soviet Union also made clear it would not continue to finance the MPLA military indefinitely.

Peace talks in early 1989 led to agreement on a cease-fire in June 1989 but soon collapsed. Agreement on the role to be accorded UNITA leader Jonas Savimbi proved a key obstacle to peace and while intense diplomacy ensued to pull together an agreement that would hold, fierce fighting also erupted. Only in May 1991 did the talks reach a conclusion with signing of the Bicesse Accords, a process helped by the end of the Cold War and more US-Soviet cooperation. The deal called for MPLA and UNITA forces to be integrated into a 50,000-strong national army, the holding of elections and the deployment of a United Nations Verification Mission (UNAVEM) to monitor implementation of the agreement.

Elections took place in September 1992, but Savimbi rejected the result and within a month the two sides had returned to war. In this phase of the conflict, both sides

²⁹ Human Rights Watch (1993).

focused on holding or seizing towns and both engaged heavily in laying mines. These included defensive barrier minefields laid by the government of Eduardo dos Santos around towns and cities it held, which were then sometimes ringed by additional mines laid by UNITA (which largely controlled the countryside) to obstruct the inhabitants getting out to collect water, fuel and food. In Huambo province in 1993, MPLA forces dropped mines by air to protect its retreating troops. UNITA's military fortunes waned, however, as its external support started to dry up while MPLA troops were strengthened by heavy investment in new arms.

In September 1994, the two sides (but not their leaders) signed a new agreement, the Lusaka Protocol. This provided for a new UNAVEM peace-keeping mission with some 7,000 troops, who started to deploy in 1995 and were to stay for 15 months. Cease-fire violations occurred but steadily diminished, and by 1997 UNAVEM was pulling out, leaving in its place the UN Observer Mission in Angola.

Hostilities resumed, however, at the end of 1998 after Savimbi stalled implementation of the Lusaka accords. Clashes occurred first in Kwanza Norte, Lunda Norte and Cuando Cubango, and then spread to many other parts of the country in the next few months. Although the government had signed the Anti-Personnel Mine Ban Convention in December 1997,³⁰ both sides continued to lay landmines. By September, refugees were again crossing into the neighbouring Republic of Congo and the UN estimated that more than 1.3 million people were displaced internally. In late 1999, the government claimed it had driven UNITA out of most of its strongholds in the central highlands and its troops continued to enjoy success in the first four months of 2000. Although UNITA appeared to be in a state of disorder, it resorted to guerrilla attacks as the year progressed.

In June 2000, President dos Santos reaffirmed the validity of the Lusaka agreement and said UNITA and Jonas Savimbi could be pardoned if they renounced war, but the fighting continued. By 2001, the number of internally displaced people had risen to an estimated 4.3 million and a further 430,000 people had fled to neighbouring countries. Fighting continued in central and eastern Angola and both sides continued to use landmines: the government to protect military positions; UNITA to stop people escaping government areas and to deny the access to their fields.

The death of UNITA leader Jonas Savimbi in February 2002 brought a rapid end to hostilities. The government signed a Memorandum of Understanding with UNITA in April ending hostilities and a formal peace was declared in August. The only area where fighting continued was in the northern, diamond-producing province of Cabinda, where the government launched an offensive against the Cabinda Enclave Liberation Front (FLEC).

Peace left the government confronting a humanitarian crisis with around 1.8 million people in need of food relief. Of the country's total population of 14 million, an estimated 4.6 million had been displaced internally and roughly half the population had gravitated to the capital to escape the fighting. In addition, more than 440,000 people had taken refuge in the Democratic Republic of Congo, Zambia and Namibia. Repatriation and resettlement of refugees and internally displaced persons (IDPs), however, was severely constrained by the devastation to the country's roads and bridges and widespread presence of landmines.

³⁰ Angola's parliament ratified the treaty only in July 2000.

Many areas of the country had been mined several times in the course of different phases of the conflict and reflecting the movement of frontlines. Mines were laid within populated areas (such as Luena) as well as in dense barrier minefields surrounding them. The density of mines laid in those locations, however, had less impact than random, nuisance mine-laying. For the purposes of providing humanitarian relief, small numbers of mines could deny access to thousands of kilometres of road.

History of mine action in Angola³¹

After the Bicesse accords, signed in May 1991, responsibility for demining lay with the Angolan government and mine clearance was undertaken initially by teams belonging to its armed forces, the FAPLA/FALA. With elections approaching, they gave priority to demining roads, railways and mined areas inside towns or villages. Their efforts, though, were judged to have only limited scope or effectiveness. The teams lacked organisation, resources or support, and they had few records or maps of mine-laying to work from.

A Joint Mine Clearing Commission meeting in March 1992 noted that none of the mine clearing teams had a radio or vehicle, and most lacked basic demining equipment such as helmets, flak vests, mine markers, demolition materials or even properly functioning detectors.³² Although FAPLA/FALA teams received support from British military engineers, most mine clearance had ground to a halt by mid-1992. In southern Angola, the SADF also provided training and advice up to mid-1992 to FAPLA/FALA demining teams, which reported clearing some 300,000 mines.

In May 1992, Kap Anamur, a German non-governmental organisation (NGO), began a mine clearance project in southern Cunene Province. Within a year it was operating with five German and 25 national staff. By the end of 1994, it claimed to have cleared more than 50,600 anti-tank mines and 25,300 anti-personnel mines, but it kept few clearance records or markers showing where it had worked.

Humanitarian mine clearance only acquired significant momentum after the 1994 Lusaka accords. This opened the way for the arrival of 7,000 peacekeeping troops under the umbrella of UNAVEM, and for operators such as the Mines Advisory Group (MAG) and HALO Trust in 1994 and Norwegian People's Aid (NPA) in 1995.

In late 1994, the UN set up a Central Mine Action Office (CMAO) to coordinate the activities of NGOs, UNAVEM and the Angolan military, and to build capacity and support for NGOs in fundraising. A central committee was then established involving the UN Special Representative, UNAVEM and CMAO to coordinate the military and humanitarian needs of mine action, including committees that focused on UN troop deployment and the quartering and demobilisation of Angolan troops.

In June 1995, UNAVEM gave the South African company, Mechem, a US\$6.5 million contract to clear 4,500 kilometres of priority roads. Working with two teams, in the north and the south, and using air-sensing, mine-protected Casspir vehicles, it completed most of the task by early 1997, although obstruction by UNITA forces

³¹ See the Annex for a summary chronology of mine action in Angola.

³² Human Rights Watch (1997).

resulted in some roads being left uncleared. In addition, by early 1997, UNAVEM troops had built or repaired some 38 bridges.

Other key developments included setting up a Central Mine Action Training School in late 1995 as a joint government-UNAVEM initiative to produce trained deminers. The UN also helped to fund the first general survey of Angola, which was conducted by NPA in 1995-98. The resumption of hostilities, however, halted both the survey and much of the mine clearance then under way, and was accompanied by renewed mine-laying.

The UN operation, however, became the object of widespread and damning criticism. UNAVEM commanders proved unwilling to support a unified programme. By stalling disbursement of funds from the UN Department of Peacekeeping Operations, CMAO was left unable to implement clearance plans. An assessment of mine action in Angola carried out for the UN in 1996 found that “the UN proved unable to provide the type of leadership and human resources needed to overcome political difficulties in Angola and the administrative and bureaucratic problems associated with peace-keeping missions,”³³ and the UN's failure to appoint staff with the expertise and vision to manage the programme meant CMAO was unable to “move the programme forward substantially.”³⁴

Angola's Council of Ministers had, in the meantime, issued a decree in May 1995 setting up a National Institute for the Removal of Explosive Devices (Instituto Nacional de Remocao de Obstaculos e Enghenos Explosivos or INAROOE) under the Minister of Welfare and Social Reintegration. INAROOE's mandate was to coordinate and conduct mine clearance and to set priorities for the sector. By December 1996, in addition to its headquarters in Luanda, it had opened four regional headquarters. It planned to deploy 12 66-man demining brigades, three to each area, by mid-1997, expanding later to 18 brigades – one for each province. But those plans were stalled by shortages of funds.

INAROOE's founding decree gave no indication of how it was intended to interact with any other agency, including the UN. This created a vacuum in relations with both CMAO, which was supposedly coordinating mine action and supporting institutions like INAROOE, and UNAVEM, which had set up a training institute that would be the source of INAROOE's demining manpower. Only in April 1997 did the Angolan government and the UN sign a two-year agreement for the UN's Department for Humanitarian Affairs and UNDP to undertake a US\$25 million programme to provide INAROOE with technical and management support. As part of this development, INAROOE was provided with a database populated with the results of the NPA survey, and in 1997 it took over the mine action training school.

But delays in creating a framework for institutional ties with organisations like CMAO and UNAVEM resulted in correspondingly slow development of INAROOE's capacity, both as an implementing and a coordinating agency. By the end of 1997, it was still operating only seven demining brigades. Moreover, much of the mine action under way in the mid- to late-1990s occurred largely on the initiative of individual demining NGOs with often nominal supervision or direction from central government or provincial authorities. A UNDP review mission in 1998 found that

³³ DHA (1996).

³⁴ *ibid.*

INAROOE's dual role as regulator and implementer had become an impediment. Underlining widespread concern about the effectiveness of the organisation, Landmine Monitor reported in 2002 that INAROOE had been unable to provide it with clear statistics for mine clearance activities.³⁵

In July 2001, after consultations with the UN and donors, the government set up the Inter-sectoral Commission on Demining and Humanitarian Assistance (CNIDAH) to take over from INAROOE the role of regulator/coordinator. CNIDAH, answering to the Council of Ministers, is responsible for setting policy and standards, planning mine clearance, survey, and mine risk education and marking. It provides a forum for consultation with the armed forces, other government agencies and mine clearance agencies, represented in the provinces by the governor. Its status also benefited from the appointment as its head of General Santana Andre Pitra Petroff, a respected veteran politician and special counsellor to Angola's president.

The aim of the change was to integrate mine action into a wider government agenda of social and economic reconstruction, resettlement of refugees and IDPs and the provision of emergency relief. However, CNIDAH's ability to perform the functions assigned it was constrained by a lack of experienced manpower and the extremely slow delivery of resources by UNDP, which holds the mandate for capacity building in the mine action sector. The UN's decision to support CNIDAH was taken in August 2002, but the UN authorised funds only at the end of March 2003, equipment was not delivered until the end of November, and CNIDAH only became operational with its own permanent offices in January 2004.

INAROOE meantime was reorganised and reformed under new management as the National Demining Institute (INAD) with a mandate to function only as a demining agency. INAROOE's Technical Demining Brigades (Brigadas Tecnicas de Sapadores), starved of funds as a result of donors' lack of confidence, have not hitherto proved productive but under INAD have a new opportunity to prove themselves. By 2004, INAD had seven brigades with around 67 men each and planned to increase this over two years to 15 brigades.³⁶ In response to its demand to be involved in the Landmine Impact Survey, INAD was given responsibility for two provinces. INAD's ability to realise its expansion plans, however, depended on the government's willingness to finance them. At the end of 2004, funds promised by the government had not come through.

³⁵ ICBL (2002: 69).

³⁶ Information provided by Leonardo Severino Sapalo, Director General, INAD, 24 August 2004.

The General Survey of Angola

Agency	NPA and HALO, Greenfield Consultants (GFC)
Client	UN/INAROOE
Type	Level 1, General Survey
Objective	To record details of mine sites and identify high and low-risk areas of contamination
Dates/duration	1995-98
Scope	National (15 of 18 provinces completed)
Focus	To report mine information that would support reconstruction
Info management	Visual Dbase
Cost	n/a

The 1994 Lusaka accord opened up opportunities for mine action on a significant scale for the first time after 30 years of conflict. Up to that point, the only survey work that had been conducted was to support emergency clearance at specific locations. The General Survey started in 1995 – then known as a Level 1 Survey – therefore marked the first attempt to provide a systematic and comprehensive picture of the extent and location of mine contamination across the country.

Survey objectives

The objectives were “to investigate and record mine information – in the process identifying high- and low-risk areas which is essential for the safe reconstruction of the country's infrastructure and the resumption of productive activities”.³⁷ The overall humanitarian priority at the time was repatriation of IDPs and refugees. Particular attention was therefore paid to road access and to the conditions required both for the movement of people and the distribution of food and other relief. Obstacles included the generally poor level of local amenities and the levels of tension in specific areas, often linked to the military presence.

Survey teams marked on maps the roads they used in green and those used by other vehicles and considered accessible in yellow. Roads that were inaccessible were marked with a dotted red line. The teams gave GPS fixes for known or suspected mines and recorded details of reported accidents.

The survey was geared specifically to producing information useful to demining agencies. NPA's four-page mine site reporting sheet, adopted as standard by all participants, provided enumerators with the option to provide a reference for the centre point of the suspected mined area (SMA), or a polygon map with grid points defining its perimeter, a more precise representation than required in impact surveys and one that allows a far more accurate depiction of the mine threat to linear features such as roads, railway lines and power lines.

At the same time, the UN's terms of reference specified that, in recording general

³⁷ NPA (1998c: 4).

details of mined areas, the survey should address criteria applied both to areas that were mine- or UXO-affected and to those that were not affected in order to identify what were high-risk and low-risk areas. In accordance with standards set by the 1996 International Conference on Mine Clearance Technology in Denmark, areas were recorded as mine-affected if the reports submitted were based on information provided by people unqualified in mine action and not confirmed by survey teams. Areas were designated high- or low-risk only on the basis of reports from survey teams.³

Implementation

The survey started out involving NPA with support from several other NGOs active in demining in Angola. HALO Trust undertook to survey two provinces, Huambo and Bie; GFC/CARE took on Kuando Kubango; and MAG, which had started working in Moxico, would undertake survey in that province, although the southern half of the province, then under UNITA control, was largely inaccessible. As the survey progressed, however, NPA took over all provinces with the exception of Huambo and Bie. Most of the work was undertaken in 1996-97 when NPA operated six survey teams, but from mid-1997 it reduced the number of teams.

A major obstacle to survey work, then as now, was the dire state of the roads as a result of fighting, mining, destroyed bridges or neglect. In a country of Angola's size implementation was slow as a result. To complicate matters, survey teams worked for the most part with poor quality, outdated and small-scale maps of 1:100,000 whose data was not compatible with GPS, resulting in some error in GPS fixes.

Provincial reports, however, made up for this weakness by giving considerable detail on the condition of roads and bridges. These came in charts representing conditions on individual roads as well as colour-coded provincial summary maps. The provincial reports also include written description of roads providing GPS fixes for known or suspected mines and recording details of reported accidents as well as information on their physical state, vegetation and political/military factors.

Implementation, however, was seriously affected by the tense military situation and general climate of suspicion that prevailed after the Lusaka accord and the survey acknowledges the quality of information supplied varies substantially between areas. A precondition of the survey was that both the government and UNITA confirm agreements allowing free access to the areas they respectively controlled and the release of information, but this was never forthcoming. Military on both sides remained sensitive to allowing the survey of areas they considered of strategic importance and in some areas teams were turned back at roadblocks, threatened or just treated with hostility.

Survey teams needed to work in many areas with liaison officers – a process that facilitated access but which could also add significantly to the amount of time needed to complete surveys. Moreover, while some liaison officers proved helpful in obtaining data, others clearly were assigned with the principal objective of tracking the movements of survey teams. Although cooperation in many provinces was good and conditions improved in the course of 1996, an NPA report in that year notes that “in comparison to mine surveys undertaken in countries such as Mozambique or

³⁸ *ibid.*: 5.

Cambodia, the amount of cooperation from the military authorities in Angola is poor".³⁹

Outputs

Despite these conditions, NPA and its partners by the end of 1997 had completed the survey in nine of Angola's 18 provinces and had achieved partial coverage of five more.⁴⁰ Although some headway was made in 1998, the fragile peace collapsed towards the end of the year and the survey could not continue. By then NPA had produced survey reports on 13 provinces. Although surveys of Huambo and Bie by HALO Trust were not complete, reports were also prepared on those provinces. The reports filed thus covered Angola's most densely populated areas, although quality of data varied enormously between different regions. The provinces for which no reports were entered were the politically sensitive oil-producing province of Cabinda and the diamond-rich province of Lunda Norte. Cuando Cubango, also unfinished, was not then a priority, given its relatively small population sparsely distributed over enormous distances.

In view of the inability to complete the survey, NPA did not issue a final survey report but hard copies of the provincial survey reports were compiled and made available to relief agencies in Angola. These are considered among the most significant outcomes of the operation. The data they contained was provided to INAROOE to be entered in a centralised database set up by Vision Dbase. But at the time INAROOE was a one-way street for information and Angola's infrastructure did not support easy exchange of electronic data, particularly among organisations working in the provinces. Hard copies were therefore essential and became almost certainly the most widely used product of the survey.

NPA, as part of a programme to support development of local mine action capacity, shared its survey coordinator with INAROOE as a database manager, supervising the entry of survey data into its database. The process was fraught with problems that ranged from shortage of experienced operators to frequent power cuts, and many survey reports were lost.⁴¹ Moreover, there was no quality assurance on data entered by survey teams. Operators encountered a lot of inconsistencies in data entries and found coordinates badly recorded but lacked the capacity to send material back to operators for confirmation.

Outcome

The survey was widely used by relief agencies in Angola as a result of the availability of hard copies. Although overtaken by renewed hostilities, which resulted in additional mining, the data remains a valuable reference point for operators in the absence of other sources of data on the location of suspected hazards.

³⁹ *ibid.*: 9.

⁴⁰ NPA (1998: 5). The provinces completed were Benguela, Bengo, Kuanza Norte, Malanje, Uige, Zaire, Kuanza Sul, Namibe and Huile. Provinces where survey teams had achieved considerable coverage but additional areas needed to be explored were Bie, Kuando Kubango, Cunene, Huambo and Moxico. Those where minimal or no work was completed were Cabinda, Lunda Norte, Lunda Sul and Luanda.

⁴¹ Information provided by Sara Sekkenes, NPA, December 2004.

The database, however, appears to have been little used at the time that data was fresh and soon fell into a state of disrepair as a result of the weakness and lack of motivation on the part of INAROOE management. Some rehabilitation of the database was carried out after 2001 but an unknown amount of the data entered was lost.

Landmine Impact Survey

Agency	Coordinator: Survey Action Center; Implementers: NPA, HALO, MAG, INTERSOS, Santa Barbara, INAD.
Client	Government of Angola
Type	Impact survey
Objective	An overview of mine/UXO contamination impacts to provide a basis for planning and prioritising mine action
Dates/Duration	Original estimate: December 2003-August 2005 (revised to February 2006)
Scope	National
Info management	IMSMA
Cost	Original estimate: US\$5.8m

The end of the war united Angola under a national government for the first time in more than 40 years, providing a new opportunity for sustained action to address the problems of mine contamination and to develop the institutional framework for undertaking it. But Angola still lacked a comprehensive national survey of the landmine and UXO problem and its impact. NPA and its partners in the general survey had covered all but three provinces, but the data was focused on minefields and the survey had been overtaken by the last round of fighting.

The Survey Action Center proposed a landmine impact survey to fill the gap by providing an assessment of the socio-economic effects of landmine contamination focused specifically on communities. Donors appeared to be unwilling to fund such a project while INAROOE remained the Angolan institution charged with oversight of demining, so low was the credibility of its management. The Angolan government's decision to set up CNIDAH, however, met an essential prerequisite for obtaining donor support. The EU agreed to provide US\$1.8 million and the US came forward with US\$1 million. Other major contributors included Germany, which provided US\$787,000, and Canada contributed US\$559,000.

Outputs planned

The LIS was intended to provide CNIDAH, the new national authority, with a basis for planning and prioritising mine action and thus offered it an opportunity to introduce a degree of coherence that had not previously existed in Angola. It was hoped that it would enhance the role of the national authority in a sector where demining organisations had hitherto operated largely autonomously in the areas in which their donors funded them to work.

In addition to the survey report, the project should leave CNIDAH with a populated IMSMA database.

Implementation

SAC initially estimated the cost of the LIS at US\$5.8 million and planned to complete data collection in February 2005, 26 months after the start of the project, and to issue a final report six months later in August 2005. The targets appear to have been set, however, before preliminary assessment of practical issues of implementation had been completed. It must have quickly emerged from advance survey missions and preliminary opinion collection that there would be little chance of meeting either goal given the operating environment in Angola. After an operational review in November 2004, the deadline for completing data collection was extended to August 2005, set publication of the final report for February 2006 and raised the total cost estimate to US\$6.7 million. Donors are concerned that costs may rise even higher, prompting some to propose an independent review of the survey before agreeing to provide additional funds.

SAC received offers from a number of organisations to survey the whole country but never deemed this a practical proposition given the size of Angola, its political complexities, and the logistical challenges posed by weak infrastructure and communications. SAC preferred instead to employ operators already active in the country⁴² and five organisations signed on as implementing partners.⁴³ This approach offered considerable advantages over the strategy adopted, for example, by CIDA for the LIS in Mozambique, using one agency with no local experience to undertake the survey for the whole country.

Implementing partners brought to the survey knowledge of mine action and the provinces they would survey, experience of working in the challenging local conditions and working relationships already established with provincial authorities. In addition, as direct beneficiaries of the information, it is in the operators' own interests to generate the best quality data possible. Furthermore, in coordinating the Angola LIS, SAC has found that smaller operators tend to be more efficient than big organisations. The bigger partners operating more teams have generally encountered more problems with staff absence due to sickness and other factors.⁴⁴

SAC's director and operations officer carried out an advanced survey mission to Angola in October 2002 and returned two months later in December to discuss implementation and terms with the UN and prospective implementing partners. However, SAC and the Angolan authorities did not sign a formal agreement on conduct of the survey until 2004. SAC says that from the outset, it consulted in detail and had strong support from CNIDAH's president, General Petroff, who reportedly issued a letter supporting SAC's activities in December 2002.⁴⁵ In contrast, international agencies and stakeholders working with CNIDAH and other government departments say Angolan authorities felt insufficiently consulted in the preparation of the LIS and SAC needed to make more effort to foster a sense of Angolan ownership of the project, shown by experience in other countries to be essential to the end use of the survey.

⁴² Information provided by Bob Eaton, SAC Director, 17 December 2004.

⁴³ NPA initially took on the survey in nine provinces, later reduced to seven (Zaire, Uige, Bengo, Cuanza Norte, Cuanza Sul, Luanda, Malanje, Lunda Sul); HALO Trust took on four provinces (Benguela, Huambo, Bie, Cuando Cubango); MAG took on one (Moxico); InterSos two (Huila and Namibe); and Santa Barbara one (Cunene).

⁴⁴ Uli Tietze, SAC Senior Coordinator, 3 September 2004.

⁴⁵ Information provided by Bob Eaton, SAC Director, 17 December 2004.

The delay in reaching an agreement between SAC and Angolan authorities was partly a result of the demand made by INAD late in the process that it should participate in the LIS and take over conduct of the survey in five provinces. Initial discussions and planning for the LIS had taken place at a time when INAROE had ceased to exist, and INAD was still in the process of setting up and taking over control of INAROE's demining brigades. Discussions with INAD led to an agreement in mid-2004 that it would take over conduct of the LIS in two of the politically most sensitive provinces, Cabinda and Lunda Norte, previously assigned to NPA.

The task of identifying the basic administrative unit of the survey and the total number of communities that would need to be visited for the survey was undertaken only in February 2003 by Anthony Zenos, a consultant with extensive knowledge and experience of mine action in Angola. At that time a comprehensive village-to-village survey of all communities had been undertaken only in Benguela province. Using that data to extrapolate an average village population and using data from other sources, notably the Ministry of Health, the consultant produced an estimate of 16,906 communities that would need to be surveyed,⁴⁶ a far higher number than SAC had envisaged. Even this number has turned out to be an underestimate. In Huambo, the report envisaged 1,542 communities would need to be surveyed, but in the process of conducting the survey HALO Trust found 2,826.⁴⁷ Similarly in Malanje, NPA expected 1,097 communities according to the initial estimate and had to contend with 2,145.⁴⁸ The higher number of communities to be surveyed had obvious implications for both the budget and time needed to complete the survey, but no adjustment was made at this stage.

Preliminary opinion collection carried out by SAC at the national level appears to have been cursory and unproductive. SAC sent out questionnaires to 67 organisations, including government departments and NGOs, but received replies from only some five or six, providing data of variable, often poor, quality.⁴⁹

NGOs were critical of SAC's approach. It sent out a 13-page questionnaire in mid-November 2003 requiring considerable amounts of data in a particular format within a tight deadline. According to one interviewee, some of the data requested could only have been obtained by consulting offices in the provinces, a necessarily slow process given the lack of telecommunications facilities. In the view of several, the request and time allowed to fulfil it were unrealistic and SAC as a result failed to collect potentially useful data that would have been available to it with a more flexible approach. In particular, SAC made no use of the NPA General Survey on the grounds that its minefield-focused data was incompatible with the community-focused objectives of the impact survey. A number of LIS stakeholders found this a surprising omission. The general survey offered at least a potentially valuable reference point for checking the quality and accuracy of the information collected by impact survey teams.

Stakeholders also expressed surprise at the absence of any systematic public information campaign to raise awareness of the LIS and its objectives among both relief agencies and the general public. One LIS implementing partner found that one year after the start of the project, one of the key UN agencies in Angola was still unaware of the LIS and its purpose.

⁴⁶ Estimated number of mine-affected communities in Angola from report by A. Zenos.

⁴⁷ Information provided by SAC Coordinator, Uli Tietze, 23 August 2004.

⁴⁸ NPA survey coordinator, Valerie Warmington, 24 August 2004.

⁴⁹ *ibid.*

SAC's Luanda office, however, was itself under heavy pressure in the early stages of the LIS towards the end of 2003 as a result of staff shortages. SAC appointed four expatriate staff in Luanda to coordinate the LIS, but the first appointee as field coordinator, from Mozambique, was rejected by Angolan authorities without explanation and the replacement candidate arrived only in May 2004. Shortly before he arrived, the database officer resigned on personal grounds and, as a result of delays in the government issuing a visa, her replacement did not arrive until mid-June 2004.

Training was conducted in three separate sessions for HALO Trust, NPA and the other implementing partners, but was entirely in English. In retrospect, SAC felt it would have been better to have had a Portuguese-speaking trainer available. Some participants felt the training was too short and failed to go into sufficient detail. Moreover, testing of the survey questionnaire was compressed into the training session. Since the implementing partners worked to different timelines, it only proved possible for HALO Trust and NPA to field test the instrument. By the time the other implementing partners started training the questionnaire was already in use.

Preparing for data collection in the field encountered a number of teething troubles. HALO Trust, in its contract, insisted on procuring its own equipment with funds provided by SAC. NPA provided a list detailing vehicles and equipment required to SAC, which was to handle the procurement. SAC, however, opted to buy a different and cheaper vehicle than that stipulated and not equipped for the operating environment in Angola, forcing NPA to have the vehicles fitted locally with features required under its SOPs.⁵⁰ This did not delay the start of data collection but proved a costly and time-consuming distraction from core survey issues.

The 18-page survey questionnaire is one of the most elaborate ever used in an LIS and also broke new ground with amendments introduced by stakeholders. Its preparation, however, dragged on for more than six months. Discussions between stakeholders started in late 2003 and led to agreement on the need for a number of changes to the questionnaire. The original questionnaire, for example, did not include any questions about roads, which, in the context of Angola, are of critical importance. Then SAC distributed a questionnaire in March 2004 that omitted some of the agreed amendments. Discussions continued with stakeholders until May, when a new questionnaire was issued. By then, HALO Trust had completed its survey of most of Huambo province with the previous questionnaire. Once the changes were agreed, HALO had to resurvey the area already covered, involving some 130 communities, using the new questionnaire. This represented eight days, or 80 survey team days, of additional work.⁵¹

Unlike other impact surveys implemented by a single organisation, SAC agreed to a HALO Trust proposal that it take advantage of the impact survey process to collect technical data. This included polygon mapping of suspected minefields, giving turning points and a perimeter, but did not extend to area reduction. HALO used existing, survey-trained staff for the task and has found that collecting the extra data has not added significantly to the time teams need to spend at any given location or

⁵⁰ Information provided by NPA Luanda. Vehicle deficiencies identified by NPA included the lack of features regarded as basic requirements for operating in Angola, including a bumper or grill capable of supporting a KODAM radio aerial, lack of a second fuel tank and lack of either a hook or winch.

⁵¹ Information provided by HALO Trust, 19 August 2004.

slowed down survey implementation. It argues that the extra time invested in acquiring what might be deemed “Level 1.5” data giving a more precise outline of minefield locations will represent a significant saving later by precluding the need to undertake a full technical survey before proceeding to clearance.

HALO Trust, however, is the only implementing partner to be undertaking this level of data collection and no provision was made for publishing its technical findings in the final LIS report. The IMSMA database in CNIDAH needed another module to accommodate polygon data and CNIDAH staff lacked the training to process it. Among other implementing partners, some needed to recruit extra staff to carry out the survey and did not have time to train them in technical data collection. Some were sceptical of the value of producing maps of minefield perimeters based on estimates rather than area reduction.

Early findings of the Angolan LIS meanwhile have sharpened the long-running debate on how the LIS impact scoring system needs to be refined to address local conditions more accurately.⁵² Key issues include the weighting given by the scoring system to blockages of agricultural land and mine/UXO contamination of infrastructure such as roads and power lines. Operators produce numerous examples of how the system as presently structured cannot capture the reality of the impact that mines and UXO have on the community.⁵³ The default scoring system gives a value to blockages of land and water sources that is not necessarily appropriate to conditions in Angola, with its vast tracts of sparsely populated land and plentiful water. Similarly, surveyed communities may consider themselves not directly affected by mine/UXO contamination of roads or power lines that are outside their immediate locality but of importance to the provincial or national economy. Among the unresolved issues in the LIS was whether SAC or the operators would have responsibility for analysing the survey data collected.

The results of HALO Trust's survey of Huambo province, the first provincial survey to be completed, highlight the issues. The province is one of the most densely populated and in the past three years has recorded one of the highest mine/UXO casualty rates. Applying the default scoring system, the Huambo survey found only three communities to be highly impacted, another 27 to be medium impact and 112 to be low impact.⁵⁴ “Anyone who knows the country knows that doesn't reflect reality,” was the comment of one demining agency staffer, echoed by a number of interviewees. By comparison, the 1996-98 General Survey in Huambo had identified 193 minefields in the province of which 121 were deemed by surveyors to be high-risk. Still, SAC found that applying scoring systems giving different weightings to blockages made little difference to the number of high-impact communities, although

⁵² The default scoring system assigns two points for the presence of mines, one point for UXO, two points for each recent victim and ten more points divided between a range of different blockages.

⁵³ Two examples from Moxico province: parts of the population in the town of Luau are living within a minefield, but houses, which are the only blockage, are not assigned a high score in the system. Without recent victims, therefore, a community that by any rational criteria rates as a priority clearance task would emerge as a low-impact community. In Cazomobo, three districts which include suspected mined areas have had no recent victims and will similarly appear as low impact, but these are districts to which families returning to the area will be directed to settle.

⁵⁴ Information provided by SAC Coordinator, Uli Tietze, 23 August 2004.

it did produce significant variations in the numbers of medium- and low-impact communities.⁵⁵

The Huambo survey also drew attention to another key issue for the Angolan LIS: access. Angola has few all-weather roads, and after three decades of war, most of its roads are in extremely poor condition and hundreds of bridges have been destroyed in the course of fighting. In the November to March rainy season, many secondary roads become impassable. Many roads cannot be travelled on because they are mined. From the outset of the LIS there have been questions whether survey teams would be able to access enough communities to produce a sufficiently comprehensive assessment of mine/UXO impacts. Huambo province is relatively well served by roads yet even there, working in the dry season, HALO Trust found 138 localities inaccessible, 87 of them cut off by mined roads.⁵⁶ In other provinces, particularly in the rainy season, access promised to be substantially more difficult, raising the question of whether SAC would find time and money for survey teams to return to these areas.

The matter of access is one of several that pose a larger question about the merits of proceeding with the Angola LIS at this time or whether the survey would have benefited from a delay of one or two years. In this debate, the advantage of acting swiftly to produce a report that would accelerate preparation of a national strategic plan has to be weighed against the possibility that delay would have allowed the survey to take place in conditions that allowed the collection of more comprehensive, better quality data. Delay would have given survey teams improved access as roads became accessible by clearance or opened up by bridge repairs.

Another key issue in this debate is the quality of data available to surveyors given the large-scale movements of internally displaced people that have occurred within the country in the two years since the end of the civil war and the large number of refugees in neighbouring countries who have or are about to return to Angola.⁵⁷ This has two important consequences.

First, assessments of landmine impacts and clearance needs quickly become out of date in areas where new population movements and settlements create new socio-economic needs and development priorities.

Second, newly settled communities lack sufficient knowledge of their locality to provide quality data to an impact survey. In Malanje, the first province surveyed by NPA, senior survey staff expressed “real fear that we are not getting good data from the villagers”. NPA was concerned by what appeared to be under-reporting of mine contamination. It appears villagers were reluctant to identify roads as mined for fear that the roads would then be closed to delivery of humanitarian assistance. NPA had found significant discrepancies between the information villagers provided to survey teams about mining of roads and the information obtained from a variety of sources by UNOCHA and the UN Security Coordinator (UNSECOR). The data recorded in

⁵⁵ *ibid.*

⁵⁶ *ibid.*

⁵⁷ As of 25 August 2004, UNHCR estimated that 239,154 Angolan refugees had returned home since the signing of the April 2002 peace agreement and 201,846 remained in the main countries of asylum. It expected repatriation of the remaining refugees abroad to be completed by the end of 2005.

IMSMA, however, was the data obtained by survey teams. Still, the UN Quality Assurance Monitor's initial finding was that the number of false negative and false positive responses was not excessive compared with other impact surveys.⁵⁸

An IMSMA database has been created in CNIDAH to store data collected by the LIS. Although entry of LIS data is under the supervision of SAC's database officer, the work is performed by CNIDAH operators. Therefore it remained unclear how, or if, data such as the minefield polygon maps produced by HALO Trust would be used.

The CNIDAH database team also maintains the former INAROE database as the repository of operational data. No mechanism or procedure had been established for synchronising the two. As a result, mine/UXO clearance reports were being entered only in the INAROE database, creating a risk that the LIS would continue to record hazards that had already been removed and would thus be out of date before it was completed. To avoid this, it had been proposed that clearance reports should be filed in IMSMA format to allow the LIS database to stay current.

Unmet needs

The LIS was described by one observer with detailed knowledge of Angola and mine action there as akin to putting a Rolls Royce engine into a Fiat 500. Angola in general – and CNIDAH in particular – remain acutely short of technical skills. SAC did not make any provision for training. Even if CNIDAH acquires the data from the LIS, the systems and structures to use it for analysis or planning within CNIDAH are limited.

CNIDAH needs training not only for operators in specific tasks of data entry and management but also for senior management in data analysis. The precise skills required are to be the subject of a study conducted by the Cranfield Mine Action Unit from Cranfield University. Once the study is completed a decision will be needed on who is to pay for it. Without such skills, the full potential of the LIS for planning and prioritising mine action – in other words full value for the considerable expense – will not be realised.

The problem is not confined to CNIDAH or its operations in the capital. Responsibility for mine action tasking and prioritising belongs to provincial administrations, specifically to deputy governors. But the skills deficit is even more challenging outside Luanda. Provincial administrations now operate with only the most rudimentary resources in terms of personnel and equipment. Most do not have computers, much less staff who know how to use them for even elementary tasks.

CNIDAH's mandate is to coordinate the measures to deal with mines and UXO taken by nine ministries and other government departments but it does not extend to provincial administrations which, under a government programme of decentralisation, have been given responsibility for prioritising mine clearance tasks. Provincial administrations, however, lack the experience or expertise to fulfil this function. CNIDAH's mandate needs to be revised to ensure it also plays a coordinating role in planning and prioritising.

⁵⁸ Comment by UN Quality Assurance Monitor, Hemi Morete, 8 September 2004.

Conclusions and findings

Angola is among the least surveyed of countries exposed to severe mine contamination so any well-conducted survey exercise will yield useful data. However, it also presents a set of particular physical features: an enormous area of land, sparse population and weak road and communications infrastructure. These give rise to particular needs. In general, land and water are not in short supply and in much of the country mine/UXO contamination does not pose a major obstacle to accessing these resources. The poor state of roads and the disruption of transport by often small clusters of mines, in contrast, is a major obstacle for the movement of people, the delivery of humanitarian and other services, the recovery of commerce and political stabilisation.

Amid continuing debate about the availability of donor financing, the logical approach for a country such as Angola and for the stakeholders in mine action would be to identify what types of information about mines it most needs as it emerges from three decades of conflict, and which of the available types of survey would most cost-effectively provide it. After a decade of mine action, the decisions on survey activity emerge from a more haphazard process, often shaped as much by what individual organisations can find donor funding for as by the needs and priorities of the country.

Angola, which has recent experience of a general survey and is in the process of undertaking an impact survey, will provide an interesting point of comparison for weighing the relative merits of each. The 1995-98 General Survey, although incomplete, proved a valuable resource to international agencies working in the provinces. It included detailed reports of road conditions and surveyors' assessments of the high, medium or low priority of hazards. And, although overtaken by four years of war in which new mines were laid, it continues to provide a reference point for operators because of the locational data it provides on mines and UXO.

The Angolan LIS, the biggest and most expensive landmine impact survey undertaken in the world so far, takes a community-focused approach and will have less precise information on roads but will in some provinces collect technical data on hazard locations that may preclude the need for technical survey before clearance. The measure of its success will depend ultimately on the extent to which it provides – and is used as – a reliable tool for planning and prioritising mine clearance and helps to integrate mine action into the government's broader social and economic development plans.

It would have been difficult for a single organisation to complete the survey in an acceptable time frame and at an acceptable cost. But SAC's decision to employ operators already active in Angola to carry it out has worked sufficiently to the advantage of both the survey and the operators as to suggest the formula should be adopted for subsequent impact surveys unless particular circumstances make that impractical.

The timing of the LIS appears to have been dictated more by the availability of donor funds than by a consideration of whether prevailing conditions in the country met basic requirements for its implementation. The survey addresses an urgent need in Angola for national baseline data. Moreover, SAC's "can-do" approach to making it happen had the merit of helping to catalyse action that might otherwise have dragged

on for years. Against this, it is questionable whether any institution in Angola is yet equipped to make full use of the LIS. A delay of one to two years would arguably have allowed time to better prepare the institutional infrastructure in mine action, particularly in the provinces. It would also have allowed the survey to take place after the population movements which are now under way. These can impair the quality of collected data and can quickly render survey findings on the impact of contamination out of date. Repair of roads and bridges in the interim would also have enhanced access.

The involvement of stakeholders in discussions on the questionnaire resulted in what operators are satisfied is a much improved survey instrument compared with those employed elsewhere. The Angolan survey also provides an opportunity to discuss and amend the LIS scoring system, which has long been a subject of debate in the mine action community but is a conspicuously weak tool for measuring socio-economic impacts of mines/UXO in the environment and conditions that apply in Angola.

Although SAC conferred with CNIDAH in the planning stages of the LIS, CNIDAH – and other stakeholders among the international agencies and NGOs – felt insufficient attention was paid to consulting it. This does not appear to have damaged the project, which has received strong and effective support from CNIDAH president General Petroff in particular, but attention needs to be paid to developing an Angolan sense of ownership at national and provincial levels to ensure optimum use is made of the product.

Annex. A chronology of mine action in Angola

1991	Bicesse accords between the government and UNITA open the way for both sides to start mine clearance but, poorly organised and resourced, demining teams are able to make little impact.
1992	Humanitarian demining begins with Kap Anamur of Germany in Cunene province
1994	Lusaka accords concluded. United Nations deploys 7,000 troops, including engineers, who undertake some demining. NPA, HALO Trust and MAG begin working in Angola. The UN sets up a Central Mine Action Office to coordinate mine action.
1995	Mechem awarded a US\$6.5 million contract by the UN to clear/check 4,500 kilometres of road. Government issues a decree setting up INAROOE to conduct and coordinate mine action. UNAVEM opens a mine action training school. NPA begins a general survey of Angola.
1997	Government signs an agreement with the UN Department of Humanitarian Affairs under which UNDP will undertake a US\$25 million, two-year programme to provide INAROOE with technical and management support.
1998	War resumes forcing suspension of the NPA survey and leading to the laying of more landmines.
2001	Government sets up CNIDAH to take over from INAROOE the role of regulator and coordinator. INAROOE'S demining teams are cut in size due to lack of funds, some are absorbed into INAD.
2002	UNITA leader Jonas Savimbi killed, the peace process resumes and mine action gains fresh momentum.
2003	Landmine Impact Survey coordinated by Survey Action Center starts.
2004	Government signs an MoU with SAC for implementation of the LIS, which is now to include INAD as an implementing partner in two northern provinces

Chapter 3

The case of Bosnia and Herzegovina

Laurence Desvignes and Jussi Hanimaki

General background

Background to the conflict, economy and society

Yugoslavia was a multi-ethnic country, created after the 1914-18 War and composed of ethnic and religious groups that had been historical rivals, even bitter enemies, including the Serbs (Orthodox Christians), Croats (Catholics) and ethnic Albanians (Muslims). During the 1939-45 War, Josip Broz Tito led a fierce resistance movement against German occupation and, after Germany's defeat, created the Socialist Republic of Yugoslavia by merging Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia, and Slovenia, along with two self-governing provinces, Kosovo and Vojvodina. Tito's death in May 1980, and the consequent absence of strong leadership of the country, led to economic and political chaos.

By 1991, the population of Bosnia and Herzegovina (BiH) had reached an estimated 4.3 million, divided into three main ethnic groups: 44 per cent Bosniak (Bosnian Muslim), 31 per cent Serb, and 17 per cent Croat. While ethnic communities in the cities were intermingled, rural communities were more mono-ethnic (but often sharing a border with a different mono-ethnic community).

The economy of BiH was diversified, despite being one of the less-developed Yugoslav republics, with industrial production built on substantial energy, mineral and forestry reserves contributing around half the gross national product. Although a significant proportion of the population was rural, agriculture remained poorly developed, accounting for 10 per cent of GDP (due to difficult terrain) and 18 per cent of employment.⁵⁹

⁵⁹ www.state.gov/r/pa/ei/bgn/2868.htm#gov.

In the early 1990s, following the break-up of the Soviet Union, a number of Yugoslavia's constituent republics, including BiH, declared independence from the Serb-dominated authorities in Belgrade, resulting in three years of inter-ethnic conflict. During the war, hostilities were conducted mainly by three distinct armies: the Bosnian government army (ARBiH), the Bosnian Croat army (HVO) and the Bosnian Serb army (VRS). The war destroyed the country's economy and infrastructure, caused the death of about 200,000 people and displaced half of the population.

In 1994, Bosnian Croats and Muslims agreed to a cease-fire and established a federation. This new alliance failed to stop the Serbs from attacking Muslim towns. In response to a massacre of thousands of Muslim civilians in Srebrenica, the US led a NATO (North Atlantic Treaty Organisation) bombing campaign of Serbian artillery positions across Bosnia. In November 1995, the General Framework Agreement for Peace (GFAP, or Dayton Agreement), was signed by representatives of Bosnia, Croatia and Serbia partitioning BiH into the Muslim-Croat Federation of Bosnia and Herzegovina (FBiH) and the Serb Republika Srpska (RS). There is also a third, independently administered entity, the District of Brcko, in north-eastern BiH.



Entities and municipalities/
districts

- Federation of Bosnia and Herzegovina
- Republic of Srpska
- Brčko District

After the Dayton Agreement, a Peace Implementation Conference was held in London in December 1995. It resulted in the establishment of the Peace Implementation Council (PIC), a group of 55 countries and international organisations sponsoring and directing the peace implementation process.⁶⁰

⁶⁰ www.ohr.int/ohr-info/gen-info

The Agreement called for democratic elections and the prosecution of war criminals. It also established the position of the High Representative representing the international community. The Office of the High Representative (OHR) has been designated as the final authority to interpret the agreement on the civilian implementation of the peace settlement. Most recently, in December 2004, the OHR intervened to jail several policemen in RS accused of protecting war criminals.

In 1996, the implementation of the military aspect of the Peace Agreement was being carried out by the 60,000-strong, NATO-led Implementation Force (IFOR). Its objective was to create a secure environment for political and civil reconstruction. IFOR was succeeded by a smaller, NATO-led Stabilization Force (SFOR troop levels were reduced to approximately 12,000 by 2002) whose mission was to deter renewed hostilities.⁶¹ In early December 2004, the European Union took over the NATO-led international peacekeeping operations in Bosnia and Herzegovina and SFOR was replaced by the European Union Force (EUFOR). As of writing, EUFOR consisted of 7,200 troops. Although peaceful, the region remains ethnically divided and economically depressed (official unemployment in the fall of 2004 was approximately 40 per cent).⁶²

BiH has received a substantial inflow of international aid to rebuild the country and implement economic reforms to transform BiH into a functioning, self-sustainable market economy. Annual assistance flows averaged some US\$750 million from 1996 to 2002, equivalent to around 10 per cent of GDP, bringing the total actual aid disbursement to US\$5.6 billion. Support for Eastern European Democracy (SEED) and other foreign assistance accounts for 20-25 per cent of BiH's economic growth. As of early 2005, BiH remained, to a substantial degree, dependent on external economic aid and in the midst of transition from socialism to capitalism. This, in addition to general recovery from the war, remains the main challenge for the country.

The nature of contamination and its impact

Bosnia and Herzegovina has the largest mine and UXO contamination problem in south-eastern Europe. During the war the three armies relied heavily on the use of mines as a deterrent against incursions. It is estimated that, at the end of the war, combatants had emplaced more than 18,000 minefields,⁶³ concentrated along former confrontation lines and around housing, public buildings and key infrastructure.⁶⁴ A general needs assessment survey conducted in June 1994 by the Office of the UN High Commissioner for Refugees (UNHCR) in 41 communities revealed that landmine incidents had occurred in 36 communities⁶⁵ (87 per cent of those surveyed). It also indicated that landmine contamination had severely affected agricultural production

⁶¹ Blagden et al. (2004).

⁶² These figures are estimates and do not take into account the impact of a "grey economy" that would probably reduce the unemployment figures to around 25 per cent. It should also be noted that unlike the Federation, RS does not provide monthly unemployment statistics.

⁶³ In 2001, the BiH Mine Action Centre (BHMACE) estimated that the total number might be as high as 30,000. (ICBL, 2001).

⁶⁴ These were sometimes for defensive purposes, but often laid to deny access to other ethnic groups.

⁶⁵ Nine regions of central BiH were targeted by the survey.

in 17 communities, and that access to land had been reduced by 20 to 50 per cent by landmines.⁶⁶

Under the Dayton Agreement, the armies were required to “lift” their mines from the Zone of Separation⁶⁷ and other areas from which their forces were withdrawn, to mark other minefields, and to provide minefield maps and records. Mine lifting did not meet international clearance standards and resulted in a reduced, but still unacceptable residual hazard to civilians. Minefield maps and records were often unreliable and a number of fields had never been properly mapped. As a result, BiH was left with extensive but often low density minefields in urban, suburban and rural areas, as well as considerable quantities of unexploded ordnance (UXO).

Mine action in Bosnia thus faces special problems. First, few areas of the country were and are deemed completely safe⁶⁸ – including those in which mines had been lifted by the militaries. Second, many of the approaches used elsewhere for technical survey (TS) are not useful in BiH;⁶⁹ as a result TS is a very recent activity in BiH (starting in 2003). Third, the decentralised political make-up of the country and continued ethnic distrust between the two major entities (FBiH and RS), made it virtually impossible to launch a coordinated nationwide mine action programme.

Demining, by any standards, has been slow. By the end of 2001 only 34 square kilometres of land had been cleared to humanitarian standards – less than 1 per cent of the area initially suspected of contamination. In addition, a significant and, apparently, growing proportion of clearance tasks that were undertaken had discovered no landmines or UXO: a waste of scarce resources symptomatic of the specific nature of BiH's landmine contamination problem.

The most recent estimates provide a *slightly* more optimistic picture of the extent of contamination. Still, the database at the Bosnia and Herzegovina Mine Action Centre (BHMACE) indicates that there are more than 670,000 mines and 650,000 items of UXO spread over roughly 10,000 locations. The total contaminated area was estimated in December 2004 to cover roughly 2,000 square kilometres, equivalent to more than 4 per cent of the territory.

More than 1.3 million people (roughly a quarter of the total estimated population of the country) live in the impacted communities; of these, 100,000 reside in communities identified by the LIS as high impact areas. Villages and smaller units, including many farms and seasonal communities, make up 1,169 (85 per cent) of the total; many of these rural communities are near the former front lines. Figure 1 indicates the nature of contamination by district and region.

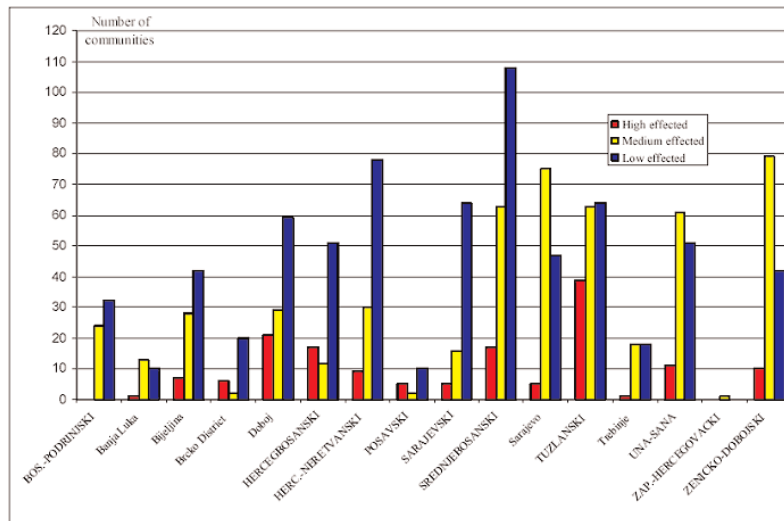
⁶⁶ The World Bank (1996).

⁶⁷ A belt two kilometres wide on each side of the inter-entity boundary line.

⁶⁸ This is due to the frequent use of landmines by militias for ethnic cleansing purposes, and to their continued use after the war to discourage returning refugees. Landmines were readily available as BiH had a number of munitions factories prior to the war, and there was widespread knowledge about how to use landmines as this was taught at secondary school. (Mitchell, 2004) Also, most young men had to perform military service during which they would receive some basic training on deploying landmines.

⁶⁹ For example, test lanes are unlikely to help in determining the boundary of the area that should be cleared when there may be only a handful of mines or UXO per hectare.

Figure 1. Mine-affected communities in FBiH and regions in RS



The effects of landmine contamination are indicated by victim data. The LIS – using data collected by the International Committee of the Red Cross (ICRC) – reported that most of the 129 victims (casualties in 2002 and 2003) were killed or injured during agricultural activities and that non-agricultural land such as forest areas, pasture and areas for food collection or hunting are the most frequently blocked resources. Particularly in rural areas frustration levels are high and out of sheer economic necessity people are willing to take risks that sometimes lead to serious, sometimes fatal, accidents.

Still, there is some reason to hope that progress is being made. From 1992 to October 2004, 4,857 landmine and UXO casualties were reported by the ICRC (of which 56 per cent were military). Of these, 1,511, including 424 fatalities, occurred after the cessation of hostilities. The yearly number of victims has significantly decreased from 632 in 1996 to 72 in 2002 and 32 from January to October 2004. Thus, as can be seen in Table 1, the average monthly number of victims has come down from more than 50 in 1996 to slightly more than three in 2004.

Table 1. Landmine victims in BiH since the end of hostilities (data from ICRC)⁷⁰

Year	Casualties (fatal)
1996	632 (110)
1997	290 (88)
1998	149 (60)
1999	95 (38)
2000	100 (35)
2001	87(32)
2002	72 (26)
2003	54 (23)
2004(to Oct. 1)	32 (12)
Total	1,511 (424)

⁷⁰ ICRC (2004), up to October 2004.

While landmine contamination continues to negatively affect the recovery of BiH from a war that ended almost a decade ago, the BiH Mine Action Strategy has now been revised. Instead of a country free of mines, the best-case scenario envisaged is that the country will be “landmine-impact-free” by 2010.⁷¹

History of the mine action programme

According to a GICHD study,⁷² mine action in Bosnia has gone through three principal phases:

1. The initial rush to respond, when a number of donors established programmes to address humanitarian and priority reconstruction requirements, and to build long-term capacity.
2. The first efforts by the donor community and local authorities to create Bosnian structures to oversee and coordinate a more integrated mine action programme, which ended in crisis.
3. The current status of the programme reflects a recent second effort to establish an adequate legal framework and management structure, both to restore donor confidence and to provide a foundation for devising and executing a strategy to make Bosnia free from the worst impacts of mine contamination within the foreseeable future.

1. The initial post-war period, 1995-1997

After the Dayton Agreement, mine action depended mainly on the international community. The three entity armies conducted some mine lifting under the supervision of IFOR while most of the other early initiatives focused on developing basic capacities for humanitarian demining. Lacking a coherent overall strategy, however, the early mine action in BiH consisted mainly of stand-alone initiatives.

In May 1996, the UN established its mine action centre (UNMAC) to coordinate mine action, supervise the development of national bodies and develop local capacities. It initially focused on directly managing clearance and survey teams as an emergency response. The US State Department supported the initial establishment of UNMAC and three regional MACs, survey and clearance training as well as a mine detection dog programme by contracting RONCO, a commercial firm, at a cost of US\$3.5 million. Norwegian People's Aid (NPA) also established a large demining programme and provided its own training. The World Bank, the European Commission (EC) and other donors dedicated significant funding to survey and clearance operations as a support to reconstruction and resettlement programmes.

By 1997, the EC had provided equipment and training for deminers and explosive ordnance disposal (EOD) teams,⁷³ while the US was delivering a programme to train personnel from the Entity Armed Forces (EAF)⁷⁴ in demining. The number of persons holding basic humanitarian demining qualifications rose from near zero at the start of

⁷¹ Survey Action Center/BHMAC (2004)

⁷² “Chapter 2: Bosnia and Herzegovina,” in GICHD (2005).

⁷³ The EC contracted (a) BACTEC International to train and establish nine EOD teams (four persons each) and (b) DSL to train and establish 18 demining teams (12 persons each).

⁷⁴ After Dayton, the three armies were merged into two: one for FBiH (Croat-Bosniak), the other for RS (Serb).

1996 to more than 1,200 by the end of 1998 (with the EAF in charge of the bulk of the training).

Demining in BiH was partially commercialised at an early stage. The EC, for example, contracted two commercial companies (BACTEC and DSL) to train and equip the demining authorities in FBiH and RS. In July 1996, the World Bank approved the Emergency Landmines Clearance Project (ELCP) that supported clearance, reconstruction and resettlement projects.⁷⁵ The ELCP was administered through Project Implementation Units (PIUs) which worked with the MACs in both entities.⁷⁶ The PIUs awarded contracts to commercial firms based on competitive tenders.

By 1997, BiH had, in effect, the first national mine action programme in which funding came from abroad and clearance was to be done principally on a commercial basis (through a series of competitive tenders).⁷⁷ The US also issued a second contract to RONCO in late 1996 to undertake full demining operations with three “brigades” of deminers, which eventually evolved into three, ethnically separate, commercial demining companies.

Immediately after the Dayton Agreement, mine action in BiH benefited from widespread external interest and support but suffered from a lack of a coherent strategy. Despite a plethora of activity, demining was done on a piecemeal basis, often through private companies operating for profit. This was clearly not the best way to deal with the scale of landmine and UXO contamination in BiH.

2. The search for a centralised structure, 1997-2002⁷⁸

The need for a more coordinated programme under the control of local authorities was soon acknowledged. At its December 1996 meeting in London, the Peace Implementation Council called for:

- The establishment of a national authority to channel donor resources to the entity Mine Action Centres;
- A central database and mapping facility; and
- Clear standards for mine clearance operations.

In January 1997, to meet the first of these challenges, the Council of Ministers appointed a three-member Demining Commission (DC). In October of that year, the State government and the Board of Donors⁷⁹ agreed to replace UNMAC with the Bosnia and Herzegovina Mine Action Centre (BHMAL).⁸⁰ At the same time, the entity

⁷⁵ The World Bank and other major donors – notably the US – also included funds for mine survey and clearance within the budgets of the large infrastructure reconstruction projects. International companies generally managed the demining components of these projects, but often sub-contracted specific tasks to local demining firms.

⁷⁶ Initially, both the Federation and RS established mine action centres that reported to the respective entity governments and not to the UNMAC.

⁷⁷ Most mine clearance was done by commercial companies in Kuwait's post-Gulf War clearance programme, but this was financed by Kuwait.

⁷⁸ Much of the information in this section from the entry for BiH in ICBL (2004), available at: www.icbl.org/lm/2004/bosnia.en.

⁷⁹ This is the coordination body for donors supporting mine action in Bosnia.

⁸⁰ The formal handover of responsibility from UNMAC to BHCD and BHMAL occurred in July 1998.

governments agreed to integrate their Mine Action Centres and PIUs “within a defined legal framework ... acceptable to the Board of Donors.”⁸¹

Despite these steps, throughout the late-1990s mine action in BiH continued to suffer from a number of problems, including:

- Many international organisations being involved with overlapping mandates but often with very different objectives and motivations;
- The difficulty of establishing a civilian demining authority and programme management structure in a country that lacked a constitutional framework for effective governance or delivery of public service programmes, and that remained profoundly divided along ethnic lines;
- The difficulty of building a commercial demining capacity in a country that lacked either (i) a sound public procurement system, or (ii) governance traditions that distinguished between State institutions and the party in power;⁸²
- Poor cooperation among the BH, FBiH and RS MACs;
- The high cost of mine clearance;
- Limited attention by the entity armies to demining; and
- The spread of corruption that turned off donors.

In 1998, a number of attempts were made to address some of these problems, as follows:

- The International Trust Fund for Demining and Mine Victims Assistance (ITF) was established by the Slovenian government and became the principal vehicle for channelling donor funds to Bosnia's mine action programme (the US also agreed to match funds channelled through the ITF).
- UNHCR established six demining teams that surveyed, marked and cleared minority return areas and worked to strengthen demining activities via existing institutions (e.g. MAC, Entity Civil Protection Authorities (CP)).⁸³ UNHCR stopped its demining programme at the end of 1999.
- The EU started providing equipment and training for the Entity CP Authorities. By the end of 2000 the Civil Protection authorities in FBiH and RS were independent government services reporting directly to the Entity Prime Ministers.
- BHMIC replaced UNMAC; however, the two Entity MACs and BHMIC were expected to carry out coordination, including standardisation of policy and procedures e.g. establishment of standards, accreditation, certification, etc., and management of a mine action database without having effective authority.
- The first phase of UNDP support to build MAC capacities was initiated and extended into 2000.
- EAF started humanitarian demining under SFOR supervision.

⁸¹ *Demining in Bosnia Herzegovina after 1 January 98 – Agreed Principles* (30 October 1997), cited in GICHD (2005).

⁸² As GICHD (2005) reports, in many cases, the parties in power were also intimately connected with jingoistic ethnic groups that wanted to force a break-up of the country, and with criminal syndicates that financed the parties and the ethnic extremists in return for virtual immunity.

⁸³ Both FBiH and RS have their own Civil Protection (CP) Authorities; independent government agencies that are charged with issues related to “civil protection” (including participating in humanitarian demining). In 2002, for example, CP authorities cleared 11 per cent of the total cleared area (Entity Armies, Commercial Companies and NGOs cleared 22, 30, and 37 per cent respectively).

However, the initial loosely-coordinated response, allegations of corruption, poor coordination and management within the MAC structure, the lack of a coherent strategy to build local capacity of the MAC, and the increasingly high costs of clearance led to the early closure of the World Bank's Emergency Landmine Clearance Project and the dismissal of the Demining Commission by the High Representative in 2000 (on suspicion of corruption).

A new Commission was appointed in 2001 and a Demining Law was finally enacted in 2002 by the BiH Parliament, giving BHMAC authority over both entity MACs.

3. The current status of the programme

BHMAC and coordination

Since 2002, mine action in BiH has become far more centralised with the Ministry for Civil Affairs having the leading role in mine action. BHMAC has established itself as a State-level body and organises

- Training courses for staff members;
- Working groups with other organisations on daily activities and strategic planning, revision of the national demining strategy, finalisation of SOPs and standards;
- A system moving towards coordination of all aspects of mine action.

Meanwhile, other actors continued building local capacities, in particular for the EAF (supported by SFOR, since December 2004 by EUFOR), and the Civil Protection forces (supported by the EU and UNICEF). A training centre was established in 2002, including UXO clearance training and, as of 2003, the Civil Protection initiated mine risk education (MRE) training courses with UNICEF support.

In 2003, a strategic plan and four different annual work plans (for BHMAC, the two Entity MACs and Brcko district) were prepared and the quality assurance (QA) system was changed and harmonised with the International Mine Action Standards (IMAS) for all demining tasks (e.g. clearance, technical surveys). On 1 June 2003, the Demining Commission adopted new national mine action standards and the first SOPs for humanitarian demining.

The replacement of a UN structure with a centralised national one has resulted in significant improvement at policy and operational levels. By the end of 2004, BHMAC was:

- In firm control of national planning through the production of a Demining Strategy and annual plans;
- Regulating mine action through quality assurance mechanisms (national standards, SOPs, basic and senior management training standards, etc.);
- Acting as a resource information centre (information management, e.g. of surveys, database, mapping, etc.); and had
- Established a system for determining priorities and guaranteeing the quality of work (prioritisation, accreditation and certification systems).

BHMAC's enhanced role and expertise is recognised by all stakeholders. Donor institutions such as the ITF generally rely on BHMAC expertise or seek its approval before funding a mine action project. The system is now working almost without foreign technical advisers (only three remain out of an initial 47) and BHMAC profits from a competent and skilled staff.

National strategy

In October 2004, the Council of Ministers approved the revised Mine Action Strategy for 2005-09, the original one having been approved in 2003. The strategy is a result of an extensive review process involving two strategic planning groups and representatives of all national, non-governmental and international stakeholders.⁸⁴

The National Demining Strategy calls for Bosnia and Herzegovina to be free of the impact of mines and UXO by 2009 and defines an integrated plan of mine action with all the components – humanitarian demining, mine risk education and victim assistance. The strategy for humanitarian demining is based on: (a) the results from the LIS and Task Assessment projects (*see below*) and (b) on BHMAL's own categorisation of suspect areas through systematic survey as:

Priority 1: land in regular civilian use or land required for refugees or IDP return, infrastructure renewal or other economic projects (9 per cent of total suspect area);

Priority 2: close to land categorised as Priority 1 as well as land in temporary use such as agricultural and forestry land (28 per cent); and

Priority 3: all other areas (63 per cent).

The cross-referencing of these results produced the picture of landmine contamination in BiH set out in Table 2:

Table 2. Distribution of suspected area according to impacted communities and category of priority⁸⁵

Suspected hazardous area at start of 2005 (sq km)	Priority 1 area	Priority 2 area	Priority 3 area	Total suspected area (sq km) according to impacted communities (LIS)
Highly impacted communities	61.44	132.42	128.18	322.03
Medium impacted communities	176.91	336.86	574.15	1,087.92
Low impacted communities	87.92	179.03	323.09	590.04
Total suspected area according to priority categories	326.27	648.31	1,025.42	2,000.0

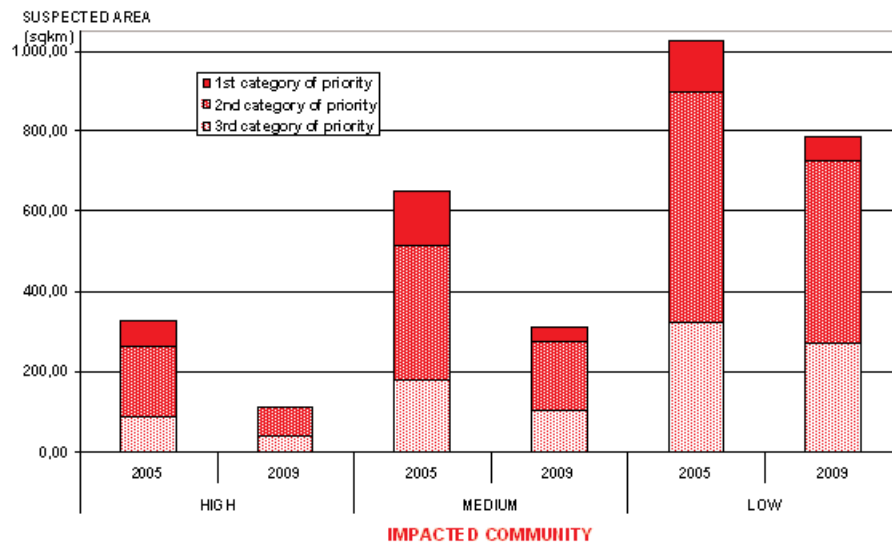
⁸⁴ Two groups were created to implement the review process strategy:

1. A strategic planning group (with the Demining Commission as the chair and key decision-makers as members, i.e. UNICEF, UNDP, OHR, OSCE, EU and BHMAL representatives).
2. A strategic planning working group defining strategic goals and objectives with relevant organisations (Ministry of Education, InterSoS, NPA, Handicap International, Help (a German clearance NGO) and others are members and the BHMAL serves as chair). Two subgroups were created following the first meeting: one technical working group on MRE and one technical working group on victim assistance (with mainly local organisations as members and government representatives).

⁸⁵ According to BHMAL (2004c: 4).

In terms of **demining** (as set out in Figure 2 below), the strategic plan calls for the reduction of suspect area by 716.39 square kilometres by the end of 2008. The plan foresees that **Priority 1** areas in **highly impacted communities** will be completely eliminated in this period, while the reduction percentage in medium impacted communities will be 47.97 per cent and low impacted communities 76.70 per cent. The reduction will take place through systematic survey (*see below*), general survey, technical survey, clearance and marking.

Figure 2. BiH mine action strategy⁸⁶



BHMAC has also included the Task Assessment and Planning (TAP) Process as a major part of the national strategy for the future. Basically, the process calls for the annual preparation of 25 community mine action plans – in high impacted areas – by BHMAC. These plans integrate the three major aspects of mine action – humanitarian demining, MRE and VA – at a community level which are then to be implemented by the various actors (EAF, CP, NGOs). However, as of writing, only one such plan was actually being implemented (in the Ulice Brcko district, by NPA).

Along with a more centralised national decision-making and planning structure, local stakeholders have taken a slightly more important role in all fields of mine action. In 2003, for example, the Army and Civil Protection (CP) authorities were responsible for approximately 29 per cent of humanitarian demining activities; in the first nine months of 2004 this had risen to 33 per cent. The trend is likely to continue, partly as a result of strategic decisions, partly due to the diminishing interest of donors. MRE activities are conducted through the public education system, CP and various NGOs, while victim assistance – the least developed area of mine action – remains predominantly the purview of the social services, international organisations (notably the ICRC) and NGOs (especially Handicap International).

BiH remains heavily dependent on international assistance for mine action funding. In 2003 the ITF and UNDP were responsible for nearly US\$13 million of international funding. In the same year, 11 governments (as well as the EC and NATO) provided

⁸⁶ Task Assessment and Planning Process, Powerpoint presentation, BHMAC, November 2004.

about US\$10.4 million for mine action, while BiH sources (national, entity level, local and municipal) provided a total of US\$7.46 million (an increase from US\$5.06 million in 2002).⁸⁷

The continued dependence on external and non-governmental actors is also evident at the operational level. In 2003, the total area cleared in BiH was 6,411,947 square metres (i.e. nearly six-and-a-half square kilometres). CP and Entity Armies were responsible for less than one third of this total; the rest was cleared by 13 NGOs and 17 commercial companies.

Thus, on the one hand, mine action in BiH has become more centrally coordinated under the firmer control of national authorities, which is reflected in the National Strategy and BHMACH's increasingly pivotal role. On the other hand – given the depressed state of the economy, the continued coordination problems posed by political and ethnic divisions, the presence of numerous actors, as well as the persistent (and projected) problems with external funding⁸⁸ – the prospect that BiH will, in fact, be “landmine-impact-free” by 2010 is far from certain.

Overview of surveys

At the end of the war and under the Dayton Agreement, the armies in the country had an obligation to submit all minefields records and maps to IFOR. Unfortunately, the information covered only about 60 per cent of known minefields. Further information had to be collected from a number of sources, particularly the local population living close to minefields and those who had been involved in laying mines during the war.

Mine action in BiH, as described above, has gone through a series of organisational crises and changes that have further contributed to the confused nature of attempts to quantify the true extent of mine and UXO contamination. The sheer number of stakeholders engaged in collecting information; the political, religious and ethnic divisions of the country; and the nature of the problem – low density contamination spread over a large geographical area – have all contributed to difficulties in making a proper assessment of the nature of the challenge. These difficulties will become apparent as we look in detail at some of the various surveys conducted in BiH (see Table 3), starting with general surveys. Because of their relative significance for present and future mine action in BiH, the LIS, the related Task Assessment and Planning (see below), and technical surveys will be discussed more thoroughly than other types of surveys.

General surveys

General surveys were initiated in 1997 to identify suspected hazardous areas (SHAs) in BiH and to improve overall control of technical field operations by the various demining organisations (who were themselves conducting limited general surveys for their own purposes). Since 1998, BHMACH has taken charge of the general survey process.

⁸⁷ See: www.icbl.org/lm/2004/bosnia.en.

⁸⁸ The need for additional funds for the strategy rises from about KM2.5 million (approx. US\$1.5 million) in 2006 to KM25.2 million (approx. US\$15 million) in 2008. (BHMACH 2004b: 18).

Table 3. Chronological list of surveys of BiH

Date	Type of survey	Objectives
1997	General survey by demining organisations.	Technical tasks (e.g. clearance) identification to reduce suspected areas. Assessment of the overall mine situation in country.
1998	Agreement for general survey to be taken over completely by BHMAC.	
1999	Systematic survey by BHMAC (can be related to the General Assessment in IMAS) in the Federation of Bosnia and Herzegovina.	Hazard area identification (polygons of suspected areas). Broad overview of contaminated areas in Bosnia and Herzegovina with more geographical accuracy than general survey.
1999	General survey conducted by BHMAC only.	
2001	Task Impact Assessment by NPA.	To ensure that tasks respond to NPA and local authority priorities and have a positive impact on communities.
2002/2003	Landmine Impact Survey (final report August 2004) by Handicap International/SAC.	To determine the impact of mines/UXO on communities using socio-economic indicators.
2003	Systematic survey initiated in Republika Sprska.	Hazard area identification (polygons of suspected areas). Broad overview of contaminated areas in BiH with more geographical accuracy than general survey. Linkages with systematic survey in the Federation.
2003/2004	Technical Survey by organisations.	To confirm more finitely clearance tasks. To reduced contaminated areas in a timely and cost-effective manner.
2003/2004	Task Assessment and Planning (TAP) by BHMAC/SAC.	To define Integrated Mine Action Plan for Highly Impacted Communities.
2003	Knowledge, Attitude and Practices (KAP) survey by ICRC (based on the evaluation of MRE programmes in Croatia, Bosnia-Herzegovina and Kosovo).	To increase the effectiveness of MRE programmes to meet the needs of affected communities.
2003/04	Victim Assistance Survey by Handicap International.	To provide information on victim assistance resources and gaps in order to elaborate a comprehensive long-term strategy for landmine victim assistance in Bosnia and Herzegovina.
2004	MRE survey by Handicap International.	To elaborate strategic options for integration of MRE into the school curriculum in Bosnia and Herzegovina and for the harmonisation of curriculum.
2004	MRE survey by InterSoS.	To assess the perceptions
2004	MRE survey by Genesis.	To identify the current level of mine/UXO knowledge and awareness among school children and schoolteachers. To analyse local communities needs and design and/or improve methodologies
2004	MRE survey by Proni.	To assess the existing needs and capacities to plan effective and integrated mine action intervention at community level
Forthcoming	Planned survey for media by BHMAC/UNICEF.	To identify training needs for local media as regards mine action issues with a view to ensure their effective participation in the circulation of information relevant to risk management.

A general survey identifies the nature of the technical task in each SHA (i.e. the need for a technical survey or to start demining). If an organisation decides to conduct the technical task, a Red Folder, prepared by BHM MAC, is handed over to the relevant organisation (including maps, photos, basic data on the location, an operational plan and details on the socio-economic impact of the plan).

BHM MAC general surveys provide overlapping information with the LIS but, due to limited capacity, have been conducted only in Priority 1 areas. There were around 20 surveyors in 1998 and this number increased to 40 in 2004. Surveyors in charge of general survey also attended a demining training course so that they could carry out “secondary” inspection when needed. (There are around 30 inspectors controlling ground operations, and, in total, 70 staff members are familiar with the process of general survey.) General surveys permit a good overall picture of the mine and UXO situation, can be used to reduce suspected areas, and can help in defining a national demining strategy. In BiH, it is the basic reference point for any mine action by the Entity Armed Forces.

Some demining organisations, such as NPA, consider general surveys unreliable. Thus, NPA conducts a short re-survey before starting technical survey, does its own mapping (ordinary land measurement methods), and has its own database to keep track of activities and tasks carried out.

Systematic surveys

Systematic survey started in the FBiH in 1999 and in RS in 2003. Overlapping with general surveys, systematic surveys give more accurate information on SHAs and have resulted in the reduction of the size and number of SHAs in the Federation by more than 50 per cent. Systematic survey is the main method of reducing SHAs in BiH.

Systematic survey provides, through polygons of suspected areas, precise geographical data on contaminated areas, and has contributed to the elaboration of BHM MAC's mine action strategy and the determination of operational plans. Much like general surveys, systematic surveys provide some overlapping information with the LIS (*see below*).

Technical surveys in BiH

Agency	Demining organisations and institutions
Client	BHM MAC
Type	Technical Survey
Objectives	To determine the exact boundaries of contaminated areas. To reduce contaminated areas in a timely and cost-effective manner)
Dates/duration	2003 to date (ongoing)
Scope	National
Focus	Suspected contaminated areas in selected communities (mainly high impact communities)
Information management	Based on general survey, systematic survey, and LIS information from BHM MAC
Cost	Depending on agencies carrying out the task. Strategic Plan for 2005, approx. US\$8.5 million

Expressed need for the survey

As clearance of all suspected areas in Bosnia and Herzegovina will take time and availability of funds is limited, it was essential to find a way to reduce contaminated areas to their real boundaries in a timely and cost-effective manner. Technical survey was introduced in 2003 as a partial answer to this need.

Objectives of the surveys

- To distinguish within SHAs between areas to be cleared and “Areas Without Obvious Risk” (AWOR) that could be returned to civilian use.

Implementation

As part of the general survey process, surveyors go to the field and collect information on contaminated areas. If one area is suspected to be dangerous but the presence of landmines is unsure, it will be targeted for technical survey. A priority list for technical surveys and for clearance tasks was established for 2004 (and for 2005) and adopted by the Entity Governments and Brcko district. In general, the plan is to increase the size of the area targeted for technical survey in the future, in part by integrating technical survey into the community mine action plans being developed annually. The first areas targeted are high impact communities (as defined by the LIS).

Usually, if there is a clear indication of mines during a general survey, then a technical survey is conducted to reduce the size of the suspected area and to determine the exact perimeter of the minefield. But in BiH, given the low density of mines and likelihood of overlapping minefields, even if the general survey shows no indication of mines (e.g. no visible mines, no accident etc.) in a suspected area, a technical survey may still be necessary to avoid the potential of accidents from mines that were not detected during general survey. BHM MAC developed procedures on how to conduct technical surveys (which could be called the final step or verification of general survey). BHM MAC has issued SOPs for technical survey (to cover differences in ground surfaces and priority level) which are summarised in Annex 2.

Actual output

BHM MAC's goal for 2004 was for 18.3 square kilometres to be cleared through technical survey. As Table 4 demonstrates, the goal was nowhere near reached: less than 1 square kilometre had been “cleared” by technical survey during the year to October.

In addition to the nature of landmine contamination (low density, often located in terrain that is difficult and time-consuming to survey), the main reason for the shortfall is lack of accredited machines (16) within the seven implementing bodies and organisations: technical survey has been conducted mainly by CP, the Entity Armies and some NGOs (with NPA having the most significant TS capacity).

Table 4. Size of technically surveyed areas in BiH, January-September 2004⁸⁹

CANTON/ADMINISTRATIVE REGION	Cleared area in m2	AT mines found and destroyed	AP mines found and destroyed	UXO found and destroyed	Houses cleared
BOSANSKO-PODRINJSKI CANTON	7,916	/	9	/	/
HERCEG-BOSANSKA CANTON	335,995	/	/	1	/
HERCEGOVAČKO-NERETVANSKI CANTON	39,322	/	1	6	8
POSAVSKA CANTON	12,413	/	/	/	/
SARAJEVSKI CANTON	363,612	/	1	53	/
SREDNJE-BOSANSKI CANTON	9,236	/	3	/	/
TUZLANSKI CANTON	61,643	1	3	1	/
UNSKO-SANSKI CANTON	21,872	/	3	/	/
ZENIČKO-DOBOJSKI CANTON	4,178	/	1	1	/
FEDERATION OF BH	856,187	/	21	62	8
BRČKO DISTRICT	51,587	/	/	/	/
REPUBLIC OF SRPSKA	54,248	/	1	1	/
TOTAL :	962,022	1	22	63	8

Information management

Information from general survey, systematic survey and LIS is used to define the technical tasks. Once the technical survey has been defined, then selected and conducted by one organisation, the relevant data is entered into the BHMALC database. A quality control certificate is then produced by BHMALC for the relevant area, confirming to people which part of the land – declared as AWOR – can be used for civilian activity and which part will be marked for clearance.

Post-clearance documentation will include the final report from the agency which carried out the technical task, the technical project, minefields records, mine accidents, mine lifting information, surveyed/cleared areas, relevant maps, the quality control certificate, etc.

Outcomes – use of survey output

Ideally, at the operation level, technical survey, by reducing the contaminated areas, speeds up the clearance process and therefore saves resources, time and lives. Given the recent introduction of technical survey in BiH – and the shortfall in meeting actual goals – it is difficult to estimate the actual outcome. Nevertheless, certainly in the Brcko area where NPA is implementing the TAP, technical survey has successfully speeded up the clearance process.⁹⁰

Technical surveys are recognised as an increasingly significant part of the overall BiH mine action strategy for the remainder of this decade. They will be conducted in two ways:

- As part of integrated community mine action plans (e.g. Brcko/NPA); and

⁸⁹ BHMALC (2004c).

⁹⁰ Interview with Per H. Breivik, NPA Operations Manager, Mine Action Team BiH, November 2004.

- As individual projects that help eliminate high impact areas or enable access to (use of) economically significant resources.

The shortfall in 2004 led to a revision of the size of technical survey areas within the BiH Strategic Plan. Nevertheless, technical survey area is slated for an increase as follows (in square kilometres):

- 2005: 6.5;
- 2006: 11.7;
- 2007: 16.5; and
- 2008: 18.0.⁹¹

While the use of TS makes eminent sense as a method of speeding up the continued reduction of the size of the SHAs in BiH, the experience so far indicates that there are two inter-related problems.

First, as already indicated, at the moment organisations active in BiH don't have enough accredited machines necessary for conducting technical survey at an accelerated rate. Thus, a major investment in such machinery is needed if the targets set in the Mine Action Strategy are to be reached. Given the expected outcome – more land released for civilian use faster than through actual clearance – such an investment seems worthwhile, particularly in areas where a partial release would make a significant impact on the local economy.

Second, securing adequate funding may prove difficult. The BiH Mine Action Strategy calls for an increase not only in the size of the area targeted for TS, but also – naturally – for an increasingly sizeable proportion of resources devoted to humanitarian demining to be devoted to technical survey. In 2006, the plan is to have more funds devoted to technical survey than clearance. In 2005-2008 more than half of the resources for humanitarian demining are to go to technical survey.⁹²

However, from a donor perspective, technical surveys are less attractive to fund as they do not directly result in the practical destruction of mines and UXO, but rather in the confirmation that there are no mines or UXO in the suspected areas. Although donors are aware that technical surveys will lead to good demining projects, they are usually more interested in funding physical demining activities. A partial answer to this problem may yet be offered by integrated community mine action plans that include technical survey as one element.

⁹¹ BHMAL (2004b).

⁹² *ibid.*

The BiH Landmine Impact Survey

Agency	Handicap International/Survey Action Center (SAC)
Client	BHMAC
Type	Landmine Impact Survey (LIS)
Objectives	To define the socio-economic impact of mines/UXO at community level; to improve national planning and effectiveness of mine action.
Dates/duration	October 2002-December 2003 (and four-month extension). Finally released August 2004.
Scope	National
Focus	Socio-economic impact of mines and UXO within communities.
Information management	BHMAC and IMSMA databases. Analysis of information by SAC and BHMAC/Handicap International.
Cost	US\$1,500,000 initially. US\$2,006,730 (after extension). (Co-funders: US – US\$999,000; EC – US\$852,000; Canada – US\$156,000)

Expressed need for the survey

The Survey Action Center has been implementing impact surveys worldwide since 1998 (a total of ten had been completed at the time of writing). In June 2000, SAC conducted a fact-finding mission to BiH to study the feasibility of an LIS. SAC developed a country plan and first presented the project to BHMAC in 2001. After an SAC Advance Survey Mission to BiH in March 2002, an agreement to conduct an LIS was reached between BHMAC and SAC. Through a tendering process, Handicap International was selected to carry out the project and the LIS was formally initiated in October 2002.

The agreement took time because of scepticism about the utility of the LIS for a country that had already been covered by several surveys. But the need for an authoritative dataset that could be used to refine the BiH mine action strategy – and pressure from outside donors who wanted a comprehensive picture of the mine/UXO problem and who were frustrated by the slow process of clearance – pushed BHMAC to accept the proposal for an LIS.

It is clear that the survey was not conducted for purely informational purposes but also as a way of securing continued outside interest in mine action in the country. (Indeed, ITF and NPA felt that the LIS should have been performed soon after the end of the conflict and not seven years later, so that an adequate strategy could have been implemented earlier.)⁹³

This is not to say that the LIS did not respond to a real need for information. For example, the NPA representative interviewed complained of the poor quality of general surveys conducted in BiH. Others (e.g. members of SFOR) echoed these sentiments maintaining that the LIS was “money well spent”.⁹⁴

⁹³ Interview with Roman Tursic, ITF Project Manager, November 2004; and Peir Breivik, NPA Operations Manager, Mine Action Team BiH, November 2004.

⁹⁴ Interview with Per Breivik, NPA, November 2004; and interview with SFOR MICC members (Milad Cerimagic and Major Martin Grunwald), November 2004.

Objectives of the survey

- Define the scale and socio-economic impact of landmine contamination in BiH;
- Provide a reliable national database to be used in future mine action planning; and
- Establish baseline data for measuring the overall performance of the mine action programme.⁹⁵

Planned outputs

The major planned output of the LIS was a comprehensive study of the socio-economic impact on communities of mine/UXO contamination, with three general components:

- Information on mine and UXO victims and general behavioural patterns;
- General information on topography, infrastructure, conflict history and threat; and
- Information on the socio-economic impact of mines and UXO on affected communities.

The LIS was to provide the three major partners of mine action – national authorities (mainly BHMAC), donors and implementing agencies – with a common database of the needs of the primary stakeholders: the local communities. The database would give national authorities the ability to manipulate data in a transparent way responsive to national priorities. Donors (via the ITF) would have data conforming to international standards, and implementing partners (e.g. NPA) would have detailed information for tasking resources and measuring progress across all areas of mine action.

Handicap International implemented the survey in accordance with the principles and operating protocols established by the Survey Working Group (SWG). Data collection started in March 2003 and was completed in October 2003.⁹⁶

HI established five regional offices in regular contact with the regional MACs. Sixty people worked on the project, including two SAC international staff members. Five regional coordinators, supported by five assistants, supervised and monitored the project. Sixteen two-person surveyor teams implemented the LIS at field level and were supported by an operational coordinator, a data quality officer and nine other support staff in Sarajevo. A total of 23 vehicles supported the operations.

BHMAC and Civil Defence/Civil Protection (CD/CP) provided the HI team with extensive support, including coordination and liaison at regional and municipal level. Four meetings were organised with the Demining Commission during implementation. Meetings were also organised with the ITF and US representatives.

More than 2,900 (out of a total of 6,146) communities in BiH were visited by HI. A total of 1,366 were identified as affected by mines and UXO.

The survey had four phases: (1) a preliminary expert opinion collection phase to define the number of communities to be surveyed; (2) the actual surveying of communities selected; (3) a smaller-scale complementary survey phase; and (4) a negative sampling phase.

⁹⁵ www.sac-na.org/surveys_background.html.

⁹⁶ For a brief account see: www.sac-na.org/surveys_bosnia.html.

Phase I: Expert opinion collection.

Seven sources of expertise were contacted: BHM MAC, mine action coordinators at municipal level, Civil Protection, NPA, the ICRC, the Landmine Survivors Network and the OHR. The list of 6,146 communities was handed to them and the “experts” were requested to provide feedback on which communities were affected. The responses were used to select the communities to be visited by the LIS teams.

Phase II: Survey implementation by LIS teams.**Phase III: Complementary survey.**

To ensure that all affected communities were targeted (the villagers might not always know everything), HI used BHM MAC maps and overlapped them with selected communities: 668 additional communities were identified and 10 per cent were selected and visited (67 communities).

Phase IV: Sampling.

In the last phase, a sampling of non-suspected (and non-visited) areas was made. Of 3,211 non-suspected areas, 312 were visited and 10 communities were found to be affected.

A four-month extension was required to complete the project (with US\$156,000 of funding from the Canadian International Development Agency – CIDA). This resulted in a delay in the production of the report, which was finalised in the spring of 2004. UN certification was received in August 2004 and the final version was then distributed to stakeholders.

In addition to the four phases above, a Task Assessment and Planning (TAP) pilot project was incorporated into the LIS. With fieldwork conducted in two phases in August and September 2003 by BHM MAC, the TAP project provided more detailed information on eight high-impact communities (and 38 SHAs within such communities). TAP is discussed in detail below.

Actual output

According to its executive summary, the major conclusion “relevant to mine action” of the *Landmine Impact Survey, Bosnia and Herzegovina* was that the impact of mine contamination was particularly severe on communities engaged in agricultural pursuits near the former frontlines. This was hardly a new finding but rather confirmed the general facts already known. The LIS results are indicated in the map below.

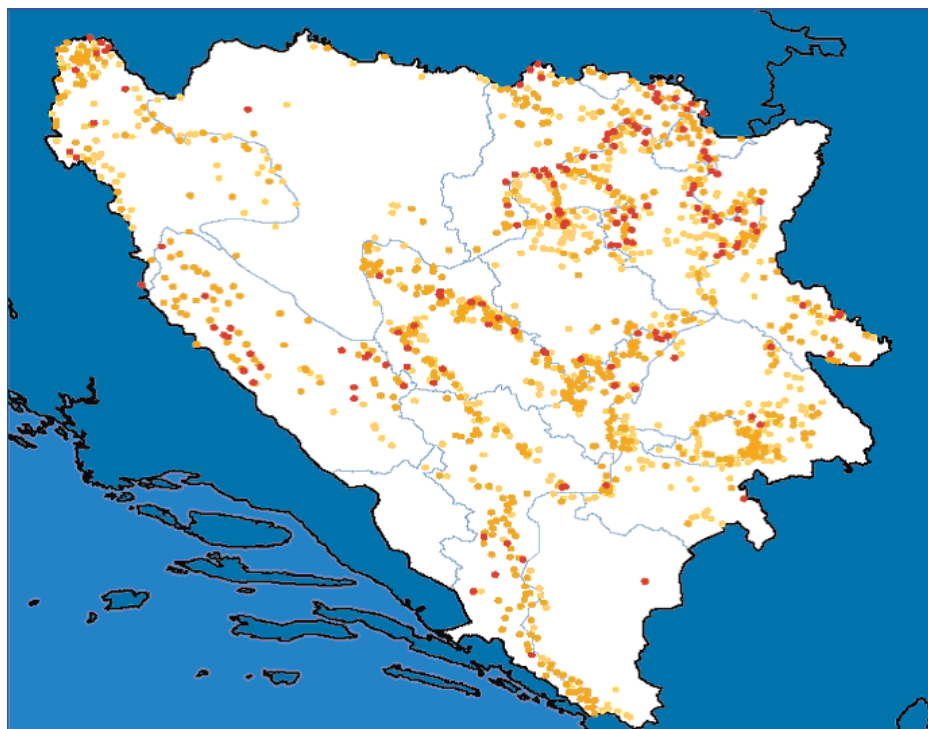
To define the scale, type, location, hazard and social/economic impacts of mine contamination in BiH, the LIS categorises individual communities – based on the level of the socio-economic impact of contamination – into high, medium or low impact. To do this the LIS used the “**mine impact score**” to take into account:

- The nature of munitions in the SHA (presence of mines/UXO);
- The types of livelihood and institutional areas to which mines are blocking access (cropland, community's pasture, water points, non-cultivated area, housing area, roads, other infrastructure such as schools and hospitals); and
- The number of “recent” victims of mine incidents (i.e. those killed or injured in the previous 24 months before the passage of the survey team in the community).

The presence of any of the above gave a community a score of 1 (in most categories) or 2 (presence of mines, blockage to irrigated cropland, recent mine victims – 2 for each victim). These scores were then tabulated to arrive at the categorisation of communities as high (score of 11 and above), medium (6-10), or low (1-5) impact.

In the final stage of the LIS (and in accordance with protocols set by the SWG), the generic scoring system was modified to meet the country-specific needs of BiH by allowing local authorities – BHMIC and its regional representatives, the Demining Commission, CP/CD – to set specific “weights” to most of the indicators used in calculating the mine impact score.⁹⁷

Landmine Impact Survey, Bosnia and Herzegovina



LIS RESULTS AS OF NOVEMBER 2003

Community impact category

- High
- Medium
- Low

In the end, the LIS identified 1,366 mine-impacted communities in 128 municipalities of the total of 148 in BiH. Contamination amounted to 2,134 distinct mine- and UXO-contaminated sites. The survey covered 92 per cent of all suspected communities in BiH (the other 8 per cent had been excluded after phase I) and 10 per cent of non-suspected communities as a false negative sample.

Of the 1,366 affected communities, 154 (11 per cent) were categorised as high impact,, 696 (51 per cent) as medium impact and 516 (38 per cent) as low impact. Before the national authorities' weighting the number of high and medium impact communities

⁹⁷ This process is explained in greater detail in SAC & BHMIC (2004: 173-178 (Annex III)).

was lower (3 per cent high impact, 45 per cent medium, and 52 per cent low) than it was thereafter.⁹⁸

Information management

Once collected, the data was coded and entered into the IMSMA database for analysis. All data entry was carried out at BHM MAC offices. BHM MAC has the IMSMA database as well as its own database but both databases have not been integrated, an issue which is still being addressed.

The Quality Management System included internal quality control based on the ISO 9000:2000 Standard and external UN Quality Assurance Monitoring (there were two QAM interventions in 2003, one before data collection began and the other during the collection phase).

Outcomes, potential outcomes, and shortcomings

The LIS ranking into high, medium and low impacted communities is key information for national and strategic planning purposes. While the LIS hardly challenged any of the well-known general facts about the nature of land contamination in BiH – e.g. that the country suffers from a low density of mines spread over a wide area – BHM MAC used LIS data to revise the BiH National Demining Strategy for 2005-2009. This process started in August 2003 and SAC subcontracted Cranfield Mine Action and GeoSpatial International to assist BHM MAC.⁹⁹ The work was completed in October 2004 when the Council of Ministers formally approved the Revised Mine Action Strategy.¹⁰⁰

The LIS provided, though, only part of the information used to refine this strategy. For example, the humanitarian demining part of the revised Demining Strategy is based on cross-referencing the LIS results (high-, medium- and low-impact communities) with the BHM MAC prioritisation of clearance (first, second and third priority areas). Logically, high-impact communities in first priority areas will be targeted first – the long-term goal is to eliminate contamination in such areas in BiH by 2009.

In terms of macro-level planning, the timing of the LIS was in fact fortuitous: the new demining law of 2002 centralised mine action planning into the hands of BHM MAC, and the LIS gave an additional means of devising short-, medium- and long-term strategic plans at the national level. By acting as an important element for the revision of BiH mine action strategies and assisting BHM MAC to refine its priorities, the LIS was also extremely useful for enhancing coordination of mine action in BiH. All stakeholders interviewed expressed satisfaction with the results and with the follow-up towards integrated community mine action. The results of the survey also rekindled the interests of donors in supporting mine action in BiH. Thus, according to the ITF, donors who had been disillusioned in the late 1990s were showing a renewed interest in BiH in 2004.¹⁰¹

⁹⁸ SAC & BHM MAC (2004).

⁹⁹ ICBL (2003), available at: www.icbl.org/cgi-bin/print.cgi.

¹⁰⁰ BHM MAC (2004b).

¹⁰¹ Interview with Roman Turkovic, ITF, November 2004.

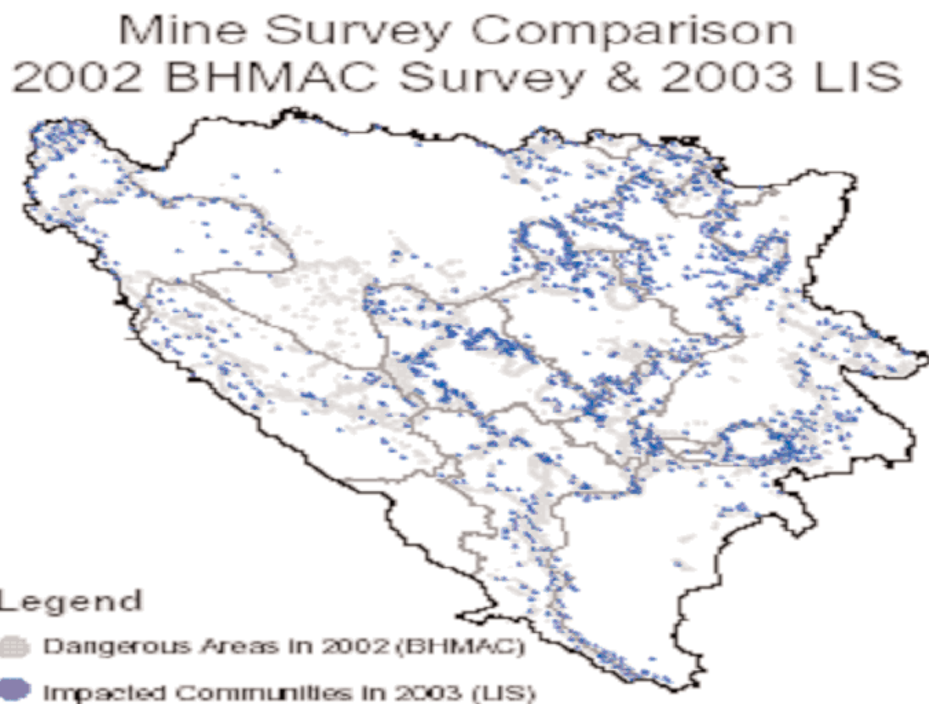
In practice this means that the LIS has proved useful. But was it worth the cost of more than US\$2 million? Two points should be stressed: first, the information provided by the LIS was not entirely new; second, the information overlapped with previous findings. At best, one can conclude that the LIS helped refine mine action strategy in BiH; at worst, one can characterise it as unnecessary and costly effort that overlapped with already existing surveys. Either way, the LIS's practical significance is marginal rather than decisive for the future of mine action in BiH.

In this context, the following serious shortcoming, as described by BHMACH, is worthy of note:

- Comparison of the results of the systematic survey and LIS results, led to overall conclusion that... LIS did not identify all impacted communities... Final examination shows that 70.13 per cent of suspected area is inside the impacted communities, or 29.87 per cent is outside the identified communities.¹⁰²

This is a serious shortcoming representing almost one third of the suspected area in BiH and calls into question the actual reliability of the LIS. As BHMACH puts it: "LIS results are a representative sample of the distribution of suspect area according to impacted communities and categories of priority in 1,366 identified communities." But, as noted above, the LIS "missed" a large number of suspected communities (potentially as many as 600). Representative does not, in short, mean comprehensive.

The map below identifies the overlap between BHMACH data in 2002 and LIS findings.



*Mine Survey Comparison 2002-2003*¹⁰³

A summary of results from the LIS is set out in Table 5. The method of negative sampling used in the survey further undermines the claims to comprehensiveness.

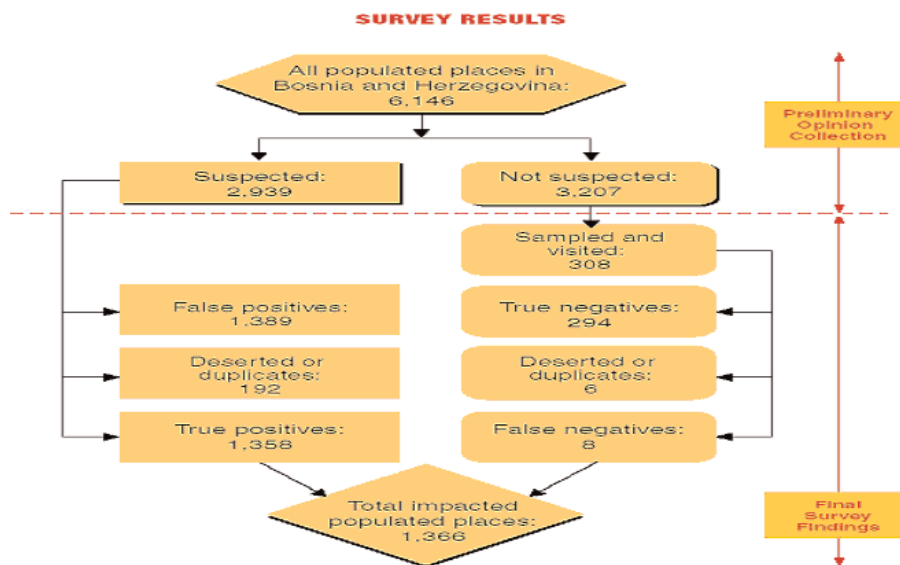
¹⁰² BHMACH (2004b).

¹⁰³ From SAC website: www.sac-na.org/pdf_text/bosnia/BiH_WallMap.pdf.

Roughly 3 per cent of communities not suspected to have landmines were actually found to be contaminated. Because only a proportion of non-suspected communities were sampled, it is possible that there may be close to 100 similar (falsely assumed not to be contaminated by landmines) communities in BiH.

The explanation for the “missing” communities is that they were not selected in the expert opinion collection phase of the LIS. To achieve 100 per cent accuracy, these results would therefore need to be reviewed.

Table 5. LIS summary of results, including negative sampling



Such shortcomings notwithstanding, the representatives of all stakeholders interviewed for this study expressed at least lukewarm satisfaction with the LIS as an important and authoritative tool for prioritising the future use of resources available for all aspects of mine action in BiH.

But while the LIS proved useful for strategic purposes – it was, one authority put it, highly accurate on a “strategic level” – the survey was relatively meaningless on the micro “operational” level.¹⁰⁴ In other words, the LIS did not generate sufficiently precise geographical data to be used to devise specific mine action plans at the community level.

¹⁰⁴ Interview with David Rowe, BHMACH, November 2004.

Task Assessment and Planning

Agency	Survey Action Center (SAC)/BHMAC
Client	BHMAC
Type	Task Assessment and Planning (TAP)
Objectives	To determine appropriate mine action activities in impacted communities
Dates/duration	Summer 2003-January 2004: Pilot Project; 2004 onwards: implementation
Scope (national provincial etc.)	National but targeting 154 high impacted communities initially
Focus	Integrated mine action plan according to communities' needs
Information management	BHMAC database; SAC for pilot project; Information analysis along with LIS, general survey and systematic survey data.
Cost	The pilot project funded from the overall budget for the LIS (ca. US\$16,000); the cost of subsequent community projects unknown at the time of writing

Expressed need for the TAP

During the LIS, BHMAC acknowledged the need to establish more links with the affected communities in order to better target mine action interventions. A Task Assessment and Planning (TAP) pilot project was subsequently undertaken in order to link the results of the LIS with operational mine action in BiH, and to use this as a basis for developing a more advanced mine action assessment and planning model at the micro-level. The TAP was considered necessary, as one BHMAC representative put it, to make the LIS “real”.¹⁰⁵

Objectives of the survey

- To link the results of the LIS with operational mine action in BiH and to use this as a basis for developing a more advanced mine action assessment and planning model at the micro level;
- To provide better planning information at community and SHA levels to define what kind of mine action activities should be conducted in targeted communities (initially in high-impact communities); and
- To provide information in order to reduce the level of impact of mines and UXO on affected communities.

Planned outputs

- Pilot project report;
- A Community Action Plan for each community visited including: basic information on community (from the LIS); information from the general survey on the relevant targeted high-impacted community, systematic survey's map and boundaries of local community; mine action plan; expectations from the plan; estimated costs to carry out the plan, etc.; and
- Evaluation report at the conclusion of the project.

¹⁰⁵ Interview with David Rowe, BHMAC, November 2004.

Implementation

A Memorandum of Understanding was signed in May 2003 between BHMAL and SAC to carry out the TAP. In July 2003, BHMAL selected 15 communities for the pilot project – all defined as high-impact communities in the LIS – in cooperation with Handicap International and from a review of available data obtained through the various surveys. Also in July a preparation seminar was held for operational officers from BHMAL regional offices who then returned to their posts to train the survey teams.

Fieldwork took place in two phases, the first (August 2003) in eight selected communities (with a total of 38 SHAs as defined in LIS), the second (September 2003) in seven selected communities (with 16 SHAs).

During the first phase, however, almost twice as many surveys were actually conducted in the eight affected communities as had been originally planned. As a result, the first phase was extended and it was agreed that only eight high-impact communities would be targeted in the pilot project. A total of eight mine action plans were completed, translated into English, and sent to the SAC which approved the pilot project and produced a final report in January 2004. Simultaneously, however, BHMAL went ahead and conducted TAPs in the other seven communities, independent of its contractual obligations to SAC.

Two evaluation meetings were held, in September 2003 (to present the results of the TAP in the eight affected communities) and in November 2003 (to focus on project methodology with an emphasis on population classification, problems with estimating the likelihood of minefields, definition of potential benefits, and ways of integrating mine action components).

Actual output

The final TAP pilot project report was included as an annex to the LIS.¹⁰⁶

A total of 25 community mine action plans based on the TAP model were in the process of being produced for high impact communities in 2004 and another 25 annually thereafter. NPA started implementing a TAP in the Brcko District in 2004 (*see below*).

Information management

Information from systematic survey, LIS, general survey, BHMAL database, etc. was initially used to select the high-impact communities in which the TAP pilot project was conducted.

The MAC operation officers at regional level – the TAP focal points – coordinated the collection of data and data analysis to prepare community mine action plans (from initially eight impacted communities).

Those plans and related information were sent to the SAC, which analysed the information, approved the pilot project and produced a final report in January 2004. In August 2004 TAP, along with LIS, received UN certification.

¹⁰⁶ SAC & BHMAL (2004: Annex VII).

Outcomes and potential outcomes – the use of survey results

TAP has become the basis for a new BiH-wide model of priority-setting in mine action at the community level and is the prototype for future similar surveys in high-impact communities. TAP represents the general move of BiH mine action strategy towards integration of all mine action components at the community level. Flowing from the LIS, TAP focuses on the socio-economic impact of mine risk and potential benefits for the at-risk community. Moreover, rather than focusing on the pure clearance of risk areas (risk elimination), the focus is shifting to risk reduction and risk impact reduction.

In 2004, NPA commenced its TAP project in Brcko district and another six have so far been approved for implementation starting in 2005. BHM MAC prepared 24 TAPs – also referred to as Community Mine Action Plans – in 2004 and another 25 are slated for preparation in 2005. In short, TAP is used to connect all mine action components (survey, reduction, clearance, mine risk education, marking, victim assistance) and integrate them into a series of micro-level plans.

From 2004 onward, the TAP procedure has been adopted for other impacted communities. BHM MAC is standardising the TAP, training operational and management staff, and continuing with fieldwork and integration of all mine action at community level. Initially, the TAP will focus on the 154 high-impact communities defined by the LIS.

Task Assessment and Planning Process, 2004-2005¹⁰⁷

2004

COMMUNITY MINE ACTION PLANS TO BE PREPARED BY BHM MAC	IMPLEMENTATION		GIVEN TO THE DONORS FOR CONSIDERATION	
	IMPACTED COMMUNITY	IMPLEMENTING ORGANIZATION	IMPACTED COMMUNITY	TAKEN BY
24	1	Ulice-Brčko	NPA	0

2005

COMMUNITY MINE ACTION PLANS TO BE PREPARED BY BHM MAC	IMPLEMENTATION		GIVEN TO THE DONORS FOR CONSIDERATION		
	IMPACTED COMMUNITY	IMPLEMENTING ORGANIZATION	IMPACTED COMMUNITY	TAKEN BY	
25	6	Matic	Army	Zavala	ITF-Austrian Embassy
		Bijela Ploca		Srbijani	
		Boskovići		Sizje	UNDP MA Portfolio
		Makljenovac	Civil Protection	Puticevo	
		Ulice-Brčko	NPA	Sijekovac	
			Bosanska Bojna	Japanese Embassy	

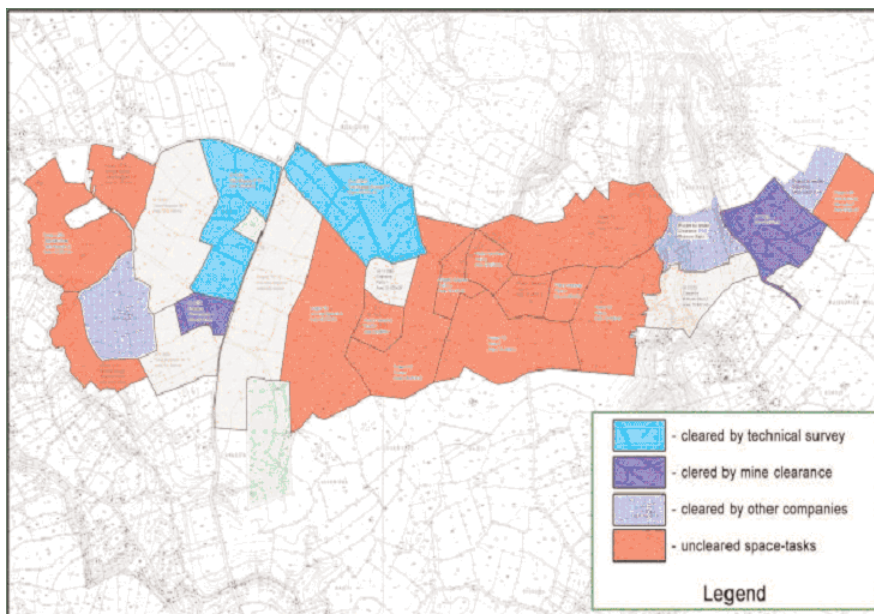
One (and so far the only) “living” example of a TAP (at least four others were due to be initiated with the start of the demining season in 2005) is the NPA’s TAP project in the community of Ulice in the district of Brcko. Independently administered, on the front lines of the three armies during the war, and a site of relatively frequent landmine incidents (due to a high rate of returnees), Brcko remained heavily contaminated after the war (in 2003 BHM MAC estimated that mines/UXO covered

¹⁰⁷ “Task Assessment and Planning Process”, Powerpoint presentation, BHM MAC.

about 12 per cent of Brcko – in comparison to 1.6 per cent in RS and 6 per cent in Federation).¹⁰⁸

NPA's Integrated Community Mine Action plan in Brcko, initiated in May 2004 and expected to be finished in 2005, includes, as set out below: 14 technical survey projects (covering ca. 1,807,780 square metres), eight mine clearance projects (300,271 square metres), permanent marking and MRE. The total area covered by the project is 2,107,051 square metres.

Brcko district NPA TAP project



Given that only one TAP is currently under way and none have been completed, it is difficult to measure the success of the TAP process at the moment. One can safely assume that, based on NPA experience in Brcko, TAP will have a positive impact at the community level. However, while progress towards the reduction of landmine contamination in BiH will undoubtedly be more focussed it will not necessarily proceed any faster.

While the TAP model is a worthwhile and relatively inexpensive process, making the actual selection process will be difficult and depend often on the “attractiveness” of each project to donors. Thus, the TAP/Community Mine Action projects will be divided into two tiers:

- Communities where success is relatively easier to “prove” and achieve – for example, in much of Brcko the terrain is flat, making the district relatively easy for demining activities – and will attract donors.
- Other communities that do not attract outside funding as easily and will become the “domain” of local government actors (entity armies, CP).

Mine risk education surveys

From October 2001 to April 2002, there was an external evaluation of ICRC's mine

¹⁰⁸ www.db.idpproject.org/Sites/IdpProjectDb/idpSurvey.nsf/.

awareness programmes in Bosnia and Herzegovina, Croatia and Kosovo.¹⁰⁹ The evaluation included a survey on the *Knowledge, Attitudes and Practices (KAP)* of people towards mine/UXO dangers.¹¹⁰ A manual analysis of the survey results of 1,546 respondents was produced by ICRC Sarajevo and presented to all relevant stakeholders in the country in 2003.

The data from the ICRC evaluation – along with the LIS – became the baseline for BHMIC and other MRE bodies to define target groups, types of activities and areas where MRE should be implemented. The first annual MRE national plan was approved in mid-2003 by the Demining Commission and integrated into the national strategy in 2004.

In 2004, Handicap International, InterSoS, Proni and Genesis – all supported by UNICEF – carried out a number of specific MRE surveys:

- Handicap International's survey, in April to August 2004, assessed previous experiences in MRE and measured awareness and knowledge among pupils, school directors and teachers. Based on the LIS categorisation of communities, the MRE Survey covered 166 primary and secondary schools in high (1/3), medium (1/2) and low (1/6) impacted areas. MRE questionnaires were filled by 2,692 pupils, 530 teachers and 59 school directors.
- The Genesis (a local NGO) MRE survey also targeted schoolchildren and teachers.
- The Proni (a local NGO) and InterSoS (an Italian NGO) surveys focused on mine awareness at the community level. Former Handicap International staff members employed to carry out the LIS were hired to carry out the InterSoS MRE survey so that skills and experiences in conducting interviews were not lost.

The information from these surveys is being used to define the best strategies for Community Mine Action Plans. According to Handicap International, their survey indicated a generally good level of awareness about mines and UXO, but found that this did not translate into risk-averse behavioural patterns.¹¹¹

MRE surveys have focused on activities within the educational system. But relatively little is known about the MRE needs, successes and activities outside the educational sector. The LIS devoted little attention to MRE, yet one of its findings was that less than one quarter of the 1,366 impacted communities reported MRE activities outside schools (and only 26 per cent in schools). There is a need for information of the MRE needs of adult populations (particularly in rural areas where most landmine incidents take place) and the best methods of reaching such populations.

Victim assistance survey

Victim assistance has been the least focused mine action activity in BiH. Direct support to mine victims has been established by international organisations (notably the ICRC) on an ad hoc basis while the two entity governments' social and healthcare policies are to provide assistance to persons with disabilities (including landmine victims).

¹⁰⁹ ICRC now refers to mine awareness as mine risk education, in conformity with general practice.

¹¹⁰ ICRC (2002).

¹¹¹ Interview with Melissa Sabatier, Handicap International, Sarajevo, November 2004.

Since 2002, a consistent effort has been made to define a coherent nationwide victim assistance strategy. In September 2003, BHMIC initiated regular landmine victims' assistance meetings. Simultaneously, Handicap International (with UNICEF support) conducted a survey of resources and long-term needs for victim assistance on behalf of BHMIC. The initial report was presented at a workshop in Sarajevo in November 2003 and distributed in printed form in December 2003. The report – essentially a “desktop survey” of the state of victim assistance in BiH that built on information from, among others, the LIS and the ICRC – analysed the legislative framework, existing programmes and information sources. It recommended:

- Establishment of a Landmine Victim Assistance Information and Research System;
- Improved coordination between stakeholders;
- Strengthening BiH's rehabilitation care system;
- Harmonisation of access to that care system; and
- Promotion of employment to mine victims.

These recommendations were included in the revised BiH Mine Action Strategy adopted in October 2004.¹¹²

Other surveys

UNICEF and BHMIC are planning a media survey to identify the training needs of local media with a view to improving community access to information on mine risks. As of writing, this survey remained in the planning stage.¹¹³

Conclusions

BiH is probably the most intensely surveyed of the countries included in this study. Although some surveys are overlapping (e.g. elements of the BHMIC general and systematic surveys and the LIS survey) BiH does not suffer from a lack of easily accessible survey data. Yet, despite millions of dollars spent on uncovering the extent of landmine contamination in BiH, the progress of actual landmine clearance and reduction of the size and number of SHAs has been slow. Roughly 2000 square kilometres remains contaminated at the beginning of 2005; in 2002 the total suspected area was 2,089 square kilometres.

This – inevitably frustrating – situation is a result of a combination of factors. First, data remains incomplete. No survey has provided 100 per cent coverage of the country. Moreover, continued survey efforts have identified new SHAs over the past few years – in other words, better information has often increased the size of the suspect area. Second, data is in some cases redundant: the LIS, for example, did not unearth “new” information but rather pinpointed areas of greater need for humanitarian mine action. So, instead having “priority” areas/communities (as was the case prior to the LIS results) there are now also areas defined by the “level of impact”. Third, some surveys seem to have produced contradictory results; about 30 per cent of areas defined as “dangerous” by BHMIC, for example, do not have “impacted” communities according to the LIS. But, presumably, the dangerous areas (unless cleared) are no less dangerous today than they were prior to the LIS. In addition, there is a problem of resources. Numerous interviewees expressed a

¹¹² Handicap International 2003.

¹¹³ Interview with Nathalie Provost, UNICEF/BHMIC, November 2004.

sentiment that can be summed up as follows: “We (roughly) know where the mines are, but we don't have the capacity to clear them.”

Of the surveys discussed in detail above, the LIS stands out as the most comprehensive effort to grasp the entirety of the impact of landmine contamination. Given the recent changes in BiH Mine Action Strategy it is tempting – and several interviewees echoed this sentiment – to argue that the LIS (or something similar to it) should have been conducted years earlier. Indeed, one of the essential shortcomings in the post-Dayton mine action in BiH was a lack of accurate data that resulted in *ad hoc* demining efforts and, often, a waste of resources. However, while a nationwide survey in the immediate post-war period would probably have resulted in a more effective demining programme, it would have been virtually impossible to overcome the many obstacles – political and ethnic divisions chief among them – that remained from the conflict.

But the fact remains that by 2002 when the LIS was started, the mine action community in BiH was not enthusiastic about expending more money on surveying. The main push for the LIS came from donors looking for a “neutral” assessment of priorities. In the end, while LIS produced some new information its main impact has been to boost outside interest in BiH landmine problem that has waned over the past few years. In short, the LIS was undertaken as much, if not more, for strategic rather than informational purposes, making the expense of more than US\$2 million for the LIS a questionable undertaking.

Somewhat ironically, the LIS categorisation of communities according to impact also highlighted the need for more *individualised surveys* in order to address the specific and varied needs of the many communities (in short: the 154 high-impact communities may have very different priorities). In short: **while the LIS used “community” as the basic survey unit, it did not provide sufficiently accurate information on the exact location of mines within those units.**

The TAP process, begun in 2003, has been adopted as part of the national strategy to answer this need. This raises another question about the validity of the LIS within BiH: if it is necessary to proceed through yet another series of surveys at community level before mine action can proceed, would it not have been more cost effective to skip the LIS altogether? TAPs and Community Mine Action Plans could have been based upon already existing general and systematic survey information lodged in the BHMACH database.

All of the above is not to argue that the LIS was simply an expensive way of boosting donor interest and highlighting the more central role of BHMACH in national planning. For most of the post-war period, surveys in BiH focused on trying to map out the actual locations of mines and UXO. Thus, information about the socio-economic impact of landmines remained relatively sparse until the LIS. What the LIS has provided is a reasonably reliable dataset of the socio-economic make-up of affected communities.

Despite a wealth of survey data, BiH still lacks a comprehensive post-clearance evaluation system. At present, such surveys have been conducted infrequently, as with the Task Impact Assessments by NPA. In fact, one of the findings of the pilot TAP was that even the estimation of potential economic benefits of humanitarian

demining for communities lacks adequate assessment criteria. More information is needed about whether or not the land cleared is actually used for the benefit of the local community in question.

In terms of MRE and Victim Assistance surveys, BiH has seen increased activity in recent years. Yet, the surveys conducted so far have yielded only a partial picture of the situation. In terms of MRE, surveys have focussed mainly on schoolchildren, thus leaving the most risk prone part of the population (adult males in rural areas) largely untouched. In victim assistance, the only nationwide survey was a desktop study completed in December 2003.

Recommendations

In general, the major lesson from BiH has to do with the timing and execution of nation-wide surveys. The only such survey in BiH is the 2002-3 LIS. Conducted seven to eight years after the end of the conflict, the LIS was undertaken rather late and provided often overlapping data with already existing surveys. While the BiH LIS clearly addressed a strategic need, a chief (and obvious) recommendation for other post-conflict situations is that nationwide survey should be conducted as soon as after the end of hostilities.

As the LIS did not cover 100 per cent of the suspected areas, there is also a need to revisit the first – expert opinion collection – phase of the survey.

In terms of specific recommendations for BiH, the following stand out:

1. The future focus of BiH survey activity relative to humanitarian demining should be at the community (micro) level. This is, in fact, already being implemented through the TAP process and the design of community mine action plans. However, the methodology used seems to vary between communities and regions. Thus, a review of such methodologies and additional training for local actors if necessary should be conducted.

2. Technical survey capacity needs to be developed further. As technical survey is designed to become an increasingly important part of BiH mine action in the future, it is necessary that the capacities in this area are developed further. Already in 2004 it was evident that the actual size of the area cleared by technical survey fell far short of the declared goal. This is largely due to the lack of equipment and the relative novelty of TS in BiH (since 2003).

3. BiH needs to develop a consistent post-evaluation strategy.

4. An MRE survey of non-school age (rural) population is needed. MRE is currently being focused on by BHMAL. But based on what we know about the risks to different portions of the population, the focus of survey (and general MRE) activity should be on a different group of the population. With demining continuing at a slow pace, this need must be addressed urgently.

5; BiH needs to develop a centralised victim data network.

The recommendations are summarised in the following table.

SURVEY NEEDS/ SHORTCOMINGS	RECOMMENDATIONS
Landmine Impact Survey Some impacted communities were missed (based on negative sampling)	Review “expert opinion” (phase 1) used to exclude 3207 communities from the survey
Task Assessment and Planning (TAP) Reliability of some results questioned due to lack of consistency in methodology applied	Standardisation of the methodology used for TAP Additional training and quality control
Technical Survey Capacity for technical survey is lacking while its significance for BiH mine action is increasing	An investment in training and appropriate machinery
Victim Assistance Survey Data is fragmented	Establishment of a central database system (under BHMACH) including consistent follow-up of the rehabilitation of mine victims <i>(NB. As of 2005 assistance was to be coordinated by BHMACH and the first task was to develop a centralised database)</i>
MRE Surveys Have mainly focused on the educational system, more data needed on adult populations	A national review of MRE outside the school system A media survey (planned but not conducted)
Post Clearance Evaluation No systematic post-clearance evaluation	There is a persistent need to review the effectiveness – particularly the socio-economic impact – of demining activities. <i>(NB. A Post Clearance Evaluation is to be incorporated in future Community Mine Action Plans)</i>

Annex. Chronology of the mine action programme

YEAR	MAIN EVENTS
1995	November – Signature of the Dayton Agreement, requiring removal of mines by warring factions and exchange of minefield records.
1996	<p>May – Creation of UNMAC and regional offices.</p> <p>US State Department contracts RONCO to assist in set-up of MAC and regional MACs, training of local personnel in clearance and survey, launching of an Explosives Detection Dog project, establishment of a training school.</p> <p>World Bank (PIU) and EC support clearance and survey for reconstruction and resettlement programmes:</p> <ul style="list-style-type: none"> ➤ Emergency Landmine Clearance Project established by the World Bank in July launching competitive contracting and institutional development through PIU ➤ EC support to demining activities in both entities. <p>Other donors provide technical advisors to MAC or support international NGOs, e.g. NPA and HELP, to start humanitarian demining.</p> <p>Entity Armed Forces (EAF) conduct mine lifting under IFOR supervision (and with US State Department support).</p> <p>The Ministry of Education initiates MRE, along with the Red Cross, UNICEF and some NGOs. Adhoc victim assistance activities initiated.</p>
1997	<p>Bosnia and Herzegovina signed the Anti-Personnel Mine Ban Convention in December.</p> <p>UNDP Trust Fund established to support capacity development.</p> <p>A three-member Demining Commission is appointed by the Council of Ministers.</p> <p>UNMAC/Board of Donors/Government agree to establish BHMACH.</p> <p>Transfer of equipment and personnel supported by US/RONCO into 3 commercial companies (from each region).</p>
1998	<p>1 July – UNMAC transfer into a National MAC (BHMACH) with two Entity MACs. Demining Commission under the authority of the Ministry of Civil Affairs.</p> <p>UNHCR six-team demining programme in support to refugee return programme.</p> <p>First phase of UNDP support to BHMACH capacity development (until 2000).</p> <p>EAF start humanitarian demining under SFOR supervision. EAF provide basic training for all deminers. EC support to capacity building of Civil Protection Authorities in both entities through HELP.</p> <p>ITF established (US matching funds mechanism).</p>
1999	<p>1 March – Bosnia and Herzegovina becomes a State Party to the Anti-Personnel Mine Ban Convention.</p> <p>End of UNHCR demining project.</p> <p>Second phase of European Union support to Civil Protection: transfer of operational responsibility from HELP to Civil Protection.</p> <p>General survey taken over entirely by BHMACH.</p>
2000	<p>Early closure of World Bank PIU due to allegations of corruption and other problems.</p> <p>Dismissal of the Demining Commission by OHR.</p> <p>Direct agreements established between the EC and the Civil Protection.</p> <p>March – Poverty Reduction Strategy Paper (PRSP) process initiated by the Government through the creation of a state-level joint coordinating body.</p>
2001	<p>New Demining Commission appointed.</p> <p>Second phase of UNDP capacity development programme (2001-2003).</p> <p>June – First draft of Bosnia and Herzegovina Development Strategy (PRSP I).</p>

Annex (continued)	
2002	<p>Demining Law endorsed by the Bosnia and Herzegovina Government. New BHMAL structure established with regional MACs under BHMAL authority. National Demining Strategy being produced. Capacity Building of Civil Protection (training centre for EOD) and EAF strengthened. Municipal/cantonal coordinators appointed in the Federation. April – PRSP process began with BHMAL Deputy Director and RS MAC Director coordinators of the Working Group on mine action (as part of the Medium-Term Economic Development Strategy). Landmine Impact Survey (LIS) initiated. December – Task and Planning Assessment (TAP) pilot project supported by SAC.</p>
2003	<p>MRE capacity of Civil Protection supported by UNICEF/BHMAL. BHMAL strategic planning and annual plans produced. Standards and SOPs for clearance activities adopted by the Demining Commission. National Demining Strategy (mine impact free by 2010) adopted by the CoM; revision process started in August. LIS implemented and extended into 2004. May – PRSP II drafted.</p>
2004	<p>LIS completed IMAP – phase 3 of UNDP support will run until 2008. SOPs and standards for MRE and victim assistance being produced. Technical survey process. PRSP approved by CoM (February 2004), Presidency (March 2004) and Parliament. Revised National Demining Strategy adopted by CoM, 1 October .</p>

Chapter 4

The case of Lao People's Democratic Republic

Guy Rhodes

The context

History of the conflict

The independence drive for the Lao People's Democratic Republic (Lao PDR) began in the French colonial era, continued under Japanese occupation during the 1939-45 war and thereafter when the French attempted to re-establish control over Indochina. The 1954 defeat of the French at Diem Bien Phu in Vietnam, however, effectively signalled the end of colonial aspirations in the region.

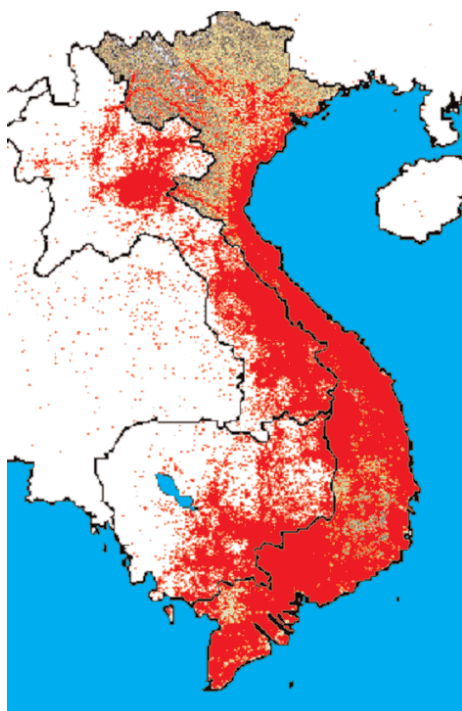


Figure 1. Air-strike data over Indochina from US National Archives

In the absence of the French, an internal power struggle in Lao PDR developed between the Pathet Lao (PL), supported by the People's Army of Vietnam (PAVN), and the Royal Lao Army (RLA) and Hmong irregulars, sponsored by the United States of America (US). Ground battles between these forces were particularly intense in Luang Phrabang and Xieng Khouang provinces, which bordered the Pathet Lao stronghold provinces of Phongsali and Houaphan, though campaigns were waged throughout the country – as far south as the provinces of Champasak and Attapeu – and were often accompanied by intense US air support for the Hmong and RLA.

In addition to the civil war in Lao PDR, the country was also drawn into a wider conflict



Figure 2a. Blu 63, Phine District, Savannakhet (Photo: UXO LAO)



Figure 2b. 500lb bomb prepared for low order demolition (Photo: UXO LAO)

as the PAVN used a network of paths and roads through eastern Lao PDR to by-pass the demilitarised zone in neighbouring Vietnam and bring supplies to support the communist war effort in southern Vietnam. The US responded by conducting one of the heaviest aerial bombardments in the history of warfare in an effort to stem this logistical artery, known as the Ho Chi Minh Trail.

The neutrality of the country, supposedly guaranteed by the 1962 Geneva Protocol, was violated by both the Vietnamese and the Americans. For six years, the US termed all its air operations over Lao PDR “reconnaissance flights”, even though Lao PDR, between 1965 and 1973, was the recipient of two million tonnes of explosive ordnance delivered in 580,344 bombing missions. Today, access to US combat activities reveals that ordnance was dropped in vary degrees in most provinces covering an area of 87,213 square kilometres – out of a countrywide total of 236,800 square kilometres.¹¹⁴

In addition to air strikes, Southern Vietnamese troops with US support also invaded eastern Lao PDR to confront North Vietnamese troop movements and to block supply routes. The largest ground battle took place in the province of Savannakhet and reportedly involved 60,000 South Vietnamese and 100,000 North Vietnamese army troops.¹¹⁵

Explosive remnants from ground battles from the Indochina War, such as mortars, artillery shells, grenades, rockets and landmines, remain a considerable problem in many areas, but it is the unprecedented scale of the air-delivered ordnance such as cluster bomblets and general purpose bombs that most contribute to the nationwide contamination affecting the country today. Estimates of the percentages of air-delivered ordnance that failed to detonate during deployment range from 10-30 per


¹¹⁴ UXO LAO (2003a).

¹¹⁵ Case Study Lao PDR in GICHD (2001).

cent, which, considering the sheer magnitude of bombs dropped, leaves a considerable legacy of the war. Clearance teams have found at least 120 different types of ordnance scattered across Lao PDR, including 13 types of cluster bombs alone.¹¹⁶

Since the end of the 1975 war, other more localised conflicts have contributed on a small scale to contamination in some areas of Lao PDR. A disputed border with Thailand in Boten District of Xaignabouri led to intense fighting over the ownership of three villages in the late 1980s. Other clashes have occurred as part of a long-running dispute between the government and ethnic Hmong. Contamination in these instances, however, is negligible compared to that caused by the fighting between 1964 and 1973, which gives Lao PDR the distinction of being the most heavily bombed country in the world, per head of population.

According to a national socio-economic impact survey conducted by Handicap International Belgium (HIB) and published in 1997, ten of the country's 18 provinces are described as being "severely affected" by the presence of unexploded ordnance (UXO),¹¹⁷ and a further five are considered to have "significant UXO contamination".

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">10 most affected province in order of impact</p> 	Savannakhet	<p>The HIB survey identified 2,861 villages, or 25 per cent of all villages nationwide, that still contained items of UXO. Anti-personnel bomblets were the most common type of UXO reported in the survey, present in more than half of the contaminated villages. Other ordnance such as large bombs, varying from 100kg to 1,000kg, was reported in 40 per cent of the villages, and mortars were reported in 25 per cent of the villages.</p> <p>The survey identified the presence of landmines in 214 villages, though mine contamination is typically dwarfed by the extent of the UXO problem. This is reflected by the UXO LAO 2003 operation statistics, which show that mines only contribute to about 1 per cent of the total number of items cleared.</p>
	Xieng Khouang	
	Saravan	
	Khammouane	
	Sekong	
	Champassak	
	Saysomboune	
	Houaphan	
	Attapeu	
	Luang Phrabang	

US bombing data, released in the late 1990s, was used to calculate that 36.8 per cent of the country's land area is affected by UXO, and 12,427 square kilometres, or 5.2 per cent of the country, is considered high risk.¹¹⁸

In human terms, a figure of at least 11,000 accidents since 1975 is widely used with an ongoing victim rate of about 140 casualties reported per year. Most observers, though, believe that victim numbers are under-reported due to the limited surveillance system existing today.

The nature of UXO contamination

The nature of UXO contamination in Lao PDR presents considerable challenges for the application of "standard" mine action approaches, including survey methodologies.

¹¹⁶ Cumming-Bruce (2003).

¹¹⁷ Identified as having one or more severely contaminated districts.

¹¹⁸ UXO LAO (2003b: 6).

This relates to the characteristics of UXO contamination resulting from intense aerial bombardment, which differs markedly from that caused by landmines.

“Standard” approaches to mine action tends to assume that contamination exists in more or less discrete packages (e.g. minefields), that ordnance is present at or close to the surface of the ground,¹¹⁹ and that much of its socio-economic impact can be described in terms of “blocked access” or “land-denial”. These assumptions are not necessarily applicable to Lao PDR – a fact that helps to understand both the context of survey activities and the development of broader aspects of mine action in the country.

Mapping of contamination

Physical boundaries of UXO contamination can rarely be defined into “discrete packages” in the same way as many minefields. While high concentrations or hotspots of contamination may occur, they typically exist within lower-risk areas of residual contamination that are an artefact of the blanket bombing during the war. An inability, in most instances, to effectively delineate or even estimate the boundaries of contamination undermines the fundamentals of several traditional survey approaches.

Depth of contamination

The depth of contamination as a result of air-dropped ordnance can be significantly greater than typical depths of landmines, and hence contamination in Lao PDR can exist up to several metres below the ground. Such buried ordnance complicates standard approaches used in mine action – particularly since the impact of UXO on current or planned land use activities is a function of the depth to which such activities disturb the ground.



Figure 3a. Cultivation activities typically disturb only the top 30 centimetres of soil

(Photo: Handicap International Belgium)



Figure 3b. UXO recovered from a depth of four metres

(Photo: BOMICO *)

For example, typical clearance approaches to support agriculture normally remove only surface and shallow contamination. The same piece of land, however, may not be

¹¹⁹ Detectors are typically calibrated to 20 centimetres.

* Although this photograph was taken in Vietnam it illustrates the potential depth of UXO contamination also present in Lao PDR.

deemed clear for any future development activities requiring greater ground excavation, such as construction of irrigation channels, house-building, or strengthening the transport system.

Contamination and land-denial

The social and economic impact of landmines, particularly in terms of land-denial, has been relatively well documented, but it is difficult to assert that analogous effects result from UXO contamination.¹²⁰ Although, in some places, UXO may also present full blockages for development activities, the potential for partial use of land, such as in cultivation around items of ordnance, is greater than in a minefield.

Age of the contamination

Lao PDR today is described as being in a phase of “assisted development”; this is characterised by a country receiving international assistance that is focused on longer-term reconstruction and development programmes. Lao PDR is not in a period of humanitarian emergency – indeed it is some 30 years since the end of the conflict and 10 years since internationally supported mine action was initiated in the country. This period of time has wide-ranging implications for the “survey setting” – that is, one where most of population cannot recall living in an environment free from ordnance. This fact is reflected in the title of the 1997 national impact survey report “Living with UXO”.

UXO and risk management

In general terms, items of UXO are less dangerous than landmines and survey approaches can be adapted to allow personnel to enter contaminated areas for mapping and planning – activities that could not be undertaken to the same extent in a landmine setting. The reduced threat posed by most UXO is currently reflected in several areas of UXO LAO operations, particularly technical survey, for which personnel commonly walk around contaminated areas identifying boundaries for follow-up clearance activities. Furthermore, villagers are often tasked to remove vegetation from planned demining or explosive ordnance disposal (EOD) sites ahead of clearance tasks – an activity that is seldom undertaken on land affected by landmines.

Ordnance as a resource

UXO and scrap metal are considered a valuable commodity in many rural communities as they generate income for a sector of the population. The industry is well-established with a regional network of dealers and smelting facilities stretching from Thailand to Vietnam; in these countries, scrap metal typically fetches 2,000-5,000 kip (US\$0.20-US\$0.50) per kilogram for high grade material and 10,000-15,000 kip (US\$1-US\$1.50) per kilogram for explosives.¹²¹

NGOs working in areas along the former Ho Chi Minh Trail in southern Lao PDR find large numbers of foragers, including children, hunting for scrap metal; many use Vietnamese-made metal detectors that are sold in local markets for as little as US\$16.

¹²⁰ Bottomley (2003) and Moyes (2004).

¹²¹ Laos Country Report in ICBL(2004).

Recently constructed roads allow greater access into areas of contamination and easier access to markets where metal and explosives can be sold.



Figures 4a and 4b. A scrap metal dealer collects UXO and other war debris on the Lao PDR-Vietnam border (Photo: VVAF)

The history of the mine action programme¹²²

For almost two decades after the end of the war, formal UXO clearance operations were usually undertaken by the Lao army in support of activities such as the resettlement of internally displaced persons (IDPs), or to facilitate infrastructure improvements. Several projects were supported by external funds, including the presence of foreign advisors and in some cases direct foreign clearance assistance.¹²³ From 1992, Western commercial companies became engaged in clearance contracts for private developers, mineral exploration firms, and civil engineers, as well as for aid contractors building roads and bridges. The leading international commercial clearance company in Lao PDR is Milsearch Defense Pty. Ltd., which operates a joint venture with a company under the Ministry of, Defence, Bolisat Phathana Khetphoudoi (BPK). Since 1992, Milsearch/BPK has undertaken some 30 clearance contracts.

In the early 1990s, the Mennonite Central Committee raised awareness of the UXO problem in Lao PDR and joined forces with the Mines Advisory Group (MAG) in Xieng Khouang Province, where MAG initiated clearance activities in late 1994. By the end of 1995, after discussions between UNDP, UNICEF, MAG and the Lao government, the UXO Trust Fund was established, followed in 1996 by the creation of a national Trust Fund Steering Committee and the UXO LAO programme.

Two key responsibilities of the UXO LAO office were the coordination of UXO-related activities and the preparation of work plans – with the goal of reducing UXO casualties and clearing land in support of food production and other development activities. To this end, UXO LAO commissioned a national survey to assess the extent of UXO contamination and its socio-economic impact in Lao PDR. The contract was awarded to Handicap International Belgium, which published its findings in 1997.

While the HIB survey project was underway in 1996, UXO LAO opened provincial offices in Xieng Khouang, Houaphan and Savannakhet, and instruction began at a newly acquired training facility with support from the US. The same year, Gerbera

¹²² See Annex 1 for a chronology of the mine action programme.

¹²³ Chinese, Russian and Vietnamese assistance has been reported on, both during this early period of clearance operations and more recently.

initiated a clearance programme in Houaphan Province and UNICEF assumed a lead role in the coordination of community awareness activities, establishing a technical working group for the topic. In addition, three US NGOs created a UXO awareness curriculum under the umbrella of an association known as Consortium, which worked in conjunction with the Ministry of Education.

In the two years following the completion of the national survey, mine action activities in Lao PDR entered a period of considerable expansion. UXO LAO enlisted further external assistance to support provincial operations from Norwegian People's Aid (NPA), the Belgium military and MAG. Furthermore, HIB and Gerbera expanded their provincial office responsibilities. A year later, in 1999, World Vision (WV) moved into Khammouane province and set up the ninth provincial office for UXO LAO.

Between 1999 and 2001, the Lao government pursued a strategy of nationalising all NGO operations under UXO LAO. While most NGO-supported operations since 1997 were already within the framework of the UXO LAO programme, some operations by MAG and Gerbera, for instance, engaged local personnel directly. Those operations where UXO LAO did not yet have managerial responsibility were handed over to them and international partners assumed the role of advisors and capacity builders with a goal of eventually being phased out entirely.

In 2002, a cash-flow crisis of donor support to UXO LAO Trust Fund forced a temporary reduction of more than half of UXO LAO's operational staff. The same year, a UNDP programme review recommended a multi-year strategy plan and a separation of regulatory and operational activities in the mine action sector. Over the following two years UXO LAO returned to a role close to the one that it had played previously.

The “formal” clearance efforts of UXO LAO, NGOs, commercial companies and the Lao military, however, must be set against the backdrop of “informal” clearance undertaken by villagers. This informal clearance aimed at expanding land for agriculture and construction, and profiting from the value of items of UXO for scrap metal and their explosive content, has gone on for three decades and although it is not documented, the number of UXO items cleared thereby is substantial.

Current status of the mine action programme

The full complement of national staff in UXO LAO numbers 1,134 according to the organisation's 2004 work plan. This total includes staff at the headquarters in Vientiane and across nine provincial operations, where 1,032 are directly involved in operations, 63 hold provincial office staff positions, 32 are employed at the national headquarters, and seven work at the National Training Centre. National staff are supported by 15 international advisers, five of whom are located at the national headquarters in Vientiane. Technical advisers are provided by UNDP and the following implementing partners: MAG, HIB, Gerbera, NPA, and the Belgium military.¹²⁴

The organisational charts of each provincial UXO LAO team are not identical. Numbers of personnel and the arrangement of operational teams can vary based on funding levels and operational conditions in a province. But although the

¹²⁴ Statistics from UXO LAO (2003b).

configuration may vary, UXO LAO capacities typically consist of the following components:

Community awareness teams

- Providing awareness in rural communities of the continued danger of UXO; and
- Educating villagers on ways to minimise the hazards caused by UXO and reduce risks through behaviour change.

CA resources typically consist of six-person teams supported by a truck and communication equipment.

Survey teams (technical)

- Gathering technical (and socio-economic) data ahead of clearance projects in order to accelerate clearance activities.

Survey teams typically consist of two-person teams supported by motorcycles and survey equipment.

Clearance teams (operating in two distinct capacities)

- *Roving Teams* undertaking clearance of scattered surface UXO.

Resources typically consist of a five-person team (sometimes not a permanent unit but drawn from sections of the area clearance capacity).

- *Area Clearance Teams* – undertaking clearance of larger areas (typically 2-3 hectares). Standard teams are composed of four section leaders and four sections of five deminers each.

UXO LAO represents perhaps only about half the overall clearance capacity in Lao PDR.¹²⁵ Outside the UXO LAO structure, some NGOs have again established independent operations, such as MAG's support for CARE International in Savanakheth or UNESCO on the Plain of Jars. A significant programme of clearance support for the World Food Programme (WFP) is also currently being planned with the Swiss Foundation for Mine Action (FSD). In addition, the Lao military and commercial firms such as Milsearch and MineTech operate direct contracts with support from The World Bank (WB) and the Asian Development Bank (ADB). Milsearch alone has approximately half the staff numbers of UXO LAO today and considerably more were employed in 2003 when the company cleared an estimated 600 hectares of land¹²⁶ compared to the 880 hectares cleared by UXO LAO for the same period.

UXO LAO continues to be one of the major agencies conducting mine and UXO risk education, visiting 512 villages in 2003. Outside UXO LAO two other projects focus on awareness activities: Consortium and UNICEF. Consortium is an NGO working in four provinces implementing a UXO education curriculum in primary schools in conjunction with the Ministry of Education, Youth Union, Women's Union and UNICEF. UNICEF also operates an independent project "Sport in a Box" with the Youth Union in six provinces. This project focuses on children up to 18 years of age, targeting especially those who may become involved in the scrap metal trade.¹²⁷

Survivor assistance is a component of mine action in Lao PDR on which both the Government and international donors have placed a low priority. Medical care for

¹²⁵ GICHD (2001: 137).

¹²⁶ ICBL (2004).

¹²⁷ Sport in a Box, A Project for UXO Safety Education in the Lao PDR, Project Brochure (undated).

victims is typically provided through district and provincial hospitals with some cases referred to a national level, especially where complex surgery is required. International NGO support for UXO survivors includes HIB, Garneau International, Consortium and COPE¹²⁸ (a partnership between the Ministry of Health, POWER, World Vision, the Cambodian School of Prosthetics and Orthotics, and the Association for Aid and Relief Japan).

National Strategic Plan (NSP)¹²⁹

Box 1. National database facility

The UXO LAO database was established in 1997 to store UXO and mine information collected from the Socio Economic Impact Survey: “Living with UXO”. The database has a Microsoft Access application and ArcView GIS function. The original database, though, is now being used in parallel with IMSMA and a conversion is in progress.

Routine work of the database includes:

- Collating work plans from provinces for submission to National Regulatory Authority and subsequent plans for the monitoring of activities;
- Collation of monthly progress reports from provincial operations into monthly Progress Summary Reports and distribution to key management staff; and
- Provision of bomb and impact data to UXO LAO field operations and Lao Government Agencies, international organisations and NGOs engaged in development planning.

It is planned that the database facility will be transferred to the National Regulatory Authority (NRA) when it is fully established.

In 2004, the mine action operational environment in Lao PDR was transformed by the approval of the ten-year strategic plan, “The Safe Path Forward”. The plan redefined the role and structure of the national UXO programme by removing the coordination role of UXO LAO and transferring these responsibilities to a National Regulatory Authority (NRA).

The implications of the plan are that UXO LAO becomes an operator alongside other national and international agencies, all of which report to the NRA. Agencies are grouped into three sectoral components: community awareness, clearance (humanitarian, commercial and military) and survivor assistance. UXO LAO retains operations in nine provinces and the current international implementation partners are free to continue to work in support of UXO LAO and/or engage in their own independent activities. Other agencies are also encouraged to enter the sector.

Also of note, the NSP calls for UXO LAO to transfer its community awareness teams to other organisations and for the Ministry of Culture and Information to provide the oversight for mine risk education (MRE) programme, although the curriculum will be developed through the Ministry of Education. The NSP goal for MRE is to reach all impacted communities identified in the 1997 national survey.

¹²⁸ Of the 1,048 people assisted by COPE in 2003, 400-500 were reported to be UXO/landmine survivors.

¹²⁹ This section draws on three documents: NRA (2004) and UXO LAO PDR Prime Minister's Office (2004a) and (2004b).

Box 2. The work of the National Regulatory Authority

The National Regulatory Authority is the official civilian institute of the Government of Lao PDR responsible for the coordination, regulation and oversight of all UXO/mine action activities. The NRA reports directly to the Prime Minister and consists of representatives from all concerned government ministries. In brief, the NRA is intended to provide:

- Periodic review of the strategic plan;
- Accreditation, licensing and oversight of all UXO/MA operators: including UXO LAO, NGOs, commercial companies, and other government bodies;
- Management of the database, prioritisation and tasking of all UXO/mine action operators and activities, including preparation and monitoring of annual work plan; and
- External quality assurance (QA) of all UXO/mine action activities, including Post Clearance Impact Assessments.

The principal planning objective of the NRA is to reduce the number of victims from UXO, and to support socio-economic development by remaining sensitive to both National Poverty Eradication Programme (NPEP) objectives, and to local level priorities expressed by affected communities.

Besides determining the structure of mine action activities in UXO LAO, the ten-year plan has an overall goal to address the most highly impacted communities and allow people to live free from the impacts of landmines and UXO.

- | | |
|-----------------------------|---|
| Priority I (High) | Agricultural tasks, roving tasks, public service utilities and educational facilities |
| Priority II (Medium) | Grazing land and forested areas, communal facilities and government facilities and offices |
| Priority III (Low) | Public infrastructure work, communal “profit-making” areas, tourism sites, commercial/private business sites. |

The NSP provides broad categories to govern (clearance) task prioritisation by agency type whereby “*humanitarian UXO/mine clearance operations will focus strictly on Priorities I and II, with a marked preference for Priority I tasks. By the end of year 2013, all Priority I tasks will have been dealt with*”. The NSP goes on to state: “*Few, if any, Priority III tasks will be addressed in the context of this plan by operators funded through humanitarian assistance programmes. These will be dealt primarily by commercial operators.*”

In addition to the framework of the NSP, national clearance priorities for activities funded through humanitarian programmes are becoming more “mainstream” through developmental programming that considers national priorities such as poverty reduction as further frameworks for planning. The 2004 Work Plan for instance, considers the National Poverty Eradication Plan (NPEP) as a strategic framework.

UXO LAO work plan¹³⁰

In 1998, UXO LAO devised a system of annual work-planning that would address the decentralised nature of governance in Lao PDR and provide some standardisation and

¹³⁰ See Annex 2 for an example of a provincial work plan.

cohesion in a programme implemented through six international partners. It also formed an important basis for measuring performance and accountability.

UXO LAO follows a “bottom-up” planning process where district authorities compile a short list of priorities based on task requests from villages. These are submitted to the province level where they are combined with provincial priorities and evaluated by the Provincial Steering Committee against UXO LAO national priorities and strategic guidelines. A detailed operational plan is then developed considering the available time and resources – allocating community awareness, roving and clearance teams to specific tasks over the following calendar year.

The draft work plan is then signed off by the governor, UXO LAO provincial coordinator and a representative of the implementing partner. The signed work plan is currently submitted to the UXO LAO national headquarters where it is reviewed and subsequently approved by the National Steering Committee. These final steps of the approval process are to be transferred to the newly formed NRA.

Overview of surveys in the Lao PDR mine action programme¹³¹

Desk Survey	US Air Combat Data (MSTI/FRC)*	1998-2000
Emergency Survey	n/a	n/a
Systematic General Survey ➤ Hazard Focused ➤ Community Focused ➤ Other	n/a Socio Economic Impact Survey (HIB)* UXO LAO Community Awareness teams n/a	n/a 1996/97 ongoing n/a
Technical Survey: ➤ “Traditional” – area reduction ➤ Preparation/reconnaissance	n/a UXO LAO Technical teams*	n/a 2000
Post Clearance Documentation	Various operators: UXO LAO, NGOs, Commercial	~1992
Post Clearance Evaluation	<i>Planned – Post Clearance Impact Assessment (PCIA)</i>	Pending (2004/5)
Survivor assistance and mine risk education surveys (or needs assessments)	Accident/Victim data compiled by UXO LAO, Consortium, COPE, LDPA, MOH <i>Planned: National Network for UXO Accidents</i>	Ongoing Pending
Supplemental or not otherwise classified	Psychosocial Impact Survey (HIB)	2004
(* denotes surveys that are a particular focus of the Lao PDR case study)		

¹³¹ UXO LAO Annual Report and Work Plans from 1996 to 2004 reviewed.

According to the International Mine Action Standards (IMAS) glossary,¹³² a General Mine Action Assessment (GMAA) is “the process by which a comprehensive inventory can be obtained of all reported and/or suspected locations of mine or UXO contamination, the quantities and types of explosive hazards, and information on local soil characteristics, vegetation and climate, and an assessment of the scale and impact of the landmine problem on the individual, community and country.”

The GMAA relates to a continuous process of collecting, evaluating and analysing data to assist and update strategic planning and provide support to mine action authorities. In Lao PDR it has been 30 years since the end of the second Indochina War and about ten years since humanitarian organisations started to become established in mine action. It is difficult to assess the extent of survey activities that took place in the intervening period, however while systematic surveys of UXO hazards or victims are unreported, ongoing survey activities of a technical nature would have been an integrated component of some commercial clearance and military operations.

Figure 5. Schematic representation of the general mine action assessment in Lao PDR

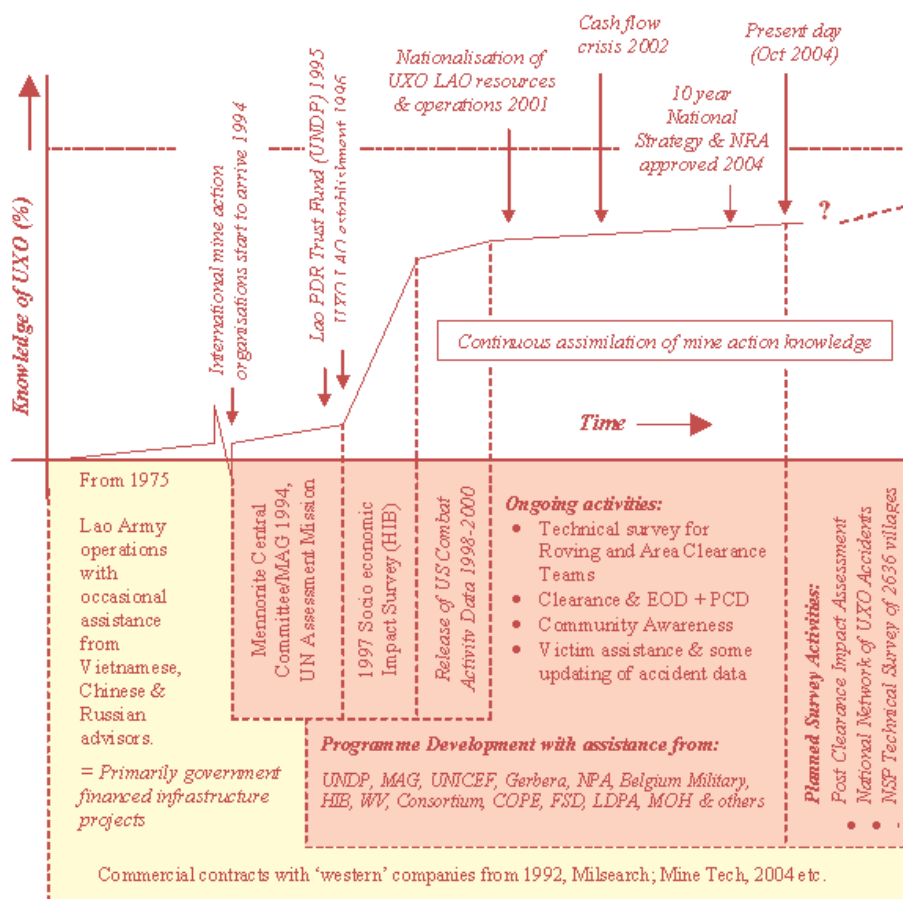


Figure 5 illustrates various activities that have improved the knowledge and understanding of the geographic extent and impact of UXO and landmines in the country. Pink shaded areas are considered humanitarian mine action activities undertaken by UXO LAO, UN agencies and NGOs. Orange areas represent military and commercial activities.

¹³² UNMAS (2001), IMAS 04.10.

For the purpose of this study, three survey projects are reviewed in greater detail in the next section of the report: the Socio Economic Impact Survey (1997), the Indochina Bomb Data Project (1998-2000), and the technical surveys carried out by UXO LAO since 1998. In the remainder of this section, however, a brief overview of these three surveys is provided against information of other notable survey activities that have been undertaken or are currently active in Lao PDR.

Systematic general surveys

By far the most significant contribution to understanding the impact and geographic extent of the UXO problem in Lao PDR came from the community-focused socio-economic impact survey “Living with UXO” completed by HIB in 1997. This still remains the baseline for UXO data in the country.

Desktop surveys

A desktop survey, commonly referred to as the Indochina Bomb Data Project, made records available from US archives of combat activities on a national scale to UXO LAO between 1998 and 2000.

Technical surveys

The nature of UXO/mine contamination in Lao PDR has limited the application of *area reduction* as a means to define the boundaries of contamination. As a result, technical surveys according to traditional terminology are not widely reported. The technical survey capacities of UXO LAO and others operating in Lao PDR are mostly associated with clearance planning and reconnaissance similar to the definition contained in the International Mine Action Standards glossary (IMAS 04.10).¹³³

Post Clearance Documentation

According to the IMAS, Post Clearance Documentation (PCD) is a comprehensive group of documents relating to a clearance activity provided during the handover process of a cleared site to a recipient authority, organisation or individual. A critical item in the documentation is a map of the completed clearance site.

PCD in UXO LAO uses the terminology *Level 3 Completion Report* to describe the documentation at the end of clearance tasks. The report has sections to be completed by the Area Clearance Team Leader, the relevant UXO LAO provincial office, and representatives of the local authority responsible for receiving the land. Copies of the report are then submitted to UXO LAO headquarters and registered in the database.

One objective of the database work plan for 2004 is to further the “development of area clearance report formats for the database system” to include the recording of clearance site perimeter details in the database. Currently, perimeter details are kept in hard copy only.

PCD relating to clearance undertaken by commercial companies does not follow UXO LAO formats but reflects the terms of the clearance contract and is often more detailed than the UXO LAO documentation. Similarly, where NGOs operate independently

¹³³ IMAS defines technical survey as “the detailed topographical and technical investigation of known or suspected mined areas identified during the planning phase”.

from UXO LAO they may also use their own internal organisational PCD approaches. MAG, for instance, is integrating computer-based mapping using ArcView into the PCD process. To date, clearance site maps in UXO LAO have been completed by hand.

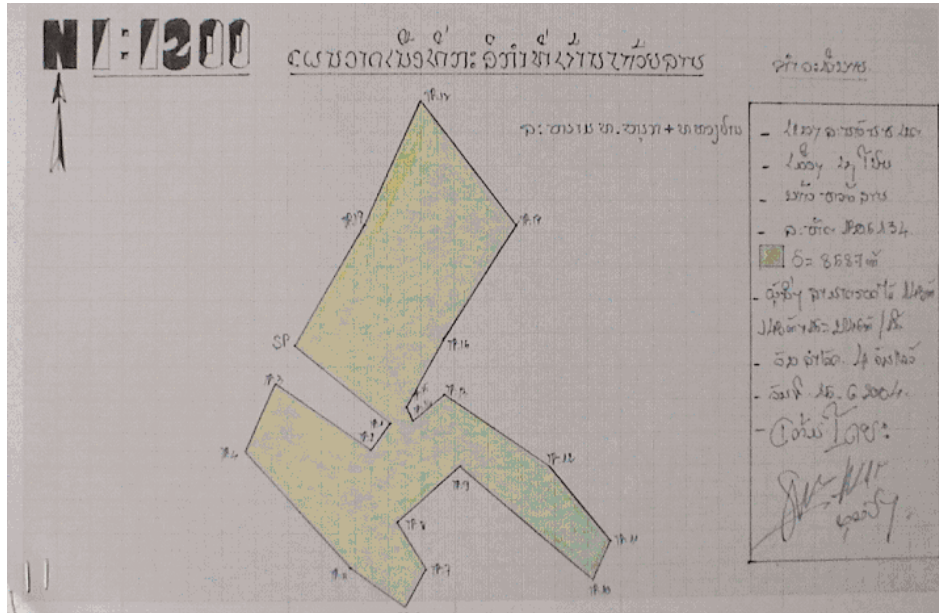


Figure 6. Example of a completion map for a site in Savannakhet

Post Clearance Evaluations

Although a definition of Post Clearance Evaluation (PCE) does not exist in IMAS, it is generally understood to be an assessment that is undertaken sometime after cleared land has been handed over to beneficiaries in order to determine whether land is being used as envisaged. PCE may consist of qualitative and quantitative approaches – including activities such as cost-benefit analysis of completed tasks. In Lao PDR, PCE activities have been limited and although there have been some general reviews of mine action expenditure and projected economic benefits of UXO LAO operations,¹³⁴ no comprehensive study has systematically re-examined past clearance sites.

A Post Clearance Impact Assessment (PCIA) of the UXO LAO programme was formerly scheduled to begin with UNDP assistance in 2003. As of writing, no detailed plan for the PCIA had yet been developed although it was expected that the PCIA would take place in 2005.

Survivor assistance and mine risk education surveys¹³⁵

The socio-economic impact survey completed in 1997 remains the most comprehensive collection of data on victims and the circumstances surrounding accidents in the country. Accident data records during this survey documented the age and gender of the victim, the type of UXO involved, the outcome of the accident (death or type of injuries), and the date, location and cause of accident. In addition, the

¹³⁴ Fisher (2001); GICHD (2001).

¹³⁵ Draws on findings from the feasibility study into a National Network for UXO Accidents in Lao PDR UNDP/HIB (2004a).

survey data also provided a broader view of accidents by analysing the type of injuries, the affected groups, and the activities at the time of the accident. However, since the survey did not cover all communities, the data remains incomplete.

In addition to the 1997 survey, there have been ongoing efforts within UXO LAO to update the victim database. Several other organisations such as Consortium, COPE, the Lao Disabled Peoples Association (LDPA), as well as the Ministry of Health include the collection of data on UXO victims and survivor needs in their own programmes (*see below*) and some attempt has been made to share this information. The updating and monitoring of accident information on a national scale, though, have not been fully successful and a concerted effort to readdress the collection of accident data is overdue.

UXO LAO

In the event of an accident being reported to the UXO LAO provincial office, a survey or community awareness (CA) team is dispatched to complete a UXO LAO accident report form, which is then faxed to UXO LAO headquarters.

Although reports are received by UXO LAO and summary tables of accidents are updated monthly it is widely believed that the total number of accidents is considerably under-reported. In practice, UXO LAO only work in nine provinces, and even within these only in certain districts. In those provinces where UXO LAO operate, comparison of data received at a national level compared to information retained at a provincial level indicates failures in the effectiveness of information transfer.

It is also clear that a reliance on a passive reporting mechanism for villagers to communicate with UXO LAO has limitations (as opposed to an active reporting mechanism where all villages are periodically visited). A study by HIB in 2004 concludes that *“this system of reporting does not seem to work. Village Leaders do not complete forms, or forms do not make it back to UXO LAO District/Provincial offices. Moreover, not every village has been visited by CA or Survey Teams so no form is available in these villages. Finally, Village Leaders have to be literate in Lao to complete it, which is not always the case.”*

Consortium

Consortium is an NGO operating in four provinces providing survivor assistance and MRE. In 1996, it initiated a War Victims Medical Fund and keeps a simple *Excel* spreadsheet on victims treated at district or provincial hospitals and whose medical costs have been supported by Consortium. While this is a source of accident information it is far from complete, as it is limited to four provinces and does not include fatal UXO accidents, or victims that did not receive treatment through the Consortium programme.

Cooperative Orthotics and Prosthetic Enterprise (COPE)

COPE provides technical support to five rehabilitation centres in five provinces that provide prostheses, orthoses and wheelchairs to persons with disabilities (PWDs), including mine and UXO victims. Data on patients arriving at the five centres is

entered into a *Visual Dbase* database and central data kept in Vientiane is updated by email regularly. While the database contains thousands of patients, it does not record UXO victims who died from their injuries or who have not been admitted into a rehabilitation programme supported by COPE.

Lao Disabled Peoples Association (LDPA)

LDPA is active in six provinces and comprises 1,600 members of whom 70 per cent are estimated to be UXO victims. New members complete forms that include cause of disability and, if relevant, the date of accident, which is entered into an *Access* database in Vientiane. The database does not include all disabled persons, nor does it capture victims who died as a consequence of injuries suffered from UXO.

Ministry of Health (MOH)

The Ministry of Health, through its provincial departments, does not systematically collect information on UXO victims but some hospital admission and referral registers indicate UXO as a cause of injury and, in the event of death, registers the cause. Summary statistics are forwarded from district to province and then on to Vientiane. MOH data is typically limited to recognition that an injury or fatality is a result of a UXO accident. It does not provide much insight into the activity at the time of the accident or the location of the accident.

Other surveys

In 2003 and 2004, a study on the psychosocial affects of mines/UXO accidents on children and their families was undertaken in Lao PDR. The survey was conducted by HIB in conjunction with the Lao Youth Union (LYU), the LDPA, and the National Rehabilitation Center (NRC) in response to a request from UNICEF. The project targeted five of the nine most affected provinces: Savannakhet, Xieng Khouang, Champassak, Luang Prabang, Saravan or Kamouane and used the victim data provided by UXO LAO and others.

The study targeted around 500 respondents, including:

- Children injured by mines or UXO;
- Adults who had been victims as a children;
- Children whose parents had been a victim of a mine/UXO accident; and
- Families (parents and siblings) of children who had been killed or injured by a mine or item of UXO.

The objective of the project was to “determine the long-term psychosocial affects of accidents on children and their families and to make recommendations for future programme development. The study addressed issues of traumatising both psychologically and socially, services provision and access to education, health care and community support mechanisms.”¹³⁶

Study findings are intended to supply data to help target MRE programmes and to tailor messages for children and adolescents, who make up about 40 per cent of accidents in Lao PDR. They are also expected to “provide local communities,

¹³⁶ HIB proposal “Psycho Social Support to Child Victims of UXO” (2002).

government agencies, NGOs and INGOs, with a more nuanced appreciation of the main effects of mines and UXO on children and adolescents and their care givers.”

The project duration was proposed as 12 months, to be initiated in mid-2003 and to be completed in mid-2004. As of writing, the final report for the psychosocial survey had not been released.

Socio Economic Impact Survey ‘Living with UXO’

Table 3. Summary sheet of Socio Economic Impact Survey 'Living with UXO'	
Agency	Handicap International Belgium
Client	UXO LAO/UNDP
Type	Socio Economic Impact Survey ¹³⁷
Objectives	<p>Conduct a national survey to:</p> <ul style="list-style-type: none"> ➤ Determine the scope of UXO/mine contamination in Lao PDR; ➤ Access its socio economic impact on various sectors; ➤ Identify local attitudes, responses and adjustments towards UXO; ➤ Prioritise communities and districts for UXO/mine clearance; ➤ Provide data to help define an awareness approach and strategy; and ➤ Assist UXO LAO in fundraising activities.
Dates/duration	13 months: June 1996 to July 1997
Scope (national/provincial)	National – 15 of 18 provinces (three provinces were excluded through an “expert opinion” process). Village-level data was collected in 7,675 villages in 86 districts (out of a total of 11,000 villages and 142 districts in Lao PDR)
Focus	Community Impact
Information Management	<p>Project created the national database in UXO LAO Database application:</p> <ul style="list-style-type: none"> ➤ Microsoft Access ➤ GIS functionality: ArcView
Cost	US\$696,000; Donors were Government of Sweden and UNDP. Additional funds were received that increased the budget by some 25 per cent (final amount undetermined)

Expressed need for the survey

A decree issued by the Prime Minister in 1995 authorised the establishment of a nationwide programme for UXO/mine action. The following year, the UXO LAO Office opened with one of its first activities to request bids to conduct a survey to obtain a national understanding of the presence and impact of UXO. In June 1996, HIB was awarded the contract to implement the survey project.

¹³⁷ The Lao PDR survey did not follow a standard SAC/Landmine Impact Survey methodology. The project was undertaken prior to the establishment of the Survey Action Center and the Global Landmine Survey initiative.

The requirement to undertake a survey was a matter of urgency as UXO LAO was developing fast with provincial offices being established, community awareness activities starting, and training and procurement underway. It was imperative that a national survey be completed to help shape the development of the UXO programme in Lao PDR.

Objectives established for the survey

The objective of the project was to conduct a national survey to assess the scope of UXO/mine contamination in Lao PDR and its socio economic impact in the country. The project findings were envisaged to be used as a framework for the prioritisation of communities and districts for UXO/mine action, including the analysis of the victims of UXO, to help define MRE strategies and approaches to survivor assistance.

Outputs planned

- Establish a survey database with GIS functionality populated with survey data;
- Rank villages, districts and provinces based on the severity of the UXO impact; and
- Provide national, provincial and district reports and maps for dissemination to appropriate stakeholders.

Implementation process with activities

HIB implemented the survey as an independent sub contractor providing administrative and logistical support direct from its office in Vientiane. Data collection was undertaken in close collaboration with the Ministry of Labour and Social Welfare (MLSW) and the provincial and district authorities.¹³⁸

The survey was conducted in four phases: a *Preparatory Phase*, including the review of existing data; *Phase 1*, collection of data at a provincial and district level; *Phase 2*, village level survey; and an *Analysis and Reporting Phase*. The following activities were identified for each phase:¹³⁹

Preparatory Phase

- Review existing datasets
- Refine methodology and training curriculum
- Develop and test a questionnaire

Phase 1

- Collect information on the scope and scale of the UXO/Landmine problem at the national, province, and district levels;
- Identify criteria for measuring the impact of UXO/landmines on the society and economy
- Analyse the information collected to determine which provinces and districts are most severely affected by UXO/landmines; and to
- Identify five priority provinces and the most severely impacted districts within those provinces for the purpose of planning a follow-up socio-economic impact survey at the village level (Phase Two).

¹³⁸ Approximately two thirds of the data collectors used in the survey had been involved in the March 1995 National Census.

¹³⁹ Taken from Handicap International Project Proposal, (1996a; 1996b).

Phase 2

- Collect information on the type of impacts that UXO/Landmine have on the social and economic activities of affected villages;
- Establish criteria for identifying priorities for UXO/landmine clearance and community awareness activities.

Analysis and Reporting Phase

- Consolidate and process data
- Analyse information collected to identify priority sites for planning of future UXO/landmine marking, clearance and community awareness activities.
- Generate reports at a national, provincial and district level

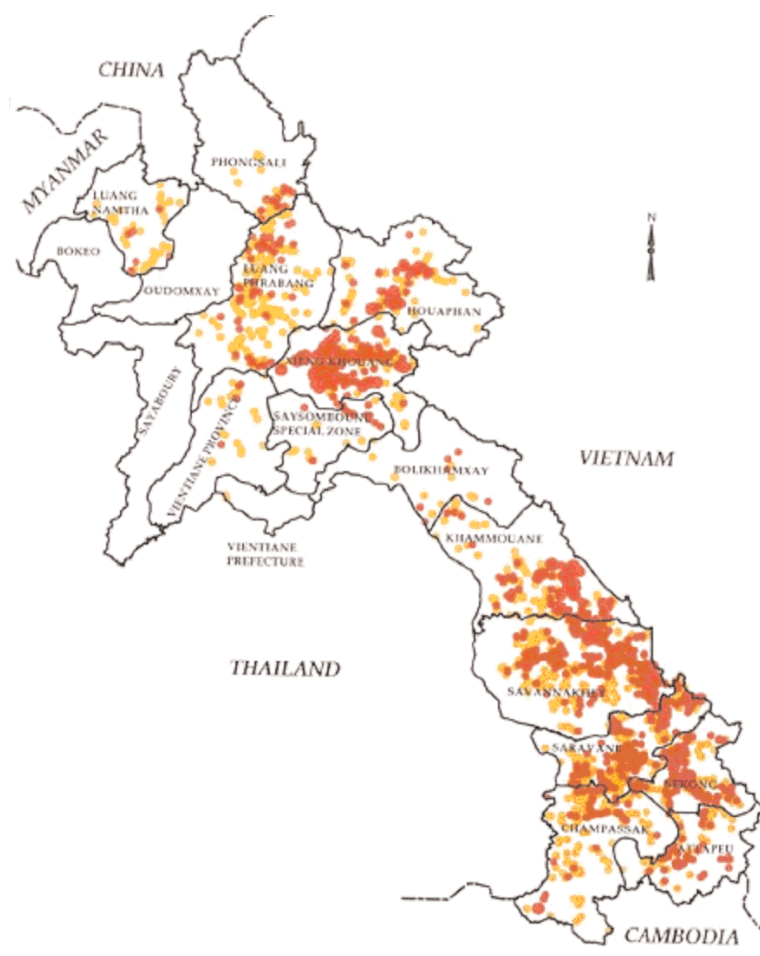


Figure 7. Summary map of villages impacted by UXO in Lao PDR

Actual outputs

In accordance with the planned outputs, the survey results populated a database at the UXO LAO central office and a comprehensive set of reports at a national, provincial and district level were generated. These ranked villages, districts and provinces based on the severity of UXO impact. The number of villages actually visited, however, far exceeded that estimated in the original proposal, which had estimated that after the Phase 1 district-level survey, village-level data would be

focused in five provinces, 30 districts and 2,700 villages.¹⁴⁰ The actual number of villages visited was more than double this figure, totalling 7,675 in 86 districts and 15 provinces.

Initially it was believed that the survey would harness several criteria to measure the socio-economic impact of UXO by using a combination of indicators such as:

➤ Types of UXO	➤ Land denial & UXO location	➤ Economic activities
➤ Human Accidents	➤ Population density	➤ Development priorities
➤ Livestock accidents	➤ History of fighting	➤ Development plans ¹⁴¹

It soon became apparent that such an approach was too ambitious and a ranking scheme was introduced that essentially focused on the main variables: accident information, land use in contaminated areas and the history of the conflict (*Box 3*).

The outcome of the classification was that the impact categories for villages (“severe”, “high”, “medium” and “low”) were less of a measure of the socio-economic impact of UXO than of exposure to risk.

The ranking of districts considered “severely” impacted were those that had more than 35 per cent of the villages reporting contamination. Districts in this category were then used as a benchmark to determine the most affected provinces, where the 10 most affected provinces contained at least one severely impacted district.

In September 1998, the original categorisation scheme was adjusted further, similarly focusing on risk reduction but by ranking affected villages by a single datum – the location of UXO. This was justified based on the analysis of accidents where 40 per cent occurred within village centres themselves or along main thoroughfares and thus it was considered that the location of UXO was a good indicator of accident risk. In this scheme the category “severe” was dropped and “high” impacted villages were considered those where UXO are present in the village centre; “moderate” impact where UXO exist in cultivation areas; and “low” impact where contamination exists in forested or grazing land.

In addition to the UXO impact-ranking of various administrative units in Lao PDR, the full extent of survey findings were well presented in reports that were widely distributed to facilitate the integration of data into end-user planning and operations.¹⁴² An output of the project that was not highlighted in the original proposal was the *recommendations section* contained in the final report that provided guidance to help use the survey data and to assist with the development of the UXO LAO programme. These recommendations remain central to the *Planning Assumptions* of the 10 year National Strategic Plan approved in 2004.

¹⁴⁰ “Unexploded ordnance in Lao PDR, Socio-economic Impact Survey”, Project Proposal (1996)

¹⁴¹ Taken from a PowerPoint presentation to UXO LAO by HIB in 1996.

¹⁴² Refer to HI report “Living with UXO” (1997), and provincial reports for details of findings including examples of maps down to district level.

Box 3. 'Living with UXO': methodology used to calculate a nominal socio-economic impact score [GLOBAL].Handicap International – Belgium (HIB) during 1996 and 1997

$$\text{GLOBAL} = 3 * \text{UXOACC} + 2 * \text{LANDUSE} + 1 * \text{HISTORY}$$

Values ranging from 0 and 24, reassigned nominal values (in parentheses)

0 to 0	(0) No impact
1 to 6	(1) Low impact
7 to 12	(2) Moderate impact
13 to 18	(3) High impact
18 to 24	(4) Severe impact
	(9) Unknown – if the major indicator or 2 minor indicators are UNKNOWN

1. UXO Accidents [UXOACC]

The human impact of the UXO is obtained by the weighted mean of the period and the number of accidents, the location of the accidents and the percentage of all victims on

$$\text{UXOACC} = 3 * \text{ACTUALIT} + 2 * \text{WHEREACC} + 1 * \text{GPTXVIC}$$

1.1 *How recent are the accidents [ACTUALIT]?*

This information is obtained from the Accident questionnaire.

$$\text{ACTUALIT} = 1 * \text{Number of victims between 1973 and 1976} \\ + 2 * \text{Number of victims between 1977 and 1986} \\ + 3 * \text{Number of victims between 1987 and 1997}$$

Values obtained between 0 and 63, reassigned nominal values 0 to 9 (in parentheses)

0 to 0	(0) No victims.
1 to 5	(1) Very few victims or victims in immediate post-war years only.
6 to 10	(2) Few victims or victims in immediate post-war years only.
11 to 15	(3) Several recent victims.
16 to 63	(4) Many victims and/or recent victims.
	(9) Unknown- if the number of accidents reported in the village is positive, but the number of accident forms equals zero.

1.2 *Location of UXO accidents / incidents ? [WHEREACC]*

This information is obtained from the Accident questionnaire.

$$\text{WHEREACC} = 3 * \text{number of accidents inside the village} \\ + 2 * \text{number of accidents just outside the village} \\ + 1 * \text{number of accidents in the forest or grazing lands}$$

Values obtained between 0 and 58, reassigned nominal values 0 to 9 (in parentheses)

0 to 0	(0) No victims
1 to 5	(1) Very few accidents and accidents occurred in the forest
6 to 10	(2) Few accidents or accidents occurred in the forest
11 to 15	(3) Several accidents and/or accidents occurred outside the village only.
16 to 58	(4) Many accidents and/or accidents occurred inside the village
	(9) Unknown – if the number of accidents reported in the village is positive, but the number of accident forms equals zero.

1.3 *Numbers of victims as a percentage of the actual population of the village [GPTXVIC]*

This information is obtained from questions 1 and 22 of the Village questionnaire.

Box 3 (continued)

Values obtained between 0.0 and 1.0, reassigned nominal values of 0 to 9 (in parentheses):

0 to 0% (0)

0.0 to 0.5% (1)

0.5 to 1.0% (2)

1.0 to 2.0% (3)

2.0% (4)

(9) Unknown – if the total population of the village is unknown.

2 *Limits of land use due to UXO? [LANDUSE].*

This information is obtained from questions 24 and 16 of the Village questionnaire.

$$\text{LANDUSE} = 2 * \text{DANGER} + \text{UXOLAND}$$

Values obtained between 0 and 12, reassigned nominal values 0 to 9 (in parentheses)

0 to 0 (0) No impact

1 to 3 (1) Low impact

4 to 6 (2) Moderate impact

7 to 9 (3) High impact

9 to 12 (4) Severe impact

(9) Unknown – if DANGER = (9) Unknown

2.1 *Presence of UXO / Landmines and how many (question 24) ? [DANGER]*

Values obtained between 0 and 200+, reassigned nominal values 0 to 9 (in parentheses)

(0) No UXO / Landmines reported

(1) Yes UXO reported, number of UXO is Unknown

(2) Yes UXO reported still today, at least one item of UXO still present

(3) Yes UXO reported, number of UXO is more than 10 items

(4) Yes UXO reported, number of UXO is more than 150 items

(9) Unknown- if the answer to the question was left blank.

2.2 *Location of UXO / Landmines (question 16) ? [UXOLAND]*

+ 6 In village centre

+ 2 Along path or road

+ 2 In irrigated rice fields

+ 2 In low land rice fields

+ 1 In upland rice fields (“hai”)

+ 1 In grazing land

+ 1 In near forest (woodlots near village)

+ 1 In far forest (forested areas far from the village)

+ 1 Other types of land

+ 16 Everywhere (throughout the village and land used by its inhabitants)

Values obtained between 0 and 17, reassigned nominal values 0 to 9 (in parentheses)

0 to 0 (0) No impact

1 to 4 (1) Low impact

5 to 8 (2) Moderate impact

9 to 12 (3) High impact

> 12 (4) Severe impact

(9) Unknown – if no answer was provided to question 16.

Box 3 (continued)

3 *Impact of the war on the village? [HISTORY]*

This information is obtained from questions 10 and 11 of the Village questionnaire, about the history of ground battles and air bombardment.

HISTORY = INDEXBMB + TYPEARTIL

Values obtained between 0 and 8, reassigned nominal values 0 to 9 (in parentheses)

0 to 0	(0) No impact
1 to 2	(1) Low impact
3 to 4	(2) Moderate impact
5 to 6	(3) High impact
7 to 8	(4) Severe impact
	(9) Unknown – if the answer to both indicators is missing (blank). Note – if one of the two indicators is missing. HISTORY takes the value of the other indicator.

3.1 *Was the village bombed during the war (question 10)? [INDEXBMB]*

Was village bombed during the war?

+ 0	No
+ 1	Yes

How many times?

+ 1	One time
+ 2	Two to five times
+ 3	Six to 50 times
+ 4	More than 50 times
+ 1	Other types of land

Presence of small craters?

+ 1	One to 150 small craters
+ 2	More than 150 small craters

Presence of large craters?

+ 1	One to five large craters
+ 2	Six to 20 large craters
+ 3	21 to 100 large craters
+ 4	More than 100 large craters.

Duration, in years?

+0.33 per year One to twelve years, up to maximum score of 4.0

Values obtained between 0 and 15, reassigned nominal values 0 to 9 (in parentheses)

0 to 0	(0) No impact
1 to 4	(1) Low impact
5 to 8	(2) Moderate impact
9 to 12	(3) High impact
13 to 15	(4) Severe impact
	(9) Unknown – if no answer was provided to question 10.

3.2 *Intensity of ground battle near village (question 11)? [TYPEARTIL]*

+ 0	No, ground battles not reported
+ 2	Yes, ground battles reported
+ 2	Artillery used

Box 3 (continued)

- + 2 Anti-aircraft artillery used
- + 1 Mortars used
- + 2 “Big guns” used
- + 2 Tanks used
- + 2 Military camp in vicinity
- + 1 Administrative office in vicinity.

Values obtained between 0 and 15, reassigned nominal values 0 to 9 (in parentheses):

- 0 to 0 (0) No impact
- 1 to 4 (1) Low impact
- 5 to 7 (2) Moderate impact
- 8 to 11 (3) High impact
- 12 to 14 (4) Severe impact
- (9) Unknown – if no answer was provided to question 11.

Source: Ms. Christiane Vellin, former survey statistician (HIB internal memorandum, 1997). The information in this box was prepared by Michael Sheinkman, former survey adviser for GIS/database.

Information management

The HIB survey provided the first national Geographic Information System (GIS) in Lao PDR. Information collected by the survey was entered into an information management system that used a *Microsoft Access* database application with *ArcView* GIS functionality. Initial geographic data used a 1:200,000 map scale, though, as part of the development of the database; this has since been significantly upgraded with many geographic features now available on a 1:50,000 scale. A conversion of the database to IMSMA is also currently in progress.

The coding system used by the survey to identify provinces, districts and villages was that of the National Statistics Centre for the 1995 National Census and thus village and accident reports from the HIB survey have a coding reference that facilitates analysis and integration of additional datasets.

Outcome¹⁴³

Planning, operations and coordination

The principal objective of the survey was to identify the most affected areas of the country in order to target a national response to the UXO problem. While the criteria for assigning relative “impact” of villages, districts and provinces is quite simplistic, the impact ranking of administrative units in Lao PDR by the HIB survey has defined the UXO programme today.

The survey concluded that UXO operations should concentrate on the ten most

¹⁴³ At the time of researching this case study the HIB survey had already been completed for seven years. It is important to appreciate that while such a period of time allows a better evaluation of the medium-term value of the survey project, such an assessment can suffer from a lack of informants remaining in key positions to elaborate benefits of the project in the years immediately following the completion of the survey.

affected provinces – including the Saysomboune 'special zone'.¹⁴⁴ Apart from Saysomnounge, the UXO LAO programme has followed these recommendations and provincial offices were established in the remaining nine provinces.

At a district level, the UXO LAO programme also followed the severity of the impact identified by the survey and today there still remains a considerable correlation between severely impacted districts and the targeting of operations today (see Table 4). Furthermore, at a village level, the ranking of communities has generally formed the basis for deployment of UXO LAO resources with adjustments made for operational considerations such as accessibility and the clustering of activities within target districts. The degree of integration of survey data into operational planning at this level, though, varies between provinces and implementing partners. Increasingly there has been a greater influence of other factors for planning purposes as more information is obtained and UXO activities progress.

Table 4. Correlation between districts targeted for UXO LAO activities in 2004 against the “severely” affected districts identified from the HIB survey findings in 1997			
Province	Clearance Percentage of total planned clearance (by square metres) targeted at “severely affected” districts in 2004	Roving Tasks & Survey Percentage of planned resource deployment in “severely affected” districts in 2004	Community Awareness Percentage of planned resource deployment in “severely affected” districts in 2004
Attapeu	100	100	60
Sekong	100	100	100
Saravan	100	100	57
Champassak	61 (+2 other districts)	100 (+6 other districts)	100 (+1 other district)
Savanakhet	74 (+1 other district)	83 (+1 other district)	86 (+1 other district)
Khammouane	79 (+1 other district)	75 (+1 other district)	25 (+1 other district)
Xieng Khouang	100	100	100
Luang Prabang	48 (+3 other districts)	100 (+7 other districts)	100 (+7 other districts)
Houaphanh	20 (+2 other districts)	50 (+6 other districts)	0 (+5 other districts)
<p>Notes:</p> <ul style="list-style-type: none"> ➤ In Attapeu and Sekong, all districts of the provinces are severely affected and have targeted operations ➤ A divergence of activities from “severely” impacted districts would be expected based on severely impacted villages existing in other districts and an incorporation of moderately affected villages into operational plans. In addition, progress of UXO LAO activities over seven years will have addressed many operational goals (especially with respect to progress of CA teams). Furthermore, additional information has been acquired since the survey and operations often support development plans that warrant the review of contaminated 'areas' as opposed to 'villages' as a targeted unit. ➤ The criteria used to determine degree of impact between that used in HIB survey report and those adopted in September 1998 may vary marginally. ➤ Some inaccuracies may exist in the table due to inconsistencies between maps and text in the 2004 work plan. ➤ The '+' symbol signifies the number of additional districts of operation outside those severely affected according to the HIB report. 			

¹⁴⁴ The special zone is under the direct administration of the national government and remains a sensitive area due to instability caused by the Hmong ethnic resistance.

The study team visited the province of Savannakhet where HIB has been responsible for providing the technical support to the UXO LAO programme since 1997, and where it was envisaged that the survey data may have been understood and used more readily in operational planning. The HIB survey also ranks Savanakheth as the most affected province.¹⁴⁵

The study team learnt that the use of the survey data in the UXO programme in Savannakhet has been a function of time. According to HIB, village data from the survey was fully used for three years following the survey: to support planning of clearance, roving, and community awareness activities. The focus on the survey data, however, for prioritisation of clearance activities appears to have diminished and the mechanisms for generating an annual work plan also focus on priorities presented by districts and provincial administrations that support development plans¹⁴⁶ and respond to requests from village authorities. These may or may not follow the impact ranking of the HIB survey. Furthermore, other frameworks and factors are now considered during prioritisation, such as the NPEP that highlights 46 districts (seven of the 15 districts in Savanakheth) as national priority development areas.

In addition to the geographic targeting of UXO LAO operations, the survey findings document in detail accident circumstances and village attitudes and behaviour towards UXO. This information has been used extensively by all MRE actors present in Lao PDR.

Some sources contend that the HIB survey findings could have been integrated into planning and operations even more effectively¹⁴⁷ and that today, decisions are often made without reference to the survey. Irrespective of the apparent loss of focus on the survey findings in some areas, the use of the HIB survey has been remarkable compared to the degree of use of national survey data in other mine action programmes.¹⁴⁸

While several key elements of the survey have become dated,¹⁴⁹ and the degree of coverage of the survey has been questioned,¹⁵⁰ the HIB survey findings remain the baseline for UXO information in Lao PDR. This is reflected in the National Strategic Plan approved in 2004 that uses the 1997 survey as a starting point for the ten-year plan. The NSP references the HIB survey four times using it as a benchmark for MRE activities and “stepped-up” technical surveys activities.

¹⁴⁵ HIB (2002; 2004b).

¹⁴⁶ For instance, clearance is support for the following beneficiaries in Savannakhet Province were cited: BTC, HI, World Food Programme, CARE, MOE, MCTPC.

¹⁴⁷ For instance, HI village level reports have not been fully used in all provincial UXO LAO offices – an observation highlighted in a UNDP external evaluation mission to Laos PDR (van Ree et al., 1998).

¹⁴⁸ The success of the integration of data from the HI survey was facilitated by the quality and extent of the distribution of maps and reports (national and provincial) at the end of the project. See, for example, HIB (1997a-d).

¹⁴⁹ Particularly accident information.

¹⁵⁰ Based on information acquired since the survey it appears that the “expert opinion” that governed the targeting of the provinces and districts for the survey had shortfalls in some geographic areas. The survey coverage is thus referenced as incomplete in the UXO LAO Annual Report 2003.

Planned follow-up/additional survey

The recommendations of the HIB survey report included the establishment of a secondary project to collect supplementary information to improve socio-economic impact assessments and to establish an ongoing system for monitoring UXO accidents. A discrete follow-on project did not, however, materialise.¹⁵¹

A considerable focus on CA teams in the aftermath of the HIB survey provided an opportunity to collect further general survey data as an ongoing activity.¹⁵² At the end of 2003, CA teams had visited a total of 4,484 villages with a target to reach another 542 villages in 2004. To date however, the CA survey data has not been incorporated into the initial HIB dataset, but rather entered into the national database using a separate table. The amalgamation of these two datasets remains a pending activity which must be carefully managed, particularly as UXO LAO begins to concentrate more on clearance.¹⁵³

While recommendations of the impact report called for an ongoing mechanism for recording accident data, a recent study by HIB¹⁵⁴ concludes that this has not been achieved, irrespective of efforts undertaken by UXO LAO and others (see above section Overview of Surveys in Lao PDR). Accident numbers continue to be significantly under-reported and it is likely that a project based on the recommendations of recent HIB feasibility study (2004) will be implemented in the near future.

US Air Combat Data¹⁵⁵

Expressed need for the project

Most of the UXO contamination in Lao PDR originates from US air-delivered ordnance dropped between 1965 and 1973. Details of these combat missions were recorded in a data system developed by IBM in the early 1960s that provided information daily to the US Joint Staff via the National Combat Command Information Processing System (NIPS). While the vast majority of ordnance detonated, the provision of these records to UXO LAO offers a valuable oversight of where remaining contamination may exist today and provides information on expected types of UXO.¹⁵⁶ Data of this nature can assist the planning of UXO clearance and economic development projects by complementing the HIB survey and improving the spatial understanding of expected contamination in the country.

¹⁵¹ An initiative that the Lao authorities did not approve.

¹⁵² General survey data forms a section of the UXO LAO standard "Village Visit Report".

¹⁵³ It is planned in the NSP to contract out CA activities, though a mechanism to support this is not yet clear

¹⁵⁴ Feasibility Study into a National Network for UXO Accidents in Lao PDR (2004b)

¹⁵⁵ This project has been referenced by various other names such as the MSTI Project, South East Asia Air Combat Data Project, and the Indochina Bomb Data Project. Much information in this section is taken from the DSCA Statement of Work (1994) and a report "South East Asia Air Combat Data" (Smith, 2004).

¹⁵⁶ In addition to the bombing data this project also provides information on the deployment of defoliants – known as herbicide mission data obtained from the US Armed Services Center for Research of Unit Records (CRUR) which is the source for the substantiation of veterans' claims of herbicide contact.

Agency	<i>Contractors:</i> Management Support Technology Inc (MSTI), later Federal Resources Corporation (FRC), Fairfax Virginia. <i>Donor:</i> Defense Security Cooperation Agency – Humanitarian Assistance and Mine Action (DSCA-HAMA)
Client	UXO LAO/Government of Lao PDR
Type	Desk top – review of US records of combat activities from the US National Archives and Records Administration (NARA)
Objectives ¹⁵⁷	<ul style="list-style-type: none"> ➤ Provide geo-referenced records of US combat activities to UXO LAO: ➤ Provide assistance with mapping and geospatial information management to assist the display of combat records and further data analysis ➤ Train UXO LAO staff in management of data and map production
Dates/duration	From 1994, DSCA in conjunction with MSTI/FRC developed an informational/ relational database from the separate declassified tapes of US air combat activities. Relevant datasets were released to UXO LAO between 1998-2000
Scope	National
Focus	US Records of combat activities
Information Management	MS Access with data stored and queried using ESRI shape files
Cost	Donor: US Department of Defense – funding level undisclosed Expressed need for the project

Objectives established for the project¹⁵⁸

The project (*see Table 5*) called for the recovery of data from three major US databases of bombing missions and one database of herbicide missions between 1965 and 1973.

The recovered data was required to be geo-referenced and incorporated into a geospatial database for ease of analysis and to allow a Geographic Information System to support future surveys, development plans and clearance activities. An end goal was for Lao national capacities to be capable of managing data and printing maps to support the wide range of UXO mitigation efforts.

Outputs planned

- Provide UXO LAO with geo-referenced data from the following databases:
 1. SEADAB SE Asia Database (Air Combat Aircraft January 1970 to June 1975);
 2. CACTA Air Combat Activities (Air Combat October 1965 to December 1970);

¹⁵⁷ The original project proposals included details of collaboration with agencies and departments in the US such as DSCA, NIMA, host nation institutions, provision of GFI, and much technical specifications for the development and revision of topographic maps, data GIS tools, consolidation of codes, ordnance descriptions, host nation training requirements etc. For the purposes of this study detail is omitted from this section with a focus placed on final product and value of outputs to the UXO programme in Lao PDR.

¹⁵⁸ The provision of US combat data to Laos is part of a regional project whereby bomb data has also been provided to Cambodia (2001) and Vietnam (2002/3).

3. SACCOACT Strategic Air Command B-52 Missions (June 1965 to August 1973);
4. *Herbicide files* Herbicide missions (July 1965 to February 1971);

Including provision of:

- Location of ordnance drops;
- Ordnance category and specific type;¹⁵⁹
- Ordnance number expended;
- Target and bomb damage assessment, and
- Mission information such as date and types of aircraft used;
- Provide assistance to upgrade geographic data used by UXO LAO including improved map scales;
- Training to ensure that UXO LAO is capable of querying, displaying and printing/plotting ordnance data to support information requirements.

*Implementation process and activities*¹⁶⁰

Supported by the US Defense Security Cooperation Agency (DOD) a contractor, Management Support Technology Inc (MSTI), later Federal Resources Corporation (FRC), was used to implement the project. Activities were broken down into three phases: Requirement/Definition, Production, and Delivery.

Actual outputs

The four databases and most of the required information outlined in the proposal were recovered and provided to UXO LAO over a period of two years according to the following timetable:

- SEADAB: Completed October 1998;
- CACTA: Completed March 1999;
- SACCOACT: Completed November 1999;
- Herb & Ranch Hand: Completed February 2000.

The UXO LAO database at the time of the US Air Combat Data Project operated a 1:200,000 scale spatial database. The bomb data project improved geospatial information to help display bomb (and herbicide) data from the war. Data shape files of some features, such as roads and rivers, to scales of 1:50,000 scales or better were provided though full spatial information for UXO LAO operations at a scale of 1:100,000 remain incomplete.¹⁶¹ In addition, the project provided satellite imagery from Landsat 7 with national coverage to a resolution of 15 metres in black and white imagery and 30 metres in colour.

¹⁵⁹ For example: Cluster Bomb: e.g. CBU 24/29, CBU 2A, CBU 12; General Purpose Bomb: e.g. 500lb GP Mark 82; GP bomb with delay action fuse: e.g. Mark 36 destructor; rockets, missiles; projectiles, ammunition; flares, sensors.

¹⁶⁰ The detailed activities of this project are technical in nature and have been deliberately excluded here.

¹⁶¹ An objective of a VVAF supported project approved for 2004/2005 aims at supporting the continual upgrade of the national database including provision of complete spatial information at a 1:100,000 scale – and ultimately a 1:50,000 scale.

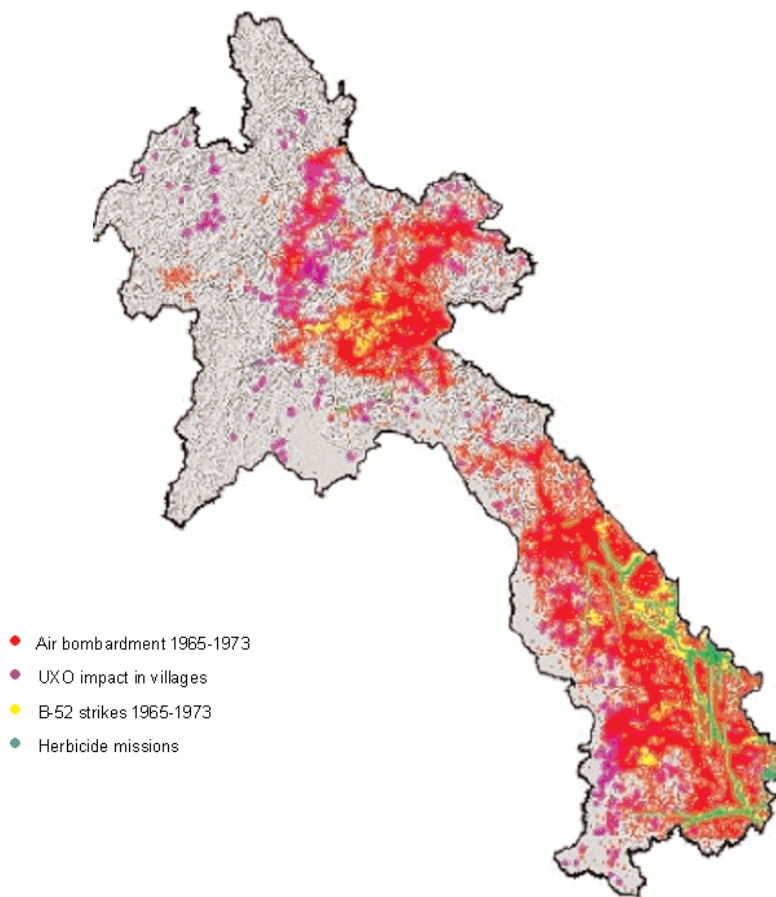


Figure 8. National map of Lao PDR illustrating a summary of US Air Combat Data where bomb and herbicide data is superimposed on the HIB village impact data

Outcome

Planning, operations and coordination

The value of the bombing data must be understood in the context of its limitations. First, UXO LAO estimates that 70 to 90 per cent of the ordnance detonated as intended, thus the bomb data identifies ordnance that was expended from aircraft, not the number that remained in tact. Second, there has been three decades since the end of the war and a considerable amount of ordnance has been removed through formal and informal clearance activities. Third, the bombing database contains inaccuracies and it is not complete – some codes or descriptions of ordnance are confusing and the coordinates of ordnance drops recorded may differ appreciably from actual impact locations. Fourth, and perhaps the most important aspect of the bomb data, is that it only reflects US air-delivered ordnance and does not represent UXO originating from ground battles such as mortars, rockets and artillery, nor the presence of landmines. In many areas of the country it is UXO from ground battles and landmines that contribute most to the impact of the contamination felt today.

In sum, the bomb data maps do not have the same value as minefield maps in regard to definition of boundaries of contamination or the nature of items remaining, however the importance of the bombing data as a resource to assist planning of operations and development activities should not be underestimated.

The HIB survey was an impact assessment using the village as the unit of investigation. The national summary map presented for the project illustrates a colour scheme of “dots” of relative *impact* based on the location of communities visited during the field assessment phase of the project. The survey however falls short of providing a national map representing the spatial distribution of contamination. In the absence of a map that identifies the extent of the *contamination* between communities surveyed, or indeed contamination in areas not surveyed, the bombing data goes some way to address this shortfall.

Consider Figure 9: this map of Savannakhet province illustrates village impact data superimposed on bombing data. The additional bomb information significantly improves a spatial appreciation of the likely location of contamination than does the impact survey alone. Furthermore, the bombing data may actually be more valid than it would at first seem since there is likely to be a fair correlation between the location of ordnance originating from ground battles and the targeting of US air strikes.

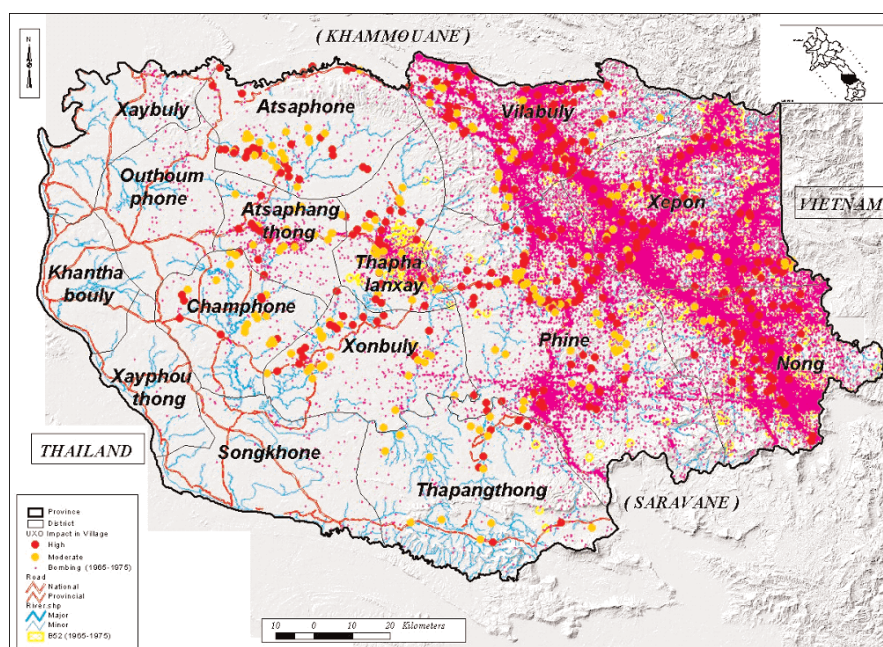


Figure 9. Savannakhet provincial map: showing UXO impact data from the 1997 HIB socio economic survey and bombing data from records of US air combat activities.¹⁶²

Several stakeholders of survey data value bombing records above community impact data, for example, where their projects are associated with population relocation, or are undertaken away from communities or where the scale of the task, such as a major infrastructure project, is above a community unit. In such cases, the lack of geographic data on contamination between communities exposes the limitations of a survey based on village impact alone.

¹⁶²This figure illustrates the relationship between the HI impact data and US bombing data for the province of Savannakhet. Earlier in the case study an example of a work plan for Savannakhet is provided this includes a map of poverty by district for the province. This information and guidelines set out in the NSP form the overarching macro data and strategic frameworks for the mine action sector in Lao PDR.

Tailored maps and ordnance details generated from the bomb database have been provided to support a number of development initiatives. Of note, UXO LAO provided the Asian Development Bank with maps and information from bombing records along Route 9 – a major road development project through Savannakhet improving communication links with neighbouring Vietnam. Further examples include data customised for the German demining company Gerbera working along Route 7, and the Australian company Milsearch to support clearance at the Nam Theun 2 dam hydroelectric project in central Lao PDR.

At the time of the HIB socio-economic survey the bombing data was not available. It would, however, have been a valuable component of the “expert opinion” and planning phase of the project. In hindsight, the bombing records reveal several areas where appreciable contamination fell outside the districts targeted by field operations.

In Oudomxay Province for instance, the authorities provided HIB with information that excluded the province from the 1996 field assessment, but the bomb data identified expected contamination in the eastern districts of the province.

Box 4. Royds Consulting Engineers in Houaphan Province¹⁶³

A project undertaken by Royds Consulting firm in Houaphan province is a good example of problems caused by UXO contamination. Royds was contacted to build irrigation schemes on the Nam Pheun and Nam Et rivers, work starting in 1994. Royds subcontracted the work to John Holland, only to be forced to halt work due to the discovery of UXO.

An initial reconnaissance survey was followed by extensive clearance of the project site by the commercial firm Milsearch. In all, this cost the company US\$1.2million – half of this going to pay for UXO clearance and the other half to pay John Holland while they waited for clearance to end. This made the whole project economically much less viable for Royds and delayed the project for many months.

While the precise location of UXO could not have been determined, the provision of bombing data and tailored maps of the development project area could have significantly assisted initial project planning of Royds Consulting.

In addition to direct operational and planning support the value of bombing data as a simple resource to provide visuals for reports, proposals and donor presentations in the UXO sector is considerable. Maps of US air combat activities can best illustrate the extent and intensity of bombardment that Lao PDR witnessed over the nine years between 1964 and 1973 and it is often these images that have greatest impact when presenting the case for funding requirements in the UXO programme.

¹⁶³ Example taken directly from the HI survey final report “Living with UXO” (1997b).

UXO LAO technical surveys

Agency	UXO LAO
Client	UXO LAO (Roving & Area Clearance teams)
Type	Technical Survey ¹⁶⁴
Objectives	<p>(1) <i>Technical survey for roving teams</i> Provide inventory of spot tasks and maps for mobile roving teams to assist the work planning process, prioritisation of tasks and to facilitate quick and effective EOD activities</p> <p>(2) <i>Technical survey for area clearance teams</i> Provide details of area clearance sites (including socio economic data) and necessary resources required to assist the work planning process, task prioritisation and to facilitate quick and effective clearance.</p>
Dates/duration ¹⁶⁵	2000 to date
Scope	Nine provinces (national total: 18 provinces, of which 15 are considered contaminated)
Focus	Technical investigation of sites prioritised for clearance
Information Management	Reports are currently not returned to UXO LAO in Vientiane – typically remaining in paper format in the provinces and are used in the generation of the provincial work plan
Cost	Estimated at US\$17,000 per annum for equipment purchase, salaries and running costs per two-man team for first year

Expressed need for the survey

In the late 1990s, UXO LAO had amassed village level data from two main sources: the HIB socio-economic impact survey and through community awareness teams that collected data as part of their ongoing activities. The sources of information were typically *general* in nature – collecting village statistics and describing the impact of UXO on a community – but lacked a concerted effort to focus on potential clearance sites to provide technical information to support clearance operational planning directly. In order to address the lack of focus on potential *clearance sites* as opposed to broader *community* data it was considered necessary to incorporate technical knowledge into the data gathering process.

Established survey objectives

The objectives of the technical survey capacity in the UXO LAO programme was initially to strengthen links between information gathering and clearance operations by providing technical and impact data that supports the development of more accurate work plans and better targets both roving and area clearance capacities.

¹⁶⁴ The “traditional” terminology for technical surveys (formerly known as Level 2 surveys) described an activity of area reduction whereby the boundaries of reported areas of contamination were delineated and marked. The technical survey implemented in Lao PDR is more attuned to the current terminology of IMAS 04.10 – considered a reconnaissance and preparation activity prior to clearance. Level 2 terminology is, however, still used by UXO LAO.

¹⁶⁵ Not a discrete project but an ongoing activity as part of the overall UXO LAO programme.

A secondary objective was to update level one data in villages where CA teams had not been active.

Outputs planned

- Complete Level 2 questionnaires for each potential clearance site investigated.
- Facilitate the annual work plan process through improved assessments of resource and time requirements for planned clearance tasks.
- Increase in the operational output of clearance capacities, measured in numbers of ordnance disposed (roving teams) and square metres (area clearance teams).
- Improved targeting of resources based on beneficiaries, development plans and land ownership.

*Implementation process with activities*¹⁶⁶

Survey teams work as a provincial asset and are usually tasked by the provincial HQ based on the framework of the work plan and in conjunction with district authorities and sometimes village authorities as a result CA team visits.

Work practices of the surveys teams differ depending on whether the survey is undertaken in support of roving team tasks or area clearance tasks. The principal differences are that roving clearance tasks are mainly concerned with surface UXO at one or a number of discrete sites, while area clearance tasks require clearance of surface and subsurface ordnance over expansive areas.

The same survey report is completed for both roving and area clearance tasks though certain fields may not be applicable to surveys in support of roving tasks. The so-called Level 2 reports include information on:

- Land ownership, land use/planned land use, development plans, beneficiaries;
- Type of clearance required, estimated timeframes and resources;
- Ordnance types, numbers, conditions;
- Impact data (blockage);
- Physical attributes: vegetation cover, terrain, soil conditions etc;
- Accident information – human/animal;
- Other (including access information, previous clearance details, marking);
- Attachments: Location maps, site maps, technical UXO data sheets.

In addition, according to the UXO LAO Standard Operating Procedures (SOPs), technical teams should also complete a Village Visit Report if CA teams are not visiting the community.

Survey activities in support of roving tasks

- Conduct a village meeting to complete appropriate fields on Level 2 report (and Village Visit Report where necessary) – including accident details if applicable;
- Locate UXO;
- Inspect and identify UXO;
- Mark a trail to UXO;

¹⁶⁶ The procedures here apply to the survey of UXO, not for surveying of mined areas. For further details see UXO LAO SOP Section 3 Part 3.

- Survey a trail to the UXO and record information on a map;
- Submit reports and maps to district/province.



Figure 10. Physical marking of a trail to help teams locate UXO
(Photo: UXO LAO)

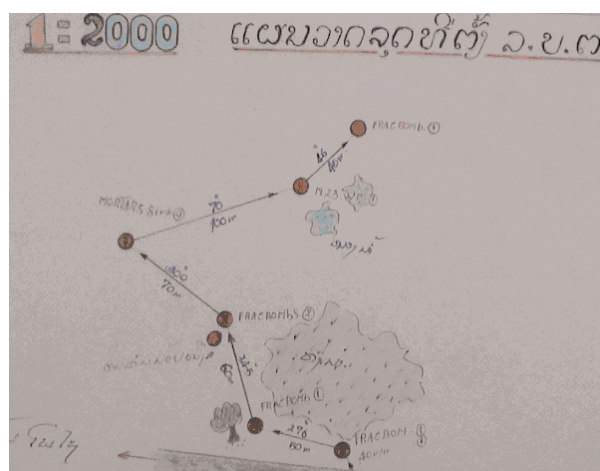


Figure 11. Map of UXO sites to support a roving clearance activity
(Photo: Guy Rhodes)

Survey in support of Area Clearance tasks

- Conduct a village meeting to complete appropriate fields on Level 2 report (and Village Visit Report where necessary) – including accident details if applicable;
- Accurately define the boundaries of the area to be cleared and the clearance depth required to support the planned land use;
- Mark reference points – to include start point and turning points for clearance perimeters;
- Determine average clearance rate of one deminer at the site (*see SOP for methodology*);
- Obtain information on accidents.

Actual outputs

Although other changes in UXO LAO occurred at the same time as the introduction of technical survey teams into the UXO programme, the considerable increase in the productivity of clearance activities is attributed in part to better information provided by the technical survey. Furthermore, timeframe considerations used to generate the annual work plan draw largely on the results of the technical survey. According to the UXO LAO Director, in 2003 more than 10 million square metres of land was surveyed, with about 80 per cent of this selected for clearance in the UXO LAO work plan.

The extent to which technical surveys have led to improvements in targeting appropriate beneficiaries or the tying of clearance priorities to suitable development plans is difficult to ascertain. While considerable variation between provinces occurs, it appears that in most situations technical surveys are simply conducted as a precursor to clearance and not in a function where the prioritisation of tasks are appreciably adjusted based on further impact data collected at the time of the survey.

Information management

To date, technical survey reports are not submitted to UXO LAO headquarters. It is considered that the turn-around time between technical survey and clearance activities is too short and thus only clearance information is entered into the database. Technical reports therefore typically remain as hard copies in the provinces used to support the work plan process. However, with a conversion of the database to IMSMA and a greater emphasis on technical survey activities in UXO LAO it is envisaged that technical survey information will also be available and managed at a central level – particularly data from the technical survey initiative outlined in the NSP.

Outcome

Planning, operations and coordination

The information that technical surveys provide on the location of ordnance for roving tasks, and the delineation of boundaries, physical conditions and clearance requirements for area clearance tasks has contributed to a significant increase in the operational output of UXO LAO clearance capacities.

The maps and inventories of UXO sites generated by surveys for roving teams have led to a greater efficiency of mobile EOD activities by maximising time spent on UXO removal rather than on locating UXO and task planning. For large-scale area clearance, the technical reconnaissance activities of the survey teams determine resource requirements and mark perimeters to facilitate clearance operations. The boundaries identified by survey teams are then generally followed strictly by clearance teams.

While the annual work plan for UXO LAO operations appears to function relatively well, with technical survey data supporting the planning process, international NGOs are concerned about the transparency of the task selection and how much the wishes of local villagers contribute to planning decisions.

Planned follow-up/additional survey

There is an ongoing debate on the purpose/capacity/objectives of survey teams and a strong element within the advisory capacity of UXO LAO advocates for survey teams to take additional steps to evaluate the presence of ordnance and reduce the number of tasks that yield no UXO during clearance from the annual work plans.¹⁶⁷

The current debate is fuelled around issues such as cost benefits, risk management, and the conflict between humanitarian and developmental priorities. The debate is particularly contentious where some operators advocate that technical survey teams be tasked to release land if survey investigations suggest sites are UXO-free or of such low risk that deployment of scarce UXO LAO resources are not warranted. It is particularly the lower risk posed by UXO compared to landmines¹⁶⁸ that provides an

¹⁶⁷ See 'Minutes of Technical Strategy Meeting' June 2004

¹⁶⁸ It should be noted that landmines are more prevalent than first assumed. In Xieng Khouang province, for instance, the provincial coordinator maintains a map marked with 30 minefields of which 18 have been marked, and two fenced off. MAG has retrained surveyors to address mines as well as UXO settings.

opportunity to review different approaches to technical surveys – an activity that should be fully explored to help speed up clearance work and to better target operations.

The ten-year strategic plan (2003-2013) for the UXO programme calls for a strengthening of the technical survey capacity in Lao PDR to allow areas of contamination to be better defined across the country and for tasks to be categorised according to a prioritisation scheme outlined in the NSP. An ambitious plan calls for technical teams to revisit 2,636 villages from the HIB national survey project by July 2005 and to confirm impact data and collect more data of both technical and operational relevance. It is envisaged that the exercise will provide a clearer picture of the total area of land to be dealt with based on the pressing needs of each community and ultimately the total resources required to address the problem. The assets to support this “stepped-up” focus on technical survey activities are to be drawn from area clearance resources in each province.

Current unmet information needs

In order to explore information needs for the UXO programme it is necessary to have an appreciation of the limitations of the existing data that is currently available. The National Survey on the Socio-Economic Impact of UXO, which is considered the baseline data for UXO in Lao PDR, presents a summary of findings that essentially categorise villages on the basis of exposure of the population to accident risk.¹⁶⁹ While the risk of accidents is arguably the leading indicator of impact from a humanitarian perspective, it is misleading to consider the scheme an appreciable measure of the full socio-economic impact of the UXO contamination.

The end users of the HIB survey data should be aware that the ranking of villages, districts and provinces according to land types that pose greatest accident risk to communities lacks deliberation on the extent of the UXO contamination,¹⁷⁰ and is indifferent to critical development considerations that are vital for planning purposes.¹⁷¹ It is perhaps unrealistic within the limitations of the HIB project resources and timeframes to expect a ranking scheme based on a more complex socio-economic model but the shortfalls of the end product must be understood.

The National Survey therefore provides a framework of *villages* to use as guidelines for targeting resources at a strategic level. The effective prioritisation of clearance tasks, however, requires survey data at a greater resolution, focusing on *areas* of contamination or *areas* of development where potential clearance sites are identified. Additional tools and criteria for effective task selection should incorporate factors that capture the projected socio-economic benefits of each clearance activity.

Initially, the UXO LAO technical survey teams were introduced to fulfil the role of additional data collection to support task prioritisation – as well as to collect technical data for clearance planning. In practice, the tools in place to capture the benefits of a clearance task are poorly organised and it appears that any socio-economic

¹⁶⁹ Based on a review of past accidents and the type of land where accidents were located.

¹⁷⁰ Impact scheme does not incorporate the size of the area of contamination or the number of areas contaminated.

¹⁷¹ Such as numbers of people affected, development plans, land ownership, beneficiaries, etc.

information currently collected is largely unused in the work plan process. This weakness in the prioritisation process is understood by UXO LAO and a review of the methodology and approach of the technical survey capacities is currently a focus of the organisation. Furthermore, a review of past clearance activities – the objective of a planned PCIA project – is overdue. Findings from the PCIA can also be used to further adjust data collection and prioritisation schemes. Both these initiatives are discussed further in the following section in the context of an established NRA.

Some stakeholders question the geographic coverage of the HIB survey which, although extensive, excluded some geographic areas where appreciable contamination has since been identified. It would be valuable to determine the extent that the database represents a full *national* picture of the UXO problem and to what degree additional data collection activities have addressed shortfalls in the coverage of the 1997 survey.

The HIB survey data on victims is outdated and although several reporting channels have attempted to update victim data, the current under-reporting of the number of victims is widely recognised as a major data deficiency in the UXO programme. An improved understanding of victim numbers, the activities leading to accidents and the status of survivors will better define the humanitarian problem in Lao PDR today and significantly improve the MRE and survivor support programmes. For appropriate targeting of clearance activities at high risk sites more accurate information on the circumstances of accidents and better precision of the location of current accidents will also be of considerable benefit for clearance planning. An initiative to address deficiencies in the victim data and to install mechanisms to update accident data is also discussed in the following section.

Although further data collection activities are necessary, stakeholders also identified an appreciable weakness in the current data management systems at the national database. Mechanisms for encouraging access to, and use of, data from the database, and a review of the required resources to facilitate an effective response to data requests should be implemented. Improvements to the database unit will increase the extent that stakeholders are able to capitalise on *existing data* – in addition to future data collected.

Conclusions and recommendations

In general, the consensus expressed by stakeholders is that the UXO programme in Lao PDR has a wealth of data to use for strategic and operational planning on a macro scale. The two principal projects that have contributed to this data pool are the National Socio-economic Survey and the desk top survey that provided US Air Combat Records to UXO LAO. In addition, other data that is not mine action specific, such as poverty mapping (undertaken as part of a Lao PDR development plan) provides valuable national strategic frameworks in which to link mine action priorities.¹⁷²

National coverage of survey information

The extensive coverage of the impact survey served the main purpose of defining the UXO problem to help shape the development of the UXO clearance programme in

¹⁷² For information on national human development and assistance framework see UNDP (2001, 2002).

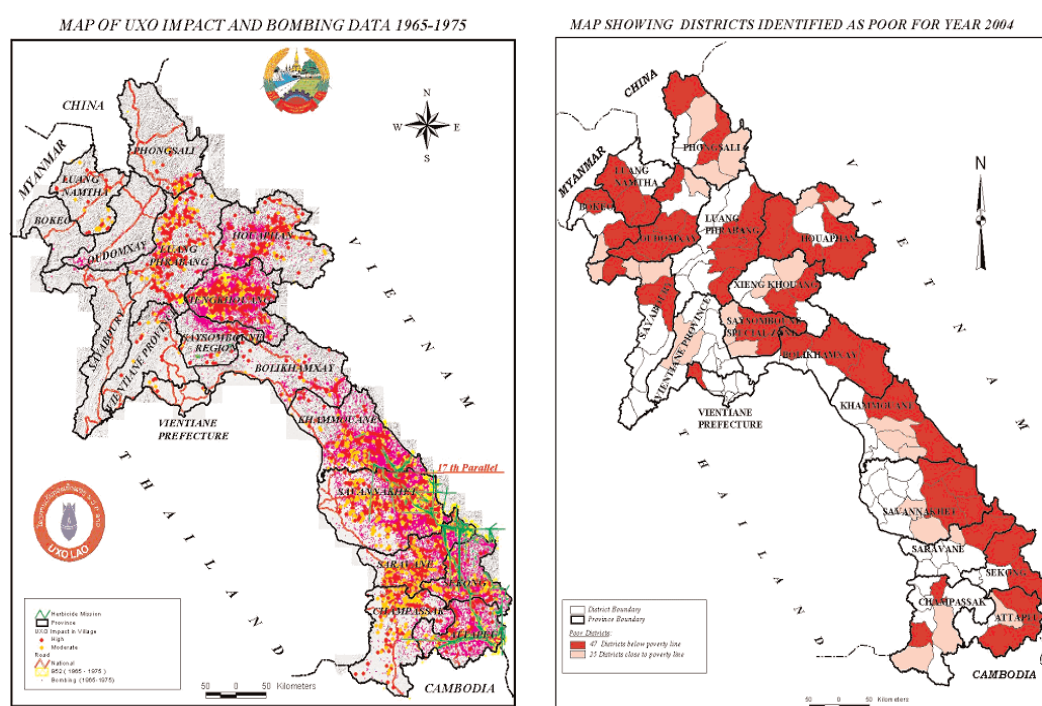


Figure 13. Examples of data at a macro-level: (a) UXO community impact data, bombing data from US records of combat activities and (b) national poverty maps National coverage of survey information.

highly affected areas, and inject valuable information into MRE and survivor assistance activities – as well as facilitate fundraising.

Although the HIB survey visited 7,675 villages of a total of some 11,000 in Lao PDR, data coverage is referenced as incomplete in some literature.¹⁷³ It appears that the “expert opinion” that governed the targeting of the provinces and districts for the survey had shortfalls in some geographic areas based on review of bomb data archives and knowledge that has been acquired in the years following the HIB survey. Although CA teams have collected additional information within the framework of the HIB survey and have also visited areas outside the targeted HIB villages, coverage is not complete and data from CA teams has yet to be entered into the same data table as the HIB survey information.

It is recommended that UXO LAO¹⁷⁴ integrate the data from the HIB survey and CA teams into a single database and review the geographic scope of survey data at a village level across the country based on the increased quality of expert opinion available today. Such an exercise, in conjunction with appropriate action, would address concerns by some stakeholders that the geographic extent of UXO data is limited.

Socio-economic impact data

A recommendation of the HIB survey was that further refining of the socio economic data for villages be undertaken in order to better define factors that contribute to

¹⁷³ For example: UXO LAO Annual Report 2003.

¹⁷⁴ This recommendation applies also to the NRA who will inherit the database facility from UXO LAO.

“impact”. Apart from a greater focus on victim data, capturing socio-economic data at a *village level* on a wide geographic scale is complex, timely and may prove to have limited value when reviewed against the pressing needs of improving the current work plan process.

Rather than spending resources further developing the fabric of village data to better define areas of contamination¹⁷⁵ and to develop more complicated socio-economic modelling, perhaps the HIB survey and additional CA data collected at village level may serve as an appropriate baseline of data. Although work at this level should be continued, a greater concentration of efforts must now be focused on the work plan process and the need to incorporate more transparent criteria and prioritisation schemes for selection of clearance tasks based on socio-economic benefits at a *site level* rather than that at a *village level*.

At a site level planners will profit from a greater understanding of the expected level of contamination, the risk of further accidents, details of future land use plans and importantly, the nature and number of beneficiaries that result from clearance activities. Such factors can be reviewed against strategic frameworks and expected costs of clearance activities proposed. In order to achieve this, the technical survey methodology and approach must be further developed and actually used (and monitored) to strengthen justification of work plan priorities.

The NSP calls for a technical survey of 2,636 contaminated villages from the HIB national survey in order to confirm land use and impact data and to collect additional information on proposed development activities and undertake more specific technical investigations. While this will provide enhanced data to support prioritisation it is a daunting task – complicated by the nature of the UXO contamination, the dynamic development environment and the timeframes proposed. In addition to this “national” technical survey, a technical follow-up will still be required at each task proposed for clearance in the work plan. This study recommends that a focus is placed on the *task level* of site investigation and evaluation – building on the existing work plan process – rather than on tying up considerable assets in a national programme which may not provide the value of data anticipated.

Victim data

The difficulty of assessing the socio-economic impact of UXO contamination puts a greater emphasis on the level of deaths and injuries as an indicator of the humanitarian problem. The victim data currently available in Lao PDR is outdated and the incidence of accidents is believed to be considerably under-reported. In order to assist the targeting of MRE, survivor assistance and clearance resources, a priority should be given to update victim data and to install an active mechanism to ensure that data remains current.

A feasibility study conducted by HIB, under contract from UNDP, has recommended that a system similar to the Cambodia Mine/UXO Victim Information System (CMVIS) be set up in Lao PDR. A clear understanding of accident data will significantly enhance information available for planners – particularly the NRA, the repository of the proposed Lao PDR UXO/Mine Victim Information System (LMVIS). An expanded

¹⁷⁵ Defining areas of contamination in the complex UXO contamination setting in Lao PDR – especially over a large scale – is a daunting task.

national victim programme has broad support amongst operators, authorities and donors but implementation of the plan is awaiting the full establishment of the NRA, which will determine how the project should proceed.

Defining areas of contamination

The HIB impact survey is based on the community as the survey *unit* and therefore only provides limited information on hazard-based location data. The UXO programme therefore suffers from appreciable geographic control of actual contaminated areas, apart from a general picture provided by the records of US bombing.

A priority of the NSP is to obtain a better understanding of the geographic extent of contamination in the country to assist the effective targeting of UXO LAO resources. The nature of the UXO contamination in Lao PDR however is considerably more complex than contamination in a typical minefield setting¹⁷⁶ and thus the delineation of areas of contamination presents considerable challenges. The UXO problem is poorly defined in three dimensions – characterised by irregularly scattered ordnance on the horizontal plane and a highly variable subsurface component of contamination on the vertical plane. It is hard to envisage how a quality hazard-based survey could be devised and implemented on a large scale at a realistic cost and in an appropriate timeframe, however desirable it may be.

Targeted technical surveys¹⁷⁷ in high priority areas, or focused on tentative lists of clearance tasks is perhaps more realistic, addressing two main concerns: first, that prioritisation of clearance site occurs according to clear socio-economic and humanitarian criteria, and second, to ensure that resources are deployed effectively in contaminated areas.

Aspects of priority setting

The HIB data and information collected by CA teams remains an important reference and one that should be used more in planning activities of the UXO programme. A prioritisation scheme for clearance activities, though, should not be determined solely by a ranking scheme of villages based on risk reduction, but must be responsive to shifting strategies and projects at a local level as well as to national development plans.

The work plans devised by UXO LAO provides a framework which gives *top-down* strategic direction from a central level while allowing provinces and districts to identify *bottom-up* solutions to UXO problems within the national context. In order for the work plan process to function in a clear manner, however, every clearance request at a local level should be accompanied by a technical and socio economic assessment.

An example of an appropriate humanitarian intervention would be one located in a district identified as a national priority development area according to NPEP, at a site where accidents are occurring, and where a credible development project is planned. In the Lao programme today the identification of priorities is not undertaken in a fully transparent fashion, and there is a need to develop criteria to support a logical

¹⁷⁶ In other countries predominately affected by minefields, national technical surveys – though desirable – are rarely completed due to the scale of the required task.

¹⁷⁷ “Clearance” in this context refers to area clearance activities as opposed to roving teams.

assessment of tasks. To strengthen this critical component of the programme, adaptations to the technical survey are required (accompanied by further training), together with better instruction provided to UXO LAO provincial coordinators. A full review should be undertaken to ensure that the implementation of a rational task selection process actually occurs, and that relevant justification of work plan priorities are documented and scrutinised.¹⁷⁸

Minfield versus UXO

The focus of this study has been on survey approaches to UXO whose presence and degree of impact overwhelm the contribution of landmine contamination when viewed on a national scale. In some areas of the country, however, landmines have greater prevalence and approaches to survey must be more conventional.

The scope of this study did not include a detailed review of the relative impact of landmines and UXO in the Lao context, or adaptations to survey approaches between landmine- and UXO-affected areas. The British NGO, MAG, however has been particularly active in this regard and has adjusted the configuration of field teams and working procedures to address landmine contamination.

It is generally assumed that mines pose a greater human risk than UXO. Furthermore, the nature of areas contaminated by landmines can usually be more readily described in terms of *blockage* or land denial than corresponding areas of UXO contamination. In such instances, economic benefits of clearance activities are more easily determined and if supported by additional accident data or appropriate development plans, the prioritisation of landmine clearance above UXO in some affected areas may be justified.

Review of past activities to help shape future work

During the period between 1996 and late 2004, approximately 5,000 hectares of land and 600,000 items of unexploded ordnance were cleared by UXO LAO. A comprehensive review of past clearance activities, however, has not been undertaken and thus an evaluation is now overdue to assess the effectiveness of the UXO programme and the degree to which intended benefits have been accrued to the intended beneficiaries.

The importance of a comprehensive evaluation of UXO LAO operations has been identified as a priority activity and is expected to take place in 2005. Until the NRA is in a position to conduct these activities UNDP will oversee the PCIA project. The PCIA offers an opportunity to improve the tools available for prioritisation of clearance tasks at a micro level – by defining a better list of criteria against which the expected benefits of future clearance can be evaluated. In other words, the PCIA should identify well-targeted and successful clearance projects that have taken place since 1996, review the factors that have made them successful, and develop guidelines in the UXO LAO programme to help replicate them.

UXO programme national database

Many stakeholders view the national database facility as an underused capacity and identify a need to improve the integration of existing information into planning

¹⁷⁸ A responsibility of the newly formed NRA.

processes more effectively. Data requirements for some stakeholders may be addressed by greater understanding of the available resources and through greater encouragement and success at accessing tailored information in a timely fashion.

The database will better respond to information needs by a restructuring of the existing facility through a completion of the conversion to IMSMA and improvements in the geographic information available. Specific tasks that should be undertaken or completed are listed in Table 7.

Table 7. Suggested technical improvements to the national database¹⁷⁹	
➤	The conversion of the following databases to IMSMA structure:
➤	Monthly Progress Reports of the Roving Clearance Teams;
➤	Monthly Progress Reports of the Area Clearance Teams;
➤	Impact Survey (1996-97) and UXO Accidents (1996-97)
➤	An update of information by combining existing databases:
➤	Impact Survey (1996-97) combined with Community Awareness Village Visit Reports
➤	UXO Accidents (1996-97) combined with Monthly Report of UXO Accidents.
➤	Creation of new databases to:
➤	Record Area Clearance Task Completion Reports using IMSMA.
➤	Record Technical Survey reports for Area Clearance Tasks using IMSMA.
➤	Improve geographic data:
➤	Expand 1:100,000 scale spatial database to include UXO contaminated provinces of Houaphan, Xiengkhoang, and Luang Prabang (not covered by earlier projects).
➤	Research and conduct GPS observations to permit calculation of accurate datum transformation parameters from Indian 1960 datum to WGS 1984 for 1: 50
➤	Replace 1:100,000 scale feature data in the national spatial database with 1: 50,000.
➤	Additional datasets
➤	Recent population and agricultural census data should be obtained to complement UXO data and strengthen demographic and economic data to support planning.

A UNDP evaluation mission in 1998 identified the UXO LAO database as a capacity that needed to be strengthened – including consideration for more staff and resources. Although the responsibility of the database will be moved to the newly established NRA, the recommendations for the facility remain current. It is suggested that more deliberate efforts should take place to move the information management systems from a predominantly static repository of information into a more dynamic capacity. This would maximise a two-way sharing of information between the database and end users. This should include an outreach to UN agencies, NGOs, commercial enterprises and other potential beneficiaries of data that operate outside the UXO LAO structure.

¹⁷⁹ Adapted from objectives of a VVAF-supported project to UXO LAO (some activities are currently underway).

It is further recommended that a review of the database facility should include an assessment of how data from the US combat activities has been used. Stakeholders may be unaware of possibilities of manipulation of data sets, for instance, the ability to rank villages or districts based on munitions that have the greatest humanitarian impact. It would seem that there is considerable value in providing a greater number of tailored maps of specific locations and associated tables of ordnance types and numbers and distributing them more widely.

The role of the National Regulatory Authority

The NRA establishment in Lao PDR serves to separate regulatory and operational activities in the mine action sector. Some of the main objectives for establishing a national authority were to improve the effectiveness of the mine action sector through better data management, a broadening of considerations to enhance prioritisation mechanisms and provision of greater transparency and stakeholder involvement in the processes.

The NRA when fully established will have a considerable portfolio of information to support effective management of the UXO programme in Lao PDR. Specifically, the NRA will inherit the UXO LAO database providing access to the HIB impact data, CA reports from some 5,000 villages, national bomb data from records of US combat activities and the NPEP strategic framework. In the near future, further upgraded victim data from the planned LMVIS, expanded technical survey data from 2,636 villages and the findings from the PCIA will also be available. Additional databases, such as recent population and agricultural census, could also prove valuable tools in placing mine action priorities in a broader development context – complementing UXO data and strengthening demographic and economic data for planning purposes.

The mandate of the NRA includes prioritisation and tasking of all UXO/mine action operators. Even with the considerable data available, the NRA should be careful not to compromise the essential input from districts and provinces. The NRA should thus use the information available centrally to define frameworks for the prioritisation process and to provide operators with necessary data to allow appropriate detailed plans to be generated from the field – while ensuring that procedures are in place to validate the bottom-up planning recommendations.

Survey terminology

The current SOPs and survey report forms used in the UXO LAO programme continue to use outdated terminology for several survey types. In October 2001, the first edition of the International Mine Action Standards removed all reference to the original Level 1, 2 and 3 terminology and although they still remain in common use today the numerical reference for a survey level is now officially obsolete.¹⁸⁰

It is recommended that when SOPs and survey forms are next reviewed in the UXO programme, terminology be updated to reflect the current international mine action standards.

¹⁸⁰ Discussion on survey terminology is expanded in GICHD (2005b).

Table 8. Summary of survey data needs reported by stakeholders and recommendations	
REPORTED SURVEY NEEDS	NOTES AND RECOMMENDATIONS
<p>GEOGRAPHIC COVERAGE OF HIB IMPACT SURVEY HIB survey not fully national in scope and considered partial coverage by some stakeholders.</p>	<p>Review the “expert opinion” used in the original survey to exclude data collection in some areas of the country. US bomb data was not available at the start of the HIB project but provides further information on the expected extent and impact of contamination together with improved knowledge of the UXO situation gained since 1997. UXO LAO could consider sending teams to additional areas outside the scope of those covered by HIB and subsequent CA team activities to address some stakeholder concerns that the geographic extent of the survey is limited.</p>
<p>HIB SURVEY IMPACT CRITERIA Village impact criteria today is based on a risk reduction model alone</p>	<p>CA teams have contributed considerable amounts of additional village level data which complements the work undertaken by HIB. Currently the databases are stored in separate tables and they should be combined.</p> <p>Indicators used to rank villages are rarely questioned by stakeholders today although a recommendation of the HIB survey was to explore impact criteria further. The UXO programme has matured and research/adjustments to impact criteria could be further reviewed and updated. The recommendations of this study however are to concentrate more on socio economic and humanitarian criteria to prioritise clearance at a “site” level as opposed to “village” level and to incorporate better tools into the technical survey methodology and approach.</p>
<p>VICTIM SURVEY Victim data for Lao PDR is out dated and incomplete. Mechanisms to report victim data are inadequate and current victim rates are under-reported.</p>	<p>Victim information is arguably the most important humanitarian impact indicator for UXO contamination, and accurate data is crucial in the planning and implementation of an effective MRE and survivor assistance response. For effective risk reduction strategies through clearance there is also a need for better data on the circumstances, and where feasible, better precision regarding the location of accidents. A focus to provide mechanisms to keep national victim data current is also required.</p> <p>A successful UNDP-HIB feasibility study was completed in (2004). An expansion of the project is planned to create a national victim database and support an “active” process of collecting and updating accident information. It is envisaged that a system similar to the CMVIS will be developed.</p>
<p>RECORDS OF US BOMBING ACTIVITIES Underused in the UXO programme</p>	<p>As part of an effort to revitalise the 2-way sharing of information between database and various stakeholders the value of records of US bombing activities should be reviewed. This study concludes that the bomb database, despite its limitations as a measure of current contamination, could be integrated more effectively in support of various stakeholder activities.</p>
<p>TECHNICAL SURVEY Technical survey teams are currently only used as a precursor to clearance. They play a minimal role, if any, in prioritisation of tasks based on impact or other criteria.</p>	<p>Technical teams should be used in a more integrated fashion to determine priorities based on agreed criteria with particular attention given to areas of confirmed contamination and with clear socio economic benefits. Current technical survey tools should be reviewed in conjunction with necessary training for survey teams. Additional instruction would also be required at a province/district level to better use the data and improve the transparency in the work plan process.</p>

Table 8 (continued)	
TECHNICAL SURVEY (continued)	Future role of technical survey is currently being reviewed in UXO LAO.
	The NSP calls for expanded technical surveys of 2636 villages identified as contaminated from the HIB national survey – to classify land use, review development plans and collect more data of technical and operational relevance.
	It is anticipated that the technical survey initiative outlined in the NSP will not fully satisfy the requirements for planning and justifying specific clearance tasks in future work plans. As the UXO programme develops additional technical investigations will be required for specific tasks to define clearance boundaries, identify resource allocation and gather updated socio economic data to support the work plan process.
POST CLEARANCE DOCUMENTATION There are limited possibilities to review geographic data of former clearance activities undertaken in National database	IMSMA allows the convenient recording PCD information – particularly location of clearance and perimeter details and a conversion clearance records to IMSMA will facilitate monitoring of clearance activities.
	Task Completion Reports are currently being entered into IMSMA to support a complete record of activities.
POST CLEARANCE EVALUATION No widespread Post Clearance Evaluation conducted in Lao PDR to date.	There is a need to review the effectiveness of the UXO programme by revisiting former sites of clearance to review past prioritisation of clearance activities and the socio economic impact of the entire programme. A “sidebar” to the main objective of the evaluation should be to refine a list of criteria against which future clearance activities can be assessed as part of the work plan process.
	A comprehensive PCE is an activity planned for 2005.
NATIONAL DATA BASE FACILITY Considered an underused capacity by stakeholders	The mine action authority should oversee the completion of the on-going conversion to IMSMA, the update of geographic data and the integration of databases to optimise the ability of the database unit to address stakeholder demands (see Table 7).
	A strategy should be developed to strengthen the database as a proactive information provider – maximising the 2-way information flow between the central level and provinces (and other stakeholders).
	A strengthening of the technical aspects of the database is due to start in late 2004 although a review of human resources and mechanisms to support data provision to and from stakeholders should also be prioritised in conjunction with this initiative.

Note: Considering that existing data could be further exploited, it is important to assess the value of additional information gathering activities and to identify mechanisms to ensure that data from new initiatives is successfully incorporated into the planning decisions of stakeholders. There is little value in collecting further data if it is not readily used.

Annex 1. Chronology of mine action in Lao PDR¹⁸¹

War	1964 -1974	➤Lao army cleared vital transportation routes during the war period.
Post-war Phase	1975-1990s	➤Lao army and Vietnamese advisors support some clearance of roads, schools, wats (temples), and various construction sites for public buildings. Battle area clearance was also conducted in some villages in the north. Lao army continues to support clearance efforts – primarily in support of infrastructure projects financed by the government. ➤In the late 1970s, an agricultural area in Xieng Khouang was cleared through a Russian aid programme. ➤Chinese Army undertake some clearance ahead of Chinese-funded road construction projects.
	1992	➤An Australian Company, Milsearch, started operations – operating in a joint venture with an army company, Bolisat Phathana Khetphoudoi.
Humanitarian Mine Action – Initial Phase	1994	➤Mennonite Central Committee/Mines Advisory Group UXO project starts in Xieng Khouang (community awareness, May – and clearance, October).
	1995	➤Lao PDR Trust Fund for UXO established under Prime Minister's Decree 49/M, with UNDP and UNICEF where UNDP administered the fund.
	1996	➤Establishment of UXO LAO Head Office & Training Centre (PM Decree 49/M). ➤Established UXO LAO provincial offices in Xieng Khouang (MAG,1994), Houaphan (Gerbera, 1996). ➤Contract for National Socio Economic Impact Survey awarded to Handicap International and field activities undertaken. ➤UXO LAO Community Awareness (CA) activities initiated – UNICEF assumed a lead role in a CA Technical Working Group. ➤US and Lao PDR sign a MOU for US training support and in-kind assistance (equipment, vehicles and equipment). ➤A group of 3 US NGOs, formed an entity, Consortium, and developed a UXO awareness curriculum for primary schools – tested in Xieng Khouang.
Expansion Phase	1997	➤Publication HIB National Socio Economic Impact Survey report. ➤Field operations start in Savannakhet with Handicap International. ➤Proposal for NPA to provide technical assistance in Champasak, Sekong and Attapeu accepted.
	1998	➤NPA initiate support programmes in Sekong and Attapeu ➤Belgium military start technical advisory responsibilities in Champassak. ➤Field operations begin in Luang Prabang with Gerbera technical support. ➤Work Plan process, Community Awareness strategy finalised ➤General expansion of operations. ➤Nationalisation of equipment and resources initiated. ➤Independent review of programme conducted (van Ree et al., 1998). ➤POWER joined with other Survivor Assistance NGOs and Government agencies to form the Co-operative Orthotic and Prothetic Enterprise (COPE).
	1999	➤Operations in Khammouane Province initiated with World Vision technical support.

¹⁸¹ Information mainly compiled from UXO LAO (2003b); ICBL (2004); GICHD (2001: Laos Case Study) and MAG (1999).

Annex 1 (continued)		
Transition Phase – Nationalisation	2000	<ul style="list-style-type: none"> ➤ Transfer of field staff from implementing partner to UXO LAO contracts ➤ Start of Progressive Team Leader Course at the National Training Centre ➤ UXO LAO Standard Operating Procedures (SOPs) finalised
	2001	<ul style="list-style-type: none"> ➤ Continued nationalisation of operations ➤ UXO LAO staffing targets achieved
	2002	<ul style="list-style-type: none"> ➤ First Senior Explosive Ordnance Disposal (SEOD) course initiated ➤ Cash flow crisis of donor assistance – most provinces scale back operations significantly ➤ UNDP mission review undertaken
	2003	<ul style="list-style-type: none"> ➤ Return to full team strength in most provinces (donor support secured to enable Champasak and Khammouane to return to full strength in 2004)
Re-order Phase	2004	<ul style="list-style-type: none"> ➤ 10 Year National Strategy: 'The Safe Path Forward' approved by the National UXO Steering Committee. The plan redefines the role and structure of the national UXO programme ➤ Decree 32/PM approved authorising the establishment of a National Regulatory Authority ➤ Swiss Foundation for Mine action (FSD) partner with World Food Programme

Annex 2. Example of a UXO LAO Provincial Work Plan, 2004: Savannakhet¹⁸²

Savannakhet is considered the most severely contaminated province in Lao PDR with UXO covering an estimated 75 per cent of the land area. This results from both intense bombing of the east and centre of the province between 1964 and 1973 and ground battles, the largest being in Sepone District in 1971.

District	Number of tasks	Description	No. of beneficiaries	Area for clearance	Roving Teams: To visit 296 villages in 7 districts
Atsapangthong	1	Infrastructure	390	50,000	<i>Community Awareness:</i> To visit 46 villages, 16,411 people sensitised <i>Survey:</i> To visit 290 villages in 7 districts.
Phine	4	Agriculture	1,401	150,000	
Phine	1	Infrastructure	462	40,000	
Sepon	9	Agriculture	1,401	540,000	
Sepon	4	Infrastructure	981	148,000	
Nong	2	Agriculture	784	120,000	
Nong	2	Infrastructure	1,203	90,000	
Vilabuly	3	Agriculture	470	21,000	
Vilabuly	1	Infrastructure	245	3,000	
Thaphalanxay	9	Agriculture	1,307	480,000	
6 Districts	36		8,644	1,858,000	

Six of the seven districts that are identified as “poor or very poor” from national poverty mapping have targeted mine action activities in 2004. Only one district, Atsaphang Thong, is targeted for UXO LAO operations and not categorised as “poor or very poor” according to the National Poverty Eradication 2004 Plan.

Of note 35 per cent of the planned area for clearance supports the following development projects:

- *Poverty Eradication Project in Phine District funded by Lao Government, 440,000 m²;*
- *Road construction in Xepon district, funded by Belgium and implemented by NGO BTC, 150,000m²;*
- *Road construction in Nong & Phine Districts funded by the EU, 100,000m².*

¹⁸² Adapted from UXO LAO (2003b: 33-34).

Chapter 5

The case of Mozambique

Nick Cumming-Bruce

Introduction

This case study looks at the use of survey in mine action in Mozambique. It reviews the appropriateness of the surveys conducted as well as their utility in planning, managing and evaluating mine action operations. It is based on fieldwork in-country in August 2004 and discussions before and since with key informants, particularly the National Demining Institute, demining operators, donors and the UN.

The origins of Mozambique's landmine problem

Thirty years of conflict ending in the 1990s left Mozambique severely contaminated by landmines in all of its ten provinces, inflicting casualties and posing a serious obstacle to post-war recovery and rehabilitation. Even now, the government estimates 1.7 million people are directly affected by landmines,¹⁸³ but after a decade of humanitarian mine action, landmines now claim only a few victims each year. Given competition for donor funds, the government and aid agencies are under growing pressure to identify the socio-economic impact of landmines and UXO and to establish the priority and appropriate level of funding that mine action should be accorded in Mozambique's wider development agenda.

Mozambique's slide into conflict started in 1964 when the Mozambique Liberation Front (Frente de Libertação de Moçambique or FRELIMO), set up two years earlier in Tanzania, launched an armed struggle to end Portuguese colonial rule. Within a year, FRELIMO had started infiltrating and setting up bases in northern Mozambique and laying both anti-personnel and anti-vehicle mines. By the late 1960s, Portuguese forces had nicknamed the north "Minas Gerais" or "General Mines". Portuguese troops also laid extensive barrier minefields in northern Cabo Delgado province near the Tanzanian border to try to check FRELIMO infiltration.

By 1970, FRELIMO had launched operations further south into central Tête province menacing the Cahora-Bassa hydroelectric dam, at that time still under construction. Portuguese forces responded by laying substantial numbers of mines around it, albeit far fewer mines than military commanders intended because of inadequate supplies.

¹⁸³ Information provided by Faduco Mavie, National Demining Institute (IND), 9 August 2004.

FRELIMO meanwhile continued laying mines along major roads and paths to try to limit troop movements and productivity in the districts. These roads and paths were also used by civilians.

Landmines from this conflict, however, constitute only a small proportion of the contamination that remains today. The pro-independence struggle ended in 1974 after a military *coup d'état* in Portugal gave power to officers who favoured independence for all its African colonies. Mozambique set up a transitional government and in 1975 declared full independence under a FRELIMO government led by President Samora Machel. Within two years, however, the FRELIMO government became embroiled in a war with armed groups financed and equipped by hostile neighbours.

In 1976, Mozambique closed its border with Rhodesia in line with UN sanctions and in support of the Zimbabwe African National Liberation Army (ZANLA). It also backed the African National Congress, which used bases in southern Mozambique to launch attacks into South Africa. The following year the FRELIMO government declared itself a Marxist-Leninist vanguard party and turned to the Soviet Union for support. In the same year, Rhodesia's Central Intelligence Office created the Mozambique National Resistance (MNR or RENAMO), launching operations in central Mozambique.

From the outset of this war, Rhodesian military instructors trained RENAMO in the use of landmines, which its units used to block major roads and supply routes as well as against airstrips. FRELIMO, like the Portuguese colonial government before it, now actively employed mines to defend key economic installations and strategic positions such as military bases. From 1980, this conflict sharply escalated.

In 1976, the Lancaster House Agreements signed in London had ended civil war in Rhodesia and paved the way for a majority-based government. The new regime promptly signed a security agreement with Mozambique providing for defence of the land corridor linking Zimbabwe to the coast and for support in the destruction of RENAMO. By then, however, the former Rhodesian Intelligence Organization had transferred management of RENAMO to South Africa's Military Intelligence Directorate and the more militarist government led by P.W. Botha now embarked on a more aggressive strategy of destabilising Southern Africa's frontline states.

In Mozambique, this entailed building up the strength of RENAMO, which soon started to expand the scope of its military operations in the strategically crucial central provinces – Gaza, Inhambane and the richest province, Zambezia. FRELIMO's response included laying large minefields along the border with South Africa and indiscriminate mining elsewhere in the country as protection for temporary positions used by patrols or to deny insurgents access to food and water sources. In the later stages of the war, the government dropped mines by air over parts of Zambezia province as part of their counter-insurgency operations.

By 1986, famine and intensifying RENAMO operations, including the killing and mutilation of civilians, sent thousands of refugees fleeing across the border into Malawi. The government launched a major counter-offensive along the Zambezi river in 1987, helped by Zimbabwean paratroopers and Tanzanian troops. This helped turn the tide of the war but also caused hundreds of thousands more refugees to flee to Malawi, Zambia and Zimbabwe. FRELIMO's position in central Mozambique became

precarious and it suffered another blow in 1986 when President Samora Machel died in a mysterious plane crash over South Africa. Foreign forces added to the problems of landmine contamination. Zimbabwean forces mined the Limpopo and Beira transport corridors, Malawi troops put down mines along the Nacala railway and Tanzanian troops laid mines defensively around their military camps.

By 1988 the war had reached a stalemate and pressures on both sides prompted a number of initiatives to bring about peace talks. Mozambique, facing economic disaster, had dropped its socialist economic programme in 1987 and adopted a harsh International Monetary Fund (IMF) structural adjustment programme. In 1990, the government adopted a constitution that allowed a multi-party political system. In South Africa, de Klerk's assumption of the country's presidency in 1989 led to a curtailment in support for RENAMO.

Peace talks started in 1990, leading to the Rome Peace Agreement signed in October 1992. This provided for an immediate cease-fire, demobilisation of both armies and the holding of legislative and presidential elections. To oversee the transition to elected government, the UN deployed a 6,400-strong peacekeeping force, ONUMOZ, with a mandate that included coordinating clearance of landmines. Peace, however, did not immediately halt the laying of landmines. Sporadic, albeit increasingly rare, use of landmines by disgruntled military personnel, poachers and bandits continued to be reported until the mid-1990s.

History of mine action in Mozambique¹⁸⁴

By the end of the war, Mozambique was initially assessed as one of the world's most severely mine-contaminated countries and it appeared in urgent need of humanitarian mine action to allow social stabilisation and economic recovery. Mozambique's early post-war priorities included resettling an estimated 6.7 million people displaced by conflict, including some 1.7 million refugees who had fled to Zimbabwe, Malawi, Swaziland and Tanzania. Moreover, by the end of the war Mozambique was ranked by the UN among the world's ten poorest countries and landmines clearly posed an obstacle to both resettling and cultivating land and to developing the country's infrastructure. However, mine action got off to a slow start and it never, either then or now, appeared to figure high in the priorities of national leaders.

The major obstacle to initial mine clearance efforts was political infighting, both between FRELIMO and RENAMO and between a number of UN agencies. The Rome peace agreement had made no explicit reference to the issue of landmines and responsibility for initiating the programme lay with the UN's Supervisory and Control Commission, which in turn needed the agreement of both the FRELIMO government and RENAMO. By January 1993, they had approved the Commission's proposal to hire Gurkha Security Guards, who were assigned to clear roads north of the central city of Beira under a contract that ran to February 1994. By then GSG had cleared 160 kilometres of road at a cost of US\$1.7 million and had found only six mines. As a result of political obstacles, however, no other professional demining took place until mid-1994.

¹⁸⁴ See the Annex for a chronology of mine action in Mozambique.

The UN had produced a demining plan for Mozambique in January 1993. The first stage aimed to identify 2,000 kilometres of road as priority for clearance to support the delivery of food to feeding centres for drought-affected populations, the establishment of transit centres to receive refugees returning from neighbouring countries and for setting up assembly areas for demobilising soldiers. The second stage called for identifying and clearing the routes needed to repatriate refugees from neighbouring countries and to facilitate economic recovery. A third stage foresaw the setting up of a school to train deminers who would clear remaining areas and who, in the long term, would become available for mine clearance work elsewhere in Africa.

But objections from FRELIMO and RENAMO stalled implementation. Only after a UN ultimatum threatening to withdraw support for mine clearance did they give their consent, clearing the way for the first nationwide survey conducted by HALO Trust. In the meantime, both the government and RENAMO carried out some clearance, although RENAMO remained unwilling to open access to some areas it considered strategically sensitive and the quality of its clearance work was judged to be poor. It was not until early 1995, more than two years after the peace accords, that a company of soldiers of the joint Defence Armed Forces of Mozambique, which incorporated former FRELIMO and RENAMO soldiers, and trained by the French military, began clearance in Maputo province.

The UN proved little more effective at expediting mine clearance as a result of rivalry between UN agencies. UNDP, which had control of mine clearance funding, would not back projects proposed by the UN's Office of Humanitarian Assistance Coordination (UNOHAC), and was slow to act on requests by any projects which were not operating through the UN Trust Fund. Despite the availability of ample donor funds, spending on mine clearance by April 1994 had totalled only US\$1.4 million. A month later the UN Department for Humanitarian Affairs decided to take US\$7.5 million away from UNDP and put it under UNOHAC's control.

However, UNOHAC's performance did not help. It drew up a short list of five companies to engage in clearance in 1993 but reached no decision on which to engage until May 1994. At that point it awarded a US\$4.8 million contract to clear 2,000 kilometres of road to a consortium that included Mechem of South Africa and Royal Ordnance of the UK. The operation, named Project Caminho, stirred international controversy among human rights groups and donors for employing firms that designed and manufactured mines and was acknowledged by the UN as a mistake.¹⁸⁵ Six months later, UNOHAC was replaced by UNDP.

At this point, most mine clearance work was taking place outside the UN system. HALO Trust, after completing the initial nationwide survey, had concentrated since 1993 on training mine clearers, focusing on the northern provinces of Zambezia and Niassa where it started clearance from early 1994. Norwegian People's Aid (NPA) also began training deminers in mid-1993 and from 1994 started to deploy them in central Tête province. RONCO Consulting Corporation started a programme training dogs and handlers in late 1993 and began clearance operations in mid-1994. Handicap International, primarily engaged in opening prostheses workshops, initiated a mine risk education programme (then called mine awareness) and also engaged in some clearance work.

¹⁸⁵ Human Rights Watch (1997). It cites an official of the UN Department for Humanitarian Affairs stating "it is now our view that no arms producer can ever again receive a UN mine clearance contract."

Although the government and some international agencies employed a number of commercial demining companies,¹⁸⁶ the international NGOs and RONCO have provided the backbone of the international mine clearance effort in Mozambique. An indigenous organisation emerged after October 1995, when the UN launched the Accelerated Demining Programme (ADP). Six months later, ADP was operating with 450 mine clearers deployed in Maputo and Inhambane provinces, supported by nine expatriate advisers and a team of Gurkha field supervisors.

This geographic distribution of assets – with HALO Trust in the north, NPA in the centre and ADP in the south – has survived ever since, but will not last much longer in view of plans by NPA to withdraw from Mozambique in about two years' time and HALO's interest in winding down in the north, posing a challenge for national management of mine action, an area that has emerged only slowly.

The National Mine Clearance Commission (CND), first discussed in 1993, finally took shape with a government decree issued in May 1995. It mandated the commission to collect and analyse data, establish procedures for identifying demining priorities, draw up a national plan, approve and licence all operators, develop national capacity and monitor and coordinate all demining agencies. The result was disappointing. CND did not become operational and convene its first formal meeting until the end of 1996, 18 months after being set up. Six months later, in June 1997, CND was dissolved by government decree and replaced by the Instituto Nacional de Desminagem (IND), mandated to “successfully establish and develop a coordination, supervision and management mechanism”.

IND has also been dogged by both disagreement on its role and the inertia of national leaders on the issue of mine action. In 2000, the government approved a staffing level of 120 for the IND in line with UN recommendations calling for a strong national authority – but it found little interest from donors in supporting the associated costs. Moreover, direct donor financing of most mine clearance eroded IND's authority, and to this day it has been in a position to provide only limited direction or support to demining agencies. Its management role has been largely confined to accreditation, database management, preparation of a five-year national mine action plan and an annual plan of demining priorities.

Current status of mine action

Since completion of the Landmine Impact Survey in 2001, IND has formulated ambitious goals for mine action:¹⁸⁷ By 2009:

- All high and medium impact areas to be cleared;
- All items of unexploded ordnance (UXO) to be destroyed;
- All existing stockpiles of landmines to be destroyed;
- All remaining low impact areas to be surveyed and marked;
- National mine risk education/marketing programme to be fully operational; and
- Long-term survivor and victim assistance programmes to be established.

Mozambique completed destruction of its landmine stockpiles in March 2003, but the

¹⁸⁶ These included Mechem, Zimbabwe-based Mine-Tech and Special Clearance Services and Krohn Demining Enterprises of Germany. Their involvement has fallen off in recent years because of the lack of funds available.

¹⁸⁷ The Five-Year National Mine Action Plan, 2002-2006, 19 November 2001.

IND, set up under the Ministry of Foreign Affairs, has been no more successful than its predecessors in attracting much government interest or support for mine action. Until 2003, the government had provided no direct financial support for mine action. Moreover, although the National Mine Action Programme (NMAP) identifies poverty reduction as one of its two main aims (along with reducing risk of injury or death caused by landmines), the government's poverty reduction plan (Plano de Accao para a Reducao de Pobreza Absoluta) makes no reference to landmines.

To date, there has been no national survey of victims or any attempt even to develop a mechanism for compiling accurate statistics on mine-related trauma. The IND says it does not receive any accident data from the Ministry of Health, only what is reported by demining operators. There has not been any national survey for the purposes of developing mine risk education (MRE). In the 1990s, MRE was led by Handicap International but in 2001 it handed over the role to the IND. Since then, the IND has lacked personnel or funds to follow up on more than a limited scale.

Against this background, mine action is in a critical transitional stage. Although IND continues to appeal for financial assistance to undertake technical surveys for a more precise definition of tasks and priorities, key donors are re-evaluating the importance of mine action within Mozambique's overall development needs and reducing financial support. A review conducted in 2004 on behalf of the Danish government, for example, noted that the number of accidents had fallen from 133 in 1998 to 11 in 2001, 47 in 2002 and 13 in 2003. It found that "the major mine threat in the country has been reduced to a level which no longer requires a wide and long-term involvement of international efforts and operators".¹⁸⁸

NPA, as a result, is preparing to cease demining in Mozambique by the end of 2006 and hand over its demining assets to a Mozambican NGO, although which entity will receive them has yet to be decided. Its current operations have scaled down new clearance tasks and are focused on compiling accurate records of the clearance conducted since it arrived in country.

The HALO Trust/UNOHAC Landmine Survey of Mozambique

After three decades of conflict, Mozambique faced a formidable challenge to resettle refugees and internally displaced people, alleviate acute food shortages and start the process of rebuilding the country's battered infrastructure. Humanitarian agencies undertaking these tasks urgently needed a survey of landmine contamination to expedite the process. The cease-fire commission, however, regarded mine action as a security rather than humanitarian issue and did not approve it until August 1993. At that point, however, UN procedural obstacles caused further delays costing several precious months. The UN did not give HALO Trust the go-ahead until October 1993 and a contract was not signed until December. As a result, fieldwork started only in February 1994, 18 months after the end of hostilities.

¹⁸⁸ Review: Support to Humanitarian Mine Action, Mozambique, prepared for Ministry of Foreign Affairs, Denmark, April 2004. The review also queries whether more villagers are threatened by HIV/AIDS spread by demining teams than are saved from injury or death by their clearance activities.

Agency	HALO Trust
Client	UNOHAC
Type	Emergency
Objective	General assessment of landmine contamination
Dates/duration	February to June 1994
Scope	Nationwide
Focus	Supporting post-conflict delivery of humanitarian assistance
Info management	Software: Shaman
Cost	US\$395,000

The survey's declared objectives were “to provide an overall assessment of the landmine situation in Mozambique for the benefit of all organizations and agencies working (there) and to enter this information in the Shaman database.”¹⁸⁹ The survey report repeatedly states that it does not provide an exhaustive survey of all parts of the country and what has been achieved is “a basic framework”, reflecting an inability to access some parts of the country.¹⁹⁰ However, after the cease-fire, the key question for humanitarian agencies was access. As the first attempt to define the scale and geographic location of Mozambique's mine contamination, the survey focused particularly on providing intelligence on the state of roads and infrastructure useful to relief agencies.

Such a focus was also necessary given tight constraints on time and budget. To survey a country of nearly 800,000 square kilometres and few roads, HALO had four months and a budget of US\$395,000. Accordingly, resources available for the survey were, by present standards, extremely modest. HALO employed six three-man teams (comprising surveyor, translator and driver). Teams were broken into two groups assigned to the southern and northern provinces but worked as self-contained units. Their movements were constrained, however, by the poor condition of the roads, lack of up-to-date maps, limited availability of fuel and time.

Shortage of time meant that the teams had to concentrate on collecting data in the field and did not have time to return to Maputo, for example after completing work in each province, to process the data collected. This delayed the time when it became available to end users. Instead of receiving a continuous flow of information from the provinces as the survey progressed, humanitarian agencies had to wait for several weeks after the completion of field work to have access to the survey findings. It also meant there was no time for quality assurance, either of fieldwork or data entry. This almost certainly contributed to errors later found in the data. Staff entering data worked from handwritten, travel-stained reports and had no opportunity to send data back to survey teams for verification. As a result, coordinates entered for some minefields were wildly off target – anecdotal reports suggest some were located in the Indian Ocean.

At the time this survey was conducted, there was little experience and few guidelines to steer its implementation. Survey teams worked with a two-page questionnaire compiled on the basis of experience in Cambodia but in the course of fieldwork the

¹⁸⁹ HALO Trust/UNOHAC (1994).

¹⁹⁰ *ibid.*: 14.

options it offered for recording data were found to be too limited¹⁹¹. At the outset, HALO's team leaders met UNOHAC's representatives from different provinces in Maputo to explain the survey plans and request their assistance gathering data in advance of teams' arrival in their area: but, to meet the demanding deadline under the prevailing political and security circumstances, collection of expert opinion was undertaken in the course of the fieldwork.

The survey teams' first point of contact was UNOHAC provincial representatives, both for an overview of mine contamination and for guidance on potential sources of information. Contact was also made with provincial governors, military commanders, police and administrators as well as other aid agencies. Military liaison officers and soldiers in military assembly areas provided useful information on what type of mines had been laid and at what locations and where mine casualties had occurred. Data collected in these interviews was noted on provincial maps to help plan how best to survey the area. But HALO reported that local people, including many encountered along the roadside, proved the main source of accurate information on mine locations.¹⁹²

The survey produced reports on 981 separate, mined locations, which included stretches of road closed by a single mine and large defensive minefields made up of many thousands of devices. Most sites were believed to be affected by five mines or less.¹⁹³ The quality of data, however, varied widely. HALO attempted to cross-reference location data as far as possible but found that it was "not uncommon" to have estimates of a suspected mined area provided by different sources varying by several kilometres.

Survey teams only had access to maps on a scale of 1:250,000 which dated from before independence and were therefore wildly inaccurate. These still showed towns and villages that had been abandoned or destroyed in the years of fighting, along with roads that had fallen into disuse or disappeared, and they failed to show new settlements or roads. Among the products of the survey, HALO produced maps displaying the roads travelled by the survey teams, other roads in regular use and suspected mined areas, but on the scale of the maps available, neither roads nor suspected mined areas could be plotted with any accuracy. As the survey report made clear, the maps therefore had to be used in conjunction with Danger Area information in the Shaman database.

The survey set out to cater to the needs of two different constituencies of end-user: humanitarian agencies and the mine action community. A decade after its completion, lack of institutional memory makes it difficult to assess the extent to which it fulfilled the needs of the former. The report contains extensive information on the state of roads that could have provided a useful guide to aid agencies, even two years after the end of hostilities. Anecdotal comment suggested the information on mine contamination was not greatly trusted because of inaccuracies in mine location data. However, the report repeatedly warns of uncertainty over mine location reports and of the need to use the survey as a point of departure for building up data.

A major shortcoming appears to have been the lack of effective follow-up on the part

¹⁹¹ Comment by Guy Rhodes, Survey Coordinator, 16 December, 2004.

¹⁹² HALO Trust/UNOHAC (1994: 8).

¹⁹³ *ibid*: 3-5.

of the UN. There does not appear to have been any systematic effort to distribute the report to stakeholders and relief agencies. Sketch maps produced by survey teams were delivered to the UNOHAC demining office in Maputo but were never entered in the database and later were reportedly lost. The survey report also noted that some of the best available information on mine locations was held by soldiers sent to assembly areas prior to demobilisation and urged comprehensive efforts to debrief soldiers before they dispersed and the information was lost. This would have been a relatively straightforward task for the UN, staffers who served with the UN mission at the time say, but it never happened.

As a result, the main beneficiaries of the survey appear to have been HALO Trust, NPA and ADP, which used the survey as intended – as a reference or point of departure for building up data on mine contamination in their respective areas of operation. HALO and NPA, at least, continued to use the survey in this way for some years. It also became one of the data sources used in the later landmine impact survey.

The Landmine Impact Survey

Agency	Canadian International Demining Corps, Paul F. Wilkinson & Associates Inc.
Client	Canadian International Development Agency
Type	Landmine Impact Survey
Objective	Assessment of social and economic impact of landmines
Dates/duration	January 1999 – August 2001
Scope	Nationwide
Info management	IMSMA
Cost	US\$2.2 million

By 1997, Mozambican authorities had no more detailed information on the location and extent of its landmine problem than the HALO emergency survey completed five years earlier. Individual mine action operators – HALO, NPA and ADP – had built up more extensive data in their areas of operation, but no mechanism existed for systematically sharing this information with the government or the humanitarian relief agencies and commercial companies interested in working in rural areas and therefore potentially exposed to mine risks. The IND still lacked a central database detailing the extent of the problem or any other tool that would allow it to prioritise and coordinate clearance activity. The Landmine Impact Survey was intended to meet these needs.

Its stated objective was to “collect, record and analyse information on the location of known or suspected mined areas throughout the country and to provide an overview of their social and economic impacts as perceived by the residents of landmine affected communities”.¹⁹⁴ It would therefore deliver an IMSMA database including all the location data, maps and sketches together with the system for determining the level of social and economic impact. In line with the broader aims of the global landmine survey initiative conceived by the Survey Action Center, it was also intended to provide donors with a set of data according to a standard formula that

¹⁹⁴ CIDC (2001: 10).

would allow them to assess Mozambique's landmine problems in a broader, international context. However, almost every stage of the Mozambique LIS was to become dogged by controversy that would prevent it achieving most of these aims.

Implementation

Initiation and oversight of the MLIS was taken on by the Canadian International Development Agency, already financing a programme to build mine action capacity in Mozambique. It took up the project as a priority and signed a memorandum of understanding with the government to support an impact survey in August 1998. At the outset, it expected the survey to last 12 months and to cost Can\$1.5 million (then about US\$1.2 million). Both estimates proved unrealistic. Planning, recruitment, training and preparation alone took a year. Fieldwork would take 14 months. Overall, the Canadian International Demining Corps (CIDC) needed 31 months to complete the project at a final cost of US\$2.2 million.¹⁹⁵

This was perhaps unsurprising in view of the formidable logistical challenges faced in a country of Mozambique's size (799,380 square kilometres), lacking a gazetteer and equipped with few paved roads. Survey staff would travel on aggregate 800,000 kilometres to complete the survey and interviewed some 13,000 people in 31 languages.¹⁹⁶ To complicate matters, the survey coincided with the worst flooding in decades, particularly in the south of the country, forcing CIDC to rearrange the timetable for implementation and start fieldwork in the north.

CIDA would only employ a Canadian company for the survey. It opened the project to competitive bidding within Canada and then selected CIDC to implement the project although the company had no prior experience of survey. CIDC brought in as implementing partner Paul F. Wilkinson & Associates, a company without previous experience in the demining sector. CIDC's inexperience was compounded by hiring locally in Maputo a manager similarly short on experience. CIDC replaced him after some months by a former project manager with knowledge of the country and the sector.

The choice of operator raised immediate concerns on the part of SAC and some mine clearing agencies in Mozambique and this factor, combined with scepticism among some operators about the value of conducting an impact survey instead of pulling together data already available in their separate databases, may have made it more difficult for CIDC to obtain the optimum support and cooperation from international members of the mine action community.

Despite the existence of an inter-governmental Memorandum of Understanding (MoU), there also appears to have been at best modest interest in, or understanding of, the project on the part of Mozambican authorities. At the point when CIDC arrived in Maputo, the IND had just been created to replace the CND and was barely functioning. Its director declined even to meet CIDC staff, let alone provide support,¹⁹⁷ although they did meet regularly with other IND personnel. Only after IND gained a new director half a year later did cooperation improve, but even then it

¹⁹⁵ The LIS notes this included US\$500,000-worth of vehicles handed over to the IND on completion of the survey.

¹⁹⁶ Mozambique Landmine Impact Survey.

¹⁹⁷ Telephone interview with Paul Wilkinson, 3 August 2004.

lacked the expertise or capacity to contribute to the design or implementation of the survey, leaving little sense of local ownership.

The LIS states that it was implemented in accordance with the Survey Working Group's protocols for the conduct of impact surveys. Survey Action Center contends the methodology used in the Mozambique was flawed because impact survey protocols require that they be conducted as a census, not on the basis of a sample of communities,¹⁹⁸ as was the case in CIDC's Mozambique survey. CIDC responds that from the outset the LIS was designed to be carried out as a sample and in a country the size of Mozambique could never have been undertaken on any other basis.¹⁹⁹ An evaluation of the LIS by Scanteam notes that CIDC adapted the methodology of the survey to address the conditions that existed within Mozambique, but concludes that "these adaptations did not change the fundamental methodological approach" of impact surveys.²⁰⁰

CIDC planned the survey on the basis that teams would visit around 1,800 communities nationally, or about 180 per province. The LIS report states that in the course of carrying out the survey, interviewers in fact visited more than 1,800 communities, including all 791 communities that identified themselves as mine affected. Nonetheless, operators say survey enumerators did not visit some of the mine-affected areas and communities where they were working at the time of the survey.

Among criticisms directed at CIDC's conduct of the survey is the suggestion that its preliminary research and expert opinion collection (EOC) was at best rushed and cursory. CIDC responds that, on the contrary, its EOC before starting fieldwork required a much greater investment of time and effort than originally envisaged. It reports conducting 202 meetings with individuals or groups to try to identify the data available.²⁰¹ These included meetings with the main actors in mine clearance, provincial authorities, the military and the police. CIDC also had access to the databases of ADP, HALO Trust, NPA and Handicap International.

More than half the LIS interviews involved five to eight people, another quarter involved nine to 12 people, and although some lasted only 15 minutes, the average duration of interviews was 100 minutes. Because of distances involved and time constraints, teams did not have time to revisit areas. CIDC acknowledges this may have affected the extent to which interviewees were representative of their community but argues that it also reduced the possibility of collusion.

CIDC is dismissive of criticism that staff recruited to conduct the survey lacked experience or appropriate skills for assessing information on mined areas.²⁰² The purpose of the LIS was not to define the extent of landmine contamination but to assess its impact. From more than 400 initial applicants, 42 people were selected for training. This was carried out for four weeks in classrooms located in an ADP camp before a further two weeks' training during field testing of the questionnaire and survey procedures. Over the 14 months of fieldwork on the survey, only four staff

¹⁹⁸ Telephone interview with Bob Eaton, Survey Action Center, 28 July and 17 December 2004.

¹⁹⁹ Telephone interview with Paul Wilkinson, 3 August 2004.

²⁰⁰ Scanteam (2003).

²⁰¹ *ibid.*

²⁰² Cited by Scanteam (2003: 125).

dropped out and two were dismissed. CIDC's only reservation about the staff recruited was that for cultural reasons they did not include more women. Only seven women applied for fieldwork but they then declined to take up positions offered to them.²⁰³

The more serious criticism levelled at the LIS is that some sites reported as surveyed were never visited by survey staff.²⁰⁴ Paul Wilkinson robustly rejects the charge as “so improbable as to be almost impossible.”²⁰⁵ Fabrication of reports and the details of locations (including GPS readings, identity of people interviewed and photographs taken en route and at the location) could not have been undertaken by one enumerator but would have required the cooperation of several team members and would have had to escape the attention of those checking data in the field and in the analyst team. He also discounts the idea on the basis of close personal knowledge of the survey teams and their personal commitment to the project. The Scanteam evaluation concludes: “The claim that the survey teams did not visit sites recorded does not seem to be borne out by the information available.”²⁰⁶

Quality assurance was undertaken by two monitors. The first, a SAC employee, acted as monitor until October 1999. The second monitor worked under contract to SAC until November 2000 and thereafter acted on behalf of UNMAS until the survey's completion. Even so, questions about the quality of the LIS data raised questions about the thoroughness of the QA undertaken – and gave rise to considerable reservations within UNMAS about whether or not it should certify the survey. UNMAS eventually certified the LIS because there were few, and no adequate, grounds in the SWG protocols for not doing so.²⁰⁷

Outcome

Mozambique gained a number of valuable resources from the survey. These included a national gazetteer containing the names, official and alternate, of around 11,300 communities. It also yielded an Information Management System for Mine Action (IMSMA) database linked with Geographic Information System which is, for the first time, producing computerised maps on a sufficiently large scale (1:50,000) to be of use to demining operators. These resources represent a quantum leap over what was previously available to the IND or its predecessors. But the results of this exercise have also proved highly contentious.

The LIS found, as expected, that landmines affected all of Mozambique's ten provinces and all but five of 128 districts. But it also identified 791 mine-affected communities and 1,374 suspected mined areas (SMAs) estimated to cover 562 square kilometres and affecting 1.5 million people (more than 9 per cent of the 1997 population). Most of these areas (41 per cent) were estimated to cover less than 1,000 square metres, but the survey also identified 59 huge mined areas estimated to cover more than a square kilometre and 234 SMAs covering an estimated area of between 100,000 square metres and a square kilometre. The survey acknowledges that the figure may be

²⁰³ CIDC (2001: 101-102).

²⁰⁴ The claim was also picked up in the Scanteam Evaluation of the Global Landmine Survey Process (2003).

²⁰⁵ Telephone interview with Paul Wilkinson, 3 August 2004.

²⁰⁶ Scanteam Annex H.

²⁰⁷ Information provided by a member of the certification committee.

overestimated “to an unknown degree” in view of the tendency of interviewees to overstate the size of suspected mined areas. In the demining community, however, the estimates are regarded as a wild exaggeration.

After a detailed review of sites identified as suspect in the LIS in its area of operation, HALO Trust asserts that the LIS has included large areas which are not mined. The LIS identified 558 mined locations in its area of operation. By 31 July 2004, HALO says it had visited 516 (92 per cent) of these locations and, after surveying them, had cancelled 318 (57 per cent). HALO says it confirmed 198 sites (35 per cent) but had previously cleared or surveyed 114 of them. Only 84 sites (15 per cent) were mined areas HALO had not previously known. Of the 175 minefields HALO identified in its area of operations as of April 1993, it says half had not been surveyed by LIS survey teams.²⁰⁸ NPA did not conduct a detailed review of the SMAs identified by the LIS in its area of operation but endorsed HALO Trust's analysis.

Paradoxically, the mine impact scoring system applied in the LIS suggested that Mozambique's landmine problem was more manageable and easy to neutralise than many might have assumed or deduced from the estimate of the area contaminated. The LIS shows only 20 communities (2.5 per cent of the total) with a combined population of 36,000 ranked as highly impacted by mines. Another 164 communities with a total population of 393,000 rated as medium impact. More than three-quarters of the communities assessed, with a total population of 1.1 million, ranked as low impact.

The LIS receives warm endorsement from the IND's director, Gamiliel Mumguambe, as giving the IND and policy makers a more comprehensive overview of Mozambique's landmine problems than ever before. Such an information resource represents a “quantum leap” in terms of the scope and quality of the data resources previously available to most government agencies, not just in mine action. This has helped IND to assert its role as the coordinating authority for mine action. It provided the basis for the first national five-year mine action plan issued in November 1991, which provided donors for the first time with a rough timeline for measuring progress in curbing the impact of mines. IND also draws on it in preparing its annual plan of demining priorities. Yet even the IND director felt the LIS “was not able to capture the entirety of the problem”.²⁰⁹

To most in the demining community, this is at best an understatement. In reality, confidence in the LIS data appears to be too low for it to be used effectively as a planning tool. Two particular weaknesses in the data stand out. IND staff express concerns about exaggeration in the estimate of land contaminated and emphasise the importance of moving on swiftly to technical surveys and area reduction in order to obtain a more precise definition of the problem which would allow them to plan more effectively. At the same time, ADP and NPA as well as HALO Trust report they have discovered mined areas that are not identified in the LIS, both in areas that were and were not covered by the LIS survey teams.

In addition, although IND uses the LIS as the basis for drawing up annual demining priorities, the tasks performed by demining agencies are for the most part selected by a process of consultation with district and provincial authorities without reference to

²⁰⁸ Information provided by HALO Trust, Nampula, 14 August 2004.

²⁰⁹ Interview with Gamiliel Mumguambe, IND Director, 16 August 2004.

the LIS. As a result, IND staff say, operators frequently decline to take on IND clearance requests on the grounds that their resources and time are already committed to other tasks. A review of activities in 2003 revealed that of the 207 tasks identified by IND in its annual demining priorities, only one third were drawn from the LIS. It also revealed that of 150 tasks carried out in 2003, only 47 were derived from the IND annual plan and only 36 of those from the LIS. Among 103 tasks completed that were not in the IND priorities, 46 were identified in the LIS.²¹⁰ IND staff also say that many of the LIS tasks undertaken are low priority, not the medium or high priority tasks.²¹¹

The outcome reflects the gap between priorities identified under the impact scoring system applied in the LIS and the priorities perceived by central and local government as a result of emerging economic and social factors such as population movement and provincial development plans. The discovery of new areas of contamination also throws up new priority tasks.

The IMSMA database, initially delivered as Version 2.2 and upgraded to Version 3 in February 2004, remains a key building block for mine action in Mozambique – providing it continues to be funded. Salaries of the database staff are paid by UNDP. The likelihood of those staff remaining if external funding dried up and salaries were downgraded to government salary levels must be in doubt. IND's database team in Maputo as of August 2004 comprised eight staff, including four data entrants. IND has also set up two regional centres in Beira and Nampula to collect and disseminate data. Operators say the Beira office is functioning well but Nampula, which has experienced technical teething troubles, had fallen far behind in entering the clearance and cancellation reports submitted by operators into the database. However, although IND has the capacity to populate and maintain the database, operators are of the opinion it does not yet have the capacity to provide the analysis necessary for planning and prioritising mine clearance.

After years of working semi-autonomously, operators are systematically reporting clearance activity to IND but data collection has been hampered by the need to adapt different formats employed by the operators to the IMSMA system. IND staff also say communication and coordination with provincial governments is still weak.

Unmet needs

The priority requirement for mine action in Mozambique identified by IND is technical survey to define more clearly the priorities and tasks identified in the LIS. A list of survey and clearance priorities for 2005 was in the process of being prepared by IND for distribution to operators as this report was completed. However, the danger is that the LIS priorities are by now largely irrelevant to the actual priorities for provincial and local authorities.

This is partly because of the uncertain importance of some of the tasks which the LIS identified as priorities. One of the high impact sites identified by the LIS turned out to consist of a single UXO piece located 13 kilometres from the nearest village.²¹²

²¹⁰ Grau de implementacao das prioridades de desminagem 2003, IND, 30 July 2004.

²¹¹ Scanteam noted that in June 2003, two years after completion of the LIS, only four of 19 high impact areas, 10 of 165 medium impact and 44 of 607 low impact areas identified in the survey had been cleared.

²¹² Information provided by IND.

Another factor is the weakness in consultation procedures between IND and other stakeholders. Economic ministries tend to consult IND only after decisions to proceed with development projects have already been taken. Provincial authorities similarly operate less as coordination bodies than as a source of policy papers.

Influenced by this background, UNDP has commissioned a two-month “review of 10 years of assistance to the Mine Action Programme in Mozambique” to be undertaken by GICHD. The study is intended to “assess (the) relevance, efficacy, effectiveness, and impact of the mine action programme in Mozambique since its inception, and analyze the extent of the task that remains to be done.”²¹³

Conclusions and findings

Mine action in Mozambique has taken place in a fragmented manner reflecting the failure of the UN to create a framework for coordination in the immediate aftermath of the civil war, the fact that mine clearance has been undertaken by operators answering mainly to donors rather than a coordinating authority and the low level of interest or commitment to mine action on the part of national leaders.

Most survey activity has been undertaken by individual operators serving their specific needs in their area of operation. This has delayed the process of identifying national demining priorities and left a vacuum in national responses to mine risk education and victim assistance. Declining donor support for mine action demands a more proactive and coordinated national response to the task of freeing Mozambique from the impact of mines.

The LIS claims to “constitute a basis for Mozambican authorities to define priority targets for mine action and to design and execute cost effective measures to address the most serious consequences of the landmine problem”.²¹⁴ It provides the most comprehensive overview of mine contamination to date but it is not fulfilling this role because lack of confidence in the quality of the data on the part of the stakeholders in mine action has eroded its credibility and utility as a planning tool. IND is using the LIS to draw up plans and priorities but operators are finding they have little relevance to their work programmes. Provincial authorities, who play a key role in setting demining tasks, do not refer to it. Demining operators are critical of its data and work mainly with provincial authorities. Donors, influenced by the operators they finance, do not feel it helps to determine the appropriate direction or extent of their support.

National ownership of a survey and involvement of other stakeholders, at least through consultation, make obvious practical sense and are essential to building confidence in the end product. Both elements were lacking in the implementation of Mozambique's LIS. A less proprietorial, more inclusive approach on the part of CIDA and more effective communication with stakeholders on the part of CIDC may have helped to avoid this outcome. CIDC insists it invested considerable time and effort in contacting and working with operators to access their data and experience, but the fact remains none of the operators share this perception and provincial authorities, who enjoy considerable autonomy and are key players in Mozambique's demining activity, are not using it.

²¹³ UNDP Terms of Reference for a Review of ten years of assistance to the Mine Action Programme in Mozambique, 2004.

²¹⁴ CIDC (2001: 11).

Some problems with the Mozambique LIS data, including the almost certainly exaggerated assessment of the area contaminated by mines, highlight weaknesses not of implementation but of the impact survey *process*. An impact survey, by definition, is only as good as the knowledge of the people it taps for information. The information which survey teams worked so hard and at such expense to obtain is often flawed because people contributing it have at best imperfect knowledge or understanding of the problems they attempt to describe. The problem is most visible in post-conflict environments where population movement and resettlement means local people are too recently arrived to have useful knowledge of local conditions and the whereabouts of landmines. However, Mozambique's LIS started eight years after the end of hostilities and this problem still arose.

The mine impact scoring system employed by the LIS also did not provide a particularly useful or sensitive tool for assessing priorities in the conditions that prevailed in Mozambique. The LIS scoring system assigns a high and fixed value to recent casualties, it is geared more towards “accident reduction than a purely economic benefit maximising strategy”.²¹⁵ In Mozambique the number of casualties had already fallen to relatively low levels and is therefore rarely a measure of impact. In the absence of casualties, however, it is difficult under the LIS scoring system for any mine-affected area to qualify as high impact.

To illustrate the point, CIDC presents six variations on the LIS results, adjusting the ten indices in the scoring system that can be altered, but only one of the variables resulted in a significant increase in the number of high-impact communities (from 20 to 37). In the rest, the increase was marginal and in one the number fell. This does not prove the scoring system wrong but the priorities identified under this scoring system should be systematically compared with those identified by provincial authorities and operators.

Landmine impact surveys do not set out to provide data that will provide a basis for the operational decisions of demining agencies, only to provide “a ranking of communities by severity of mine impact that can inform the allocation of mine action resources”.²¹⁶

The IND's IMSMA database is among the most valuable products of the LIS. It provides an indispensable tool for Mozambique's mine action in the long term and has given impetus to IND's efforts to function as a national coordinating authority. Demining agencies which previously operated without reference to the central government are now reporting clearance activities on a regular basis. At a time when donors are curbing their financial support for mine action in Mozambique, the database should be a priority for continued support.

Expectations of impact surveys in general and the Mozambique LIS (as one of the first to be undertaken) in particular have been too high. Operators looked for location data that an impact survey does not set out to provide. Donors and government looked for a more definitive picture of the landmine problem that would enable them to plan more cost-effective and beneficial interventions.

IND's calls for technical survey, however, illustrate the difficulty of using the LIS even

²¹⁵ GICHD/UNDP (2001: 27).

²¹⁶ *ibid.*: 25.

for planning purposes when the physical dimensions of the problem are so vaguely and unreliably defined. Polygon mapping, undertaken in some surveys, was not a practical proposition for a company on CIDC's budget and timetable, starting in Mozambique from scratch. It is no more probable that IND will find donor support for technical surveys on a large scale. Before launching an impact survey, governments and donors need to recognise that it is not an end in itself and make provision for follow-up survey work needed to benefit from impact survey data.

The quality assurance (QA) undertaken on Mozambique's LIS did not suffice to maintain its credibility in the face of damaging criticisms from operators about coverage, including charges of false reporting. Certification of the LIS was granted by UNMAS largely by default – the protocols did not provide grounds for denying it. QA and certification procedures clearly need to be reviewed to better protect the integrity of the impact survey process – and the value of the big sums invested in it.

Annex. Chronology of mine action in Mozambique

1992	Rome peace agreement ends the civil war, providing for a cease-fire, immediate demobilisation of both armies and holding elections but making no specific provision for mine action. The UN Peacekeeping Operation in Mozambique (ONUMOZ) is set up with a mandate to monitor the cease-fire and organise elections.
1993	The UN Supervisory and Control Commission awards the first mine clearance contract to Gurkha Security Guards.
1994	HALO Trust undertakes a four-month emergency survey. UNOHAC awards a US\$4.8 million for the controversial “Project Caminho”, involving Mechem (South Africa), Royal Ordnance (UK), both associated with the manufacture or use of landmines.
1995	UN launches Accelerated Demining Programme, the first indigenous demining agency. The government issues a decree establishing the National Mine Clearance Commission (CND).
1997	Mozambique signs the Anti-Personnel Mine Ban Convention. (It would be ratified in August 1998 and take effect on 1 March 1999.) The government dissolves the CND and replaces it with the National Demining Institute.
1998	Canada and Mozambique sign an MoU providing for a Landmine Impact Survey.
1999	CIDA awards a contract for the LIS to Canadian International Demining Corps.
2000	CIDC starts fieldwork on the LIS.
2001	CIDC completes the LIS. IND issues a five-year plan providing for clearance of all high-impact mined areas by 2006.
2003	Mozambique completes destruction of its anti-personnel mine stockpiles in compliance with the Convention.

Chapter 6

A desk study of Kosovo

Alessandro Conticini and Valérie Quéré

Introduction

This case study looks at the role of survey in the mine action programme in Kosovo, especially the effectiveness of survey for the purposes of planning and managing clearance operations. It begins with a brief overview of the context in the province and then reviews the evolution of the mine action programme from 1999 to the present day. The third section provides an overview of the use of survey in the programme; the issues raised are then addressed in detail in the fourth section, which looks in particular at the emergency survey conducted by HALO Trust and the Modified Level One Impact Survey managed by the Survey Action Center in Washington DC. The case study is completed with a few concluding remarks based on the evidence presented.

The context

Kosovo is a province of the Federal Republic of Yugoslavia, located to the south of Serbia, with an ethnically mixed population of which the majority are ethnic Albanians and the largest minority are ethnic Serbs. In 1998, civil conflict escalated, pitting ethnic Albanian insurgents in the Kosovo Liberation Army (KLA) against Yugoslav military and police forces. Several attempts were made to resolve the situation but in March 1999, after the repression of ethnic Albanians increased, the North Atlantic Treaty Organisation (NATO) initiated a 77-day aerial bombing campaign which led to a peace deal in June 1999 and the withdrawal of Serbian military forces.²¹⁷

On 10 June, the United Nations Security Council passed Resolution 1244 authorising the UN Secretary-General to set up an Interim Administration Mission in Kosovo (UNMIK) charged with establishing an international security presence to deter renewed hostilities, demilitarise the KLA and create a secure environment for the return of refugees.²¹⁸ International organisations were heavily supported by donors, enabling the provision of a major programme of emergency and humanitarian

²¹⁷ Praxis Group (2002).

assistance for recovery and reconstruction. The international security presence was guaranteed by the deployment of NATO's Kosovo Implementation Force (KFOR) under the control of the NATO Council.

For the first 12 months following the removal of Yugoslav forces, the international community focused on emergency and humanitarian assistance. The focus of activity by UNMIK and the donor community was on the provision of energy, medical supplies, demining, shelter and agricultural inputs. Since then, the emphasis has shifted to support for longer-term institutional and capacity building for democratic structures, to be managed by an elected administration, pending resolution of Kosovo's final status in the light of UN Security Council Resolution (UNSCR) 1244.²¹⁹

Ongoing challenges are the consolidation of the peace-building process, the eradication of ethnic violence and reconciliation. Since the end of the conflict, sections of the ethnic Albanian population have abused the Serb minority. Violence and vandalism have created a pervasive sense of insecurity and have undermined confidence in the juridical system, since very few perpetrators have been prosecuted.²²⁰ Given continuing ethnic hatred and desire for vengeance, the province currently remains a potential flashpoint which, without the continued security presence of KFOR military units, could erupt in renewed hostilities.

During the conflict between the KLA and the Yugoslav military and Serbian police, a significant number of landmines were laid across the province. As a result of NATO's heavy bombing campaign, the province was further contaminated with unexploded ordnance (UXO), including cluster bomblets. Mines were typically laid in fields along the borders of the province, in large defensive minefields in the interior of Kosovo, and around roads and trails of approach. Nuisance mines or improvised explosive devices were also laid in houses, schools and villages.²²¹ This scenario created a significant hazard to the early and orderly return of refugees and IDPs, and also hampering the delivery of humanitarian assistance, reconstruction of housing, infrastructure, essential services, as well as the rebuilding of civil society.

Early steps for a humanitarian mine action response took the form of providing mine awareness in refugee camps during the first few months of 1999. KFOR was initially

²¹⁸ According to paragraph 8 of Security Council Resolution 1244 (1999), the responsibilities of the international security presence to be deployed in Kosovo include: "(a) Deterring renewed hostilities, maintaining and where necessary enforcing a ceasefire, and ensuring the withdrawal and preventing the return into Kosovo of Federal and Republic military, police and paramilitary forces, except as provided in point 6 of annex 2; (b) Demilitarizing the Kosovo Liberation Army (KLA) and other armed Kosovo Albanian groups as required in paragraph 15 below; (c) Establishing a secure environment in which refugees and displaced persons can return home in safety, the international civil presence can operate, a transitional administration can be established, and humanitarian aid can be delivered; (d) Ensuring public safety and order until the international civil presence can take responsibility for this task; (e) Supervising demining until the international civil presence can, as appropriate, take over responsibility for this task; (f) Supporting, as appropriate, and coordinating closely with the work of the international civil presence; (g) Conducting border monitoring duties as required; (h) Ensuring the protection and freedom of movement of itself, the international civil presence, and other international organizations". UN Doc. S/RES/1244 (1999), 10 June 1999.

²¹⁹ DFID (2001).

²²⁰ UNSC (2004).

²²¹ Praxis Group (2002).

tasked to supervise demining until the UN could take over the responsibility. Accordingly, as soon as KFOR entered the province it began marking and clearing mines and UXO in support of its own operations. Within UNMIK, the UN set up a Mine Action Coordination Centre (MACC), which took full control of the mine action programme at the beginning of August 1999.²²²

It was foreseen that MACC would not implement mine action operations but would rely on the capacities provided by others. Its responsibilities were to consist of:

- (a) coordination and planning of activities, including surveying, marking, mine awareness, and mine/UXO clearance;
- (b) data collection and dissemination, information management, using the information field module developed by the Geneva International Centre for Humanitarian Demining;
- (c) development and promotion of technical and safety standards;
- (d) quality assurance and quality management; and
- (e) resource mobilisation, if applicable.²²³

With UNMIK operating as de facto government of the province, MACC received atypical powers over the mine action operations in the province.

MACC identified a three-phase programme for mine action in the province: emergency, consolidation and exit. For each of these MACC set specific objectives and activities to achieve them. The objective of the emergency phase was to “ensure the rapid, safe return of refugees and IDPs to their villages and to allow the resumption of normal activities, free from the threat of mines”.²²⁴ This was to be achieved through a process of verification, survey and mine/UXO clearance, integrated with effective mine awareness education and appropriate care for victims.

In the consolidation phase, the first MACC plans set the focus as “establishing the institutional arrangements upon which the medium to long-term requirements for mine action can be developed.”²²⁵ By September 1999, this objective had been substantially amended to one of “clearing all known minefields, CBU [cluster bomb] strike areas and other reported dangerous areas, before handing over to a suitably trained and equipped local capacity ... capable of dealing with the long-term residual threat... Based on current progress, the Mine Action Coordination Centre (MACC) firmly believes that this can be achieved by December 2001.”²²⁶

For the exit phase, in January 2001 the MACC also amended its objectives, so that it read as follows: “The overall objective of the UNMIK MAP is to replicate the situation that exists in virtually all European countries that have experienced conflict during the 20th Century. Although mines/UXO can often be found in these countries, they pose only a minor threat to the population and are not an impediment to economic and social development. On the occasions that mines/UXO are found by members of the public, they are aware of the reporting actions to take and a capacity is trained to respond and deal with the threat in an appropriate and timely manner. In addition,

²²² Although the formal handover of the mine action programme in Kosovo from KFOR to the civilian sector took place only on 5 October 1999.

²²³ UNMAS (1999: 3).

²²⁴ As described in UNMIK/MACC (1999).

²²⁵ UNMIK/MACC (1999).

²²⁶ UNMIK/MACC (2000a).

for those who become victims, a comprehensive assistance capacity exists. This capacity not only includes immediate emergency treatment but also appropriate rehabilitation, psychosocial, reintegration and vocational support services.”²²⁷

Since the municipal elections of October 2000 and provincial elections of May 2001, the international community in general, and UNMIK in particular, concentrated on institution- and capacity-building for the longer term.²²⁸ This was done through efforts to transfer responsibility for public services to the population of Kosovo – “Kosovarisation” – and mine action was no exception. As a result, in June 2001 an assessment of the situation concluded that the mine action programme was at the point where local capacity could take over mine action activities and in mid-December 2001 MACC completed its scheduled term and handed over responsibility for mine action to UNMIK.

Survey and clearance responsibilities were transferred to the Kosovo Protection Corps (KPC) and the Explosive Ordnance Disposal (EOD) Management Section became the focal point for all mine action activities in Kosovo. Other MACC responsibilities were allotted to different ministries or governmental agencies, as follows: the Kosovo Cadastral Agency managed the IMSMA database, the Ministry of Health Environment and Spatial Planning was responsible for collecting incident and accident information, the Ministry of Education, Science and Technology was responsible for ensuring that mine risk education was conducted within the school curricula, and the Ministry of Labour was to deal with victim assistance.

Kosovo has been, to date, the only UN mine action programme which succeeded in “closing the door” after having largely achieved its intended objectives. Despite this, there have been questions ever since as to whether the UN left too early. The MACC Programme Manager, John Flanagan, now believes that it would have been preferable to maintain the MACC for a further period of six months in parallel with the KPC to guarantee that the transition would occur as planned. In addition, retaining a rapid-response capacity could have dealt with a number of tasks that have since been identified. This should have included a technical survey capability, which would have been able to quickly confirm or disprove the presence of mines/UXO in a suspected area, thereby avoiding the uncertainty that now exists in certain areas. Thus, rather than setting time-based objectives for transition to local control, specific criteria to be achieved should have been identified.²²⁹

The transfer of responsibilities to the various ministries and governmental departments did not go as smoothly as planned. In fact, it has been asserted that a so-called “Kosovo mentality” let the programme down badly. For instance, the KPC has little or no incentive to risk their lives and limbs in clearance operations; they are paid the same whether they are gardening or demining. Many therefore prefer to be gardening – or doing nothing – to the evident frustration of the UN and others.²³⁰ This is ascribed to the lack of appropriate training and equipment but also to the lack of institutional commitment among the different bodies concerned in the early stages of the transfer.²³¹ In 2002, the EOD Management Section took back all the mine action responsibilities from the various local ministries, except for the responsibilities

²²⁷ UNMIK/MACC (2001a).

²²⁸ DFID (2001).

²²⁹ Maslen (2004).

²³⁰ Interview with John Flanagan, Programme Manager, MACC, 17 March 2004.

handed over to the Ministry of Public Health. Indeed, the EOD Management Section has, *de facto*, taken over all the responsibilities that the MACC held before, but on a smaller scale.²³²

Overview of the use of survey in the Kosovo mine action programme

Particularities determining a different use of survey in Kosovo

Kosovo is widely recognised as a rare, if not unique, case in the mine action world. Factors such as the short duration of the conflict, the relatively rapid response from donors and mine action institutions, the heavy deployment of international resources and the availability of previously unprecedented information systems,²³³ reportedly placed the mine action community on the “leading edge of humanitarian intervention”²³⁴. In addition, when further considering the relatively favourable physical conditions of the country and the unique political role played by the UNMIK as *de facto* government, the picture obtained is one of a situation relatively easy for survey.

Whereas many other mine-affected countries have often had little or no information on which to base their early plans of action, in Kosovo the MACC had a considerable amount of valuable data at its disposal at a very early stage of intervention. In particular, political and diplomatic efforts gave the MACC rapid access to information concerning (a) the type of explosive devices that would likely be encountered and (b) the approximate location of these explosive devices (in the case of many minefields, the precise location). The records were provided by the end of July 1999, both by the Yugoslav Army (VJ), in accordance with the Military Technical Agreement, and by NATO. On the contrary, problems were encountered with the KLA, which tried, autonomously, to remove the landmines it had laid, but the quality of work was uneven. Their task was also hampered by the lack of maps of where KLA fighters had laid mines.

The VJ provided information on 620 minefields and these records were often accurate, although they typically depicted arbitrary safety buffers or polygons, reflecting a group of smaller minefields. The records were inserted into the IMSMA (Information Management System for Mine Action) database but the process was time consuming. NATO, after initial reluctance, divulged its records of CBU strikes and other relevant information including minefield, UXO and other reports collected by, or reported to, NATO. However, NATO's own data were based upon point target, not actual point of impact. These might differ considerably as the location of contamination was dependent upon factors like altitude of the drop, the speed of the aircraft and the vector of direction of attack, making NATO's data of lesser value.

The economic and operational value of all the available information is said to be significant. One estimate suggests that it would have cost donors an additional US\$1-

²³¹ GICHD (2004).

²³² E-mail from Steve Saunders, Head of EOD Management Section, Pristina, 15 April 2004.

²³³ The IMSMA, or Information Management System for Mine Action, was deployed for the first time in Kosovo.

²³⁴ SAC (2000).

3 million (possibly much more) to acquire this same level of information using traditional (impact and technical) mine action surveys. What is more, the early availability of data facilitated a rapid and more effective humanitarian response.²³⁵

One further consideration seemingly makes Kosovo an atypical case. In many mine-affected countries, local inhabitants often possess the most valuable information on landmine contamination and its impact. But in Kosovo, the normal process of gathering, analysing and exchanging information between local informants and mine action organisations and bodies was, to a large extent, reversed. Given the high number of refugees and IDPs in a relatively small region,²³⁶ civilians needed to be guided through minefield areas and updated about the threat by organisations which already had information about dangerous zones. Consequently, traditional surveys were being challenged to inform, rather than be informed by, the local population.²³⁷ As often occurs, only a limited number of refugees and IDPs were willing to wait until they received assurances that it was safe to return, thereby posing an additional time constraint on mine action organisations to prevent casualties.

Mine action surveys in Kosovo

The general importance of survey in emergency relief planning in Kosovo, including for mine action, was recognised from the outset. Thus, on 13 May 1999, the UN Office for the Coordination of Humanitarian Affairs (OCHA) sent a needs assessment team to the Federal Republic of Yugoslavia, and an UNMAS programme officer joined the mission tasked with evaluating early mine action priorities and needs in the province.²³⁸

Although the UN team was refused entry into Kosovo, the preliminary information gathered from NATO and members of KLA was sufficient to enable UNMAS to produce an initial report on 1 June 1999, “The Requirement for Mine Action in the FRY”. In addition to offering an initial assessment of the immediate challenges to be faced in terms of mine action operations, the UNMAS report explicitly recognised the use of surveys as a priority operational tool and foresaw the allocation of specific funds for this activity, which would be the responsibility of the future mine action centre.²³⁹

Subsequently three main mine action surveys were conducted province-wide in Kosovo. These were:

- The “Emergency Survey” conducted by HALO Trust in June-August 1999, with publication of the findings at the end of that period in the “Consolidated Minefield Survey Results: Kosovo”;
- The “Modified Level One Impact Survey” conducted by the SAC in October 1999-March 2000.
- The “Socio-Economic Survey of Mine/UXO Survivors in Kosovo” conducted by the VVAF in July-November 2000.

²³⁵ Praxis Group (2002).

²³⁶ Comparable flows have occurred only twice in the 1990s: in the Great Lakes area of Africa in 1994 and in the Kurdish-Iraqi war in 1991.

²³⁷ SAC (2000).

²³⁸ UNMAS Update of 17 June 1999, accessed at ReliefWeb, www.reliefweb.int.

²³⁹ UNMAS (1999, 3).

The Emergency Survey

The first of these, the Emergency Survey, with funding from the UK Department for International Development, aimed to gather first-hand information on the mine and UXO contamination in the province.²⁴⁰ Prior to undertaking this rapid census, HALO Trust organised with the Geneva International Centre for Humanitarian Demining a two-day training course in Geneva for the HALO staff about to implement the survey. This included briefings on the use of IMSMA as well as on Level One/Impact Survey data, forms, etc. Consequently, efforts were made to use portions of the IMSMA format for entering HALO's records. These records were entered without cross verification with other records, resulting in a variable level of accuracy.

Data areas assessed were classified into one of the following categories: (a) No contamination exists/ Nothing to report, (b) Insufficient information (re-survey!) and (c) Definite contamination/ Report. As noted by the SAC Survey team, while the history of mined areas and access routes were described in commendable detail, data on blocked access to land and facilities, and information on victims were incomplete or in purely text form, so that MACC data operators were unable to enter the information into IMSMA in the prescribed manner. Also, no uniform community background or population data were elicited.²⁴¹ The areas included under the category "insufficient information" were originally planned to be re-surveyed by HALO Trust during winter, when temperatures forbid demining. However, the course of events made this second effort superfluous and no re-survey was undertaken by HALO Trust: instead MACC contracted private firms to re-survey restricted areas where more information was still needed during the year 2000.

The emergency survey was, to a large extent, a bilateral initiative with no coordination with the mine action community and, most importantly, with a minimal involvement of MACC²⁴² in formulating the information needs.²⁴³ Thus, as was the case with the HALO Trust survey,²⁴⁴ these emergency-type surveys tended to focus on the immediate needs of emergency relief efforts rather than on providing the necessary information on socio-economic impact needed for longer-term strategic and operational planning.²⁴⁵

The survey did provide a significant amount of data on the nature and extent of the threat, which could be used to assist in the safe return of refugees and IDPs to their villages. Unfortunately, the course of events also made this exercise partially superfluous: at the beginning of the survey, no-one was fully aware of the nature and extent of the threat – but by the end of July, through political pressure, the MACC had already received minefield and bombing records from the VJ and NATO.²⁴⁶ The data

²⁴⁰ During implementation activities the HALO staff also contributed, albeit in a very limited way, to the reduction of the UXO threat. As reported by HALO staff, they were able to remove some of the UXO encountered during field activities.

²⁴¹ SAC (1999).

²⁴² HALO staff have also, on a number of occasions, contrasted their "prompt" initiative with the MACC's initial bureaucratic burden and slowness in reaching an effective coordination role. See, for instance, the Praxis-Group (2002) and the SAC modified LOIS final report (2000).

²⁴³ Information provided by John Flanagan, MACC Programme Manager.

²⁴⁴ ICRC (2000).

²⁴⁵ Rhodes (2003).

in those records was similar to that being collected by the HALO Trust, and it tended to be more accurate.²⁴⁷

Consequently, by the end of August when MACC received the final report of the HALO Trust survey, very little of the information it contained was new. Due to its timeframe, the survey was also unable to verify the VJ/NATO records, which would have been a valuable exercise in and of itself. Thus, with the benefit of hindsight, it might have been better to delay the HALO survey until after the minefield and bombing records had been received. The survey could then have been part of a coherent, integrated information-collection plan – a useful verification of the accuracy and reliability of the VJ and NATO records as well as to collect basic information on the socio-economic impact of the mines and UXO.

It does appear, however, that MACC made some use of the HALO survey information when reviewing its initial mine action plans. Also, based on the survey's output and the VJ/NATO information MACC's director quickly decided that in two years the province could be made impact free, as in virtually all European countries affected by conflict during the 20th century.

Local mine action surveys

The HALO Trust survey was the largest implemented at the initial stage, but a number of more localised general and technical surveys were also undertaken by a number of NGOs or contracted firms. These surveys had no common data collection standards, no common guidelines or base of analysis and they were designed and implemented to support each organisation's own operations, without any reference to the broader mine action information needs of the province. These organisations were all bilaterally funded which allowed them to operate, initially at least, in a vacuum, outside any coordination or information-sharing mechanism.

Although the exact amount of money provided by donors to mine action organisations in Kosovo is not known, there is little doubt that this approach, as least as far as survey is concerned, was not cost effective. As the Praxis Group's evaluation notes, this donor – and implementer-driven exercise eschewed coordination and a logical division of responsibilities.²⁴⁸

The Modified Level One Impact Survey

²⁴⁶ Under the terms of the Military Technical Agreement signed between KFOR and the government of the FRY, the Yugoslav Army was obliged to hand over all its minefields maps. Under Article II(2), the FRY agreed to mark and clear minefields, booby traps and obstacles and to clear all lines of communication by removing all mines, demolitions and charges as they withdrew. They had also to mark all sides of minefields. Under Article III(2-a), within two days of KFOR entering Kosovo, the FRY and the Republic of Serbia were to finish detailed records of positions and descriptions of all mines, unexploded ordnance, explosive devices, wire entanglements and physical and military hazards to the safe movement of any personnel in Kosovo laid by FRY forces.

²⁴⁷ For instance, many fields in the survey forms were classified as “Insufficient Information”, strongly conditioning the reliability of the survey, and requiring, in 2000, extensive re-survey by technical survey teams directly contracted by the MACC.

²⁴⁸ Praxis Group (2002).

The MACC, based on lessons learned from earlier mine action programmes, opted to coordinate rather than implement. In this, it sought to effectively identify future priorities, while at the same time making sense and rationalising the allocation of funds, resources and organisations already on site and operating independently. This was the rationale for the Modified Level One Impact Survey.

The SAC was tasked by the US Department of State in June 1999 to undertake a preliminary Advance Survey Mission (ASM).²⁴⁹ Although MACC was still struggling to assert its leadership over mine action activities in the province, the SAC ASM was clearly designed according to MACC's expressed needs. This was obtained through close initial consultation between MACC officers and the SAC ASM, as well as a supportive collaboration for the whole period of the advanced mission. Discussions with concerned parties indicated that with minefield and UXO clearance already ongoing, a classical Level One Impact Survey (LOIS) in Kosovo was of limited utility, given such concentrated resources and the short time horizon. Therefore a modified LOIS that could account for ongoing mine action programme efforts was needed.

According to the Advance Survey Mission Assessment Report, for example, a “clear need exists for Mine Action organizations within Kosovo to have available to them some form of social and economic impact information to support operational planning and prioritisation. SAC intends to meet this need through a modified Level One Impact Survey process that will allow existing data collection efforts to be integrated to support the IMSMA database, and to create a socio-economic index of the impact of mines and UXO.” Further, “the rate of ongoing clearance, and concern for wasteful duplication of effort calls into question the need to conduct a full scale Level One Impact Survey of the type normally considered. Instead, SAC is proposing a modified Level One Impact Survey process that will allow for creation of a socio-economic index of the impact of landmines and UXO. In lieu of commissioning a full-blown Level One Impact Survey, the Survey Action Centre will support the existing players to make their respective bodies of information mutually accessible and fruitful.”²⁵⁰

The second reason for a modified LOIS arose from the need to rapidly integrate mine action programmes into a large-scale relief and reconstruction plan. MACC's Programme Manager strongly advocated making all possible efforts to implement mine action simultaneously with broader humanitarian interventions. Demands from these sectors for mine/UXO clearance in support of programme efforts were inevitable. Again, a “classical” LOIS would have been too time consuming and would have impeded the relief and reconstruction programmes of other international agencies.

Shortage of time was, however, partially mitigated by the fact that many organisations had already started a potentially useful exercise of data collection, even though these were not centrally coordinated. This presented the opportunity to shift focus away from data gathering to systematically collating data from the different organisations and inserting it into a common information management system. Thus, as the situation was already shifting from humanitarian assistance to longer-term reconstruction and development, survey teams were trained and deployed as information was gathered and collated from NGOs, civilian authorities, UN

²⁴⁹ The Advance Survey Mission took place on 26 July-3 August 1999.

²⁵⁰ SAC (1999: 13).

peacekeeping forces and the records of parties to the conflict.

Accordingly, the SAC drafted a concept proposal for a modified LOIS that was approved by MACC and recommended for full funding through UNOPS by the European Commission (EC). The SAC LOIS was undertaken in October 1999-March 2000 at a cost of US\$130,700, provided by the EC.

The project required that the SAC LOIS:

- (a) produce baseline data for the development of a Provincial Work and Priority Plan supporting the transition from initial emergency to a more comprehensive consolidation strategy;
- (b) generate baseline data to measure mine action programme progress; and
- (c) support and develop MACC internal capacity to maintain the data sets and recreate the modified LOIS analysis when needed.

SAC's first objective was to establish a simple, orderly and rational scheme for assigning work to clearance organisations and to develop a prioritisation of dangerous areas for survey and clearance based on proximity to defined areas. Given the high degree of uncertainty and unreliability of data, the proposed mechanism sought to be simple and flexible enough to accommodate additional (evolving) factors. The scale for ranking all dangerous areas in IMSMA intended to combine proximity to populated places, roads, agricultural land and wood foraging areas ("essential livelihood space") but, based on MACC needs, it did not intend to consider dangerous area size or population density.

Planned Output within this objective included:

- A scoring and priority classification of all dangerous areas;
- A scoring and classification for each existing Task Dossier²⁵¹ based on averaging the selected danger area scores;
- Excel spreadsheets in which normally computer-literate users could recalculate scores and make custom summary tables;
- A custom ArcView project called MACC OPS for operational management and elimination of dangerous areas outside of IMSMA.

SAC's second objective was to produce a ranking of communities by landmine impact severity, or landmine hazard strength. This was to be achieved by ranking communities according to the simple percentage of total area contaminated. This measure was selected because it was thought to be highly predictive of potential incidents. The resultant map clearly demonstrated the clustering of heavily-affected areas and also served public information activities.

Planned outputs included:

- A district classification based on percent total district area contaminated;
- Coordination lists of towns in high-, medium- and low-impact districts, with correlated mine awareness project information; and

²⁵¹ The MACC approach to clearance of danger areas involves the use of Task Dossiers. Task Dossiers are folders containing all available records for single or multiple danger areas. A Task Dossier is assigned to a landmine/UXO clearance organisation for survey and/or clearance. The Task Dossier was chosen as a management tool because it allowed the MACC to assign for clearance an area that held a single danger area or multiple overlapping records.

- Ten Public Information layouts in Adobe Acrobat format showing: (a) six district and danger area classification maps, and (b) four landmine/UXO awareness programme areas and district classification maps.

SAC's third objective was to develop the internal capacities of MACC and NGOs in using the provided information, updating it and modifying parameters of the system in order to account for evolving factors, even including re-ordering the selection of priorities.

Planned outputs included:

- User guide and structured training of MACC IMSMA and Operations staff on advanced GIS/ArcView analysis techniques, supporting the analytic methodology developed under this project; and
- 43 GIS feature data files used and/or developed in danger area and district classifications.

Implementation of the survey

The main characteristic of the modified LOIS was that it be a dynamic operational tool. By largely relying on information provided by the concerned organisations, MACC and NGO staff were trained not only to update the information system, but also to acquire the necessary skills to insert additional data to determine the prioritisation for a mine action response of dangerous areas. Thus, by the time SAC support came to an end in March 2000, an information system was in place that could describe where the threat was, define the nature of the at-risk areas, and rank the relative impact of mine- and UXO-contaminated areas on the population. Given that only nine months had passed since MACC had been established, this timeframe was very short.²⁵²

The main challenge of the LOIS was to create an effective information system that could incorporate data from a wide range of actors.²⁵³ This was because military (VJ/NATO), NGOs and other sources had compiled rich physical mine/UXO area data requiring an information management system capable of holding, managing and displaying the information. At that time, IMSMA was still being developed and the LOIS activities were largely developed “outside” IMSMA. According to Chris Clark: “A second reason for this was that this early version of IMSMA, coupled with the poor and unreliable power supply in Pristina, regularly caused the database and the server it was located on to crash. Indeed it was found more reliable to “work the survey” on a stand-alone laptop and hook it up to IMSMA when completed.” The large data set of danger areas, cluster bomb target coordinates, minefield plans, minor reports on suspected minefields/UXO and incidents compiled from various sources²⁵⁴ were stored in multiple stand-alone tables outside the IMSMA module. More than seven separate and independent data sets were combined by SAC to form the base for IMSMA data set for danger areas.

²⁵² Interview with Chris Clark, former Chief of Operations, MACC, Kosovo.

²⁵³ This includes data from the HALO Trust Emergency Survey, returning civilians, older records from the 1998-99 Kosovo Verification Mission and the Kosovo Disengagement Observer Mission. More than seven separate and independent data sets were combined to form the base for IMSMA data set for danger areas.

²⁵⁴ MACC reported that there were about 4,000 such records of varying reliability.

The majority of the data sets were imported into IMSMA in July and August 1999, the remainder being progressively inserted or consolidated into IMSMA by November 1999 (before the beginning of the LOIS). The data were not easily joined by common references, thus requiring significant manual manipulation of spreadsheet-formatted data sets. And only a minority of these records had been verified and validated before being inserted into IMSMA, resulting in an estimated rate of suspected number of duplicates or false reports of 30 to 50 per cent. For instance, some duplicate reports referred to the same area but were offset by 10 to 100 metres depending on observer position and reporting or GPS measuring error.

Drawing on the LOIS records, SAC created a concept of “essential livelihood space” – an area in which most social and economic activities would take place. This comprised the area within a 500-metre radius of a settlement and 200 metres either side of a road. Added to this area analysis were agricultural land and wood-foraging areas. Agricultural land was drawn by hand in the GIS using satellite imagery. Wood-foraging areas were defined as those areas of dense vegetation that intersected the social space buffer.

These areas were identified as “essential”, i.e. those where it was most likely that civilians would be at direct risk from mines or UXO and where providing clearance and mine awareness in a short time would prevent casualties and reduce the socio-economic impact of contamination. In total, the essential livelihood space equated to roughly 40 per cent of the total landmass of Kosovo. This same space would also be the location of most point-of-service relief and reconstruction projects.

The use of the concept of essential livelihood space was at the heart of planning, coordination and operational decision-making. The combination of essential livelihood space and contaminated land defined the priorities for Task Dossiers for clearance. Indeed, the information provided by the modified LOIS provided the bedrock of clearance priorities and remained so to the end of MACC operations in Kosovo.

As new information became available, it was simply added to the database and the analysis and priorities for intervention were adjusted accordingly. According to Chris Clark, the MACC's Chief of Operations: “The SAC analysis was very useful and provided a very simply and quick answer to where we should be working and in what order. This formed the base and was simply modified as time went on.”²⁵⁵

Outputs of the survey

The actual outputs of the modified LOIS were very similar to those that had been planned. Nonetheless, a number of differences can be identified and two are worth noting. The first of these was the result of the lack of data available at community level. The survey had intended to prioritise areas of intervention by ranking communities according to socio-economic impact and need. This was actually achieved at district but not community level. There were a number of reasons for this. As already mentioned, Kosovo had seen significant population displacement, thereby impeding data gathering on a community level. Also, as organisations collecting data were not effectively coordinated by MACC in the initial stages, the need for such

²⁵⁵ Interview with Chris Clark, former MACC Chief of Operations, Kosovo.

community-level data was not made clear. Finally, general time constraints encouraged a tendency towards rapid assessments, which are more typically conducted at district level.

A further discrepancy between planned and actual output was the training of NGO staff to continue the modified LOIS process. According to the initial implementation proposal,²⁵⁶ SAC activities would have also implied identifying training needs, developing training curricula and implementing training sessions for both UN and NGOs staff. In fact,²⁵⁷ it seems that no such training was provided to the NGOs, only to MACC staff. This change can be explained by the subsequent decision to use the KPC to take over MACC's responsibilities rather than one or more of the NGOs.²⁵⁸

Utility of the survey

Using GIS functions, SAC estimated that the total mine/UXO contamination problem in Kosovo covered some 360 square kilometres. Early in the programme, it was estimated that 30 to 50 per cent of the information was either duplicate or simply false, largely due to the failure to verify data before entering it into the IMSMA database. Thus, it was understood that the size of the physical area to be cleared, particularly cluster strike areas which heavily overlapped, would be substantially less than this amount. In fact, by the end of major clearance operations in Kosovo, only 32 square kilometres of land had been demined – less than 10 per cent of the early SAC estimate.

The high number of false, duplicate and overlapping records demanded a significant number of local follow-up surveys to eliminate inaccuracies from the database. According to John Flanagan, it was better to err on the side of caution, rather than to withhold information from the database simply because MACC lacked the capacity to validate the information at the time. Therefore, it was accepted that some process would be needed to assess the information's accuracy at a later stage.²⁵⁹

Yet, while mine clearance was following a rational process defined by the modified LOIS priorities, the process was not quite so smooth for **mine risk education** (then called mine awareness). There were a number of reasons for this, but it surely can be considered a missed opportunity.

An additional element which reduced the potential benefits from the modified LOIS, was the degree of cooperation with other relief and reconstruction agencies. One of the outputs of the modified LOIS was to rank district impact by percentage of total area contaminated. The methodology used allowed the incorporation of socio-economic data of relevance to the various members of the reconstruction and development community.

The idea was that each reconstruction and development agency would develop a well-defined and geographically prioritised programme and then pass it to MACC. At that point, the MACC would insert the data into the information management system,

²⁵⁶ SAC (1999).

²⁵⁷ SAC (2000).

²⁵⁸ The choice of handing mine action responsibilities over to the KPC, most of them former members of the KLA, was a controversial, political decision taken without consulting the MACC.

²⁵⁹ Maslen (2004).

obtaining a list of mine action activities to support the priorities of other agencies.²⁶⁰ Without the relevant sector rehabilitation priorities being provided to MACC, the modified LOIS analysis would be essentially an accident hazard analysis, not a socio-economic impact analysis.

In fact, none of the key actors – the leading reconstruction agency (the EC), the UNMIK Civil Administration and the other UN agencies – developed such spatially planned sector priorities. While the Humanitarian Community Information Centre had been funded and provided with GIS software and computer equipment, this resource was not used to its full potential. Numerous agencies acknowledge that spatial planning units exist, such as health facility catchment areas and school districts. However, most sector planning does not seem to have used any spatial or service area analysis.²⁶¹

Estimating relative access to services and projecting future needs would seem to be the most logical approach to allocating limited resources. MACC requests for access to such information for incorporation into the mine action planning process did not generate a useful level of data. Of the main social and economic reconstruction sectors (health, education, agriculture, water, public utilities and resettlement) only the UN Food and Agriculture Organization (FAO – the leading agency for agriculture) had come close to a priority scheme.²⁶² However, with only one sector's priorities available, incorporating the agricultural priorities would have biased the overall mine/UXO clearance prioritisation towards agricultural needs only.

While the education and health sectors had maintained master lists of facilities by location, these lists were not prioritised for funding but maintained for would-be donors on an ad hoc basis through individual contact of the agency concerned.²⁶³ In addition, the locations of the facilities were rife with place-name spelling errors and freely used either Albanian or Serbian names. Sorting out these lists would have taken a significant amount of time and manual effort.

Public utilities' planning was even more sporadic. Projects started with little notice and were dependent on when and which donor government decided to fund the effort. As an example, MACC support for clearing access to electrical power transmission pylons and sub-stations was conducted without a master plan ever being assembled by the coordinating bodies. Consequently some mine clearance actions were not matched by the appropriate inputs from other sectors and overall rehabilitative efforts were not achieved or delayed. These elements seriously undermined the modified LOIS's goal of identifying a comprehensive and rationale scale for intervention.

²⁶⁰ International relief and reconstruction assistance programmes determine project priority based on sector-specific criteria. Depending upon the focus of the programme, these sector priorities are usually assigned by town/village, municipality or geographic region. By compiling the sector priorities for relief and reconstruction resource allocation, it would have been possible to identify the relative geographic concentration of such resources across all of Kosovo. It was reasoned that towns and villages in areas with a heavy concentration of relief and reconstruction activities would have a higher demand on mine action services.

²⁶¹ SAC (2000).

²⁶² This prioritisation was based on a relative ranking of municipalities using the 1999 harvest as a percentage of the 1997 harvest.

²⁶³ The largest of these ad hoc requests involved surveying and cleaning 776 schools for UNICEF.

Thus, in sum, while efforts were made to integrate mine/UXO activities into a general provincial work plan, integration of mine action with development work partially failed due to the lack of prompt response from other agencies. However, the Kosovo LOIS did provide the opportunity to simplify the survey process – and thereby the setting of priorities by the MACC. This positively affected subsequent “buy-ins” by the implementing mine action organisations, which might have proved more resistant to a more sophisticated (and therefore expensive) survey. And the modified LOIS proved to be extremely flexible in modifying planned activities according to specific expressed needs – what John Flanagan has deemed “finding a Kosovo solution to Kosovo problems”.

Lessons learned

SAC complained about the turnover of MACC personnel, which did not help the general mine action process by frustrating the retention of institutional memory. Thus, data collection, reliability, availability, suitability and completeness were all LOIS constraints, producing significant statistical noise.

It can be argued that the modified LOIS had an intrinsic weakness, since information reliability was entirely dependent on the accuracy of information gathered and handed over by concerned parties. Yet, despite this intrinsic vulnerability, only ten extra unrecorded minefields had been found to date by the mine action programme. This implies that records provided, while not precise and accurate, had at least a very good degree of completeness. In particular, information provided by the VJ was found to be extremely accurate despite the fact that the physical representation of these records was based on arbitrary safety buffers or polygons generally reflecting a grouping of smaller minefields. In contrast, NATO data was often found to be inaccurate, because records were indicating intended targets of cluster bomb units and not the actual strike sites.

Value could have been added to the data received through a rapid verification exercise to test the reliability and completeness of records. MACC had the unusual privilege of receiving a comprehensive set of information which, when put together, presented the record of nearly all danger areas. With hindsight, we know that the information received was more or less exhaustive – but that was not certain at the time. A rapid verification assessment would have added confidence to the reliability of data. Also, if basic socio-economic impact data had been collected during this rapid verification, it would have completed the information still missing at the end of the modified LOIS.

The process would also have benefited from a common, standardised system of data collection from the outset. The fact that data sets were collected using different systems²⁶⁴ imposed a manpower-intensive effort for manually adapting them and inserting them into IMSMA. This was a time-consuming process exacerbated by the turnover of information technology personnel within MACC. This might suggest that organisations working on collecting information, especially if bilaterally funded and working independently, have to agree on using compatible data collection tools prior to implementing field activities in order to have a common frame of reference and common data sets.

²⁶⁴ Especially in the case of VJ records, a number of them were not even in digital but only in manual format.

Finally, part of the success of the modified LOIS is due to the diplomatic efforts made by the MACC staff in persuading concerned organisations to hand over collected data sets. Some organisations were initially reluctant to provide access to their records,²⁶⁵ requiring extensive consultations and persuasive diplomacy. In Kosovo this process was successful mainly due to the personal and human qualities of MACC officers. However, because data needs to be released or acquired as quickly as possible, an essential part of peace agreements between conflicting parties must be the release of relevant, available records.

The Socio-Economic Survey of Mine/UXO Survivors in Kosovo

Between June 1999 and January 2000 there were some 235 mine/UXO incidents, in which 92 people died and others sustained injuries ranging from minor wounds to loss of limbs.²⁶⁶ MACC efforts in tracking victims and their needs were addressed through two complementary processes. The first was through IMSMA, which recorded details of victims and reported incidents, allowing such data to be overlaid on maps showing geographic features and contaminated areas. The International Committee of the Red Cross (ICRC) assisted the MACC in this process. The second complementary process was based on maintaining a casualty surveillance system based on reporting from health facilities. WHO, the ICRC and health and disability NGOs (such as Handicap International) were responsible for this second process, in conjunction with the Department of Health and Social Welfare.

Despite these shared efforts, a number of gaps in the data set remained, with many victim records lacking important details.²⁶⁷ Concerns were also expressed about the quality of the data gathering and the entering process.²⁶⁸ As a result, organisations such as Handicap International, Oxfam, VVAF, Handikos (a local NGO) and UNICEF were all stressing the need to develop a long-term strategy for mine victim assistance.

Thus, for the year 2000, MACC's victim assistance objectives were, firstly, to establish and maintain an efficient individual mine/UXO victim data collection system that accurately reflected the personal details, locations and circumstances of each incident. The second objective was to monitor trends in injuries, locations and age to make meaningful adjustments in mine awareness activities. The third objective was to provide the necessary information to allow analysis and guidance of the primary healthcare needs of mine and UXO victims. Overall, the MACC intended to provide a monitoring facility for the progress of survivors through the various stages of the assistance cycle: directly assisting the individual where possible and contacting the concerned supporting agencies or governmental programmes where required.²⁶⁹

²⁶⁵ For instance NATO forces did not agree at the beginning to give access to strike records. Only after a number of consultations and agreements with UN official did they provide copies of their records.

²⁶⁶ GICHD (2001).

²⁶⁷ Data on the socio-economic situation of mine and UXO survivors was not included in the SAC LOIS.

²⁶⁸ Problems were due to the fact that sometimes the name of victims was wrong, the person who answered the questions was not the victim but a relative, information reported was inaccurate, and there was inadequate information regarding the activity at the time of incident. As a result, IMSMA database was incomplete and had to be checked several times.

Another activity to achieve these objectives was that MACC tasked VVAF to conduct a province-wide survey of landmine and UXO survivors – to address the scant quality and quantity of socio-economic information on mine/UXO victims and their households.²⁷⁰ VVAF was selected because, since the second half of 1999, it had been engaged in a pilot psycho-social assistance project in Kosovo, helping 45 war-disabled persons and their families to get on the road to recovery and social reintegration into community life. MACC reasoned that this activity, as well as VVAF's previous experience, would provide a detailed understanding of the physical, social and emotional well-being of the familial situation, education and economic status of survivors in Kosovo.

Thus, data gathering, which started in July 2000, was intended to provide an accurate picture of mine/UXO survivors in terms of demographic, economic, social, emotional and health data. In particular, a careful assessment of the short-, medium- and long-term needs of mine victims in Kosovo was sought. The survey was meant to cover the age of victims, their living conditions and assets, their employment status, their school attendance and health, their mobility and their mine/UXO awareness. MACC wanted to be able, through this survey, to refer victims to pertinent NGOs, agencies and other social services that could provide the necessary and appropriate support. In fact, victim assistance in Kosovo was negatively affected by the post of Victim Assistance Coordination Officer within the MACC being left vacant for much of the programme. Although the post was foreseen in the original MACC organigram, the position was not assigned and the responsibilities were assigned to the Chief of Public Information and its Assistant, in addition to their many other responsibilities.

During survey implementation, VVAF survey teams visited 186 villages and towns, interviewing 333 of the reported 537 landmine/UXO survivors in Kosovo. Basic demographic data from the survey showed that mine/UXO survivors were predominantly young (77 per cent were under 35), thus the rehabilitation and reintegration process must be regarded as a long-term issue. Most victims were male (89 per cent) and from rural areas.

Of the 333 survivors interviewed, nearly half had permanent disabilities and three-quarters suffered from one or more outstanding health problems, but only a small percentage were receiving treatments for their ailments. The living conditions of survivors varied greatly, mirroring the situation of the general population. Most of the families ate two or three meals a day and three-quarters owned their own land, although 22 per cent of these home-owners did not use it because they believed that it was mined or unsafe.

Employment and lack of income were among the most critical issues faced by survivors, similar to the rest of the population. Some 80 per cent were unemployed

²⁶⁹ UNMIK/MACC (2001b).

²⁷⁰ Other activities were the development of a new incident investigation report, which analysed in depth the injury, causes, activities and implications for mine action. In addition, following discussion with ICRC, the MACC provided support to ICRC field officers for improving accuracy in data gathering and further developing ICRC questionnaire form. Finally, the MACC made provisions for changing the data collection form and system for technical incident investigation implemented with the senior demining partners in the province.

and 60 per cent reported their financial situation progressively deteriorating since their accident. Education attendance was generally positive with very few cases of school age children not attending classes. Psycho-social indicators of self-esteem were generally high and 65 per cent of survivors deemed themselves “happy”. Only 20 per cent reported discriminatory attitudes by mainstream society towards them.

Few families reported living in very difficult circumstances; the majority lived in average or even good conditions. Almost every family initially received some form of assistance (food, housing or financial), and some were still receiving support through social assistance schemes.

The report concluded that, given the programmes and structures already in place in the province, “with a well organised and focused initiative, the most urgent needs of survivors can be met by the end of 2001.” Longer-term needs were to be included in long-term planning by integrating them with the needs of all disabled people in the province.

The utility of the survey

Information from the VVAF survey allowed the identification of activities needed for future victim support.²⁷¹ However, the MACC felt that the survey failed to place the individual survivors in the various phases of the victim-assistance cycle. This prevented MACC being able to directly refer victims to the relevant NGOs and agencies that could assist them. Consequently, MACC decided to conduct a further analysis of the information in its own database, along with the VVAF study information as well as records from IOM, Handicap International and Handikos – to identify and place the victims into the appropriate phase of victim assistance cycle on an individual basis.²⁷²

Nonetheless, the MACC Victim Assistance Plan for 2001 foresaw that VVAF would be in charge of providing psycho-social and socio-economic assistance to those identified and surveyed by VVAF teams during the survey. VVAF would also have to provide monthly progress reports to MACC. But a reduction in donor resources during 2001 forced a revision of initial plans. In fact, VVAF did not have the funding to continue assisting individual survivors and their families, and the only viable option was to refer the individuals to other agencies and governmental programmes. This exercise enabled the creation of an individual tracking system to identify who was (and was not, receiving assistance, to assess their needs and priorities and to allocate available resources appropriately. This led to a referral list addressed to the most appropriate agencies.

Survey results were also followed up by inserting disability-related issues of survivors into a 2001 integrated mine action public information campaign highlighting mine/UXO survivor needs. This awareness campaign was enhanced by lobbying UNMIK, through the Department of Health and Social Welfare, to take disability issues into account in its work. MACC recognised the need to develop its collaboration with the Department of Health and Social Welfare for assistance with the victim assistance cycle. One result was that UNMIK started to consider disability access issues to all new buildings. While recognising this positive outcome, this process of awareness-raising was rather late, considering the amount of

²⁷¹ UNMIK/MACC (2000b).

²⁷² UNMIK/MACC (2000b).

reconstruction that had already taken place and the number of reconstructed public buildings without facilities for disabled people.

Overall, the information from the socio-economic survey on mine/UXO survivors was important for follow-up activities, planning and coordination. But the information was collected in a relatively late phase of the programme due to the lack of a specific officer within MACC to coordinate victim assistance activities. This resulted in a less effective MACC capacity to lead coordination in this sector, a reduced impact in inserting mine/UXO victim-related needs into long-term policy, and a lack of sufficient visibility of mine/UXO victim needs.

Concluding remarks

The Kosovo case has confirmed the view that priority setting is potentially the most challenging process in mine action programme management. There are no fixed rules, no standard approaches that can be applied to guarantee a successful prioritisation of operations, only guidelines. This process is complex and it requires a careful analysis of many factors – and an irreplaceable component of human judgement.²⁷³ Nonetheless, surveys are perhaps the potentially most effective tool to foster a comprehensive and coherent setting of priorities.

Kosovo also provides evidence for the assertion that funding from donors for survey activities is potentially more effective if it is channelled through the mine action centre or, at least, if adherence to MAC rules and instructions is mandatory. If funding in Kosovo had been coordinated with the MACC from the very beginning, this could have reduced the number of NGOs or contracted firms operating in Kosovo, considerably diminishing the duplication of survey efforts and improving the overall management of funds.²⁷⁴

Nonetheless, despite MACC's attempts to better influence the type of activities and mine action resources coming into Kosovo, it has been persuasively argued that "MACC's first plans may well have reflected a need to put to good use the mine action resources that had been thrown into theatre rather than a rational priority-based approach."²⁷⁵

The Kosovo experience also suggests that during the post-conflict emergency phase, in situations where extensive mine and UXO data are likely to be provided by the former warring parties, rapid verification exercises after data has been received would add substantial value and confidence in its reliability. These exercises of verification and validation are more useful if they include the collection of basic socio-economic impact data.

Finally, it can be argued that the success of the mine action programme in Kosovo is due, in part at least, to the introduction of the first version of IMSMA. Although the system used in Kosovo was a pilot version, inevitably subject to certain problems (since corrected), the added value of this information management system to mine action is evident.

²⁷³ Rhodes (2005).

²⁷⁴ Information provided by J. Flanagan, April 2004.

²⁷⁵ Praxis Group (2002: 49).

Annex. The history of the Kosovo mine action programme

CHRONOLOGY	
23 March 1999	NATO begin air-strikes.
13 May	High-level meeting in Geneva to discuss the Kosovo region, bringing together the UN Secretary-General, the heads of key UN agencies, as well as representatives of the EU and the World Bank. The participants were given a briefing note from UNMAS on the mine threat in Kosovo. The same day, OCHA and UNMAS sent out a joint needs assessment team to the Federal Republic of Yugoslavia. The team was denied access to Kosovo, but it gathered sufficient information from NATO to enable UNMAS to put out a first assessment of mine/UXO contamination, dated 1 June 1999.
1 June	UNMAS distributes “The requirement for mine action in the FRY” to concerned parties. This is the beginning of the first mine action plan for Kosovo, stressing the importance of establishing as soon as possible a mine action coordination centre.
10 June	Belgrade begins to withdraw its FRY forces from Kosovo. The same day the UN Security Council passes Resolution 1244 authorising the UN Secretary-General to set up an Interim Administration Mission in Kosovo (UNMIK). UNMAS/UNOPS sign a Memorandum of Understanding setting the immediate mine action objective as being to facilitate the safe return of civilians to the province.
12 June	KFOR begins to enter Kosovo. By 20 June, the Yugoslav withdrawal is completed and KFOR is established in Kosovo, taking initial charge of mine action. By the end of June, some 17 mine/UXO clearance organisations and 20 mine awareness organisations had arrived in Kosovo, progressively setting up their bilaterally-funded programmes. ²⁷⁶
13 June	HALO Trust (bilaterally funded by DFID) begins a rapid province-wide assessment of the mine and UXO contamination.
15 June	Three major mine action NGOs (HI, MAG and NPA) send a joint letter of support to UNMAS indicating their intention to coordinate their joint response to the Kosovo problem and giving their full support to coordination efforts by the UN Mine Action Coordination Centre (MACC) in Kosovo.
17 June	The temporary UN mine action team opens the MACC office in Pristina.
Second half of June	As many as 50,000 refugees and internally displaced persons (IDPs) per day return to their homes. Landmines and UXO caused at least 143 civilian casualties in June 1999.
Early July	Start-up funds and equipment donated by DFID to MACC.
26 July to 3 August	The Survey Action Center (SAC) implements a preliminary advance survey mission to Kosovo to assess the need for a province-wide Level One impact survey.
End of July	MACC receives minefield records from the Yugoslav Army and Serbian police forces, plus NATO records of cluster bomb strike targets.

²⁷⁶ Praxis Group (2002)

CHRONOLOGY (continued)	
August	MACC takes <i>de facto</i> control of mine action programme in the province, leaving to KFOR clearance responsibilities only in support to their own operations.
13 August	MACC issues its “Plan for Mine/UXO Clearance”.
21 August	MACC issues the “Operational Plan for Emergency Phase Mine/UXO Awareness Education”.
24 August	UNMIK approves the Mine Action Outline Concept Plan and the Operational Plans issued by MACC.
End of August	HALO Trust submits the results of its rapid survey to the MACC.
September	MACC issues its first draft standards for mine action activities, calling for input and comment from clearance organisations. The final document was subsequently issued in February 2000, prior to the start of the forthcoming clearance season.
October	SAC implements the Modified Level One Impact Survey through to March 2000.
13 December	MACC issues its plan for the “Consolidation Phase”.
July 2000	The Vietnam Veterans of America Foundation (VVAFA) initiates a “Socio-Economic Survey of Mine/UXO Survivors in Kosovo” which is completed in November 2000.
3 January 2001	MACC issues its “Exit Strategy Discussion Paper”.
June	An assessment of the mine action situation concludes that the mine action programme was at the point where local capacity could assume responsibility for mine action activities.
10 September	MACC issues a detailed “Plan for the Transfer of Responsibility for Explosive Ordnance Disposal Operations in Kosovo from the UNMIK MACC to the Department for Civil Security and Emergency Preparedness”.
Mid-December	MACC completes its scheduled activities and hands over responsibility for mine action to UNMIK which, in turn, will hand over to the identified ministries and governmental institutes. After having passed responsibility for mine action to UNMIK, MACC “closes its doors”.
Mid-December	UNMIK passes to different ministries and governmental offices responsibilities for mine action activities according to their mandates, to comply with the overall process of establishing self-governance.
2004	The EOD Management Section has taken back all mine action responsibilities from the ministries and governmental bodies, except for those handed over to the Ministry of Public Health.

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Glossary of abbreviations and acronyms

ADP	Accelerated Demining Programme
ARBiH	Bosnian Government Army
AWOR	Area Without Obvious Risk
BAC	battle area clearance
BAF	Bosnian Armed Forces
BHK	Bolisat Phathana Khetphoudoi
BHMAC	Bosnia and Herzegovina Mine Action Centre
BH RCS	Bosnia and Herzegovina Red Cross Society
BiH	Bosnia and Herzegovina
BOMICO	Bomb and Mine Disposal Centre
BTC	Belgium Technology Corporation
CA	Community Awareness
CACTA	Air Combat Activities
CIDA	Canadian International Development Agency
CIDC	Canadian International Demining Corps
CMAO	Central Mine Action Office
CMVIS	Cambodian Mine/UXO Victim Information System
CIDA	Canadian International Development Agency
CND	Commissao Nacional de Desminagem (National Demining Commission)
CNIDAH	National Inter-Sectoral Commission on Demining and Humanitarian Assistance for Mine Victims
COPE	Co-operative Orthotic and Prosthetic Enterprise
CP	Civilian Protection Authorities
CRUR	Center for Research and Unit Records
DHA	Department of Humanitarian Affairs (DHA)
DOD	Department of Defense (US)
DSCA	Defense Security Cooperation Agency
EAF	Entity Armed Forces
EC	European Commission
EDD	explosives detection dogs
EOC	expert opinion collection
EOD	explosive ordnance disposal
ERW	explosive remnants of war

EU	European Union
EUFOR	EU Force (Bosnia and Herzegovina)
FAA	Angolan Armed Forces (Forças Armadas Angolanas)
FALA	Armed Forces for the Liberation of Angola (Forças Armadas para a Libertação de Angola)
FAPLA	People's Armed Forces for Angola's Liberation (Forças Armadas para a Libertação de Angola)
Popular	
FBiH	Federation of Bosnia and Herzegovina (Muslim-Croat)
FLEC	Cabinda Enclave Liberation Front
FNLA	National Front for the Liberation of Angola
FRELIMO	Mozambique Liberation Front (Frente de Libertação de Moçambique)
FRC	Federal Resources Corporation
FRY	Federal Republic of Yugoslavia
FSD	Swiss Foundation for Mine Action
GDP	Gross Domestic Product
GFAP	General Framework Agreement for Peace ("Dayton Agreement")
GFC	Greenfield Consultants
GICHD	Geneva International Centre for Humanitarian Demining
GIS	Geographic Information System
GLS	Global Landmine Survey
GMAA	General Mine Action Assessment
GNP	gross national product
GP	General Purpose
GPS	Global Positioning by Satellite
HALO Trust	Hazardous Areas Life-Support Organization
HAMA	Humanitarian Assistance and Mine Action
HI	Handicap International
HIB	Handicap International Belgium
HVO	Bosnian Croat Army
ICBL	International Campaign to Ban Landmines
ICRC	International Committee of the Red Cross
ICTY	International Criminal Tribunal for the former Yugoslavia
IDP	internally displaced person
IFOR	Implementation Force
IMAP	Integrated Mine Action Programme
IMAS	International Mine Action Standards
IMF	International Monetary Fund
IMSMA	Information Management System for Mine Action
INAD	National Demining Institute (Instituto Nacional de Desminagem)
INAROE	National Institute for the Removal of Explosive Devices (Instituto Nacional de Remoção de Obstáculos e Engenheiros Explosivos)
IND	Instituto Nacional de Desminagem (National Demining Institute)
ITF	International Trust Fund for Demining and Mine Victims Assistance
KAPB	Knowledge, Attitudes, Practices and Beliefs (or Behaviour)
KFOR	Kosovo Protection Force
LDPA	Lao Disabled Peoples Association
LIS	Landmine Impact Survey
LMVIS	Laos PDR UXO/Mine Victim Information System
LYU	Lao Youth Union
MAC	Mine Action Centre
MACC	Mine Action Coordination Centre

MAG	Mines Advisory Group
MCTPC	Ministry of Communications, Transport, Post and Construction
MDD	mine detection dog
MOE	Ministry of Education
MOH	Ministry of Health
MONUA	UN Observer Mission in Angola
MOU	Memorandum of Understanding
MPLA	Popular Movement for the Liberation of Angola
MRE	mine risk education
MSTI	Management Support Technology Inc.
NARA	National Archives and Records Administration
NATO	North Atlantic Treaty Organisation
NGO	non-governmental organisation
NIMA	National Imagery and Mapping Agency
NIPS	National Combat Command Information Processing System
NMAP	National Mine Action Programme
NPA	Norwegian People's Aid
NPEP	National Poverty Eradication Plan
NRA	National Regulatory Authority
NRC	National Rehabilitation Center
NSP	National Strategic Plan
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OECD	Organisation for Economic Cooperation and Development
OHR	Office of the High Representative
ONUMOZ	UN Peacekeeping Operation in Mozambique
OSCE	Organisation for Security and Cooperation in Europe
PAVN	Peoples Army of Vietnam
PCD	Post Clearance Documentation
PCE	Post Clearance Evaluation
PCIA	Post Clearance Impact Assessment
PDR	People's Democratic Republic
PIC	Peace Implementation Council
PIU	Project Implementation Unit
PL	Pathet Lao
PRSP	Poverty Reduction Strategy Plan
PWD	Person with Disability
QA	quality assurance
RENAMO	Mozambique National Resistance
RLA	Royal Lao Army
RS	Republika Sprska (Serb)
SAC	Survey Action Center
SACCOACT	Strategic Air Command Combat B-52 Missions
SADF	South African Defence Forces
SEADAT	SE Asia Database
SFOR	Stabilisation Force (Bosnia and Herzegovina)
SHA	suspected hazardous area
SMA	suspected mined area
SOP	standard operating procedure
SWAPO	South West African People's Organisation
TAP	Task Assessment and Planning
TIA	Task Impact Assessment

TS	technical survey
UCAH	United Nations Humanitarian Assistance Coordination Unit in Angola
UK	United Kingdom
UN	United Nations
UNAVEM	United Nations Angola Verification Mission
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNHCR	Office of the United Nations High Commissioner's Office for Refugees
UNICEF	United Nations Children's Fund
UNITA	National Union for the Total Liberation of Angola (Uniao Nacional para a Independencia Total de Angola)
UNMAS	United Nations Mine Action Service
UNMIK	United Nations Interim Administration Mission in Kosovo
UNOCHA	UN Office for the Coordination of Humanitarian Affairs
UNOHAC	UN Office for Humanitarian Assistance Coordination in Mozambique
UNOPS	United Nations Office for Project Services
UNSECOR	United Nations Security Coordinator
US	United States of America
USAID	United States Agency for International Development
UXO	unexploded ordnance
VVAF	Vietnam Veterans of America Foundation
VRS	Bosnian Serb Army
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization
WV	World Vision
ZANLA	Zimbabwe African National Liberation Army

Appendix

Study advisory group members

John Flanagan

JJ Van der Merwe

Alistair Craib

Bob Eaton

Dave McCracken

Hemi Morete

Rune Engeset

Heng Rattana

Laurence Desvisgnes

Felisberto Nuvunga Qareem Tariq



Geneva International Centre for
Humanitarian Demining
Centre International de
Déminage Humanitaire - Genève

Geneva International Centre for Humanitarian Demining

7bis, avenue de la Paix

P.O. Box 1300

CH-1211 Geneva 1

Switzerland

Tel. (41 22) 906 16 60, Fax (41 22) 906 16 90

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