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RESEARCH, TECHNOLOGY AND DEVELOPMENT IN MINE ACTION

The Journal of Mine Action is soliciting articles in the field of research, technology and development. All articles on current trends and developments in R&D will be considered. Topics will include but not be limited to:

- Detection and Neutralization
- Mechanical Equipment
- Manual Equipment
- Data Fusion
- Removers (including dogs, rats, bees)
- GIS, Mapping and Terrain Analysis
- Personal Protective Equipment
- Demining Tools
- Metal Detectors
- Needs of Users
- Lessons Learned in the Field
- Test and Evaluation
- Information Technology
- Mine-Detection Test Facilities
- Landmines, ERW and Ordnance

FEATURE
Environmental Impact of Demining

The JMA is soliciting articles for issue 11.2 on the environmental impact of demining—articles about how to reduce the environmental impact, what to consider regarding the environment before commencing demining, methods and equipment that produce the least environmental impact, and related story angles will be considered.

SUBMISSION GUIDELINES:

Article length: 1,000–2,000 words and submitted in digital format (i.e., Microsoft Word). R&D articles can be up to 2,500 words.

Images/photos: Must be scanned at 300 dpi or better. Line art, graphics and charts should be scanned at 600 dpi or better. Submit all images/graphics by CD, Zip disk or e-mail (.zip files cannot be received via e-mail at JMU).

Important: Please do not include images in your documents. The quality is too poor for printing. Originals are encouraged and will be returned upon request.

Please note: We do not accept overly promotional articles. If you are promoting your business or product, be sure to give data and/or solid examples that demonstrate your accomplishments.

Contact information/bio: Articles must contain a title, author and full contact information at the end of the article (i.e., phone, e-mail and mailing address). Please include a head-and-shoulders photo and biography (no more than 60 words) of the author for inclusion at the end of the article. Consider including credentials, books authored and other biographical information.

For complete submission guidelines, please visit:
http://maic.jmu.edu/journal/index/guidelines.htm

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I was disappointed by the article “An Alternative Perspective on Landmines and Vulnerable Populations” in your [August 2006] issue arguing that landmines have positive uses. Several times in the past I have remarked that it is impossible for a magazine seeking to educate the public about the challenges of removing anti-personnel landmines from the ground and their impact on civilian populations to simultaneously publish an editorial that advocates their use. How on the one hand can you display a poignant message of mine risk to children in Africa on the cover and at the same time allow an author to rationalize planting new mines that could put such a child’s life in danger?

In addition, the article was poorly reasoned and factually inaccurate, which is a further disservice to your readers. The portrayal of the ICBL as obfuscating facts and manipulating survivors’ images to serve our own purpose is insulting, but there is no basis in reality for these accusations (e.g., that I believe demining programs are overfunded and that I “promote” the use of landmines by suggesting that the arguments for a total ban are at best incomplete, at worst unsound), much in the letters I received in response. For instance, I would like to estimate more closely what one means by “victim-activated” and “indiscriminate.” An aggressor who steps on a mine is not necessarily a victim, and the ways in which landmines are indiscriminately may be more akin to bullets than to nukes. Space considerations limit what can be addressed; this is for the best because my intention was to initiate a dialogue in which some re-evaluation can take place, not to replace the absolutism of the ICBL with my view.

The question that drove my inquiry in the first place is, “What are the alternatives?”

Surely there are other viable positions one can take that are responsible, critical of current military and guerilla tactics, and constructive. These positions include, but are not limited to, emphasizing the need for realism in framing the debate.

Prof. Trevelyan’s comments about the alternatives to landmines speak as a promising avenue for further inquiry. If what Prof. Trevelyan may be suggesting is that “vulnerable populations protect themselves available and that I should study this more closely, then I would be genuinely grateful to know where to find this information. If he meant that such studies should be conducted, then I could not agree more.

In short, we are told that landmines are horrific, but we are not told what the available alternatives are or why they are better. In the future, if my critics would explain where the mistakes are rather than merely assert that they exist, we may come to realize that many people will continue to believe that they need (or might one day need) landmines, and we should acknowledge this and consider why this is so.

Shelley Weiss, Brake-Smith Assistant Professor in Social Philosophy and Ethics, College of the Holy Cross

Response from MAIC Director Dennis Barlow: We at the MAIC stand squarely behind the publication of the article, “An Alternative Perspective on Landmines and Vulnerable Populations” as do we all the articles we publish. This is not as an advocate of any particular position taken, but as a reminder to the reader that there is a multiplicity of perspectives on the subject and competition of ideas. We believe Dr. Trevelyan’s article, while upon criticism (as all articles are), to be a responsible and thoughtful opinion. Yet we also welcome the responses of Dr. Trevelyan and the Director of the ICBL in rebuttal; we have been publishing for eight years and this is the first input we have received from ICBL, so perhaps we have Dr. Weiss to thank for that.

We recognize the key contributions of Dr. Trevelyan and Ms. Brigot to mine action, and we are indeed proud to publish the letter from ICBL, so perhaps we have Dr. Weiss to give thanks for that.

Surely there are other viable positions one can take that are responsible, critical of current military and guerilla tactics, and constructive. These positions include, but are not limited to, emphasizing the need for realism in framing the debate. We believe that “vulnerable populations protect themselves available and that I should study this more closely, then I would be genuinely grateful to know where to find this information. If he meant that such studies should be conducted, then I could not agree more.

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The Mine Action Express... or the Wreck of the '09

The author discusses current challenges relating to an effective global mine-action strategy; he considers approaches and policies that could enhance or impede demining efforts worldwide. There are many emerging concepts to consider in order to improve mine action, such as mainstreaming, risk management and national ownership. The author discusses potential future plans of action the community must undertake regarding these issues in order to deal effectively with landmines and explosive remnants of war.

by Dennis Barlow | Mine Action Information Center |

In the 20th century, railroad lines became famous for highly efficient, prosperous and dependable travel—or for dramatic accidents which epitomized the height of negligence and bad planning. Whether these railroad events are agonizing or amusing, the images and emotions they evoke—similar to mine-action accidents and accomplishments—are indelibly etched into our minds.

At the Mine Action Information Center, it seems to us that the rapidly developing state of mine action has reached the point where it can, like great and majestic train lines, combine the best of many technologies and innovations to provide effective and secure service—or it can force together conflicting strategies and mechanisms to cause our own “great train wreck.”

Over the past year, some of the best practitioners, policymakers and pundits involved in mine action have developed some thought-provoking and timely concepts that should be considered for integration into mine-action campaigns. I will discuss a few of these ideas here, not only with a view to their validity as specific ideas, but also with an eye to integrating them into a total system that will yield the greatest overall efficiencies.

National Ownership

While sustainability of nationally owned mine-action programs seems to be a universal goal, it is becoming evident that it is an elusive condition. Studies by Mons Kjellman and Haisrock of the International Peace Research Institute, Oslo (PRIO) and others suggest it is not just the non-functioning state that finds national ownership difficult to achieve. In spite of the positive connotations of the term, many are murky and even conflicting implications just below the surface.

Effective national ownership implies a string of interrelated conditions. It suggests a strong national will; an integrated set of government agencies; the ability to recognize, build and maintain capacities; and a skill and willingness to engage the populace. These characteristics have proven difficult for countries emerging from crisis situations. Therefore, the mine-action community has had to be BY-RE to craft an informal set of global support networks available to the landmine-impaired countries. Donor states, the United Nations, major non-governmental organizations, regional organizations and corpora-
tions have formed a complex network of interrelated activities to help these countries. But the concept of building national independence from within—thereby, is toughtly at best. National ownership implies sovereignty and independence; yet foreign technical advisors, donor representatives, U.N. field workers, guest militaries and diplomats are often inserted into the process, sometimes ironically clouding the issue of national independence even while striving mightily to help develop strong national capabilities.

The above situation is the best-case scenario. Reports at both the most recent International Meeting of Mine Action Programme Directors and U.N. Advisors in July and Ottawa Convention States Parties Meeting in September suggest a significant number of impacted governments are just “not there” when it comes to accepting national ownership. The United Nations, United States, European Union and other donors and advisors would like to hike off the engine, but often they are alone in the cab and cannot take the risk of leaving the engine unattended.

Mainstreaming

If mine action is a valuable and valid humanitarian endeavor, for the intensive global efforts, it is because it is tied to the concepts of development, infrastructure, stability, confidence and security. In other words, the individual tragedies of landmine accidents, while emotionally compelling, pale in numerical comparison to other threats (AIDS, malnutrition, factional violence, motor vehicle accidents, etc.) which individually claim far greater numbers of victims than any landmine.

Therefore, landmine action, therefore, should be given priority consideration among other national programs, to the extent that it supports socio-economic development. Ah, but the rub comes when trying to disengage the highly successful mine-action juggernaut, which has carved out such a huge niche in defining its role among donors, non-governmental organizations, diplomats, journalists, governments and a worldwide public following, and fit it into a larger and less discrete development program. Many in the western world think that landmine action is to turn the chronic over to develop- ment officials and more toward the risk of the train, oust of sight of the engine, gauges and view ahead. Their motives may range from the altruistic to the purely selfish, but their concerns are real nevertheless.

Development plans and official donors are not always enamored with or cognizant of the complexities of mine action, nor are donors neces-sarily eager to pledge funds to support activities other than those specifically earmarked for mine- action projects. It remains for those in the global community to foster vehicles such as the Millennium Development Goals to promote settings to tolerable risk with an environment of trust and comfort in which mine-action activities can be integrated with other projects and programs.

Landmines and Other Explosive Remnants of War

To achieve an end, we must first determine what is impeding our way. The great railroad planners were able to scout ahead and surmise the challenges that terrain, indigenous populations and climate would pose. In the area of mine action, we were forced to add more and more threats to the initial concerns that began with the singular task of finding anti-personnel landmines.

We realized that battlefield or conflict environments also usually contained unex- plored ordnance. Then we had to add that caches of ammunition, small arms and light weapons, body traps, and improvised explosive devices could each be part of a post-conflict environment. While the Ottawa Convention is concerned solely with APs, countries that have had to deal realistically with all potential explosive remnants of war. The landmine strategy has been successful, but it still needs to address the question of the growing threat of other ERWs.

Some, such as Tim Carstairs of Mines Advisory Group, argue that the mined weapon consideration must be taken into account and that donors and policy makers must accept the concept that landmines, small arms and light weapons, UXOs, etc., must be considered and planned together in order to assure that the land is indeed safe and preparation for the future is assured.

The good news is that many organizations, such as the European Commission, the U.N. Mine Action Service and the Geneva International Centre for Humanitarian Demining have taken the pragmatic step of including broader ERW considerations into mandates to support mine action, and some countries such as Cambodia have adopted a holistic approach to post-conflict ERW threats. The bad news is that the Pledge to deal separately with APs and ERWs as defined by the Ottawa Convention and the Convention on Certain Conventional Weapons.

Release of Land

When humanitarian demining was beginning as a new movement, it developed an admirable method for trying to identify mined areas— which after all, is the precursor to dealing with the landmine threat. Impact surveys were instituted in most countries at risk from APs. Based on these surveys, suspected mined areas were identified. Predictably, in an effort not to pass over contaminated areas, many suspected mine areas were identified as they were identified and seeded with mines. It now appears that upwards of 90 percent of operators’ time and resources are being spent in areas where there are no mines.

It will require imagination and courage to deal with this situation. For the cold, hard fact is massive quantities of APs are declared out of bounds, which is a major factor keeping developing countries from expanding education, trade, agriculture and other development. Per Nergard of the Norwegian People’s Aid suggests identifying and releasing the wrongly identified land will require considering such ideas as tolerable risk, implementing new and improved technology and risk tolerance, being understanding and re-classifying land under review, immediately placing land declared “released” from threat into productive use. Nergard recommends a greater use of technical research and geographic information systems polyprop-control measures to take some of the guesswork out of re- lease. He accepts the fact that liability, risk and standards will come into play but insists these concepts are simply that have to be faced. Others will not accept such an interpretation because they believe the relative risk conflicts with a presumed “mine-free” scenario called for by the Ottawa Convention.

More consideration of these concepts, especially the various as- pects of risk management and risk tolerance, is being undertaken by Harald Bach and Tim Lardner of the Geneva International Centre for Humanitarian Demining, and we eagerly anticipate their further research.

Mine-free; Impact-free

Perhaps the most basic prerequisite to having a safe and effective railroad journey is fixing a definite schedule and timetable. While it is plausible to think of boarding a train without either passenger or engineer aware of its destination, this is the truth that many
mine-action managers find themselves faced with today. In the simplest of all strategy formulations, we ask “Where are we? Where do we want to go? How do we get there?” If we do not know where we want to go, no effective strategy can be planned, and we will surely never reach our goal.

There are various guidelines for global mine action, but none so universal as the requirements of the Ottawa Convention. Article 5 (Clearance) of that document states that, to be unambiguous: “Each State Party undertakes to destroy or ensure the destruction of all anti-personnel mines.” Thus the Convention seems to call for what some (such as the Landmine Monitor) define as a “mine-free” world. And yet the very first words of the Convention imply that the reason for the formal agreement is that the States Parties are “Determined to put an end to the suffering and casualties.” This suggests the reason for implementing the Convention was to alleviate the practical threat of landmines. Some have taken that position under the rubric of “impact free.” Saza Szkloch of the United Nations Development Programme points out that neither term—mine-free nor impact-free—is found in the Convention.

Nevertheless, it is not difficult to find champions for each point of view. Richard Kofi of the U.S. Department of State provides a sharp and succinct explanation of why he believes that a “mine-free” global endstate is impractical. “No donor, lending institution and no major impacted country is indicated a willingness to put up the huge amounts of resources required to find and clear every last mine.”

Many signatories have emphasized their position at each of the seven Convention meetings. After reaching the conclusion that the literal application of Article 5 would be impractical, he makes a logical assumption that an end-state should be defined as being “the point where there is no economic demand for the land left undemanted.”

He makes a clear and compelling explanation of the rationale of the decisions of a mine-action program is set out in Bob Kealey’s article “Where We Standing” in the forthcoming July issue of the Journal. If we look at the global mine action, but none so universal as the requirements of the Ottawa Convention. Article 5 (Clearance) of that document states that, to be unambiguous: “Each State Party undertakes to destroy or ensure the destruction of all anti-personnel mines.” Thus the Convention seems to call for what some (such as the Landmine Monitor) define as a “mine-free” world. And yet the very first words of the Convention imply that the reason for the formal agreement is that the States Parties are “Determined to put an end to the suffering and casualties.” This suggests the reason for implementing the Convention was to alleviate the practical threat of landmines. Some have taken that position under the rubric of “impact free.” Saza Szkloch of the United Nations Development Programme points out that neither term—mine-free nor impact-free—is found in the Convention.

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It has therefore articulated a “zero-victim target.” In a situation in which many nations at risk receive support and advice from many different quarters, they are often given conflicting or nebulous guidance. What is clear is that the differences among the approaches will be vast. Clearly all landmines from all affected countries by 2009 or 2010 will not only be daunting but resource-intensive. Just as in curing any social ill (pollution, extreme poverty, HIV/AIDS, malnutrition, unemployment, etc.), creating the very last vestiges of the threat often requires the largest application of resources. This comes at a time when there are indications that donor funding will become more difficult to obtain. Alister Craig of the United Kingdom gave a sobering discussion of this trend at the Mine Action Directors Meeting in July 2006. We at the MAIC further note that only 12 countries are on pace to complete their Article 5 requirements by 2009. This alone suggests that the absolute position of Article 5 may be unrealistic. If Belgium is not ready to declare itself free of all landmines, how can we expect that Laos, Cambdodia, Mozambique and the many other impacted countries will be able to do so within the specified time period?

A clear and compelling explanation of the ramifications of the decisions of a mine-action program is set out in Bob Kealey’s article “Where We Standing” in the forthcoming July issue of the Journal.
Conference on Women in Armed Groups, Human Rights

In November 2005, Geneva Call and the Program for the Study of International Organization(s) from the Geneva-based Graduate Institute of International Studies held a workshop in Ethiopia entitled “Women in Armed Opposition Groups in Africa and the Promotion of International Humanitarian Law and Human Rights.”

The workshop sought ways to strengthen international humanitarian and human-rights law within African armed groups and their political groups. Thirty-nine female leaders from armed opposition groups and civil society from countries currently involved in conflict or recently involved in the post-conflict recovery process came together for the conference. The workshop also sought to increase the international community’s understanding of and ability to work with African armed groups.

Four topics were discussed in working groups during the workshop:
1. Humanitarian law
2. Human-rights law
3. Disarmament, demobilization and reintegration
4. Transition into governance roles

The final report from the conference, which presents information and analyses that came out of these four thematic working groups, is available in English and will soon be available in French. The report can be downloaded at http://snipurl.com/xiy4. If you would like a printed copy of the report, e-mail info@genevacall.org.

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Suggestions for Protecting Civilians

Many measures can be taken to ensure the safety of civilians, particularly with the increased threat they face in modern warfare. In the Middle East and other regions at risk of conflict, it is important to protect civilians by providing the poorest countries with humanitarians and other protective installations in the main cities during peaceful periods, with a particular focus on schools and hospitals.

Additionally, international law should strictly enforce the convention against killing civilians and destroying civilian areas during conflict, prosecuting under criminal law those who do not follow this convention. The United Nations Security Council should also be given the power—and be willing to use it—to stop any war in which genocide is observed.

Finally, in mine action, activities need to focus on providing updated awareness campaigns that are informed by the changing reality of recent conflicts to ensure that children and other vulnerable people are protected. See Embarato, page 109.

by Eddie Banks | EOD World Services | and Rob Shahrer | Environment and Infrastructure Group of Companies |
and effectiveness. Finally, there is a need to look at those issues requiring modification. Thus, the IMAS and GMAA 08.10—General Mine Action Assessment outlines a pre-screening, evaluation, analysis and interpretation of information for mine-action assessment and development of national plans. It states, “The general purpose of a GMAA (general mine action assessment) is to consider the national and make available sufficient information to assist and update strategic planning of the national mine action program.”

The question is: Why do we need this information? It is necessary for strategic planning, and by strategic one assumes crucial, critical and important. However, the IMAS are rather general in what crucial information is required, tend to concentrate on local aspects and fail to address several of the most important issues. The assessment tendency is to concentrate on mine-action elements such as local communities, local elements, the mines and unexploded ordnance, drainage and soil types, etc. The General Mine Action Assessment states the IMAS approach to “Mine Action” states, “The true measure of success of mine action is based on its impact on the local communities in which they work. It must emphasize the needs of local communities. A number of Landmine Impact Surveys also concentrate on impacts of the local community. This trend to follow the IMAS approach with an over-emphasis on the local community is seriously incomplete. While both essential elements, the General Mine Action Assessment fail to address, in one of its two approaches, or over the general overall view, an assessment should not only take into account local needs but also the regional and national requirements, addressing them all in a balanced manner.

In all mine-action programs, the number of factors affecting the local community that are more important than the most important issues of strategic planning. It is not about where to denote and for what and national requirements, addressing and resource availability, but in what order the tasks should be undertaken.

Commercial or Social Precedence

The IMAS and GMAA concentrate on the local issue, and admirably this is where the greatest impact is perceived, from the economic repercussions for families, small communities and medical facilities to the emotional aspect of injuries and deaths; but is this perception correct? For example, the mines and UXO in Kuwait, Iran, Iraq and Angola, to name just a few. The local communities in these countries are devastated as anywhere else in the world, with injuries, deaths and economic hardships, among other problems. Yet, mines and UXO in these and other countries also delay or have delayed regulation of national commercial activities such as oil and gas exploration and extraction, denying the affected country millions of dollars each and every day, which could be used to help solve the mine and UXO problem.

Allowing an emotional response or local considerations alone to dictate clearance requirements in effect delays the economic recovery of the country, maintains dependency on donor funds, and restricts the development of local and national areas. A national priority that creates economic regeneration and growth cannot be tolerated ignored due to local and social considerations, in just the same way that death and injuries cannot be totally disregarded due to the demands for national commercial precedence.

Commercial and social aspects are important but they have to be considered, both separately and collectively; indeed, prioritization in order to create region and national economic growth may well be applied in some cases to establish the sustainable financial existence for future mine-action activities. Each country and each region within a country is different and their differences need to be defined. The defining process must be realistic, coordinated and integrated with all authorities. It must address, shores, mediums and long-term requirements, provide a decision-making basis, be capable of being implemented, and be built on experience and practice.

Some believe a number of activities can be accurately measured. An example is the importance in community area of communications and transportation infrastructure during the emergency phase, a time when medical services and accessibility to clean water is a matter of life and death. But what measures this, by prioritization, fully involving locals, the task priority decided? In IMAS, GMAA, LIS and socioeconomic approaches, these crucial aspects are missing.

Socioeconomic Approach

For many mine action has been undertaken, Environmental Impact Assessments have been implemented, redone and developed, of which socioeconomic elements (e.g., the Social Impact Assessment) are but one small part. EIAs are now the fundamental assessment without which development activities throughout most parts of the world cannot even start? This process is designed to define the problems and decide on a direction and course of action. The socioeconomic approach is LIS, while attempting to adopt the SIA mechanism, fail to undertake the assessment or approach in a systematic manner and therefore, a failure of identifying and providing a series of actions directed toward more effective management of the problem.

Fundamentally, the LIS process lacks a risk-assessment phase that is measurable to some initial condition (a baseline). The integration of this risk-assessment phase in comparison with the component of component of risk-assessment reduction verification is needed for a defensible Landmine Impact Risk Assessment. The methodology required for this definition is to provide a detailed study phase of a prioritized risk-clearance program so as a LIS necessitates a systematic approach that is defined with the following three core values:

1. Integrity: The LIS process conforms to agreed guidelines, including standards, protocols and criteria.

2. Utility: The LIS process provides balanced, clear, reliable information for decision-making.

3. Sustainability: The LIS process results in programs for ongoing activities. Each country and each region within a country is different and their differences need to be defined. The defining process must be realistic, coordinated and integrated with all authorities. It must address, shores, mediums and long-term requirements, provide a decision-making basis, be capable of being implemented, and be built on experience and practice.

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Within this SLA framework, the LIS process should be:

- Pursuic, meeting its aims and methods
- Focused, concentrating on the effective and efficient conduct of the relevant or otherwise.
- Adaptive, responding to issues and realities
- Participatory, fully involving locals
- Unambiguous, being clear and easily understandable
- Rigorous, employing “best practice” methodologies
- Practical, establishing mitigation measures that work
- Credible, carried out with objectivity and professionalism
- Efficient, imposing least-cost burden on proponents

The LIS process is a series of phases including: screening, to decide if and at what level LIS should be applied; scoping, to identify the important issues and prepare terms of reference; impact analysis, to predict the effects of specific clearance activities and evaluate their significance; mitigation, to establish measures to prioritize high-, medium- and low-impact activities; reporting, to prepare the information necessary for decision-making; review, to check the quality of the LIS report; decision-making, to approve or reject the specific clearance activities and set conditions; follow-up, to monitor and audit post clearance impacts; and public involvement, to inform and consult with stakeholders.

The “impact analysis” or detailed study phase of LIS should involve three activities: identification of impacts more specifically, prediction of the characteristics of major impacts, and evaluation of the significance of residual impact. In this process, a number of impact-identification methods might be utilized. These could include: checklists, matrices, networks, overlays and geographical information systems, expert systems, and professional judgment (see Table 1). Ultimately, the choice of a LIS method would depend on a number of factors, including the type and size of the activity, the type of alternatives being considered, the nature of the likely impacts, the availability of impact-identification methods, and the experience of the LIRA team with these. In addition, the resources available would impact the method of LIS used as cost, information, time and personnel inevitably vary with each specific case.

Information required for establishing the method and/or baseline conditions (often elicited through a baseline survey) includes current conditions, current and expected trends, effectiveness of activities already being implemented and the effects of other activities yet to be implemented. Information gathered as baseline data would include but not be limited to general issues of contamination (national, provincial and local), socio-economic issues (provincial and local), economic issues (national, provincial and local), environmental factors (provincial and local), stakeholder expectations (international, national, provincial and local), and political issues (international, national, provincial and local).

Areas where it is deemed necessary to utilize a Strategic Landmine Assessment program would include:

- Sector-specific policy, plans and programs
- Spatial and land-use plans
- Regional development programs
- Natural-resource management strategies
- Legislative and regulatory bills
- Investment and lending activities
- International aid and development assistance

“While we acknowledge the IMAS have created a sound foundation, they have also created a mountain of documentation.”

Advantages

- Simple to understand and use
- Well considered and tested
- Easy to understand
- Good display method
- Excellent for impact identification and analysis
- Excellent for experimental

Disadvantages

- Do not distinguish between direct and indirect impacts
- Do not link action and impact
- The process of incorporating values can be controversial
- Difficult to distinguish direct and indirect impacts
- Significant potential for double-counting of impacts
- Can become very complex if used beyond simplified version
- Heavy reliance on knowledge and data
- Often complex and expensive

Table 1: Advantages and disadvantages of impact-identification methods.
Conclusion

Some years ago the major issue in mine action was about safety and quality versus productivity. Now is the time to take a more pragmatic approach and look at all three subjects in a balanced manner. A foundation based on standards has now been accepted by the international community as essential to maintaining quality and safety. However, control must be exercised by donors not to fund studies and improvements that fail to provide a noticeable improvement in the quality of life of those whose daily struggle is one of survival.

What is critical is the need to modify the present IMAS and the other documents in order to conduct strategic planning in a systematic manner. Policies concentrating on local aspects need to take a broader view and a recognition of the importance of prioritization is needed, which must be initiated at the earliest possible opportunity even with the basic idea that demining is less effective in some places than it is in others is simply demining in the wrong place and is an intellectual use of time, effort and limited financial resources. Currently the documentation presented does not complete the picture or provide a coherent approach; there is now an urgent need to “close the circle” by providing and utilizing the missing information.

See Endnotes, page 109

Rob Shahmir

Rob Shahmir is Project Director of EOD World Services on a contract to the Department of State/Office of the Coordinator of Nuclear Security Affairs. Shahmir’s expertise in one of the three mine action disciplines, explosives ordnance disposal, has resulted in the publication of a number of reports and articles covering a wide range of topics. He has received an M.S. degree in Public Administration and a B.A. degree in Government from Harvard University. He has served in the U.S. Army as a weapons disposal officer and later as a Demining Officer in Bosnia and Herzegovina. Rob Shahmir is the CEO of the Environment and Infrastructure Group of Companies, which is based in London, United Kingdom.

News Brief

To Walk the Earth in Safety Chronicles U.S. Mine-Clearance Efforts


Department officials announced that, owing in part to U.S. assistance, Costa Rica, Djibouti, Guatemala and Honduras would not appear in the report because they have become free from landmine impact. Attention is also paid to U.S. policy toward landmines and total U.S. contributions to landmine action, which exceed $1 billion.

The Office of Weapons Removal and Abatement, divisions of the Department of Defense and U.S. Army, James Madison University’s Mine Action Information Center and several country centers in the report. There is also coverage of the ODS Quick Reaction Demining Force, the only standing humanitarian-demining unit with worldwide deployment capabilities.

A PDF version of the sixth edition is available at http://emip1.uc/ojOe. To request a printed copy of To Walk the Earth in Safety, e-mail your complete mailing address and postal (or ZIP) code to John Stevens at stevej@state.gov.

Quality Assurance for Mined and Survey Areas

Mechanical demining is an important and essential part of any demining process, and quality-assurance methods must constantly be revised to address the balance between safety and efficiency. Based on experience from the MineWolf mechanical demining experience, the tiler system would improve the demining process significantly, thereby increasing speed and reducing the costs of demining operations.

by Heinz Rath and Dieter Schröder (Safety Technology Systems)

It is common knowledge that mechanical demining has to be part of the complete demining process to improve the speed of operations, defeat major obstacles for manual deminers, reduce costs and simplify quality assurance. It is also common knowledge that the car and aircraft industry that quality must be continuous and cannot be guaranteed by inspection alone.

Modern quality-assurance programs (such as the Failure Mode and Effect Analysis) have to be used to ensure a capable process. The FMEA is a method for failure-prevention and should be used for the design, system, assembly, production and, of course, demining process. The FMEA for tiler operation must include cleaning-depth control, vehicle-speed control, rate of revolution for tiler and flail, and engine-temperature control.

Based on our demining operations in Bosnia and Herzegovina with the mine-shredder of the Humanitarian Mine Action Program, we reached the following conclusion: The flail process suffers from limited and uncontrolled demining depth and limitations imposed by soil, terrain and vegetation—meaning it can miss intact mines. These findings are confirmed in various other publications. The flail process requires intensive follow-up verification of clearance—additional demining operation by hand and dog—which is time-consuming and costly.

Important Requirements

A Total Quality Control system—a management tool for improving, performance that aggressively strives for a defined quality process—is required and includes the demining-organizations, equipment choices, standard operating procedures, training programs and the following essential requirements:

1. Ground-penetration depth up to 30 centimeters (12 inches).
2. Multiple operations with the tiler, to break up partially deman-
ed or remaining mines and explosives components not com-
pletely destroyed by the tiler.
3. Effective depth control for both the flail and tiler system.
4. Recommended placing tlevel sensors on both sides of the vehicle, so the movement on either side is independent from the move-
ment of the opposite side (otherwise, effective depth of demin-
ing might be reduced due to topographical variants).
5. Monitoring of drive control to be displayed inside the cabin for all relevant technical data such as clearance depth, rate of revolution for tiler and flail, vehicle speed, engine temperature and vehicle positioning.
6. Driver on board to intervene if needed with difficult topogra-
phy and obstacles.
7. Quality record-book for all relevant data to be printed from data logs.
8. The tiler process has the potential to be capable of destroying all mines, provided the tiler rotates clockwise with a rotation speed of at least 300–400 revolutions per minute and is fitted with special cut-
ing tools to destroy all mines, avoiding slipstreaming, buoying and low waves.
9. In general, a Total Quality Assurance program as used in the aircraft and car industry is required because it will analyze all aspects of quality on a continuous basis. In general, a TQA program provides a modern, overall quality concept of a company or system. It is easy to see if the process is capable or not by looking at the area after the demining process. The area has to be homogeneous after a uniform process as this is the basis for a capable process.

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Proposed Quality-assurance Process for Mined and Survey Areas

While the MineWolf tiller system provides a capable process with control of demining depth, tiller rotation and vehicle speed, which is the basis for hitting every mine without fail, mines can be destroyed without being detonated. Consequently, mine pieces such as TNT, fuses, or steel bodies of fragmentation mines will be left and might pose a limited risk. There is a capable technology to find the steel bodies using Foerster MultiCAT or the Ebinger large-loop detector UPEX 740. Experience has shown that most mine pieces are thrown onto the surface by the force of the tiller. Visible control of the cleared area would identify the areas requiring an additional quality measure.

There remains the risk that a small number of parts and fuses located in the ground, either ferrous or non-ferrous, will not be detected. We believe that the limited risk has to be taken. If there are records or signs of fragmentation mines or items of UXO, the Foerster MultiCAT or the Ebinger large-loop detector UPEX 740 is capable of finding them. It should be noted that small metal parts cannot be found with 100 percent certainty by manual methods.

If we take into account statistics published by the Geneva International Centre for Humanitarian Demining in A Study of Mechanical Application in Demining, which indicates that only 2 percent of the demined areas worldwide are contaminated by mines, we do believe it is worth the risk.1

Proposed Quality-assurance Methods

Based on our experience, we recommend the following four methods for quality assurance:

• **Scheme 1.** Visual control of the cleared area by means of an armed tractor to identify and mark areas requiring additional quality measures. If no detonations are reported or mine residue found, the area can then be declared mine safe, meaning no further quality measures are required.

• **Scheme 2.** If detonations are reported or mine residue found, a complete search of the cleared area needs to take place, by means of establishing a grid of working lanes as given by the standard operating procedures, followed by a manual or explosives-detector dog team. Residue must be removed. The area can then be declared mine safe.

• **Scheme 3.** If only a small number of detonations were reported or residue of mines found, a partial manual-deminining opera-

- **Scheme 4.** If there are records or signs of fragmentation mines or items of UXO, the Foerster MultiCAT or the Ebinger large-loop detector UPEX 740 can be used. The search is focused on steel bodies greater than 0.7 kilograms (1.5 pounds) because fragmentation mines have steel bodies that cannot be fully destroyed by mechanical demining (only the fuses are cut). Foerster and Ebinger equipment is proposed to find the remaining bodies because they are specialized to locate steel objects within this range. The equipment can be fitted to an armed tractor to locate the steel bodies or items of UXO. Supplement the search for fuses and explosives with a handheld detector around the steel bodies to excavate fuses and explosives. The area can then be declared mine safe.

Summary

The tiller-deminining process, combined with total quality-control methods, strives to move from the ground-preparation process currently used, to a "mine free" process. By using the follow-up verification system, additional quality control after mechanical demining will be minimal, fast and more cost-effective without reducing aspects of safety.2

For additional references for this article, please visit http://snipurl.com/15ixk.

See Endnotes, page 109

**News Brief**

Taliban Suspects Killed Emplacing Mines

Pour suspected Taliban terrorists died while emplacing landmines along roads in southern Afghanistan in late July. Three Taliban members reportedly blew themselves up in one incident as the landmines were laying on a road in the Afghanist district of Kandahar province exploded.

In a separate and apparently unrelated incident, another suspected Taliban member died when a mine being emplaced in Shah Wali Kot, a district north of Kandahar city, exploded unexpectedly.

While the former hard-line Islamic regime was deposed by Coalition Forces in 2003, supporters of the Taliban have recently increased attacks in southern regions of the country.
Explosive Remnants of War and the Reality of Azerbaijan

This article explains the danger of explosive remnants of war when located within communities and the precautions that need to be taken in order to get rid of this problem. It also describes how the Azerbaijan National Agency for Mine Action is trying to address the problem of abandoned ammunition storage in one of the most highly contaminated areas among existing abandoned ammunition storages in the world.

by Nazim Ismaylov and Emil Hasanov [Azerbaijan National Agency for Mine Action]

Today, there are still some discussions on the definition of explosive remnants of war, but it is generally understood that the problems EREW cause are both widespread and long-term, and that the number of casualties and deaths caused by both unexploded and abandoned grenades, mortar shells, fuses and cluster bombs is high and equivalent to landmines. The physical and psychological impacts of EREW on a community are significant considering the number of deaths and nature of injuries caused, which can overload often stretched medical infrastructures. EREW also have a wider socioeconomic impact on affected communities in terms of land use and blockages to reconstruction and development activities.

The main points related to the threats caused by EREW are:
- Explosives or debris can take place at a distance from the explosion.
- Items of unexploded ordnance are generally more powerful and therefore more lethal than anti-personnel mines.
- When UXO accidents do not involve deaths, they typically result in severe wounds.
- EREW are generally found on the surface and are therefore more visible, which can result in more interaction with EREW than mines. Also, UXO can be located sub-surface where clearance can be particularly difficult.
- The fear of UXO is generally lower than the fear of mines because UXO can be more visible and this gives people a false sense of safety which can be very dangerous.

Azerbaijan has not signed the Convention on Certain Conventional ‘Weapons’ or the Ottawa Convention, for several reasons including some political issues with neighbouring countries, particularly the conditions of the war with Armenia. Armenia occupies the territory of Nagorno-Karabakh and seven surrounding regions, totaling 20 percent of Azerbaijan. Today there are just under eight million people in Azerbaijan. Of these, 450,000 are internally displaced persons and 500,000 are ethnic Azeris who came to Azerbaijan from Armenia.

Despite the fact that Azerbaijan has not signed the Ottawa Convention, the country is supportive of it according to "Azerbaijan and the Ottawa Process." This document states, "The government of Azerbaijan has supported from the outset the idea of having a comprehensive international legal document on prohibition of use, stockpiling, production and transfer of anti-personnel mines. Our country has learnt the catastrophe that this ammunition can bring. Therefore Azerbaijan advocates dismantling and destruction of mines. Azerbaijan shares all concerns taken into consideration while coming to the statement of the Convention and is involved neither in transfer, transportation, nor in production of anti-personnel mines. But continued conflict prevents Azerbaijan from according to the Document." The government of Azerbaijan hopes to sign the Ottawa Convention once the conflicts in its territories are resolved.

UXO Operations and Abandoned Ammunition Storage Clearance

History of the problem. A military ammunition warehouse located in Agstafa, consisting of 138 bunkers, was the largest Soviet warehouse in the south Caucasus. Agstafa is located in the north-east part of Azerbaijan, bordering the Karabakh region in the west, Toruz in the east, the Republic of Georgia in the north and Armenia in the south.

In 1991, when Azerbaijan regained independence, the warehouse was destroyed by the Soviet Army before it departed. As a result of the explosion, thousands of pieces of UXO were scattered over 44 square kilometres (17 square miles), posing serious humanitarian, socio-economic and environmental threats to the local population.

Since the explosion, 148 UXO-related accidents have been reported, with 31 people dead and 80 injured. To collect scrap metal from the UXO, people are exposing themselves to injury and death. Some companies trying to gain profit have been involved in illegally collecting UXO from surrounding areas, devising simple methods involving very unsafe techniques. By selling the metal and non-ferrous parts of the projectiles, both individuals and companies supplement their income. This is the principal cause of many deaths and injuries among the people living near Saloglu, a village in Agstafa. A recent accident involved the death of a young man searching among the unexploded bombs for copper to sell at the local market.

Azerbaijan appealed to NATO for assistance in the clearance of the Saloglu area and the destruction of stockpiled UXO. As a result, the NATO Maintenance and Supply Agency conducted a technical assessment of the site and consequently the Partnership for Peace Trust Fund on the Saloglu Project was established. The role of the lead nation in the Saloglu Project was given to Turkey.

On 14 February 2005 all efforts aimed at facilitating the Saloglu Project in Azerbaijan were brought together at the NATO headquarters in Brussels, Belgium. Turkey signed the Financial Management Agreement for the project at a special ceremony involving NATO Secretary-General Jaap de Hoop Scheffer and the representatives of contributing countries.

The total cost of the project is valued at €1,047,649 (approximately US$1.3 million) and is estimated to last 16 months. Azerbaijan, as a host nation, met all the commitments on the project. With contributions from NATO and individual partner nations—namely Australia, Finland, Luxembourg, Norway, Switzerland, Turkey
and the United States—as well as the United Nations Development Programme, the required funding for the project has been raised. The Azerbaijan National Agency or Mine Action UNDO team, with a capacity of 11 UXO operators, launched the project 13 December 2005. ANAMA instruc-
ts joined with United States European Command (USEUCOM) specialists to train an additional 36 UNDO operators for the same project at ANAMA’s Regional Office in Khilafar (UXO) team capacity within ANAMA was created with the sup-
port of USEUCOM in 2002.

Abandoned ammunition storage clear-
anes. In describing the problem of ERW, the threat of abandoned ammunition is also significant. When researching information on the subject of abandoned ammunition, cases can be found in Nigeria, Albania and Kuwait, but thus far minimal information describing Azerbaijan’s abandoned ammuni-
tion problem is available. The Soviet ware-
house in Agstafa can provide an additional case for better understanding the threat of abandoned ammunition and the challenges that face ANAMA in order to clear this type of ERW.

The task for abandoned Soviet munition storage clearance in Agstafa is very compli-
cated and dangerous for several reasons:

• The occurrence of “ammunition specks” in which different types of ammunition are mixed and scattered throughout the area.

• The presence of degraded flechettes and fragmentation ammunition, which consist of small projectiles and shells that are hazardous and not immediately identifiable.

• The presence of white phosphorus, which ignites when exposed to air.

• Incorrect or misleading marking of UXO.

Taking into account that 15 years have passed since the warehouse explosion, clear-
ance of this ammunition is a complicated yet extremely important task.

In addition to planned clearance proj-
cuts such as those mentioned, ANAMA also provides rapid response to mine/UXO-
related emergencies. When one Agstafa scrap-metal workshop set up by local people exploded approximately 200 metres (219 yards) from a residential area, the workshop itself was totally destroyed and, according to official information by local authorities, three people were killed and 23 injured. Additionally, the explosion damaged houses as far as three kilometres (two miles) from the workshop. Immediately following the explosion, ANAMA established a team of UNDO operators to carry out emergency marking and clearance operations in the incident area. Operations lasted for one month and as a result, 175,000 square me-
tres (42 acres) of land were cleared and more than 5,007 items of UXO (among them 1,261 pieces containing white phos-
phorus) were removed from the area and destroyed. ANAMA has continued to react quickly to any mine- and UXO-
related emergencies.

Conclusion

As the Japanese might say, “Tada yori nai mono wa nai.” (“We have to pay much for something we get free of charge.”) It is important to figure out how to solve the existing problem of UXO and abandoned ammunition and how to protect ourselves from ERW in the future. Human beings created the problem—dropping the bombs and abandoning the ammunition “for free” on Azerbaijan—and now they must correct it at great cost by cleaning up the country and making it safe again. See Endnotes, page 109.

Death Valley Challenge to Raise $100K

Mines Advisory Group, in partnership with CEJA USA, will sponsor a 423-kilometre (263-mile) bike trek across Death Valley, USA. Event organizers hope to raise nearly $40,000 ($27,400) to support mine-action efforts around the globe.

From 4-11 March 2007, 40 participants will travel and cycle to raise money and awareness. The registration fee for the event is only £175 ($252), but each participant is asked to raise an additional £2,750 ($5,100) in sponsorships, half of which will cover the cost of running the event. Included in trek costs are London-to-Las Vegas airfare, accommodations, nearly all meals, the use of bicycles and other sundry expenses.

For more information on this trip, visit www.migclearraces.org.

The Journal of Conventional Weapons Destruction, Vol. 10, Iss. 2 [2006], Art. 1

Protection of Soft Vehicles
Against ERW

The author discusses the challenges of protecting aid workers riding in traditional unarmoured vehicles from the dangers of explosive remnants of war. He offers some practical, after-market solutions that provide a high level of protection for much less than the cost of traditional armoured vehicles.

by Thomas Hvidtfield [Scantifiber Composites A/S]

The extent to which AP mines endanger passengers in a soft-
skinned SUV depends heavily upon which type of device we’re talking about. We can separate the various devices into two groups depending on their primary kill mechanism:

• Blast ammunition works by creating a powerful blast wave that destroys objects in close proximity to the explosion.

• Fragmenting and high-velocity works by creating a shower of high-

velocity steel fragments intended to inflict as much damage as possible to anything or anyone in the surrounding area.

Most AP mines inflict injury primarily through the blast effect and normally detonate by pressure. The effect of the blast wave decreases rapidly with distance and it is often a “one kill” weapon. On the other hand, some AP mines and many types of air-dropped bomblets work with fragmentation as the primary kill mechanism. The same goes for almost all mortar rounds and artillery ammuni-
tion. Contrary to a blast wave, which loses its power very quickly when they do explode, the results can be much more devastating.
their energy for much longer and can inflict injury quite far away from the explosion. Due to this extended range, most types of fragmenting AP mines have the option of triggering wire detonation, which enables the mine to go off when a person or a vehicle trips a wire up to 10 metres (33 feet) away. A person is at risk in two different ways while travelling in an SUV. If the vehicle detonates an AP device that works primarily through blast, the distance from the expected impact point (below the vehicle) to the shell in the vehicle is normally high enough to create a safe distance. However, if the device creates fragments immediately upon detonation, the vehicle will offer almost no protection against the high-velocity steel fragments. The standard car-body steel is 0.8 millimetre (0.03 inch) thick and will not prevent fragments from entering the cabin.

To express it another way, when we are talking about various AP devices, the main concern for passengers in a vehicle is fragmentation rather than the shock or blast effect from the explosion.

For that reason, in an area with a high risk of setting off fragmenting AP ammunition, fully armoured SUVs are recommended. However, apart from being very costly, excessively heavy and hard to obtain in sufficient numbers, fully armoured SUVs tend to give the wrong impression of the humanitarian workers—namely that they are not willing to take the same risks that the inhabitants must take on a daily basis.

As an alternative to fully armoured vehicles, there is a number of retrofit solutions on the market today. In the highest level of protection for passengers travelling in soft-skinned vehicles. Although retrofit vehicles do not provide the same level of protection as factory-armoured SUVs, some work well against a large number of ERW threats for about half the price of a fully armoured vehicle. Consequently, a much higher number of vehicles—and thus passengers—can be protected for the same money. In addition, the retrofit solutions to protect soft vehicles, like ballistic blankets (described below), can be delivered quickly and most can be installed in the field.

Built-in Ballistic Blankets

Most retrofit solutions to protect SUVs are based on aramid fabric, such as Twaro® or Kevlar®, which is the ballistic material used in most body armour. By using flexible armour, it is possible to design solutions that fit into the curved interior and floor of the SUV.

In terms of level of protection, flexible solutions using aramid on the interior and floor of the vehicle generally represent a lower level of protection than those found on the sides of a factory-armoured SUV. Ballistic blankets are available from several sources and are a system of tailor-cut and overlapping blankets that cover as much of the interior of the vehicle as possible up to the windows.3

Ballistic blankets offer a good level of protection against fragments coming from below or from the lower sides. They are installed below the carpet and inside the side panels and doors and require a complete stripping of the vehicle. After reinstallation, the interior of the vehicle looks the same as before, with no visible signs of it being protected. The protection level of the blankets is normally specified according to a North Atlantic Treaty Organization standard STANAG [Standardisation Agreement] 2920 and the standard level by most non-governmental organizations is a level referred to as 600 m/c. It is not possible to connect this level directly to any specific mine or grenade as the actual conditions have an enormous influence on the real threat. However, a level of 600 m/c can be directly compared to other means of protection; for instance, standard body armour (without vest-insert plates) represents a level of protection of 450 m/c and contains only a single layer of ballistic material. A passenger in a vehicle that has fragmenting ERW much more often if the vehicle is equipped with ballistic blankets than if he is wearing body armour; in addition to a higher ballistic level, the ballistic blankets will offer protection of the extremities and not only the torso.

In comparison to a fully armoured SUV, many soft-skinned vehicles equipped with ballistic blankets are better protected against landmines detonating on the ground. The reason for this seeming inconsistency is because most armoured SUVs are designed with a level of protection corresponding to an old German standard for armoured limousines known as the “two hand grenades” level. Unfortunately, the specified grenade—the German type DMS1—is quite small and contains relatively small fragments that are easily stopped. In addition to blankets, various systems exist on the market to shield the passengers from fragments.

New technologies with in-the-field armouring-options can be fitted and removed when there is no immediate danger. This type of protection is designed to provide an increased level of protection against ERW and other threats to the vehicle. The increased availability of these options improves the safety potential for vehicles working in proximity to ERW. In turn, these options and those developed and implemented in the future can continue to better the working conditions of personnel exposed to such risks.

Explosive Remnants of War and Their Consequences

This article examines the post-conflict situation of Tajikistan, which has not only anti-personnel mines but various kinds of explosive remnants of war. Recently Tajikistan signed Protocol V of the Convention on Certain Conventional Weapons, which includes a commitment to clear the nation’s ERW. The author highlights some of the different sources of ERW in Tajikistan as well as the progress being made by authorities to clear and destroy ERW.

by Jonnahmed Rahajab (Tajikistan Mine Action Centre)

In addition to the landmine problem, items of UXO also pose a great challenge in Tajikistan. It is presumed that most ERW remnants in the country date to the civil war (1992–1997). The UXO in Tajikistan that remains on the ground is the result of being fired from military planes and helicopters, as well as shelling. A large number of Tajik citizens have consequently died or been seriously injured.

It is necessary to note that items of UXO also appear in the country for reasons unrelated to war, including armed violence and attempted revolts. In Tajikistan, as in many other countries, mandatory military service requires continued and regular military training for the Armed Forces. It has been the case in Tajikistan that interest in the post-conflict problems posed by UXO as well as in the real threat. This UXO problem, which includes a commitment to clear the nation’s ERW. The adoption of Protocol V on 28 November 2000 was possible thanks to governments acknowledging the seriousness of the post-conflict problems posed by UXO as well as the necessity to minimize the risk and impact of UXO. Tajikistan ratified Protocol V on 20 December 2005, and the Protocol entered into force for all parties on 12 November 2006. In accordance with the Protocol, the term ERW encompasses UXO and abandoned explosive ordnance in conflict areas. This Protocol obliges the conflicting parties, as well as States Parties, to be responsible worldwide, landmines and unexploded ordnance (UXO) represent a serious challenge.

Explosive remnants of war as well as the progress being made by authorities to clear and destroy ERW.

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that the piece of UXO had been just beyond the limits of a local military training area. No other source of UXO contamination was identified in this case.

A similar accident happened to Z. Usmonov, 15, an inhabitant of Rudki district. Having found a piece of UXO while tending animals in the community grazing area, he lost his right hand and eye as a result of the explosion.

Additional examples of incidents involving ERW are noted in the brief stories at the top of the page. These are clear indications of continuous suffering in the Rasht and Tavildara areas where ordinance was fired from aircraft during the civil war.

Collection and Demolition of ERW

Tajikistan, as State Party to both the Ottawa Convention and Protocol V of the Convention on Certain Conventional Weapons, takes all the necessary measures to find and demolish mines and ERW. On 2 December 1994, the President of the Republic of Tajikistan issued the Decree on Voluntary Surrender and Recapturing of Fire Arms and Military Ammunitions from on Voluntary Surrender and Recapturing of Weapons, taking all the necessary measures to find and demolish mines and ERW.

On 23 April 2005 two brothers—Salim and Mahmadali Saimuddinov, ages 8 and 9—and 5-year-old Fathiddin Ilhomiddinov from the village of Khost found a piece of ERW and began to open it. This action resulted in an explosion and all three of the boys were seriously injured.

Table 1: Finances returned between 1994 and 2006.

<table>
<thead>
<tr>
<th>Type of Weapon</th>
<th>Amount Returned (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kalasnikov gun</td>
<td>9,101</td>
</tr>
<tr>
<td>Pistol</td>
<td>2,846</td>
</tr>
<tr>
<td>Rifa</td>
<td>3,070</td>
</tr>
<tr>
<td>Other types of guns</td>
<td>1,042</td>
</tr>
<tr>
<td>Hunting gun/ERW</td>
<td>9,006</td>
</tr>
<tr>
<td>Total</td>
<td>26,865</td>
</tr>
</tbody>
</table>

In accordance with the agreement between the government of the Republic of Tajikistan and the Organization for Security and Co-operation in Europe dated 16 May 2005 and within the framework of the Programme of Small Arms and Light Weapons, an Explosive Demolition Centre was established within the Ministry of Defence. Its main objective is to facilitate the demolition of ERW. More than 70 metric tons (77 tons) of ERW have been demolished as of 19 October 2006, and the work is ongoing.

Conclusion

Taking the serious consequences of ERW into consideration, it is necessary to point out that the adoption of Protocol V by the international community and its entry into force has great importance for the safety of civilians. Of course, it significantly depends on the process of accession of the governments and the fulfilment of its provisions by State Parties. TMAC hopes the implementation of Protocol V allows all parties to take practical measures to demolish ERW efficiently and productively to provide safety for all.

Agenda for ERW and Ammunition Stockpile Disposal

As a result of the end of crises and conflicts around the world, vast quantities of ammunition have been destroyed by OB/OD. They have come from a variety of sources, primarily:

- Excess stocks of military ammunition resulting from the ending of crises/conflicts
- Unexploded ordnance on former military training or gunnery ranges
- Mines and UXO remaining from military and some civil conflicts
- The amount of ammunition in abandoned stockpiles in Iraq and Afghanistan comprises several hundred tonnes of various types of munition.

In the wake of the recent conflicts in the Persian and Balkan areas, many questions have been raised about post-war effects, such as the environmental pollution caused by OB/OD of ammunition stockpiles, Kuwait has claimed compensation from the Iraqi government for severe damage of the desert environment caused by chemical pollution of sand and soil because of OB/OD disposal of abandoned Iraqi ammunition after the first Gulf War in 1991.

Today the international market for scrap metal is very favourable, and the prices of scrap iron and especially copper, stainless steel and aluminium are rising.

Recovery and recycling of explosives for industrial use has not proven feasible. Recycled explosives from ammunition are not competitive with industrially manufactured explosives. However, explosive compounds might be incinerated for energy recovery or redelivered for fertilizing or other chemical purposes.

The distance of abandoned ammunition stocks in a post-conflict area, necessary logistics management and implementation of appropriate ammunition-disposal procedures requires a lot of human resources. The work related to ammunition-stockpile management is highly suitable for demobilization, demilitarization and reunification programmes.

Taking all environmental, economical and social benefits derived from the recovery of ammunition stockpiles into consideration, industrial ammunition stockpile recovery is far preferable to the currently applied, normal practice of OB/OD. However, further investigation and proof of concept is urgently needed.

Industrial Ammunition Stockpile Recovery: Saving Energy and Resources and Protecting the Environment

This article presents the opportunities for the disposal of ammunition in an economically and environmentally feasible way, focusing on post-conflict disposal of larger stocks of ammunition with a special view to the ongoing Ammunition Stockpile Destruction Programme in Afghanistan managed by the Afghanistan New Beginning Programme. The contents of the article are based on the experiences gathered under the umbrella of the research and development programmes Western European Ammunition Group European Cooperation for the Long-Term in Defence and European Union L’Instrument Financier pour L’Environnement (EU LIFE), together with a study carried out for NATO’s Maintenance and Supply Agency, followed by field studies on ammunition stockpile destruction in mine-action programmes.

by Erik K. Lauritzen, Mogens Straup and Inés García Sánchez | NIRAS DEMEX & NIRAS Chemcontrol |
Principles of Demilitarisation and Ammunition Disposal

Demilitarisation of ammunition can be performed in many ways. Different techniques and methods for demilitarisation of ammunition are presented in DAMAS 11:10. Figure 1 illustrates a general methodology for demilitarisation. There are many phases to follow and options that can be chosen. Each phase is comprised of a set of processes and many of the stages consist of a number of sub-stages. The most appropriate demilitarisation process to be implemented will be dictated by a number of factors, such as available technology, environmental legislation, contract conditions, commercial issues and safety regulations.

Munitions are inherently dangerous and the demilitarisation process involves considerations about explosive safety and environmental risks. In particular, downsizing and treatment stages are the most critical, during which the explosive components are subjected to processes that can be hazardous depending on the working methods, sensitivity of the explosive components etc.

In order to save resources and protect the environment, demilitarisation processes must aim for maximal recycling and minimal waste disposal. Furthermore, the processes must be as harmless as possible with respect to workers’ health and safety, and emissions into the atmosphere, soil and water.

Munitions are, with few exceptions, designed with focus on the use phase, and little or no thought is given during the design phase to the end-of-life stage, when demilitarisation is required. Consequently, demilitarisation of munitions is often a more complicated process than initial construction. Modern design of munitions is becoming more and more complex, and therefore demilitarisation has to be more carefully considered at this initial stage. With growing requirements for insensitive munitions, energetic constituents are evolving and becoming more difficult to deal with compared with traditional explosives, such as TNT. Munitions containing TNT can easily be melted out, since TNT’s melting point is lower than that of water, however, new filling compositions tend to be based on nitramines embedded in a cross-linked polymeric matrix with a higher melting point.

Mobile Ammunition Disposal Plant

In May 2000 NIRAS DEMEX published a report, Research and Development Technologies for Safe Disposal of Explosive Waste, which compiled the results of a project carried out under the EULIFE programme. The project demonstrates by means of laboratory tests that it is possible to extract the explosive content from the ammunition shells, mix it with water and incinerate the resulting mixture without risk of explosion.

NIRAS Chemconal has designed and set up both large incinerators and small-scale, mobile incinerators for disposal of hazardous waste like projectiles, PCB, etc., such as the one shown to the right. NIRAS DEMEX and NIRAS Chemconal have further been responsible for the design, construction and setup of a plant for igniting the OB/OD at the Danish Ammunition Arsenal, as shown in the photo on the next page. The process ensures any remaining explosive material within the disposed ammunition items is burnt out and is done in so a way that guarantees safe handling and eventual recycling of the shells.

During the incineration of explosives, it is possible to recover the generated energy and clean the exhaust gases to the emissions comply with the environmental requirements in the area. This technique is therefore preferable to OB/OD from an environmental perspective. Moreover, mobile incineration units can be established on-site and thus offer the same logistic advantages regarding local disposal of ammunition waste as the currently OB/OD.

The extraction of the explosives from the ammunition shells and their incineration has only been tested on a laboratory scale, however. A full-scale demonstration test is under preparation.

Proposed Design for Mobile Ammunition Disposal Plant

Overall layout. Due to the safety risks associated with the transport of ammunition, having a relocatable or transportable facility for its safe disposal constitutes an essential advantage. Below small ammunition at the Danish Ammunition Arsenal, as shown in the photo on the next page. The process ensures any remaining explosive material within the disposed ammunition items is burnt out and is done in so a way that guarantees safe handling and eventual recycling of the shells.

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Energy recovery. A boiler is installed to recover the energy generated during the incineration of the waste/explosive mixture and reuse it for, among others, heating purposes. The energy recovery supplies added income for the project.

Blue-gas cleaning. A full blue-gas cleaning system is installed to minimize the emissions and ensure they comply with the legal requirements. It is expected the emissions will comply with the tightest EU emission requirements for incineration of hazardous waste. The main focus of the blue-gas cleaning system will be removal of dust and nitrogen oxides.

An emission-monitoring system will continuously ensure air emissions comply with the established legal requirement for the flue gases.

Control system. The incineration process is carefully controlled by a computer system to ensure safe and environmentally sound operation. In case of abnormal operation, the process will be stopped in a controlled manner.

Mechanical safety measures are incorporated to protect the equipment from damage in case of improper operation or unexpected events. A tentative sketch of the overall process is shown in Figure 2 below.

A secondary combustion chamber could be installed to guarantee the destruction of organic compounds. In this way, European criteria for incineration of hazardous waste, e.g., more than two seconds at 1,300 °C (2,300 °F)—would also be met.
focus | remaining stocks had to be demilitarised. (55,000–110,000 U.S. tons). Some of the ammunition was deemed unserviceable by the Afghan Natural Army and had to be recovered, while the remaining stocks had to be demilitarised.

The Anti-Personnel and Ammunition Stockpile Destruction Programme under the supervision of the Ministries of Defence and Interior and the National Department of Security are being surveyed, and the ammunition is classified into three categories:

1. Ammunition required by the Afghan National Army for service
2. Ammunition that might be required for service of the ANA
3. Ammunition to be destroyed, including APMs

During the transfer of the ammunition from the cache, ANA transports the first two categories of ammunition together, and there is no registration of the specific types of ammunition belonging to each of the two categories.

ANRP transfers serviceable ammunition to temporary and permanent ammunition storage points called Temporary Ammunition Consolidation Points and Permanent Ammunition Supply Points, respectively. Two Ammunition Supply Points are planned in the Kabul area and another five elsewhere. The ASPs are mainly existing storage sites that have to be repaired and secured. They need to be cleared of UXO and the ammunition already stored has to be sorted. Some of the ASPs are ready, and ANA has started transporting ammunition to some of the prepared Ammunition Survey Teams.

Each of the eight Ammunition Survey Teams simultaneously undertakes the ammunition survey in multiple locations on a nationwide basis. ANRP conducts the transportation of serviceable ammunition to regional ammunition supply points with assistance from the U.S. company UXB International and ANA. ANA handles storage of the ammunition without support. Destruction of unserviceable ammunition (unsafe, unsalvageable, and non-required) and APMs is conducted by implementing partners, The HALO Trust and UXB International, by means of open-air burning and bulk demolition.

The Ammunition Survey Teams are surveying ammunition cachets. The ATS also empty the ones not considered suitable for future storage. Unsafe, unwanted and illegal ammunition, including anti-personnel mines, are destroyed by implementing partners. The rest is moved to Temporary Ammunition Consolidation Points. The survey teams consist of one ANA Team Leader, one ANA Deputy Team Leader, one International Adviser, one Translator/Associate and four drivers. Each team has two trucks and two cars. Technical assistance is provided by HALO Trust personnel.

The actual destruction of ammunition is conducted by implementing partners including The HALO Trust, RONCO Consulting Corporation and UXB International.

Proposed Industrial Ammunition Disposal Programme for Afghanistan

By the end of 2005 it was estimated that total stocks of abandoned ammunition in Afghanistan amounted to 50,000–100,000 tons (55,000–110,000 U.S. tons). Some of the ammunition was deemed serviceable by the Afghan Army and had to be recovered, while the remaining stocks had to be demilitarised.

New strategy. The EU prepared a new strategy for ammunition management for the Afghan government. Current demilitarisation practice by OB/OD may only be used up to 2007. Starting in 2007 demilitarisation of ammunition shall be performed in an environmentally friendly way. By 2012 all unserviceable and unwanted ammunition currently stored shall be destroyed.

It is proposed that the demilitarisation should be performed in accordance with the European Commission principles of best available technologies not entailing excessive cost, the EEC directives on waste management and the International Mine Action Standards.

Most likely a large proportion of the ammunition that has been consolidated will turn out to be obsolete or unserviceable stocks that must be destroyed. However, ammunition stockpiles contain valuable materials that can be recovered. If innovative, environmentally friendly demilitarisation techniques are proven to be cost-effective, then scrap metal and explosives could be recycled for commercial use. Energy and nitrogen-based compounds can be recovered from explosives to be used in fertilisers and scrap metal can be recovered from the casing materials. The present world prices for scrap metal are relatively high and it is therefore recommended that an industrial demilitarisation system should be analysed in detail, with the indirect objectives of improving business activities and creating employment for the local Afghan population. An industrial demilitarisation system could be established in connection with the Temporary Ammunition Destruction Program, for example a mobile demilitarisation plant based on closed incineration or similar technologies.

It is strongly recommended that a systematic/open detonation of ammunition should not continue as a demilitarisation technique, due to the proven environmental damage and inefficient use of resources.

Furthermore, it is mentioned that the United Nations South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons has considerable experience with demilitarisation technologies, and the publication Briefing 16—realising the Bullet gives practical guidelines for the ammunition stockpile management.

Capacity building. It is a priority for EC projects to build up local capacity. After one year of ammunition stockpile destruction, an appropriate national capacity has been established. A capacity-building plan is supposed to be prepared with special focus on local ammunition technicians and leaders of Ammunition Survey Teams. Furthermore, the capacity-building plan must be accompanied by a plan for transfer of ownership from ANRP to a local organisation and by a specific exit plan for ANRP, the international implementing partners and Technical Advisors.

It is assumed that the initial phase of the ammunition destruction programme will be implemented via cooperation between U.N. humanitarian organisations, international NGOs and other civil implementing partners on one side and the military society (including the Coalition Forces/International Security Assistance Forces), ANA, police, and security forces on the other side.

It has been proposed that industrial ammunition recovery might be transferred to commercial companies—possibly international companies in cooperation with local companies—in accordance with specific international procedures stipulated by the donor organisations. The contract must be based on industrial demilitarisation practices in compliance with the above-mentioned requirements for health, safety and environmental protection.

For additional references for this article, please visit http://dx.doi.org/10.15429/See Endnotes, page 109.
In many countries where landmines and unexploded ordnance threaten populations, people ignore warnings about these hazardous explosives to collect explosive remnants of war for the valuable scrap metal they contain. The author discusses a program proposed by the Golden West Humanitarian Foundation to manage this dangerous practice.

by Allan R. Voisburg (Golden West Humanitarian Foundation)

Much money, time and effort have been invested in conventional mine-risk education. UNICEF defines mine-risk education as “a process that promotes behavior by at-risk groups and links affected communities with other mine-action components.” The problem in this “process” doesn’t always work as well as we hope. The Cambodian Mine/UXO Victim Information System reports that in August 2006, 35 new landmine/UXO victims were recorded in Cambodia. Of these casualties, 62 percent were men, 8 percent were women, and 30 percent were children under 18 years of age. Fifty-eight percent of the casualties were people injured or killed by UXO and 42 percent by landmines. These numbers indicate a disturbing trend in which casualties are increasing despite greater efforts to eliminate threats. This trend also exists in Vietnam, Laos and other areas. We think it points to an underlying problem—collecting scrap metal is the new growth industry in these countries. The Golden West Humanitarian Foundation has taken a pragmatic approach to MRE, generalizing it to become ERW threat-indicators education. We strongly support education but believe the best way to prevent deaths and injuries is to use education as one element in a program designed to eliminate the ERW threats as quickly as possible.

Sneaky Devices

In central Vietnam and Laos, many deaths or injuries are caused in particular by unexploded cluster submunitions or 40-mm grenades. These unstable, long-lasting munitions are a widespread hazard, frequently concealed by tall grass or shallow dirt. Not only are they hit by farmers’ hoes or plows, exploded when fires are built on top of them and irrefrangible to children, but these dangerous munitions are often the very devices scrap-metal collectors indiscriminately gather, disarm and sell.

In addition, unexploded mortar projectiles can be a threat. Mortar projectiles come in a huge variety of sizes and contain a number of different fillers. In Vietnam, mortars can be found from 60-mm to 100-mm. Fillers may include incendiary, high explosives, white phosphorous and other smoke and flares. Fuzes may incorporate proximity devices, or use impact, powder rain or timing mechanisms for initiation. Unfortunately, once the paint and markings are weathered away, it is often difficult to identify the type of fuzer and, therefore, the explosive threat. Mortars can be small, easy to move and less intimidating than artillery projectiles and bombs. They can also be deadly.

These munitions, submunitions and grenades share a single deceptive characteristic: they can halt victims into a false sense of security: inconsistency. They often fail to follow any arms and detonate due to a variety of permanent mechanical faults in their arming or firing mechanism. However, at other times they do not arme or fire—sometimes years later. Firing mechanisms are complex and designed to accept input from almost any direction. Because these mechanisms are so often damaged and prevented from functioning, people come to believe they are harmless. When a civilian picks one up and it doesn’t kill him or her, that person is more likely to pick up the next one. However, the next munition or the one after that may detonate without warning, killing or seriously injuring both the person who picked it up and anyone nearby.

Challenges to Conventional Mine-risk Education Practices

So what might the problem be? Why would anyone who has received training pointing out the dangers of interacting with unexploded ordnance intentionally do it anyway? Is there something about the training that makes it ineffective? Are there other factors at play as well? Are there ways to enhance the training to make it more effective? The answers to these questions are complex and there are no easy solutions.

Programs engaged in MRE recognize that people are frequently injured by d Petrally triggering explosions in the process of their daily work, but those most resistant to behavioral change are scrap-metal collectors. Scrap-metal trading has become a well- entrenched part of many local economies throughout Southeast Asia. Scrap-metal collectors engage in their dangerous trade for a variety of reasons, but most say they simply need the money they earn from it. Studies have shown people are generally not aware of the dangers they face; but feel compelled to continue the dangerous activity due to the pressures of poverty? They often report feeling they have no choice.

The Solution

In many countries, education alone is not enough to prevent deaths. One of the best ways to address the problem of scrap-metal collection is “Remnants of War Indicators Programs and Procedures.”

These programs are designed to help people identify ERW hazards and communicate with the authorities properly. The programs are based on the principle that even if regular demining teams report on a particular area, there may be other hazards that pose a danger. These programs are designed to improve the regulatory procedures in an area, while also making it easier for the authorities to identify hazardous areas and remobilize a small explosives-processing facility for treatment (when feasible) and the metal parts sold to the scrap industry. UXO deemed too dangerous for movement would be destroyed in place by the safest method possible. Remnants of War Indicator programs will not make scrap-metal collection into an unnatural danger for processing or lost during treatment would be considered a program cost.

A bomb-in-place procedure for small items (like individual submunitions or grenades) can use fortifiers/explosives’ damage-mitigation methods such as Ms. BIP. Larger items may be controlled by ditching, sandbags or burial. Whenever possible, items will be moved away from occupied areas prior to any procedures being initiated. Under items deemed unnecessary, safe scrap-sales procedures will be applied; no complex procedures will be attempted absolutely, no procedures that include any degree of risk to operators will be conducted. Safety will never be compromised in the interest of scrap metal. Only the items the senior EOD

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people to obtain needed money in exchange for suspect items. There will no longer be an excuse that they had no choice because we are providing a choice. People do not need to endanger their families, neighbors or themselves to make a little extra money.

The senior EOD Team Leader will be provided with small amounts of cash to do on-the-spot reimbursements for dangerous items removed by the team. Scrap resulting from processing of munitions will be sold and any profits reinvested in the program. Any recovered explosives will be used to support disposal of other unusable munitions. There will be a strict system of accounting for funds. The physical inventory of munitions in the program’s safe holding area validates the expenditure monitored via closed-circuit TV. With some modifications, there will be a strict system of accounting for use in the demilitarization facility. When fuzes cannot be safely removed, projectiles can be cut behind the booster or faux fuse. Once the forward part of the projectiles is removed, the explosive can be reduced and the forward portion burned in a portable demilitarization furnace. Once the explosive charge is removed, the metal is added to the scrap to be sold. No fuzes containing primary explosives will be held and all will be used for the construction of castableè fuse. All the skills needed to make an EOD team effective can be taught and reinforced by this program. Large areas of land can be cleaned of the most dangerous items in fairly short order by these teams. While the teams will do no surface clearance past shallow-buried bombs or projectiles, the surface clearance will pay big dividends.

Conclusion
Despite separated warnings and dedicated MRE programs, casualties from scrap-metal collection continue to increase. It seems warnings aren’t enough and high-risk behaviors like collecting scrap metal must be addressed by either technical or economic solutions. This proposed program combines these two elements and helps address root economic issues through the application of new technologies and incentives. The concept includes provisions for assisting scrap dealers who currently traffic in dangerous munitions. The program may also help eliminate the illegal collection and use of explosives for fishing or other illicit purposes. It certainly is not a total solution, but it may begin to reverse the climbing rates of injuries and deaths resulting from this illegal business.

Costs of this program could easily be offset by real reductions in the fiscal and societal costs resulting from scrap-collection-related deaths and injuries. Golden West will develop and implement this program when funding is secured.

See Endnotes, page 110

The Aftermath of War

The recent conflict between Hezbollah and Israel resulted in many civilian victims and, though the fighting has ended, the problems are nowhere near over for the civilians of Lebanon whose country is littered with cluster bomblets. This article explains the effects of the conflict on Lebanese civilians and describes how organizations are trying to eradicate the cluster-submunitions problem and provide aid to affected civilians.

By Katie Fitzgerald

It has been reported Israel used cluster munitions primarily directed by artillery projectiles, followed by Multiple Launch Rocket Systems and a lesser number of aerial cluster bombs.4,5 MLRS in particular are believed by many to be highly inaccurate. They are capable of firing a high volume of mostly unguided munitions. The rockets are designed to burst into submunitions at a planned altitude in order to blanket the enemy army and personnel on the ground with smaller explosive rounds. The cluster rounds that fail to detonate—believed by the United Nations to be up to 40 percent for some munitions fired by the Israeli Defense Forces in Lebanon—remain on the ground as unexploded submunitions. In addition to the cluster submunitions, an estimated 15,300 items of unexploded ordnance—including air-dropped bombs of 500 to 2,000 pounds (225 to 900 kilograms), ground- and naval-launched artillery rounds and air-delivered rockets—now litter the ground in southern Lebanon.6

In August an August 30 Reuters AlertNet article, Stéphane Jaquenet, a United Nations High Commissioner for Refugees representative in Lebanon, said the organization’s top priority following the conflict was the safe return of the approximately one million Lebanese who fled the month-long war.7 Though U.N., Lebanese Army and nongovernmental clearance teams immediately started removing bomblets and other UXO, the United Nations and the government of Lebanon have remained seriously concerned about the danger residents could encounter.8 At the time of writing, the United Nations Mine Action Coordination Centre of Southern Lebanon assessed approximately 85 percent of southern Lebanon for cluster-bomb strikes, and it is estimated that up to one million
Cluster Munitions and ERW in Lebanon

The recent 34-day conflict between the Lebanese armed factions Hezbollah and Israel from July 12 to August 14, 2006, saw extensive use of surface-launched munitions and air-dropped munitions (to a lesser degree), resulting in wartime casualties for military and civilian actors in both Lebanon and Israel. Since the ceasefire agreement, international post-conflict attention has become focused on Lebanon due to the large number of explosive remnants of war left behind after the conflict. In particular, cluster munitions are proving problematic for post-conflict reconstruction activities in Lebanon due to their apparent high failure rate and the potential threat they pose to returning civilians, aid workers and military personnel. This article examines cluster munitions and the impact of their presence in Lebanon.

by Danièle Ressler and Elizabeth Wise [Mine Action Information Center | JOURNAL: The Journal of ERW and Mine Action

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**Cluster Munitions and ERW in Lebanon**

Cluster munitions were used in World War II and have been deployed extensively by U.S. forces in Southeast Asia during the American/Vietnam War. Millions of cluster munitions were used in World War II, and the dangers of UXO. UNICEF distributed more than 100,000 leaflets at army checkpoints as well.

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Controversy about Cluster Munitions

The dual role for cluster submunitions varies dramatically; reported failure rates can vary from less than 2 percent to over 30 percent. The potentially high failure rate of some cluster submunitions is one reason they are controversial. The range in failure rate is extreme in part because of the submunitions themselves and their parts vary greatly, particularly the fuses, resulting in varying levels of successfulness. Because some submunitions have an unexpectedly high failure rate, for example, while faulty fuses can be a reason missions fail to explode, some fuses are extremely reliable in their design.

Even testing and reporting of failure rates is problematic because there may be a difference between the failure rates in official testing conditions and combat conditions. In official testing, submunitions may be dropped on hard surfaces without obstacles such as vegetation, leading to lower failure-rate statistics than are reflected in real conditions.

Since conditions in the field are not necessarily the same as those during testing, in some cases cluster submunitions may have significantly higher failure rates during use. Failure-rate statistics based on field use, however, typically can only be derived from anecdotal or incomplete reports taken during the conflict and are therefore hard to rigorously document and prove. Thus, failure rates quoted for cluster submunitions may be underestimates if based on ideal conditions.

Reasons for a high failure rate vary and can depend on the age of the submunition; storage conditions; production; design (including the actual described, airborne, or delivered); longevity (age in impact; softness and slope of terrain; vegetation such as trees and bushes, marshes, snow or rain, and extreme heat or cold). Cluster munitions are often delivered as "unguided bombs," meaning that they can be aimed but once fired, there is no controlling exactly where they land. This results in a higher probability that they may miss the intended target and hit civilian areas.

This failure to land as planned at the intended target may occur due to atmospheric and environmental conditions, such as wind, which can affect the size and location of a cluster bomb's footprint, contributing to the potential for undetonated submunitions. The United Nations estimates that Human Rights Watch and others expressed concern when it was reported that Israel was using cluster munitions in Lebanon in the recent conflict: first reportedly on July 19, 2006, in the town of Bliss and then in turn on areas across the country with accelerated use during the last 72 hours of the conflict. The United Nations estimates the Israeli Defense Forces fired up to 6,000 bombs, rockets and artillery pieces into Lebanon. Since then, theInternational Committee of the Red Cross demanded a 90-day moratorium on the use of cluster munitions, which was later extended until March 2007. The United Nations called for a total ban on the use of cluster munitions.

As of September 2008, there have been 20 reported post-conflict fatalities and 120 reported injuries from UXO in Lebanon, in nearly all cases from cluster submunitions. Four of these fatalities and 42 of the injured were children aged 18 years or younger. The United Nations estimates that Human Rights Watch and others expressed concern when it was reported that Israel was using cluster munitions in Lebanon in the recent conflict: first reportedly on July 19, 2006, in the town of Bliss and then in turn on areas across the country with accelerated use during the last 72 hours of the conflict. The United Nations estimates the Israeli Defense Forces (IDF) fired up to 6,000 bombs, rockets and artillery pieces into Lebanon. Since then, the International Committee of the Red Cross demanded a 90-day moratorium on the use of cluster munitions, which was later extended until March 2007. The United Nations called for a total ban on the use of cluster munitions.

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NGOs have called for a moratorium on use, production or trade of cluster munitions until humanitarian concerns can be addressed; this is currently on the planks of the Chemical Weapons Convention, created in 2003 and now with over 150 member NGOs.\(^\text{38}\)

Rather than prohibiting, some nations have instead started taking a technological response to cluster munitions, creating weapons with lower failure rates, improved accuracy, self-destruct/self-deactivation systems or back-up secondary fuses.\(^\text{39}\) Rather than stop using them, the goal is to increase reliability. Not all militaries support this, with poorer ones, such as Russia and China, arguing they cannot afford such an approach.\(^\text{40}\) Yet improvements to cluster munitions are supported by many within the military who have experienced the danger of fratricide to ground troops by unexploded submunitions deployed by their own military.

The U.S. Department of Defence’s 2006 proposed military spending budget requested funding to update outdated cluster munitions.\(^\text{41}\) Upgrading cluster munitions would potentially improve targeting and the dual role. The Army requested $124.8 million to purchase 1,026 Guided Multiple Launch Rocket System munitions.\(^\text{42}\) The GMLRs claims to reduce the dual role of the current M95s by 95 percent and the impact area by 85 percent.\(^\text{43}\) These new munitions aim to solve many of the problems of the older cluster munitions: indiscriminate effects, high dual rates and attacks on civilians.

### Conclusion

The Montreux Central Committee has used the phrase “drop today, kill tomorrow” to describe the danger cluster munitions pose for civilians.\(^\text{44}\) This is clearly the case in post-conflict Lebanon, where unexploded cluster submunitions are already killing civilians. However, not all cluster munitions are created equal, and this issue exemplifies. The debate continues with some defending the use of cluster munitions, others advocating for improvements in technology or stronger legal regulation and still others denouncing any use at all. What is undeniable is that cluster submunitions should have resulted in explosive remnants of war that continue to injure innocent civilians. There may be more than one solution to the problem of cluster munitions, but it demands an answer and should not be ignored.

Further studies on the effects of cluster munitions in the recent Israeli/Hezbollah conflict, see the MAIC fact sheet on page 113.

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**Special thanks to Colin King for his assistance in providing information for parts of this article. For additional references for this article, please visit http://maic.jmu.edu**

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C. King Associate, Ltd.
C. King Associates, Ltd. This is the current conflict seeing one canister stamped with load date of September 1973 and two catastrophic failures, where “the weapon completely failed to function and none of the bomblets were dispersed or exploded.”\(^\text{45}\) Unexploded BLU-63 bombs were also found in Lebanon after Israel’s cluster bomb attacks in the conflicts of 1978 and 1982.

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**Air-dropped Submunitions in Lebanon**

BLU-63 (via CBU-58/B): CBU-58/Bs are aerial aircraft cluster bomb containing 650 BLU-63 bombs, developed in the early 1960s and supplied by the United States. These unguided bombs are called submunitions three inches (7.5 centimeters) in diameter with a scored steel casing that can produce 260 fragments on impact for an anti-personnel effect.\(^\text{15}\) While a reliable dual role is not known, HRW observers reported in the recent conflict seeing one canister stamped with load date of September 1973 and two catastrophic failures, where “the weapon completely failed to function and none of the bomblets were dispersed or exploded.”\(^\text{45}\) Unexploded BLU-63 bombs were also found in Lebanon after Israel’s cluster bomb attacks in the conflicts of 1978 and 1982.

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C. King Associate, Ltd.
C. King Associates, Ltd. This is the current conflict seeing one canister stamped with load date of September 1973 and two catastrophic failures, where “the weapon completely failed to function and none of the bomblets were dispersed or exploded.”\(^\text{45}\) Unexploded BLU-63 bombs were also found in Lebanon after Israel’s cluster bomb attacks in the conflicts of 1978 and 1982.
The types of weapon systems deployed during the conflict include (see below for specific information):

- **Small arms**
- **Cannons**
- **Howitzers**
- **Self-propelled guns** (76-mm Helcar, 90-mm M36, etc.)
- **Rocket weapons** (including cluster munitions)
- **High-explosive anti-tank (HEAT) rockets**
- **Aircraft bombs and rockets** (including cluster and "dumb" bombs)
- **Air-to-ground rockets**
- **Anti-aircraft rockets**

**Mine Situation in Croatia**

Between 1998 and 2001, records indicate 1,089 demining projects covered a total area of 160,216,939 square miles (624 square kilometers) of land. The projects found 17,975 anti-personnel mines, 13,010 anti-tank mines and 144,152 pieces of unexploded ordnance.

The Republic of Croatia consists of 21 counties and the city of Zagreb. Twelve counties are within a mine-suspected area, totaling 1,147 square kilometers (719 square miles) of land. Around 1.1 million inhabitants are directly endangered within the MSA; one in five inhabitants is threatened by a possible accident within the MSA. ERW that has been located and removed remains ERW that is emplaced in micro-locations within the MSA. Surfaces where ERW has been detected are fenced, at present totaling approximately 500,000 square meters or 66 acres. For the approximately 30,000 people live near locations still contaminated with ERW.

**Progress of Clearane Operations**

One of the issues on the third international symposium organized by the Croatian Mine Action Centre and Centre for Testing, Development and Training Ltd., held from April 24–26, 2006, in Siberac, Croatia, was UXO detection at depths over 20 centimeters (8 inches). This is an important concern for safely carrying out construction activities in certain areas where it is necessary for operations to extend below the UXO detection capability.

**Ammunition Expenditure/Failure Rates**

The Journal of Conventional Weapons Destruction, Vol. 10, Iss. 2 [2006], Art. 1

Small-arms ammunition (14.5 mm).

- Most of the ammunition was originally packaged and represented a small threat to locals. Little effort was needed to remove and destroy them. According to the official statistics from the CROMAC database, eight persons were wounded by this type of ammunition since 1991.

Pyrotechnics (smoke, flares). Pyrotechnics represented a small quantity of the findings and a medium-level threat for locals, and little effort was needed for their removal and destruction. The most common pyrotechnics found were the nuclear-blast simulator/INE signal M58 P1 cartridge and cannon blast simulator. Two persons have been wounded since 1991 by these munitions.

- Cannon shells and artillery projectiles (14.5 mm).
- A medium quantity of almost all types of artillery casings and projectiles (shells and shrapnel) was found in the Republic of Croatia, representing a huge threat for locals. Their removal, dislodgment and destruction were of medium risk. Two persons have died from this type of ammunition and six have been wounded since 1991.

**Submunitions.** Submunitions involve submunitions that were usually composed of a metal or plastic shell containing a certain number of submunitions. The most common submunitions were the KB-1, produced by Yugoslavia. Between 33 and 66 percent of the submunitions were found, highly risk for involvement for the removal. Eleven persons have died and 19 have been wounded by this type of submunition since 1991.

**Hand and projected (rifles) grenades.** Grenades are classified as common in the Republic of Croatia. They represent a huge threat for locals. They take medium risk for their removal, transport and destruction. Thirty-three people have died and 66 have been wounded from this type of UXO since 1991.

**Mortar ammunition.** A huge quantity of mortar ammunition was found because it was used for destroying targets up to six kilometers (four miles) away—the range between parties to the confrontation. This type of ERW represented a high threat because it included a certain number of unexploded mortar HE shells that usually were 60-mm, 82-mm and 120-mm caliber. These require a very high risk for removal and destruction and represent a medium threat for locals. One person has died from this type of UXO and 14 have been wounded since 1991.

- Free-flight rockets (ground-to-ground and air-to-ground). These rockets were found in medium quantity and are a huge threat for locals, although their destruction is relatively easy. Six persons have died from this type of UXO and 15 have been wounded since 1991.

**Guided missiles.** A small quantity of guided missiles was found, but they represented a huge threat for locals as they take a medium risk for their destruction.

Continued on page 43
Cannon shell, mortar ammunition 62 mm and ammunition 30 mm found in Logoriste.

GRM on the surface of an exploded ammunition depot.

Shell fired from 81mm mortars, fired likely from Volinja.

Volinja, on the border between Croatia and Bosnia-Herzegovina, has been teaching students about clearing and UXO at Polytechnic College Velika Gorica since 2003 and also at the Police Academy in Zagreb since 1987. After graduating from Military University in Zagreb in 1987, he worked as a military engineer in Konjic for six years and then as a professor at the Croatian Military Academy “Peter Zrinski.”

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Cannon shells and artillery projectiles of various calibers.
This article looks at explosive remnants of war in North Africa (Algeria, Egypt, Libya, Morocco and Tunisia) from different perspectives, including the scope and history of the ERW, its impact and its relationship to security.

Several countries in North Africa are affected by mines and ERW, as a result of the North African Campaign of World War II, also known as the Desert War, which was fought between 1942 and 1943. Algeria, Egypt, Libya, Morocco and Tunisia are dealing with the contamination that has resulted from internal and regional conflicts over the past 60 years in addition to the Desert War contamination.

Algeria

Algeria is affected by ERW as a result of World War II, the Algerian War of Independence and ongoing conflicts with terrorist groups. There is no distinction between landmine and ERW estimates, and the contamination of each affected area is different depending on the military operations that occurred there. The contaminated areas in the east and west, known as the Mersa and Chalie lines, are mostly affected by mines, as are the strategic areas in the north that the Algerian Army secured with mines in its ongoing fight with terrorist groups. The other affected areas of the country are mostly ERW-affected due to battles fought during WWII. Algeria estimates there were 91,000 mines and ERW during the independence period (25 square miles)—3,036 hectares (12 square miles)—3,036 hectares (12 square miles) in the eastern border area, and a total of 75,921 hectares (187 square miles) in the western area. The Ministry of Interior declared there had been 8,313 mine and ERW victims since specific records were kept. By extrapolating the data, we find the ERW victims can be estimated between 1,662 and 2,078.

Information on victims since 1998—i.e., in addition to the ratio of mines/ERW in Egypt—shows that the 500,000 people living in the eastern area are more affected by ERW than mines. Being a mine or a ERW victim in one of the affected regions in Egypt is a complicated health issue because of the limited health services in those areas.

All of the victims are found in three groups of people—those who work on the development and repair of infrastructure, Bedouins, or farmers, which means that they lose their main income once injured. The social system in Egypt does not give any assistance for mine/ERW victims; they might not have some assistance of up to US$80 after a long process of filing out paperwork to prove their injury. This amount is the same given to people affected in natural disasters. Every adult victim is responsible for a family, which, on average, consists of five people, and the injury affects the family’s future. Some of the families have had to take their children out of school to begin working to help the family survive after the main breadwinner in the family was injured. Many of the affected areas for mine/ERW victims in Egypt, and thus increases the victims’ suffering in other ways.

Economic impact. Irrigation projects, which are an essential facet of development projects in desert areas, have experienced delays and increased costs because of the need to clear mines and ERW from prospective sites and routes. This happened with both the El Hamam Canal in the western area and the El Salam Canal in the eastern area, with a total of 933,000 salfans (864,454 acres) needed to be cleared before the irrigation and follow-on agriculture projects could begin. Mines and ERW are also a serious impediment to the development of traditional and nontraditional sectors of the power-supply industry in Egypt. The need to remove ERW delayed large-scale “wind farm” projects in the western area and increased the costs of 50,000-volt power cable connecting Alexandria (the main port for Egypt) and the second largest city) with the existing eastern electrical network, scheduled to be connected through the western area to the North Africa network, then maybe to the European Union.

The petroleum sector, which plays a leading role in the country’s national economy, is also affected by mines and ERW. Egypt’s estimate shows there are 4.8 billion barrels of oil and 13.4 trillion cubic metres of gas in the western area, and all petroleum areas (except for those in the sea) are in mine/ERW-contaminated or suspected areas. Any petroleum/gas project must budget for mine/ERW clearance before beginning production; this amount varies from area to area.

In 1998, a German tourist was seriously injured due to an accident involving unexploded ordnance in Elain Elshokhna on the Red Sea coast. In 1999 four tourists, two German and two Swiss, were injured after their car hit an unidentified mine. In that same year, another kind of ERW in the western area. In addition, all tourist sites in Sinai and on the coast of the Red Sea are in close proximity to mines/ERW. These two accidents have not affected tourists, but another visitor to the region could have a serious impact on tourism, which is Egypt’s second largest source of foreign currency.

Mines/ERW affect accessibility to schools in the western area. In the governorate of Matrouh, all four schools have to be closed down and must be moved to new buildings, which will make them more easily and safely accessible for children. Mine/ERW affected the infrastructure and development of the new port and the attached free industrial zone of Elain Elshokhna on the Red Sea, which is on track to become the largest port in the Middle East by 2010. The Egyptian Army cleared this area for infrastructure, but some mine/ERW incidents occurred subsequently, requiring the area to be demined again to make sure the land would be safe. Three mine accidents made workers feel unsafe and delayed the project completion.

In contrast, the Egyptian Army has a very ambitious plan to move large numbers of its population to the western area in the next 20 years and, therefore, is developing a national plan to charge the development of the northern coast. This will be a result of the economic impact, irrigation, agricultural, oil/gas exploration and tourism projects. While the Egyptian Army is the only authority that deals with demining, the 20-year development plan for the northern area includes cleaning up locations affected by mines/ERW.

Libya

Libya is affected by ERW in different areas in the northern part of the country because of the World War II campaign in North Africa, in the northeastern area at the Egyptian-Libyan borders because of the Egyptian-Libyan conflict in 1977, and in the southern area, including the Libyan-Chadian conflict from 1977 to 1987.

There is an estimated 1.5 to 5 million mines and ERW in Libya; some officials make estimates up to 10 million. This estimate includes all ERW that were planted by the Libyan Army in the northeastern area and the border with Egypt. All available statistics, publications and photos show that ERW account for the majority of those numbers in the north and some areas in the south.

Humanitarian impact. There is no current estimated number of mine/ERW victims in Libya. It is estimated there were 12,258 victims during the period of 1952 to 1975, which included 3,876 deaths and 8,384 injuries. Some publications show...

**Economic Impact.** Mines/ERW affect the agricultural sector in Libya. It is estimated that approximately 259,059 hectares (1,139 square miles) in Libya cannot be used for agriculture because of mines/ERW. In 1972, the Ministry of Agriculture and Land Reclamation published an estimate of the total income loss from not using affected lands at 18,897,760 Libyan Dinars (US$14,475,728). Raising livestock is a major economic activity in Libya; however, due to the presence of mines/ERW, it cannot be sustained.

In 1986 and the United Nations followed up by issuing a report on the use of ERW and mines in criminal and terrorist activities. The United Nations noted that the terrorists used explosives that they took from mines and ERW in Siberia. According to the UN, more than 2,000 landmines were recovered from the areas affected by ERW in North Africa and the Middle East. The UN noted that the use of ERW in terrorist activities is a serious concern and that it is important to clear these areas of mines/ERW.

**Humanitarian Impact.** The humanitarian impact of mines in Tunisia is very significant, as the use of ERW and mines in criminal and terrorist activities has increased. The report noted that the terrains affected by mines/ERW include areas where fishing is prohibited, such as the Tunisian frontier. The report stated that the Tunisian government intends to construct new roads and extend the transportation network in Libya.

**Security Concerns.** The report concluded that the use of ERW and mines in criminal and terrorist activities is a serious concern and that it is important to clear these areas of mines/ERW. The report noted that the mines/ERW affected areas are located in remote desert areas with few or no local population. The report stated that the Tunisian government is working on the removal of ERW in the affected areas.

**Colombia Destroys Stockpile.** The Colombian government recently created the Colombian Mine Action Centre and the organisation is already making headway towards alleviating the threat of landmines and explosive remnants of war. With the help of funds from the European Union, CMAC will begin a Landmine Impact Survey in 2007. Work on the LID will be difficult because domestic conflict continues to hamper humanitarian efforts.

The Colombian government has agreed to train three more demining platoons to increase the national demining capacity. Currently, only one platoon is dedicated to humanitarian demining efforts. It has been difficult for military leaders to gain support for this activity because training for demining removes soldiers from combat zones.

The Colombian Air Force recently destroyed its remaining stockpile of training landmines (totaling about 100 mines), and the destruction of the remaining 786 landmines is planned for completion by the end of 2007.

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**JOURNAL:** The Journal of ERW and Mine Action

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Successful Implementation of Protocol V

Protocol V of the Convention on Certain Conventional Weapons (CCW) recently entered into force, and the author hopes lessons learned from the operations of the Ottawa Convention can be applied to this Protocol.

by Kerry Brinkert (Geneva International Centre for Humanitarian Demining)

O
n 12 November 2006, Protocol V of the Convention on Certain Conventional Weapons entered into force; it addresses the humanitarian impacts of explosive remnants of war other than landmines. This “Protocol on Explosive Remnants of War,” as it is formally known, contains “remedial measures of a generic nature in order to minimise the risks and effects of explosive remnants of war.” With the Protocol having become binding international law for the first time, attention has turned toward the work necessary to implement it.

Much of this attention has focused on practical operations of the Protocol. For instance, it has been frequently mentioned that various lessons from the operations of the Ottawa Convention (e.g., an information and education programme) could be applied to Protocol V. While valuable operational lessons can be applied in terms of how the Protocol functions, what is often overlooked is the concept of what can be applied from the Ottawa Convention regarding what might be implemented.

Lessons Learned from the Ottawa Convention

Some central concepts in the work to implement the Ottawa Convention are:

- Responsibility: It is the responsibility of each individual party to the Convention to fulfill certain obligations in areas under its control or jurisdiction.
- Measurable and time-bound obligations: Key provisions of the Convention call for actions that are clearly quantified and are required to assist when feasible and to the extent possible.
- Cooperation and assistance: Notwithstanding the fact that States Parties are responsible for fulfilling certain measurable and time-bound obligations, other States Parties are required to assist when feasible and to the extent possible.

A complication exists, though, in instances where obligations are not measurable and time-bound, or even universally applicable. In such cases, it is difficult for cooperation and assistance to manifest because objectives and deadlines are not clearly defined. A central and active role of the state is exactly how the States Parties to the Ottawa Convention have dealt with the ambiguity surrounding the Convention’s obligations in relation to mine victims.

The imperative to assist mine victims is manifested in a legal obligation for “each State Party in a position to do so” to “provide assistance for the care and rehabilitation, and social and economic reintegration of mine victims.” However, unlike the Ottawa Convention’s clear obligations to destroy or ensure the destruction of stockpiled or unexploded anti-personnel mines, the obligation concerning mine-victim assistance is ambiguous. It is neither defined nor measurable. Moreover, even if defined, the implementation of objectives and deadlines would not be universally applicable.

The Ottawa Convention’s States Parties have first dealt with the ambiguity of mine-victim assistance by clearly defining mine victims’ assistance, and adopting certain understandings regarding the place of victim assistance in broader contexts.

Second, a number of States Parties have chosen to “self-identify,” an act of indicating that addressing the matter of victim assistance is truly relevant and necessary for them. Certainly it is understood all States Parties have a responsibility to support mine victims, no matter the number of victims in a particular state. However, this responsibility is particularly pertinent for those States Parties that have indicated significant numbers—hundreds or thousands—of survivors in areas under their control or jurisdiction. A total of 24 States Parties have self-identified, acknowledging that comparatively they have some of the greater needs and greatest responsibilities to provide victim assistance.

Third, because these Parties are ultimately responsible for their populations, the matter of identifying what can and should be done by what deadline has been turned over to each individual state because conditions are unique to each of them. In addition, while acknowledging that assisting victims is a long-term task, a timeline has been established for the achievement of a meaningful level of inanimate progress: the Ottawa Convention’s Second Review Conference in 2009.

Applying these Lessons to Protocol V

Protocol V contains an obligation in Article 8.2 to assist victims of explosive remnants of war that is basically identical to the obligation in the Ottawa Convention. Hence, the lessons of the Ottawa Convention can easily be applied to the effort to implement victim assistance under Protocol V. However, even beyond victim assistance, the Ottawa Convention’s lessons can be applied to Protocol V’s Article 3, which addresses the clearance, removal or destruction of ERW.

Additionally, even beyond Protocol V’s more immediate and noticeable impact, these lessons might also be applied to Article 7, which contains an implicit appeal that clearance, removal or destruction measures meet the burden imposed by Protocol V.

Protocol V’s Article 3 calls for each High Contracting Party to “mark and clear, remove or destroy explosive remnants of war in affected territories under its control,” according to priority to those areas “posing a serious humanitarian risk.” Article 3 includes specifics regarding how these provisions should be applied, including surveying, assessing the threat; prioritising needs; marking and clearing, removing or destroying; and, reporting these activities (in accordance with high standards [left to the reader to define]), and mobilising resources to carry out these activities.

However, despite these specific provisions, success or failure in the application of Article 3 depends upon whether or not practical, time-bound or universally applicable.

The Ottawa Convention’s methodology for victim assistance, which is measured in terms of similar milestones in application. This methodology could be applicable to Protocol V’s Article 3 and 7 regarding clearance, removal and destruction of ERW, as well as to the victim-assistance obligation found in Article 8.2, and would include the following principles:

- States that wish to address the problem should do so with respect to new and existing ERW, which could be asked to self-identify.

- As the responsibility to address problems caused by ERW rests with individual Parties that have self-identified, these Parties could be asked—with assistance if necessary—to provide baseline information on the problems they face and to establish specific, measurable, achievable, relevant objectives and timelines for achieving these objectives.

- States could be asked to develop and implement plans to achieve their objectives. As part of these plans, there should be a clear articulation of priorities for assistance.

- High Contracting Parties in a position to provide assistance could respond to prioritised assistance needs as articulated by Parties that have well-developed plans.

- High Contracting Parties could periodically hold Conferences of States Parties to assess progress in achieving the objectives as previously articulated by the self-identified Parties.

Conclusion

This approach may sound self-evident, but such was not the case when similar work to implement the Ottawa Convention began. Moreover, there is an important nuance to this methodology that places the affected Party at the centre of the process: as first directing its Protocol V needs and obligations. As such, Ottawa Parties hold ultimate responsibility, notwithstanding the responsibility of others to assist, these affected states should have their voices heard when it comes to their needs and aspirations. Equally, these should not be demands for large-scale assistance until affected states have also demonstrated a solid, realistic and measurable plan for implementation.
Spacetoon Kids TV: Educating Kids on ERW

by Daniele Ressler [Mine Action Information Center]

Spacetoon is known to many across the Arab world for its television channel that is geared toward children, Spacetoon Kids TV. This channel is transmitted to over 50 million people in the Middle East and North Africa and features cartoons dubbed into Arabic and child-friendly TV programs. The objectives of Spacetoon Kids TV include being educational, family-friendly, geared toward children throughout the Arab regions via cartoons, TV documentaries and programs, posters, leaflets, calendars, gifts, activity packets and more. Children playing with these items and touching them, which can detonate in Lebanon, as well as in Vietnam, feel a great need to warn them about the dangers of cluster bombs.

The Spacetoon Jordanian office creates humanitarian and educational messages that disseminate the company’s staff designs a storyboard and characters who deliver these important messages, such as MRE, to children throughout the Arab regions via cartoons, TV documentaries and programs, posters, leaflets, calendars, gifts, activity packets and more. Hadi and Allawama say, “Because the children in the Arab world watch and love this channel, in channels and programs, we are able to communicate effectively timely messages to parents and children alike.”

Lebanon faces a post-conflict situation in which the need for MRE is great especially for children. According to the United Nations Mine Action Coordination Centre of South Lebanon, children have accounted for seven of the 23 fatalities and 49 of the 136 injuries as of November 13, 2006. Cluster submunitions can be particularly dangerous because some may resemble toys due to their small size and colorful ribbon. Children playing with these items and touching them, which can detonate the unexploded ordnance.

Spacetoon Kids TV recognizes the need in Lebanon for MRE for children. Hadi and Allawama say that at the Regional Office in Jordan, “we have a full package campaign designed especially for Lebanese children including TV spots, posters, flyers, activity books and notebooks.” The company is looking for donors who are interested in disseminating their educational materials, which are designed to provide MRE in Arabic using child-friendly and culturally sensitive techniques with cartoon characters and popular programming.

Spacetoon’s Regional Office has experience providing MRE and awareness-raising campaigns about the dangers of mines and explosive remnants of war through its work with Iraqi children. RONCO Consulting Corporation and the U.S. Department of State funded two projects in 2004 through Iraq’s National Mine Action Authority and the Ministry of Planning, and in 2005 Mines Advisory Group funded a one-year project through the Iraq Health and Social Care Organization.

Conclusion

With the help of new donor sponsors, Spacetoon’s Regional Office in Jordan plans to address the urgent need of ensuring children’s safety in Lebanon, as well as to continue to deliver MRE activities in Iraq where children are also at great risk.

See Endnote, page 111
Gasimov taught mine-risk education to schoolchildren in affected areas of Azerbaijan. “I used to go to schools, conducting mine-risk education in order to prevent incidents such as my own,” he remembers.

Gasimov’s commitment to his work in mine action helped him receive the promotion to Team Leader of the Training and Quality Assurance Team at ANAMA, an important component of the mine-action program in Azerbaijan. The T&QA Team at ANAMA was created specifically to oversee the clearance operations of the demining companies and to identify and address any problems that arise during the de-mining process.

As part of this training for the T&QA Team at ANAMA, Gasimov attended a number of courses in mine action. He provides the following description of the main functions of this team: “We conduct trainings, work on capacity building, conduct monitoring, troubleshooting at a year’s QA, and also ensure that the land clearing by the demining agencies has been done in accordance with the National and International Mine Action Standards.” He adds, “We make sure that nothing remains there and that no ordnance mixes.”

Gasimov recognizes mine clearance is at times an overwhelming undertaking, something marked by unexpected barriers. “All of my achievements in this field have been so painstaking. We work and we learn. Sometimes, we learn [by making] mistakes, but just one goal is to make the land free from mines using the approved standards.” Gasimov is happy to dedicate his life’s work to the de-mining of devices that are so harmful. “Each destroyed mine and each neutralized piece of ordnance means someone’s created life is protected here.”

In spite of the difficulties that accompany working in minefields, Gasimov feels his work at mine stations has been rewarding. He hopes one day all countries, including his own, will be free from the complications inflicted by mines and UNOD. The young T&QA Team Leader would also like to see the injury and death caused by mines and UNOD abate from the world. “Some of our people will try and reach us to save their animals and they will be covered by landmines,” Gasimov laments. “It is very hard.”

When asked about his suggestions for the mine-action community, Gasimov believes communication is essential to solving the mine problem. “My suggestion is to work closely, share the experience with other countries and as work as one force against the problem. We can share ideas and have learned so that others do not have to learn from their own mistakes.”

It is Gasimov’s sense of hope, compassion and unity that makes him a valuable member of the demining community. He not only contributes, his knowledge and dedication to his work, but he also has taught mine victims that recovery from tragic situations is well within each.  

See Endnotes, page 111.

Finally, Safe Demining

Following a series of mistakes that caused hundreds of accidents—many fatal—a new battle of the National Police of Peru now ensures demining quality for 1,711 power transmission towers.

In addition to having mined sports along with Ecuador, resulting from a conflict resolved long ago, Peru currently suffers, primarily on civilian landmine accidents in the areas surrounding the towers of the power-transmission lines that cross the country. In the mid-1980s, guerrillas of the Sendero Luminoso group launched a strategy to knock down towers with high-tension lines to cause blackouts in several regions, including the capital, Lima. In 1986, in one day—the day before elections—10 towers were knocked down, resulting in a nationwide blackout.

After that incident, authorities decided it was urgent to protect their power-transmission infrastructure. However, it was not feasible to keep guards around every tower, many of which are located deep in the jungle, in inhospitable areas or at high altitudes. The solution was to emulate land-mines quickly around those towers, but as with every plan created in haste, many mistakes and fatal consequences resulted.

Charged with the task of eradicating the landmines, the National Police developed an “explosive device for self-protection,” which was basically an adapted army grenade, equipped with a system of pressure detection and assembled in the very area where it was placed. Essentially the device was nothing more than an improvised landmine. Later, the country’s Navy would develop a mine of its own, which was smaller and more powerful, but a little safer in its functioning.

In 1993, a group of 60 police officers was assigned to plant 30 to 50 landmines around each of the 1,711 towers located at strategic spots in the departments of Lima, Junín, La Libertad, and Ica. Of those 60 police officers, only 25 had had some kind of training and qualification in explosives, and they transferred their knowledge to others. Worse still, each time one of the towers needed technical maintenance, those professionals were sent abroad to “open a path” to the tower, dismantling and removing the landmines from a trap of land where they would be replaced and deactivated later. They had no personal protective equipment and no plan for transportation and rescue if required. There were no written maps of mine locations either, since many of them had to be planted quickly in areas with altitudes of over 3,000 meters (10,000 feet) due to the physiological threats posed by high altitudes, or were inflicted to possible displacements caused by rain, floods, landslides, vegetation growth, etc.

The lack of proper training and qualifications, personal safety equipment and accurate maps, in addition to the quality of landmines themselves and the
mistaken strategy of removal and reinvestment of the landmines, caused dozens of accidents. Eighty-one of the professionals who had worked in the Division of Safety in Lima had accidents, and 52 were injured. April 8, 2004, saw the National Police Unit for Mine Action, created in 2003, sprayed for spraying a high-voltage tower in the department of Junín and killed a young boy who was working on the tower. His family filed a lawsuit, and the National Police was sued for failing to provide adequate safety measures for the workers.

There were cases like the one of Freddy Mendonça, who, at the age of 30, was working for the company that runs a high-voltage tower in the department of Junín and saw a dirty object he believed to be a radio on the ground. His curiosity and naiveté led him to take the object in his hands and plug it in, causing it to explode. His family found him unconscious and thought he was dead. The boy would only move again almost 10 hours later, and when he woke up he had a hospital. Mendonça lost three fingers on his right hand, two from his left, and became permanently blinded from the explosion. He is still undergoing treatment for the injuries and has been in the hospital for two years. Mendonça is the only one of his family to survive the explosion. His father, mother, sister, and two older brothers died in the explosion. Mendonça is now working for the same company that provided the safety measures for the tower.

As a result of this incident and others, the clearance teams felt better quality assurance was needed. Plans were undertaken to increase the number of quality assurance activities in March 2006. 523 towers have been released. Nine landmines and approximately 1,700 pieces of unexploded ordnance were found. These landmines and ordnances were removed and destroyed in a safe and controlled manner. The clearance teams are now working on the remaining 30 towers.

National Police stated that 1,456 previously deminer towers in Huancavelica, Ica, and Lima were still considered dangerous. The deployment of the National Police Mine Action Unit (UPMN) to the provinces of Huancavelica, Ica, and Lima is a critical step in the process of clearing the landmines in these areas. The National Police Mine Action Unit (UPMN) is responsible for the clearance of landmines in these areas, and has been working on the clearance of landmines in these areas since its establishment in 1996. The UPMN has received training and support from the United Nations Office for Mine Action (UNMAS) and the International Committee of the Red Cross (ICRC) for the clearance of landmines in these areas. The UPMN has also received training and support from the United Nations Development Programme (UNDP) for the clearance of landmines in these areas.

As a result of the clearance activities, the villages in these areas are now safer and more secure. The clearance activities have been successful in removing landmines and ordnances from the affected areas. The villages are now safe for the residents to return to their homes and continue their daily activities. The clearance activities have also helped to improve the quality of life for the residents of these areas. The clearance activities have been successful in removing landmines and ordnances from the affected areas. The villages are now safe for the residents to return to their homes and continue their daily activities. The clearance activities have also helped to improve the quality of life for the residents of these areas.
Somalia) in 1991, SNM troops scattered into towns, leaving empty camps open to the public.

During the civil war that broke out in Somalia in 1988, this farming community was a battlefront area, former Somali National Movement camps were located nearby. When the SNM captured Somalia (previously the northwest sector of Somalia) in 1991, SNM troops scattered into towns, leaving empty camps open to the public.

Mohamed Gahayr Geele was an SNM guerrilla fighter, and he lived in Gudka Dheenta. He later said that he had stropped shrapnel training in mine-laying in 1989. Following the war, he came upon several areas of unexploded ordnance that he collected and kept buried under a tree on his farm. To keep it safe, he buried it on his farm. From 2000 to 2005, demining agencies, especially the Danish Demining Group, visited the village several times to collect and remove unexploded ordnance. But Geele never admitted to having UXO.

Then in 2005, Handicap International, with funding from Ireland Aid/UNICEF, began its reintegration work in Somaliland and trained its mine action partners—Somaliland Mine Action Centre, Region7 Liaison Officers, the Police Explosive Disposal Team, the National Demining Agency, and the Quick Response Teams of the HALO Trust in South Africa. No one had been aware of the UXO until then. By 2006, the two teams from Radio Hargeisa and Handicap International conducted a Household Feedback Survey in 32 highly and moderately mine-affected villages in the Galkaabo region (Geedka Dheenta) village, including Gudka Dheenta. The team met with Mohamed Gahayr Geele's village.

This village is a small village in Somaliland located 45 km southwest of Hargeisa on the downwind area of a major minefield. A team of Handicap International mine action officers, a representative from the Somali National Movement, and local governmental officials visited the village in February 2006. The team met with Mohamed Gahayr Geele. He said that he had kept the UXO buried under a tree and had never admitted to having UXO.

In January 2006, the two teams from Radio Hargeisa and Handicap International conducted an Audience Feedback Survey in 32 highly and moderately mine-affected villages, including Gudka Dheenta. The team sought to discover how accurately people had the UXO.

In January 2006, the two teams from Radio Hargeisa and Handicap International conducted a Homestead Feedback Survey in 32 highly and moderately mine-affected villages, including Gudka Dheenta. The team sought to discover how accurately people had the UXO. He admitted that he was very proud to hand over the UXO.

In January 2006, the two teams from Radio Hargeisa and Handicap International conducted a Household Feedback Survey in 32 highly and moderately mine-affected villages in the Galkaabo region (Geedka Dheenta) village, including Gudka Dheenta. The teams met with Mohamed Gahayr Geele's village.

Emphasizing their objectives was to create a safer environment for its inhabitants. During the survey, the team collected key data to be used for the production of MRE radio programmes, such as interviews and reports. The team sought to discover how many UXO affected the area. During his interview, Geide admitted he had hidden some UXO items on his farm, and said he wanted to hand over the mines to the demining agencies. Radio Hargeisa did not notify the authorities; instead, they aired the interview with Geide three weeks after the event.

In the late 1990s, HI's MRE team, SMAC Deputy Manager, DDG Operations Manager, and a MRE journalist from Radio Hargeisa conducted an Audience Feedback Survey in 32 highly and moderately mine-affected villages in the Galkaabo region (Geedka Dheenta) village, including Gudka Dheenta. The team sought to discover how accurately people had the UXO.

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THE HUMAN FACE OF EOD

by Howard M. Thompson | H.M.T. Insurance Brokers Ltd.

Being a specialist insurance broker to explosive ordnance disposal organisations around the world has provided Howard Thompson with the opportunity to be on the sidelines of the humanitarian-demining community. But during a 10-day visit to Cambodia, he was able to experience first-hand the significance of humanitarian demining and clearance. Here is an overview of this experience here.

For many years now, my company has specialised in the insurance requirements of mine-clearance and explosive-ordnance-disposal organisations operating around the world. During this time, I have learned much about the skills and methods engaged in the field and have become familiar enough to visit many mine-clearance operations, particularly in Bosnia-Herzegovina and Kosovo.

In 2006, I joined one of my clients, Mines Advisory Group, for a 10-day trip to their operations in Cambodia and there saw even more beautifully, what the "human" element of humanitarian demining is really all about.

Having seen many specialists working in the field, demining by hand with the aid ofmachines and dogs. I have nothing but admiration for their work. However, this visit showed me something to which, until then, I had not attached a real human face. How many times have I read, heard and even said "the purpose of humanitarian demining is to return land to its people"? How many times have I read, heard and even said "the purpose of humanitarian demining is to return land to its people"?

I had been building a story of what humanitarian demining is really all about.

Only when you meet the returning people and see the pride they have in their homes and recovered land do you really get how much mine clearance really means to the people of mine-affected communities.

While in Cambodia, I visited many places as a tourist in Phnom Penh and Siem Reap and played operator on a remotely controlled Tempest flail machine (see photo 1).

The familiar sights of a demining programme were well in evidence, whether manual, mechanical—such as the Bozena (see photo 2)—or of the canine variety as displayed by the Cambodian Mine Action Centre team in photo 3.

The next woman we met was far too comfortable. She lived in a rather fragile house along with her children. Her husband had recently died of tuberculosis and one of her children had to live elsewhere because there was no room for all of them in this new home. She hardly held back tears as she told her story.

She kept her distance from the other villagers, and her children did not join the followers who attached themselves to us as we meandered through their village. She now has a new home and a completely new start. Her story is a sad one, yet I hope her life and her children's lives will soon improve at this all come to feel like a real part of the new community.

In complete contrast, the man in photo 9 is responsible for the community's original supply, which was created from ground cleared by the MAG team. This proud man helps the growth of his and his neighbours' crops. He needed very little persuasion to share his situation and to be photographed beside his pride and joy.

Photo 10 is a genuine display of a "different sort of pride." A tender boy delighted in showing us the clean, recently created water supply and exactly how it could be used, especially on a very hot day.

Of course there were some less familiar sights. For instance, MAG is unusual in engaging females as well as male deminers. One such young woman explained her story. Her husband had been killed by a mine, so she had to provide for her family and her young children. Working for MAG to make enough, she was helping her community and providing herself with a good living (see photo 11).

Another deminer (see photo 12) taking a break in the heat, was himself a mine victim. He also had a family to support—and a large one. Building a new life for a large family is tough, especially if your life has been lived in the shadow of explosive ordnance for years. But this visit showed me something to which, until then, I had not attached a real human face.

Moving on from where the work was being carried out, we entered the small village of Phnom Pot, which had been built on cleared land just a short drive from the area where clearance work was still being carried out. In this village we really saw the full benefit clear ance work can achieve. Young families were comfortable and secure, asking for them themselves and creating the beginnings of a thriving community.

It was hard not to feel like an intruder in their world. Such thoughts were soon dispelled, however; they moaned in pleased and were very warm and friendly, which provided an enjoyment all around. I will build their memories here.

First, we met a woman who said in her husband worked across the border in Thailand cutting wood (see photo 7). She was happy taking her pony wish to work, sitting on her back. She was the little boy not so much about as though. The next woman we met was far too comfortable; she lived in a rather fragile house along with her children. Her husband had recently died of tuberculosis and one of her children had to live elsewhere because there was no room for all of them in this new home. She hardly held back tears as she told her story.

She kept her distance from the other villagers, and her children did not join the followers who attached themselves to us as we meandered through their village. She now has a new house and a completely new start. Her story is a sad one. Yet I hope her life and her children's lives will soon improve at this all can come to feel like a real part of the new community.

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Could photo 10 be looked back upon in years to come as one of the Cambodian neighborhood well? Many! This is one shared businesswoman! She moved here to start a "village store" from her home, she says the last is fertile and again safe; she knows the community will grow and the area will become wealthy as a result of the produce being farmed and the lumber from being harvested. What's more, the mine clearance site nearby, committed to clear a large strip of land that is planned for store housing. As families return in move in, her business will grow. It seemed a very good business move to me.

We made an additional stop in this village to see a small mine-risk education classroom, held by MAG community liaison personnel (see photo 3). Our little broom proudly displayed, we were treated at an explosion. Luckily he had survived reasonably unscathed; his playmate had not been so fortunate.

Our final visit was to Ta Lom, a school that was inaccessible due to mines when MAG first arrived in the area in the mid-1990s, but which is now flourishing.

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...making it personal...
Use of Impact-Survey Data

Community impact scoring. Design of the LIS scoring system produced a simple system for ranking community impact as low, medium and high. The ranking system proved very powerful in directing attention to high-impact communities by highlighting them and their limited number, which presented a more "burning" problem to the survey teams in order to avoid interruption of relief assistance, tourism or travel. The possibility that information is biased or provided "strategically" reinforces the need to seek multiple data points in order to confirm the accuracy and completeness of the information during operational task planning.

Information Management

IMSSA limitations constrain programme management. The LIS results are recorded in the IMSSA database system. While this system has acquired some strengths, it has also presented some limitations. First, the IMSSA database was initially developed as a data repository and not as an instrument for operational management of mine-action programmes. As a result, each mine-action programme where IMSSA was deployed had to develop its own parallel software to support operations, some of which have been incorporated into later versions of IMSSA. Second, there is a need to integrate other key data sets (e.g., bombing data, previous survey data requiring verification, etc.). The project has focused on the development of a method to incorporate impact on national development along with community impact. These technical issues create important challenges to effective information management and the management of programmes in general.

Oblivion of LIS data. The database should be kept up-to-date. Ongoing analysis of survey results and programme progress requires ongoing integration of provincial staff as well as blockage data and updated SHAs and victim information; these will provide a far more complete understanding of the problem. Two Landmine Impact Surveys conducted this way (Afghanistan and northern Iraq) resulted in a total estimated contaminated area significantly lower than the total area in the survey. Furthermore, because of the IMSSA’s lack of necessary resource information for the community to make full use of the land once the blockages are removed.

Use of existing minefield databases. Where minefield databases already exist, the LIS should utilise them as valid sources to identify known mine-affected communities and Suspected Hazard Areas while also searching for more full surveys which will be required to obtain blockage data and update SHAs and victim information; these will provide a far more complete understanding of the problem. Two Landmine Impact Surveys conducted this way (Afghanistan and northern Iraq) resulted in a total estimated contaminated area significantly lower than the total area in the survey. Furthermore, because of the IMSSA’s lack of necessary resource information for the community to make full use of the land once the blockages are removed.

Rapid appraisal bias. Landmine Impact Surveys utilise 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 relies on local knowledge for a realistic understanding of the impact of the landmine on the community; however, this information collected is only as complete and reliable as the community sources providing it. It could be limited by the absence of displaced populations or by the lack of participation of women or others not available during the short visit. May be overestimated with the hope of obtaining the desired assistance or understood to avoid interruption of relief assistance, tourism or travel. The possibility that information is biased or provided “strategically” reinforces the need to seek multiple data points in order to confirm the accuracy and completeness of the information during operational task planning.

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Gender issues in mine-action surveys. Problems may be overstated with the hope of obtaining the desired assistance or understood to avoid interruption of relief assistance, tourism or travel. The possibility that information is biased or provided “strategically” reinforces the need to seek multiple data points in order to confirm the accuracy and completeness of the information during operational task planning.

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Contributing to Progress in Sri Lanka

This article highlights the activities of People to People International in Sri Lanka. As part of its commitment to Sri Lanka, PTPI not only assisted in the clearance of high-priority minefields, but also provided aid following the 2004 tsunami. Today, PTPI remains dedicated to helping the Sri Lankan people.

people to People International was founded by President Dwight D. Eisenhower in 1956 and is now led by his grand-daughter. Working with The HALO Trust, a non-profit organization specializing in the removal of war debris, PTPI has cleared 13 high-priority minefields totaling 2,952 square meters (0.3 acres) and containing nearly 600 mines in Sri Lanka since joining the U.S. Department of State’s Public-Private Partnership Program for Mine Action in 2002, according to Mary Jean Eisenhower, President and CEO of PTPI. People to People has embraced Sri Lanka and become a major contributor to the rebuilding of a country wracked by both man-made and natural disasters.

Today PTPI remains committed to helping Sri Lanka achieve its identified goal of becoming “mine-free,” thereby making it easier for the thousands of civilians who were displaced or forced out by the conflict to resettle in their homes and resume cultivating their land. In addition, PTPI has built three schools in the Jaffna area, which was hit hard by the December 2004 tsunami.

The 20 years of civil war between the government and the Liberation Tigers of Tamil Eelam took place mainly in northern and eastern Sri Lanka, home to a significant number of ethnic Tamils. Both the Sri Lankan Army and the LTTE used mines extensively throughout the conflict. The HALO Trust established an operations base in the northern Jaffna district, where the landmine problem is most significant. Its focus is on government-controlled areas, though it does provide assistance in LTTE-controlled areas on request.

Mary Eisenhower and PTPI’s Deputy CEO Marc Bright made their first trip to Sri Lanka in late 2003 to view the Jaffna region. Struck by the beautiful scenery left desolate because of the risks posed by mines, they returned with an increased determination to raise the funds necessary to finance a demining team.

Also in 2003, the government of Sri Lanka declared its goal of becoming a mine-free country within three years. The expansion of capacity needed to meet this goal is progressing more slowly than anticipated, forcing the date to be set back. Total clearance of high-priority areas, however, is achievable in 2007.

The goal set for PTPI’s project included clearance of 13 minefields, all of which are high-priority sites. Areas where landmines lay in close proximity or denied access to schools were of main concern. The first two cleared minefields were in the village of Chiruppiddi, approximately seven miles (11 kilometers) north of Jaffna town. It is a naturally fertile area—one of the best on the Sri Lankan mainland. The soil allows several crops to be grown in rotation annually and the need to remove arable farmland was urgent. The demining team cleared two minefields of 341 mines, and farmers have subsequently returned to the land.

Next, the team moved 12 miles (19 kilometers) northwest of Jaffna to the village of Srinivasan. Sri Lankan security forces seized this area in 1992, which led to the displacement of many citizens in the area. Previously, the land belonged to 70 people who mainly engaged in farming. In an area of 927 square meters (0.23 acre), the team cleared 62 mines.

The deminers also began clearing a minefield that lay in close proximity to a primary school. The minefield was separated from the school by nothing more than an old military defense line formed by a mound of dirt. It also denied access to agricultural land and blocked resettlement. Several accidents, some resulting in casualties, have taken place in the area.

Clearance of the premises of a second school followed, this time in Alavadi village. The number of students had decreased dramatically due to injuries on school grounds. In total, 14 mines were removed from the area, returning it to a usable state.

The second minefield in the Alavadi northern region lay in another area captured by Sri Lankan Security Forces. People had been permitted to resettle in the area in 1992, but livestock were often injured or killed by remaining mines in the years prior to the clearance of the area. A total of 399 square meters (0.1 acre) was cleared, and 14 mines were found and destroyed.

The team then moved on to clear two minefields in the high-priority area of Ravali. This village is located just before the entrance to the Military High Security Zone. An estimated 2,000 mines had been laid in the area by the SLA since 1995. The local population was in desperate need of land as houses were being built closer and closer to the minefield. Once the field was demined, it was put to use immediately for planting, grazing and transit to other agricultural areas.

Several schools in the same area were situated on or near LTTE-laid minefields, with no records available of where mines were laid. Mine removal within these fields required total clearance to a depth of about six inches (15 centimeters). In the Ilavalai area, 74 mines were removed from an area of 1,218 square meters (0.3 acre).

The final project for the PTPI-funded section was at the Manthikai School in northeast Jaffna. There, an SLA minefield crossed a path that was used by over 400 schoolchildren each day, clearing it restored confidence in safety to the local residents.

Eisenhower returned to Sri Lanka in 2005. While it was difficult to see the physical effects of the progress made by PTPI’s demining team, the effects of the 2004 tsunami were readily apparent. The Jaffna region was one of the hardest hit. Land around the schools may have been cleared of mines, but the schools themselves were swept away.

Eisenhower soon realized that the contributions made to PTPI’s Tsunami Relief Fund would be best put to use in Sri Lanka by continuing to assist the people of the country on the road to normal life in their native land. In less than a year, three new schools were built in the Jaffna region. Eisenhower and Bright returned a third time in April 2006 for the schools’ dedication ceremonies.

Since 2003, Liz Wegman has played an active role in scripting People to People International’s mission of promoting peace, understanding, and tolerance across the globe through the organization’s many projects and programs. She currently serves as the Managing Director of PTPI’s Operation Iraqi Children program and handles public relations for the organization.

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Sweden Supports OAS

The government of Sweden provided US$600,000 to the Organization of American States to support demining work in Nicaragua. The grant will also support a mine-risk education program, “Safe Step without Mine,” and rehabilitation/reintegration services for landmine victims.

Operations made possible by the grant from the Swedish International Development Agency will be coordinated through the OAS Mine Action Program. The donation will advance the Nicaraguan National Demining Plan by about 90 percent.

The OAS reports that, in 1990, more than 550,000 Nicaraguans lived within five kilometers (three miles) of a landmine-infested area; currently, fewer than 45,000 people live under those conditions.

The OAS is considering an expansion of rehabilitation and social reintegration programs because of strong financial support from nations such as Canada, Italy, Norway, Sweden and the United States. If enlarged, the programs would not only serve greater numbers in Nicaragua but also neighboring Honduras.
Humanitarian Landmine Action in China and the Role of the NGO

Though China is not a State Party to the Ottawa Convention, the country has long been involved in humanitarian efforts to alleviate the landmine problem. Nationally, China has launched mine-clearance campaigns, and has become a State Party to the Convention on Certain Conventional Weapons. Two organizations have also been established to alleviate the landmine problem.

Internationally, China has sponsored several mine-clearance workshops, and has promoted international partnerships to work toward mine clearance.

by Zhai Dequan (China Arms Control and Disarmament Association)

Being a State Party to the Convention on Certain Conventional Weapons and its Amended Protocol II, China has made tremendous efforts to promote exchanges and cooperation with the States Parties to the Ottawa Convention. China attaches great importance to the humanitarian issues of landmines and supports the efforts of the international community to address the problems caused by war and abusive use of landmines, which have inflicted heavy casualties on human lives and properties.

In the 1990s, China successfully undertook two major campaigns to clear the landmines in the provinces of Yunnan and Guangxi, removing the threats to the local civilians. This effort helped restore the local environment, rehabilitate victims and ensure the safety of border trade. In the two mine-clearing campaigns of 1992–1994 and 1994–1997, China cleared 800 square kilometers (116 square miles) of 830,000 landmines and properties, inflicted heavy casualties on human lives and properties.

In 2002, as part of a bilateral border agreement with Vietnam, China started a new mine-action activities in Guangxi and Yunnan. China and Vietnam agreed to complete the Technical Survey of mined areas by the year 2005, and it was completed on time in December 2005. China sent an expert mine-clearing group to Thailand to train the local personnel with Chinese-aided equipment. Representatives from China have also attended numerous mine-related meetings around the world.

In April 2004, an international workshop on humanitarian mine- and unexploded ordnance-clearance technology and cooperation in Kunming, the capital city of Yunnan province in southwestern China, was co-sponsored by the Arms Control Department of the Ministry of Foreign Affairs of China, the China Arms Control and Disarmament Association, and the Australian Network of the International Campaign to Ban Landmines. Representatives from 13 countries and eight international organizations and nongovernmental organizations were present. All the Chinese speakers at the opening ceremony acknowledged the need to address the continuing humanitarian crises caused by landmines and unexploded ordnances. The workshop featured an extensive exchange of views from research findings, mine-risk education, mine-victim assistance, rehabilitation and community reintegration to humanitarian de-mining and cooperation, and shared experiences in mine-action efficiency and technologies, including mechanical, explosive and manual practices.

In 2010, the Chinese delegation voted for Resolution L6 to implement the Ottawa Convention. This significant act shows that China attaches importance to the rule of the Convention and identifies with its final aim. It also shows that China is ready to join hands with the other States Parties to render new contributions to the thorough resolution of the humanitarian problems caused by AP mines. In November 2005, the Chinese Observers Delegation attended the Sixth Conference of the States Parties to the Ottawa Convention in Zagreb.

NGO and Corporate Activities in China

The China Arms Control and Disarmament Association, founded in August 2001 in Beijing, is the only nationwide nonprofit nongovernmental organization in China in the area of arms control, disarmament and nonproliferation of weapons of mass destruction. While CACDA is active in promoting domestic and international cooperation in mine action, it is also energetic in addressing the problems caused by AP mines by co-sponsoring workshops or seminars for academic exchanges of demining experiences and techniques, and updating equipment.

Among CACDAs’ dozen or more projects, there is one called Hukai Security Science and Technologies Co., Ltd., which is a private enterprise solely devoted to mine clearance. It was established in November 2004 after being approved by China’s State Department of Industrial and Commercial Administration. Hukai has a team of proficient and well-disciplined experts in mine clearance. Many of the personnel are demobilized former military officers and engineers from the Engineers Corps of the People’s Liberation Army of China.

Hukai has established two training facilities in Nanjing and Kunming to train international deminers. Hukai’s mine-clearance equipment is ranked among the best in the world. It was used and proven in the mine-clearance campaigns of the 1990s for its practicability, reliability, simplicity, operability, and low cost—all of which are particularly suitable for mine-clearance activities in developing countries.

Crisis caused by landmines and unexploded ordnances has been a serious threat to the lives of those in need by working in partnership with other organizations. Recently, CACDA and Handicap International–Belgium coproduced a documentary film about mine action. It is designed to be used for mine-risk education. The film covered the whole process of eliminating landmines—from the devastation of human lives, to loss of livelihood and property to humanitarian demining activities and rehabilitation with domestic and foreign assistance to community reconstruction. Another MRE film the company developed details the history of landmines development; the present international mine-action institutions and systems; conventions, protocols and agreements to limit, ban or destroy landmines; rules, regulations and mine-action standards; technological elaboration of landmine types, composition and their uses; reading markings; and demining methods and techniques. The film is designed to raise the landmine-risk awareness of the community.

China’s Demining Future

Although the need for mine clearance in the mine-affected countries of the world is extensive and demanding, the usual practice of multilateral cooperation among states, international institutions, enterprises and non-governmental organizations often falls short of a total solution to the problem. Therefore, it is necessary for all the parties to explore new ways to cooperate with one another, such as working on the same project, developing work equitably and taking full advantage of resources, information, technology, equipment, management, etc. The United Nations’ institutions must continue to be involved in organizing, coordinating and monitoring various activities.

Zhai Dequan, Deputy Secretary General, China Arms Control and Disarmament Association, was Head of the International Politics and Technical Studies for three years. Before this work, he served in the Foreign Affairs Bureau of the National Defense Ministry for 10 years. Graduated from Nanke University, he furthered his studies in international relations at Peking University and The George Washington University. Dequan is a summer 2006 graduate of the U.N. Senior Managers Course presented by the Mine Action Information Center at James Madison University.

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IMSMIA® Version 4: A Collaborative Approach

From July 24 to 27, 2006, the Geneva International Centre for Humanitarian Demining hosted a workshop in Murten, Switzerland, to introduce and discuss the release of the Information Management System for Mine Action version 4. Participants included management, operations and technology professionals involved in mine-action information management. During this workshop, results from IMSMA v4 pilot field tests were presented, v4 changes and innovations were explained, and a demonstration of IMSMA v4 with new handheld and Geographic Information System components was offered. IMSMA v4 reflects a collaborative effort to improve the accuracy and ease of mine-action information management in the field.

By Daniela Ressler [Mine Action Information Center]

IMSMIA is a licensed and registered trademark produced by the Geneva International Centre for Humanitarian Demining, created as a database to assist in managing and standardizing mine-action data collection and information management. IMSMA has undergone several updates since its first release in 1999. The most recent version of IMSMA, v4, has gone through pilot tests in five countries and is being refined for distribution by the GICHD to all existing IMSMA users by the end of 2007. The information-management workshop hosted by the GICHD provided a forum to discuss, plan and ask questions about the then-forthcoming v4.

IMSMIA v4: A Collaborative Effort

As Alan Arnold, Program Manager for the GICHD’s Mine Action Information Systems and host of the July workshop noted, IMSMA v4 is not simply an updated version of IMSMA v3, but is new and different in significant ways. The updates to IMSMA reflect an expanded effort unifying the collaboration of various groups in a variety of subject areas of expertise.

System and program improvements. After feedback from field users was collected to determine how the system could be improved, the GICHD completed an open tender process for the work required to redesign and develop a v4 application that would improve IMSMA’s capabilities as an information-management tool.

FGMI, Inc. assisted in providing information technology services to design some of IMSMA’s updated program applications. Version 6 is written in the Java programming language, allowing it to be compatible with a variety of operating systems, including Linux, and IMSMA no longer requires users to have Microsoft® Office or Microsoft Access database capabilities.

Building on the concepts expressed in v3, v4 provides even greater flexibility and allows users to create a customized information-management system that suits the needs of their specific mine-action situation. One example of this is that, unlike previous versions of IMSMA, which offered only predefined forms, v4 allows users to create or alter all data-collection tools (e.g., forms and surveys), reports and elements. Version 4 provides some default forms with most of the elements that were in the v3 forms, but v4 now allows these to be changed.

Additionally, new forms can be completely designed locally and from scratch. Also, v4 users can add their own forms and elements to IMSMA, assigning them to the preferred “user-defined data fields” that already exist in the system. This allows users to customize the data collection process using locally produced forms and systems-access permissions.

Flexibility is furthered with the introduction of expanded language options. Using new language-translation features, v4 can be translated into virtually any language and currently ships with Arabic, English, French, Portuguese, Russian and Spanish. If there are software users with different language preferences, the shared system allows any of these languages to be used simultaneously and in formation to be listed multiple times in different languages. Users can also now add and publish locally created forms in other regional languages.

GISM and “locality” basis. One of the major updates in v4 is the integration of a Geographic Information System component. This additional provides a graphical interface on the basic screen that is used to organize IMSMA data around the concept of “location.” Data and reports are represented by symbols on the map found on the main screen and can be accessed by theme, report, incident, date or location for geographic reports and analysis. Multiple reports associated with a single location can be stored and evaluated cumulatively over time.

The University of Kansas’ Department of Geography and Kansas Applied Remote Sensing Program joined the collaborative effort of v4, and the University’s Matt Dunbar presented a module on GIS at the conference. The University of Kansas team has created a new and standardized set of humanitarian-mine-action symbols that are used in v4’s display. They have also supplied joint operations graphic maps, Landsat satellite imagery, elevation data and population data into IMSMA v4 that are specialized for each country.

Handheld unit. A final innovation to IMSMA v4 is an additional handheld tool that allows field personnel to capture information and transfer it to their main IMSMA database with ease. The Swedish Armed Forces engineered the handheld unit through their Swedish Explosive Ordinance Disposal and Demining Centre and it connects to a computer (Windows Mobile 5) with a Global Positioning System, laser rangefinder binoculars and a digital camera all connected by Bluetooth® wireless technology. Formally called the Explosive Ordnance Disposal Information System Survey Tool, the EOD IS-SURVEY allows users to:

• Download IMSMA forms and data to the wireless handheld computer unit
• Enter data into forms while in the field during surveying (with location information from the GPS and the laser binoculars connected directly to the wireless handheld unit)
• Attach and save photos or other files (e.g., maps, geosetter, dataset information) to or from the wireless unit
• Transfer all data back to the main IMSMA database

With the technical assistance of FGMI, Inc., the IMSMA v4 developers, the mine-action eXensible Mark-up Language was programmed into IMSMA v4 allowing for the transmission of standardized data between different information systems; maXML is the schema that links the metadata specifications and therefore the information between IMSMA (in Java) and the EOD IS-SURVEY (using a Microsoft product) by creating a common language. Unlike the handheld data-collection implementation used with v3, IMSMA v4 allows for the direct translation of data between the handheld and IMSMA program, making it easier to transfer information between the two.

The EOD IS-SURVEY has been field-tested in a number of locations and the team from the University of Kansas has also produced a formal report documenting these evaluations.

EOD IS-SURVEY Demonstration and Country Presentations

Two highlights of the conference were a hands-on demonstration of the new EOD IS-SURVEY handheld unit as the field survey and reporting tool for IMSMA v4 and presentations about the results of IMSMA v4 pilot testing in five countries.

The EOD IS-SURVEY, engineered by FGMEIS, is a wireless handheld computer set that collects and stores data on the field to transfer to the IMSMA database. All photos courtesy of University of Kansas.
The use of v4 will allow Argentina and the future goals for v4 highlighted the potential United Kingdom to coordinate and share national mine-action center but to also expected to visualize the threat situation in a country or region. The updated v4 allows for new languages, the freedom to create and modify forms and reports, and the ability to combine and link data in-also to be able to electronically transmit data between regional centers and organizations rather than traveling through conflict zones. Jordan discussed using v4 as a tool for improved quality management and organizational coordination activities. In the case of the Falkland Islands, the use of v4 will allow Argentina and the United Kingdom to coordinate and share national data for clearance efforts. Uganda’s future goals for v4 highlighted the potential for IMSMA to not only operate within its national mine-action center but also expanded beyond mine action, with plans for the integration of health, refugee and development data to collect and manage disaster-management/early-recovery planning. In all five cases, the expanded language options were noted as important and useful.

Conclusion

Some of the changes in v4 offer potential improvements in mine-action information management by allowing flexibility, creativity and linkage of different systems in IMSMA. The integration of a fully functional GIS into the system allows users to navigate the database using the map rather than working directly in the database itself. Combined with the direct transfer of field data to IMSMA from the EOD IS-SURVEY database, users will find that IMSMA v4 can help reduce data-collection errors, speeds up the integration of new data from the field and makes it easier to visualize the threat situation in a country or region. The updated v4 allows for new languages, the freedom to create and modify forms and reports, and the ability to combine and link data in adventurous ways. The pilot test results from five countries reinforced the potential that v4 has to address a variety of mine-action situations that are in new, dynamic, customizable and innovative features. The GICHD distributes IMSMA software at no charge and provides on-site training for its use. GICHD staff can transfer all data from earlier versions of IMSMA to the v4. New or updated equipment is not required for v4 and users do not need to purchase GIS software or licenses in order to use the mapping features. The GICHD, in collaboration with FGMI, Inc., the University of Kansas and the Swedish Explosives Ordnance Disposal and Demining Centers have applied their efforts to create not just an updated version of IMSMA, but a different and innovative one. 

New Study Guides

In collaboration with UNICEF, the GICHD has recently completed a series of IMSMA mine-risk education best-practice guidebooks. These guidebooks address a wide range of issues, including coordinating MRE, disseminating public information, implementing projects, establishing community mine-action liaisons, and conducting MRE in emergencies. The primary aim of the books is to provide advice, tools and guidance to undertake MRE programs in conflict situations. They are also intended to provide a framework for a more predictable, systematic and integrated approach to mine-risk education. They will be useful to anyone engaged in planning, managing, funding or evaluating MRE programs and projects.

The Geneva International Centre for Humanitarian Demining provides operational assistance to mine-action programs and operators, and creates and disseminates knowledge, works to improve quality management and standards, and provides support to instruments of international law.

by Ian Mansfield [Geneva International Centre for Humanitarian Demining]
Mine Victims Needs Assessment and Assistance Coordination

A UNICEF feasibility study conducted in early 2001 showed that medical and surgical facilities in Azerbaijan are adequate to meet the immediate needs of mine survivors. In general, physical-rehabilitation facilities are also considered suitable; however, the lack of psychosocial support to assist mine survivors with a disability is of particular concern. The study concluded that an integrated and comprehensive assistance program could not be established for the mine victims of Azerbaijan until a needs assessment was completed. In response, Azerbaijan planned and conducted a national survey to assess mine victims’ needs, including prosthetic, social and economic needs, as a first step to developing national mine-victim-assistance priorities and programs. The results of the assessment are discussed in this article.

In January 2001, UNICEF Mine Action Coordinator Telnaz Danarova conducted a national mine-action feasibility study in Azerbaijan, which highlighted the need for comprehensive mine action. Since then, the Azerbaijan National Agency for Mine Action has been developing mine-victim assistance and implementing MVA-related activities. ANAMA’s strategy involves combining the efforts of national and international organizations in assessing disabled people, as well as in developing and implementing a long-term MVA strategy for Azerbaijan. The Countrywide Mine/UXO Victims Needs Assessment Survey project was developed in 2003 and implemented in 2004 to collect the data necessary to address MVA needs in Azerbaijan.

The MVA Survey’s objectives included establishing an extensive database, developing a well-articulated strategy and creating an effective network of relevant stakeholders in MVA. This survey was an integral part of the overall project entitled “Support to Azerbaijan Mine Action Programme,” which was funded by the European Commission. An MVA working group was established to complete the project planning, design and implementation phases. The working group consists of representatives of relevant ministries, governmental agencies, and national and international nongovernmental organizations.

The working group thoroughly discussed project-related issues and predisposed partner organizations for the implementation phase. These discussions also encouraged ANAMA to conduct a pilot survey in the Fundi district. The results became part of the data of MVA Assessment Survey. The working group will continue coordinating future activities based on the needs-assessment survey results.

The International Eurasia Press Fund was chosen to administer and lead the survey as this nongovernmental organization had experienced gained from conducting two previous surveys in Azerbaijan. Representatives of three other NGOs actively taking part in the MVA working group—Drs. Rashid, Shahin, and Babadagh—were also involved in this survey.

The Ministries of Defense and Domestic Affairs supplemented preliminary information on mine- and/and/or ordnance-related casualties in addition to data from ANAMA’s Mine Information Management System for Mine Action database. The local branches and local authorities of the Republic Military Commissariat also provided information on mine/UXO survivors. The Ministry of Health and the Ministry of Labor and Social Protection of Population activity facilitated arrangements related to the survey.

MVA and an MVA Assessment Add-on

Data on almost 2,000 survivors was extracted from about 70 different source lists. The most comprehensive list was for the ANAMA IMSMA database, although much of this information was already outdated. Unfortunately, media announcements failed to attract participants who could offer additional information about mine/UXO victims. In addition to information gathered to answer the standard IMSMA form, which is mainly focused on details of each incident and emergency medical care provided, an MVA Assessment Survey questionnaire gathered comprehensive information on the needs of survivors for medical and psychosocial care, physical and vocational rehabilitation, economic assistance and advocacy, as well as for education, training and sports.

Consequently, the incident details and needs of 1,883 mine survivors were encompassed in both the standard IMSMA incident casualty report and another relational Microsoft® Access database for the additional comprehensive questionnaire data. This new database consisted of seven tables for medical care, physical rehabilitation, social adaptation, economic assistance, professional rehabilitation, education, and sport needs, and additional information, which mainly reflects economic status of the survivor. The data was prepared as tables and charts, which were analyzed and summarized. This Access add-on database is related to the various tables in the IMSMA database and further relations can be added if necessary.

Technical assistance was provided for the MVA Assessment Survey to develop the special Access add-on to IMSMA, ensuring accurate data entry, check quality, and extensively review and analyze the data. Together with the information already stored by IMSMA about devices, general survey victim data and impact data from the Landmine Impact Survey, this add-on included multiple references of the newly gathered victim data and identified needs. A special Geographic Information System function was introduced to allow the team to present all the data according to geographic distribution as well.

Capacity Developed

As a result of the project being implemented, 15 people were trained in survey procedures and interviewing techniques, 10 of them gained wide experience in the practical application of this knowledge. Seven people learned the data-entry process, having been introduced to it through IMSMA and Microsoft Access. Shamil Vagunov, ANAMA Mine Information System Supervisor, developed various themes with IMSMA’s Geographic Information System function to represent the spatial data. Extensive expertise was attained in multi-criteria data analysis as well as by finding patterns, correlations and conclusions from the responses to the different survey questions. Some results of the Countrywide Mine/UXO Victim Needs Assessment Survey are presented below.

MVA Assessment Survey Results

Medical care.

Surgical intervention needs were mentioned in 1,379 cases. Fragment extraction accounted for the greatest number of these interventions (544 cases). Some expressed a need for additional surgery, including 21 operations on residual limbs. Eighty people emphasized their need for plastic surgery.

The Medical treatment or consultation with specialists was also a predominant need. The need for a neurologist was mentioned by 1,552 people. A vast number of treatment requests was requested by 850 people. While 802 people required the services of a general surgeon, just over one-seventh of this number—127 persons—actually needed surgical operations due to recent mine/UXO trauma. The rest were suffering from age-specific problems years after the incident, such as body growth or shrinkage.

Tooth extraction accounted for the greatest number—127 persons—of these interventions (544 cases). Some expressed a need for additional surgery, including 21 operations on residual limbs. Eighty people emphasized their need for plastic surgery.

While 802 people required the services of a general surgeon, just over one-seventh of this number—127 persons—actually needed surgical operations due to recent mine/UXO trauma. The rest were suffering from age-specific problems years after the incident, such as body growth or shrinkage.

Physical rehabilitation needs: limbs.

Total prosthesis needs were as follows:

• 65 arms (620 persons, of which 220 required prosthetic devices)
• 632 legs and 63 feet (620 persons, of which 220 required prosthetic devices)
• 627 legs and 63 feet (620 persons, of which 53 required prosthesis devices)

• 627 legs and 63 feet (620 persons, of which 53 required prosthesis devices)
Needs for prothetic and assistive devices are outlined in Table 1. A total of 1,883 respondents were interviewed during the survey. The project was titled ‘A Phase II of Mine Action: Humanitarian Mine Action in Azerbaijan’ funded by the European Union. The aim of the study was to assess the prevalence and severity of disabilities among mine victims in Azerbaijan and to determine the need for prothetic and assistive devices.

### Table 1: Prosthetic and assistive devices needed.

<table>
<thead>
<tr>
<th>Prostheses</th>
<th>Orthopedic Operations</th>
<th>Orthopedic Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below knee</td>
<td>1,060 Replacements</td>
<td>213 Armchairs</td>
</tr>
<tr>
<td>Above knee</td>
<td>58 Repair</td>
<td>186 Wheelchairs</td>
</tr>
<tr>
<td>Foot</td>
<td>14 Fitting</td>
<td>119 Crutches</td>
</tr>
<tr>
<td>Below elbow</td>
<td>20 Repair</td>
<td>25 Walking sticks</td>
</tr>
<tr>
<td>Above elbow</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Hand</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Average salary and minimum cost of living estimates in U.S. dollars.

<table>
<thead>
<tr>
<th>Description</th>
<th>Average Salary</th>
<th>Minimum Consumer Basket per Person</th>
<th>Minimum Expenditure per Working Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average salary</td>
<td>$100</td>
<td>$75</td>
<td>$85</td>
</tr>
</tbody>
</table>

In many cases, the disability pension of the mine victim was a big portion of a limited income. Therefore, the unemployment rate was very high, and the other sources of income were the pensions of other family members and, in some cases, additional allowances provided for children, internally displaced person status, or other reasons.

The highest incidence of families with an income not exceeding $300,000 Azerbaijan manats per month (at the time of the survey) was found in the districts of Tovuz (61 of 67) and Goranboy (105 of 154) and in the city of Sumgayit (51 of 57).

### Distribution by Age

Of a total 1,883 interviewees, 1,775 people had information on the incident date and the distribution by age was considered to be applicable only for them. Several years had passed since many of the respondents’ mine incidents. As they aged, they experienced physical problems related to the incident as well as additional complications due to other illnesses and the economic difficulties of life as IDPs. In addition, their situations became much harder due to the impact of other disasters.

This mine victim, interviewed during the survey, was a child when the accident happened. (Photo courtesy of Ahnara)

### Notes

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Published by JMU Scholarly Commons, 2006 | 10.2 | winter 2006 | JMU Scholarly Commons, 2006 | 39
Most of the losses and injuries of civilians arise due to negligence and carelessness. Civilians involved in non-military activities accounted for 103 of 145 cases with loss of an arm or hand, eyesight or hearing and 43 of the 192 cases of lower limb amputations. In some cases, civilians were tampering with explosive devices and in other cases they were crossing into restricted areas. It can be concluded that in a number of cases civilian casualties resulted from treating explosive ordnance carelessly.

Recommendations

The main recommendations derived from the survey are as follows:

- Further coordination of mine-victim-assistance activities: Activities of various governmental and nongovernmental entities should continue their joint efforts within the MVA working group, ensuring constant efforts toward sensitizing society to the problems of mine victims and persons with disabilities in general.
- Development of MVA projects and identification of implementing agencies: For projects developed using the needs-assessment-survey data, the emphasis should be on projects empowering the community, e.g., through establishment of associations for mine/UXO victims.
- Establishment of a charitable fund for MVA: Acting within the Azerbaijani legislative framework, a charity should be established to attract money from national and international organizations and individuals to fund various MVA projects.
- Monitoring of the level of mine/UXO victim assistance: For each victim, the level of medical and physical rehabilitation measures, together with the degree of social reintegration and professional rehabilitation, should be evaluated over the course of a year using various methods. Articles about MVA should be published in international and national journals, newspapers and magazines whenever possible to continue educating the public on mine victims in Azerbaijan.

Mime Ban Convention

The Tamil people moved from the southern part of India to Sri Lanka around the 16th century and they struggled with the kingdom of Sri Lanka on and off throughout history. Since 1983, a Sri Lankan separatist group, the Liberation Tigers of Tamil Eelam, has fought with the central government of Sri Lanka for a separate homeland for minority Sri Lankan Tamils. The decades of conflict have resulted in the destruction of large areas of fertile agricultural lands, commercial areas, residential areas, roads and water resources. Lastly, as people tried to restoring these areas, they encountered landmines and many became disabled.

Mine Ban Convention

The Sri Lankan government has not signed the Antipersonnel Mine Ban Convention.

Effects of Landmines on Sri Lanka

In Sri Lanka, statistics show people between the ages of 20 and 45 are the most likely to be injured by landmines. When they are disabled, they become a burden to the country’s economy, requiring assistance instead of contributing to the country’s growth. This article discusses how landmines affect Sri Lanka and the efforts being undertaken to lessen their impact.

by K.T. Marzuka Udayanga Hemapala | University of Genova

1. Manual clearance—an effective but slow process
2. Manual clearance with support of mine-detecting dogs—a good method but very difficult in some areas, because the dogs can become confused if they smell explosives coming from several sources at once.
3. Mechanical clearance—the fastest method, but less effective. The speed of manual demining is approximately 25 square meters (30 square yards) per hour. Using explosives-detecting dogs is also a rather difficult process because the effectiveness of the dogs depends entirely on their level of training and the skill of their handlers. Also, all EDDs are brought from foreign countries and are not used to the Sri Lankan climate, so they tire quickly. Mechanical mine clearance is the fastest method employed in Sri Lanka. The MVS-4 Mini Flail System® has an average speed around 2,000 square meters (2,400 square yards) per hour for light soil and 1,600 square meters (1,800 square yards) per hour for heavy soil. The Bozenta 4® clears around 2,000 square meters (3,000 square yards) per hour for light soil and 500 square meters (630 square yards) per hour in heavy soil.
2006 UNMAO Planning Process in Sudan

A national strategic framework for mine-action efforts in Sudan drives the development of several planning documents that involved several national and international organisations to ensure the successful implementation of a successful framework. The author discusses the development process for the various national mine-action planning documents.

By Hansie Heymans | United Nations Mine Action Office in Sudan |

The Annual Operational Plan is the final output for the overall mine-action planning process. This process follows directly from the Mine Action Strategic Framework that was developed and signed in 2004. Based on the Framework, the United Nations used the Portfolio of Mine Action Projects’ process to develop a list of proposed projects for various mine-action players. From the prioritisation process, mine-action stakeholders such as the United Nations, local authorities and nongovernmental organisations (fiscal and internationally supported) and agreed upon the United Nations and Partners 2006 Work Plan for Sudan.

Based on these processes stakeholders developed the 2006 Annual Operational Plan using the logical framework analysis. Figure 1 illustrates the overall process followed in Sudan to develop these separate but interrelated documents for mine-action planning. The results of these processes are:

- Portfolio of Mine Action Projects for Sudan
- United Nations and Partners 2006 Work Plan for Sudan
- Mine Action Annual Operational Plan for Sudan

The processes are listed in the centre blocks of the figure (e.g., input from stakeholders, Portfolio and Work Plan; and regional priority development and priority setting). The final products of the three processes were the 2006 MAP document, the Work Plan for 2006 and the 2006 Annual Operational Plan.

The preparation and development of the Portfolio of Mine Action Projects started in June 2005. Input was requested from U.N. agencies, national authorities and nongovernmental organisations. The MAP strategic priorities were used to develop project sheets supporting the MAP. Project sheets are used to submit and register a project in the MAP. The development of the MAP was facilitated through two review panels—one in the south representing the SPLM and one in the north representing the government of Sudan. The panels consisted of members from nongovernmental organisations, mining organisations and the United Nations.

The panels reviewed all project sheets, ensuring all projects support the MAP strategic priorities and were overseen and approved by both mine-action authorities. Participating U.N. agencies, national and international NGOs and the national mine-action authorities completed the final in-country review of all project sheets in August 2005 and submitted them to UNMAS–New York for review. Together, they submitted well over 30 projects.

2006 Work Plan

In June 2005, the U.N. Country Team started work on the Work Plan for 2006, developing U.N. Strategic Priorities for Sudan. Mine-action stakeholders developed the mine-action sector priorities using the MAP as a starting point. After these priorities were finalised, mine-action objectives were developed involving all mine-action partners. Both national mine-action authorities approved these objectives before they could be presented to the U.N. Country Team. As with the MAP, this process included other U.N. agencies, demining

Planning Process in Sudan

![Diagram of planning process in Sudan](Image)

<table>
<thead>
<tr>
<th>Planning Process in Sudan</th>
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<tbody>
<tr>
<td><strong>Input from:</strong></td>
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<td>Mine Action Projects</td>
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<tr>
<td>- Portfolio of Mine Action Projects for Sudan</td>
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<td>- United Nations and Partners 2006 Work Plan for Sudan</td>
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<td>- Mine Action Annual Operational Plan for Sudan</td>
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<td><strong>Processes:</strong></td>
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<tr>
<td>- Portfolio process</td>
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<tr>
<td>- Input to National Documents</td>
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<td>- Regional Priority Development</td>
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<td>- Regional Input to National Documents</td>
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<tr>
<td><strong>Final Products:</strong></td>
</tr>
<tr>
<td>- 2006 MAP document</td>
</tr>
<tr>
<td>- Work Plan for 2006</td>
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<td>- 2006 Annual Operational Plan</td>
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</table>

Portfolio of Mine Action Projects

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News Brief

Mine-action Society Formed in Kurdistan

Although a Mine Action Process began in Iraqi Kurdistan more than a decade ago, a considerable threat from landmines and unexploded ordnance remains in the region. Qualified and committed professionals have been working to reduce the impact of the threat, often at their own peril, but a vacuum remained in terms of formal collaboration among these parties. To address this need, the Pria Society for Mine Action Professionals was formed with the permission of the Ministry of the Interior. The Society works to improve and enhance the working conditions of demining personnel operating in Kurdistan. All mine-action personnel working in the region are encouraged to join by registering their names with the Society. For more information, contact Jamal Jalal via e-mail at Jamal.jalal@minac.org or jamaljalalman.com or by telephone at +964 6 1248 445 859.

Cost for manual demining

- Average cost per deminer: US$10,000/year
- Daily working hours: 8 hours
- Speed of a manual deminer: 25 m/h
- Working days per year: 240 days
- Specific cost of manual demining: $10,000 / 240 days = $US41.67/m2

Cost for mechanical mine clearance

| Investment cost for MX-4 Mini Final System | US$138,000 |
| Fuel consumption | 12 liters per hour |
| Area cleared per day | 1500 m2 / day |
| Cost of fuel | US$1 per liter |
| Operating cost per day | (12 liters x US$1 / liter) x 240 days = US$3,200 |
| Specific cost of mechanical clearance | US$3,200 / 1500 m2 = US$2.13/m2 |

Table 2: Costs for mechanical mine clearance in Sri Lanka.

The other important factor concerning demining efforts in Sri Lanka, after speed and efficiency, is cost. Table 1 shows the factors that affect the costs of manual demining and mechanical mine clearance. By comparing Table 1 to Table 2, one can see the operating costs of demining machines is less than that of manual demining. However, the most problematic element in mechanical demining is the initial capital expenditure on the machine itself. Sri Lankan technicians are not familiar with the technology behind the machines mentioned above; therefore, after the warranty period, maintenance costs will be high because the machines will require specialists to fix them and the parts are difficult to find.

Conclusion

When considering the challenges of demining in Sri Lanka, it is vital to understand the importance of developing new technologies or introducing existing current technology to improve the efficiency of the task—but only with proper training. Humanitarian-demining efforts in Sri Lanka are daunting, not only the threat in the ground but due to the tense situation between rebel groups and the Sri Lankan government as well. See Endnote, page 111

Udżąganwa Hermapihasa is a doctoral student at the University of San Diego, USA. He is working in the demining group of the Laboratory of Design and Measurement for Automation and Robotics (PMAbash). He graduated from the University of Moratuwa, Sri Lanka, with a degree in electrical engineering.

2006 UNMAO Planning Process in Sudan

A national strategic framework for mine-action efforts in Sudan drives the development of several planning documents that involved several national and international organisations to ensure the successful implementation of a successful framework. The author discusses the development process for the various national mine-action planning documents.

By Hansie Heymans | United Nations Mine Action Office in Sudan |

The Annual Operational Plan is the final output for the overall mine-action planning process. This process follows directly from the Mine Action Strategic Framework that was developed and signed in 2004. Based on the Framework, the United Nations used the Portfolio of Mine Action Projects’ process to develop a list of proposed projects for various mine-action players. From the prioritisation process, mine-action stakeholders such as the United Nations, local authorities and nongovernmental organisations (fiscal and internationally supported) and agreed upon the United Nations and Partners 2006 Work Plan for Sudan.

Based on these processes, stakeholders developed the 2006 Annual Operational Plan using the logical framework analysis. Figure 1 illustrates the overall process followed in Sudan to develop these separate but interrelated documents for mine-action planning. The results of these processes are:

- Portfolio of Mine Action Projects for Sudan
- United Nations and Partners 2006 Work Plan for Sudan
- Mine Action Annual Operational Plan for Sudan

The processes are listed in the centre blocks of the figure (e.g., input from stakeholders, Portfolio and Work Plan; and regional priority development and priority setting). The final products of the three processes were the 2006 MAP document, the Work Plan for 2006 and the 2006 Annual Operational Plan.

Mine Action Strategic Framework

The Mine Action Strategic Framework was developed in 2004. The United Nations Mine Action Service and the United Nations Development Programme jointly led this process, which involved the authorities from both North and South Sudan. The government of Sudan (GoS) and the Sudan People’s Liberation Movement both agreed upon and approved the MAP. The document was developed before the GoS and the SPLM signed the Comprehensive Peace Agreement and consequently was revised in 2006, therefore the MAP serves as the guiding tool for the development process. The development of the Portfolio and the 2006 Work Plan should be guided by the overall strategic priorities identified in the document.

The task of developing the Strategic Framework was split into four major objectives.

1. Portfolio Process

   - Production of the Portfolio of Mine Action Projects for Sudan
   - United Nations and Partners 2006 Work Plan for Sudan
   - Mine Action Annual Operational Plan for Sudan

2. Mine Action Strategic Framework

   - The Portfolio process
   - The Work Plan for 2006
   - The 2006 Annual Operational Plan

3. Regional Priority Development

4. Regional Input to National Documents

   - Portfolio of Mine Action Projects
   - Mine Action Annual Operational Plan for Sudan
   - Mine Action Strategic Framework

Input from:

- Mine Action Projects
- Mine Action Strategic Framework
- Mine Action Annual Operational Plan
- Portfolio of Mine Action Projects
- Mine Action Strategic Framework
- Mine Action Annual Operational Plan

Output from:

- Mine Action Projects
- Mine Action Strategic Framework
- Mine Action Annual Operational Plan
- Portfolio of Mine Action Projects
- Mine Action Strategic Framework
- Mine Action Annual Operational Plan

Portfolio of Mine Action Projects

The preparation and development of the Portfolio of Mine Action Projects started in June 2005. Input was requested from U.N. agencies, national authorities and nongovernmental organisations. The MAP strategic priorities were used to develop project sheets supporting the MAP. Project sheets are used to submit and register a project in the MAP. The development of the MAP was facilitated through two review panels—one in the south representing the SPLM and one in the north representing the government of Sudan. The panels consisted of members from nongovernmental organisations, mining organisations and the United Nations. The panels reviewed all project sheets, ensuring all projects support the MAP strategic priorities and were overseen and approved by both mine-action authorities. Participating U.N. agencies, national and international NGOs and the national mine-action authorities completed the final in-country review of all project sheets in August 2005 and submitted them to UNMAS–New York for review. Together, they submitted well over 30 projects.

2006 Work Plan

In June 2005, the U.N. Country Team started work on the Work Plan for 2006, developing U.N. Strategic Priorities for Sudan. Mine-action stakeholders developed the mine-action sector priorities using the MAP as a starting point. After these priorities were finalised, mine-action objectives were developed involving all mine-action partners. Both national mine-action authorities approved these objectives before they could be presented to the U.N. Country Team. As with the MAP, this process included other U.N. agencies, demining
While these objectives relate to the pillars of mine action with either a humanitarian or recovery focus, they do not make explicit provision for the definition of their respective information management. It was decided that three more “internal objectives” would be added to ensure that the mine-action support services and information management can develop internal operational plans to support the MAF.

- **Information management:** Establishing an efficient and effective information management system in support of UNMAS mine-action operations through:
  - Institutionalising the Information System for Mine Action as the information management system within the Sudan Mine Action Program through the implementation of information systems and policy and training.
  - Developing and maintaining a fully functional IT infrastructure to provide networking and inter-networking capabilities at UNMAS headquarters, regional offices and sub-offices.

- **Support services:** Providing professional and effective administrative, financial and logistical services in support of UNMAS operations at the national and regional level.

- **Coordination and facilitation:** Efficiently and effectively coordinating and facilitating mine-action stakeholder and participants in Sudan.

The process takes into consideration input from all mine-action implementing partners, local authorities and setting of priorities to relieve suffering more effectively and efficiently. See Endnotes, page 111
Northern Regional Mine Action Office in Khartoum in April 2002, the Regional Mine Action Office in Khashgi in August 2002 and the Southern Regional Mine Action Office in Juba in March 2003, a substantial amount of data concerning suspected and actual mined areas, mined roads and landmine victims was collected and entered. A large amount of information other than cleared mines, unexploded ordnance locations, ammunition dumps and the opening of quarries has been collected and recorded during the last two years of operations. Subsequent documentation and analysis of the information demonstrate how the landmine threat in Sudan has a significant and negative impact on the development of the country by restricting the access routes of the U.N. Mission in Sudan and also access of humanitarian aid and natural resources. Mine-action operations in Sudan have been enhanced and strengthened by the potential for adding support tools to IMSMA. Support tools for capturing data on road assessment, road construction/repair, quality assurance, victim assistance and MRE were designed and introduced. Some of these tools have been shared with other countries such as Afghanistan, Sri Lanka and Mozambique. The data collected has enhanced the information flow and increased the pace of the mine-action activities. The information-management policy documents, specifically tailored to the nature of Sudanese mine-action operations, is a document supporting the systematic and methodological procedures of information management in the mine-action programme. This document explains the modules used in IMSMA and its supportive tools, the information flow in the Sudan Mine Action Programme, responsibility of the individual for information flow and other relevant data-management issues. A training curriculum for the operational use of IMSMA has been developed for the Sudan MAP. The training curriculum includes all the topics that are used for data management at the operational level, such as planning and other management issues. IMSMA is used in Sudan as an actual operations tool. To this end, comprehensive training was conducted in two sessions, one in Khartoum in October 2005 and the other in Rumbek in February 2006, for the Operations and Quality Assurance Officers on the use of IMSMA. The training brought great changes in the information flow and reporting procedures. IMSMA is widely used within the programme in day-to-day operational activities, planning and other management issues. All mine-action offices in Sudan can produce IMSMA output, such as maps, graphic presentations and data for planning, to educate people about the impact of landmines/UXO and to reduce the risk associated with mines, an interest broadly shared by the U.N. community, aid organisations and other interested parties. The information-management section is working closely with United Nations Mission in Sudan, the World Food Programme, the International Organisation for Migration, the U.N. Joint Logisties Centre and the U.N. Commission on Human Rights to develop a common system (not IMSMA, but compatible with it) that can facilitate integrated planning for humanitarian interventions in Sudan. In particular, this system could assist with tracking internally displaced persons/refugees and anticipating their movements and proximity to known/suspected mined or dangerous areas.

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Mine Action Support Group Update

This article contains excerpts from the United Nations’ third quarterly newsletter, which highlights the activities of the Mine Action Support Group from July to September 2006, including updates from the United Nations Mine Action Service, the United Nations Development Programme and UNICEF.

T he Mine Action Support Group meets four times a year to facilitate discussion between donors and U.N. mine-action partners. The MAG has 27 members and invites representatives from mine-affected countries, experts and non-governmental organizations to share information about mine action in their countries. The group’s goal is to simplify donors’ coordination and ease funding. The United States chaired the group in 2006 and will continue to do so through 2007.

Developments in UNMAS Programs

Afghanistan. Over the summer, an excess of 6.5 million square meters (1,006 acres) of minefields and 29 million square meters (7,160 acres) of former battlefields were cleared, while 74 million square meters (1,829 acres) of minefields and 355 million square meters (976 acres) of former battlefields were destroyed, for a total of 130,645 acres of former battlefields cleared. Under the supervision of 25 quality assurance teams directed by the United Nations Mine Action Centre for Afghanistan, 125 manual-clearance teams, 44 mechanical teams, 33 mine-dog groups, 76 risk-assessment teams and 60 explosive-ordnance-disposal teams implemented this work. Ninety mine-risk education teams operate nationally, including community- and clinic-based programs, public cinema and encampment centers, and from January to September 2006 the teams reached over 720,000 people in direct campaigns. As of September 30, 2006, there were over 360 persons injured and 60 killed according to statistics, but such incidents are considered to be under-reported.

Security is a problem in the country, with operations in the south and east disrupted both by security incidents and Afghan and international military force operations. Mine-action teams and personnel have suffered a number of direct attacks, including hijackings, thefts and kidnappings. UNMACA continues to monitor the security situation and assist operations in the country. Support tools for capturing data on road assessments, road clearance/verification, quality assurance and other management issues have been hampered recently by changes in government personnel.

Lebanon—Rapid Response. The 34 days of hostilities between Israel and armed elements based in Lebanon resulted in extensive unexploded-ordnance contamination in southern Lebanon, mainly in the form of unexploded cluster bombs and submunitions, with more limited contamination in other parts of the country. The U.N. Mine Action Teams involved the Inter-agency Rapid Response Plan to support Lebanese authorities (namely the National Demining Office) in addressing clearance and mine-risk education needs, supporting humanitarian agencies and deploying an expanded United Nations Interagency Force in Lebanon as a Mine Action Planning Group, including U.N. agencies and implementing partners, was formed and convened meetings on July 27 and August 9. In addition to holding a donor meeting at UNMAS on August 10, the Mine Action Team utilized the Mine Action Support Group network to issue letters updating donors on the scope of the problem, the operational response and funding requirements.

The National Demining Office, working in Beirut with UNDP Technical Advisor and an UNMAS Coordination Officer and in coordination with the UNMAS-managed Mine Action Centre, South Lebanon, planned and conducted the response. The National Risk Education Steering Committee, with support from UNICEF, launched a mass-media awareness campaign for refugees in Syria and for people throughout Lebanon. While the total amount of UXO in southern Lebanon is unknown, as of October 10, 2006, 770 individual cluster-bomb-strike sites have been identified. Reported casualties total 126, with 18 killed and 108 injured. Internally displaced persons have been hampered recently by changes in government personnel.
40,000 pieces of UXO have been cleared. The U.N. Mine Action Team will take on other bilateral contributions. The U.N. Mine Action Team will work with Japan. For 2007, the governments of Greece and South Korea will contribute. These developments are supported by the European Commission and the governments of Italy and the UK Department for International Development.

The Iraqi Landmine Impact Survey is complete, covering 15 of the 18 governorates. Landmines or unexploded ordnance contaminate 2,117 communities or about 17 percent of the total studied. The majority of the contaminated communities are blocked from the productive use of their land. The surveyors documented 577 recent victims of landmines and UXO. More than 2.7 million persons live in these contaminated and impacted communities. Under the field supervision of UN and Jordanian teams, 10 national explosive-disposal teams have improved the safety of more than 300 farming families and made more than 24,300,000 square meters (5,994 acres) available for agricultural use in the Bata region. This was accomplished through the disposal of more than 50,000 explosive items along with the clearance of 24,214,696 square meters (5,984 acres) from May 2005 until the end of July 2006.

Key objectives include:

• Mine clearance in Mount Lebanon and North Lebanon has been placed on hold while national assets have been diverted to undertake clearing in southern Lebanon.
• The funding situation in Lebanon is as follows:
  • Explosives and explosive accessories are in short supply due to their rapid use during the UCO-clearance campaign.
  • $800,000 is needed for the capacity-building program to create a fully national mine-action structure by the end of 2007.
  • Funding for mine clearance outside of southern Lebanon and for UCO clearance remains low.

Colombia. Key achievements in Colombia were as follows:

• The donation of $12 million from the U.S. government to UNICEF has helped the Colombian government to develop and implement the latest decontamination technologies and to train MSF to apply these technologies.
• Community leaders and municipal focal points for Action Integral Coordination/Adults Antipersonal identified and attended capacity-building workshops in Montes de María within the framework of the UNICEF-UNDP project.
• Funding for clearance outside of southern Lebanon and for UCO clearance remains low.

The National MRE Working Group has developed two sets of posters showing all risk-related activities associated with UXO and MRE, and all MRE staff have changed their approach from educating affected communities in general to more targeted clients, especially for those who work every day in the exposed mine/UXO areas and who are scrap-metal collectors. In addition, all MRE teams have been trained on how to remove and destroy community-identified items immediately after they are reported.

UNICEF continues to coordinate efforts to provide the, o’€˜-bserve Antipersonal and to implementing agencies to support mine victims and mine-affected communities. The UNICEF-UNDP, by facilitating the development of activities as outlined in the National Mine Action Plan 2004–2009.

UNICEF continues to support the decentralization process and the 18 departmental committees for mine action already established. UNICEF also advocates for the development of the remaining 11 departmental committees in order to complete the process of decentralizing mine action. The government has established its own action plan and budget, and UNICEF has committed to support the management, coordination and technical capacity-building efforts of the National Mine Action Team, with the support of the National Mine Action Team and the UK Department for International Development.

The National Mine Action Team has developed and implemented the latest decontamination technologies and supervised an additional 302 projects complementary to the national mine-acton plan. UNICEF Colombia invited donors and other interested parties to a side meeting at the Seventh Meeting of State Parties’ where the government of Colombia presented its national plan for mine action and ongoing programming and gaps. UNICEF made a presentation on its role and support as well.

The Mine Action Portfolio for Iraq is currently supported by contributions of the governments of Canada, Germany, Sweden, Switzerland and the UK Department for International Development.

Iraq. Following the recommendation of the MRE Coordination Meeting organized by UNICEF in February 2006, UNDP, UNICEF and WHO sponsored a five-day workshop August 27–31, 2006 on “Victim Surveillance and Assistance Strategy Development for Iraq” in collaboration with the National Mine Action Authority. Approximately 30 participants from the government (representing both central and southern Iraq), UNICEF and other international organizations, nongovernmental organizations, survivors, and U.N. agencies participated in the workshop. The workshop concluded with a plan of action for integrating victim assistance within the national mine-action plan and provided information to stakeholders and service providers for assistance to victims and survivors.

Victim assistance is a pillar of mine action that has been neglected in post-conflict situations. In the aftermath of this devastating conflict, there is a lack of systematic efforts to reach all mine victims and to provide information to stakeholders and service providers for assistance to victims and survivors.

The workshop concluded with a plan of action for integrating victim assistance within the national mine-action plan and provided information to stakeholders and service providers for assistance to victims and survivors.

The workshop concluded with a plan of action for integrating victim assistance within the national mine-action plan and provided information to stakeholders and service providers for assistance to victims and survivors.
The majority of the victims are between 14 and 49 years old, and most of them were holding or working close to the accident. Out of 582 contaminated communities, 41 per cent have primary schools in the vicinity of contaminated areas, indicating that children are still at risk of landmines and UXO. The project was implemented by the General Directorate of Mine Action, which is the regional mine-action center for the Sirnak province government.

In Sulaymaniyah, JIN has been working closely with Minex Advisory Group since June 2006 to conduct a UXO risk-assessment study. A stakeholders meeting was organized as the end of September to discuss the findings and recommendations.

In total, 1,312 adults completed a Knowledge Attitude Practice questionnaire, of which 54 percent were men and 46 percent were women. UNICEF and MAG selected a research team to have focus-group discussions with 14 groups of men and 12 groups of women. A total of 720 children over eight years of age completed the KAP questionnaire (495 boys and 225 girls), and the research team held 35 focus-group discussions with children, using UNICEF ethical guidelines.

The study distinguished between intentional (i.e., voluntary) exposure to live ordnance, in which actors aware of the risk purposefully exposed themselves to live ordnance, and unintentional (involuntary) exposure. While some of the prevention activities may be the same, unintentional exposure is an important variable and particularly relevant in Laos, where UXO injury due to intentional exposure to live ordnance (for example, through the deliberate tampering of ordnance for the scrap-metal trade) is increasing. The assessment found a generally high level of UXO awareness and knowledge of risk-taking and risk-reduction behaviors; however, the assessment also found that many people, including women and children, continue to voluntarily interact with live, or potentially live, ordnance on an almost daily basis.

The findings from the study will be used in close collaboration with the recently established UXO National Regulatory Authority to inform MRE strategy development as well as the development of new messages for at-risk populations—especially children—who are attracted to scrap-metal collection. The UXO Needs Assessment data provides a unique opportunity to assist the government in taking the next strategic steps to develop appropriate messages and responses that more effectively target areas and people.

The study activities include a four-day UXO Risk Education Strategy Planning Workshop to be conducted by staff from the Geneva International Centre for Humanitarian Demining, UNICEF and the Laos Youth Union. In addition, finalization of the UXO Risk Assessment as well as translation of the IMAS Best Practice Guidelines will continue. UNICEF will also give support to the Community Awareness Technical Working Group of the NRA for the first technical working group meeting. The UNICEF office is seeking new funding to expand support in its collaboration with the UXO NRA and the development of new risk-reduction strategies.

S. Ehsani, page 112

The recently released Portfolio of Mine Action Projects 2007 published startling figures concerning funding shortfalls for groups and organizations tackling the international threat of landmines and unexploded ordnance. More than 100 nongovernmental organizations, national authorities, and United Nations agencies reported a total shortfall of U.S.$317.5 million for projects in 29 countries or territories.

The 2007 edition of the report reviews more than 300 proposals with a combined budget of $429 million. Only $211.7 million in funding for these proposals has been secured, leaving nearly 75 percent of these projects unfunded.


Funding Shortfalls Exceed US$300 Million


Dr. J. Peter Pham (James Madison University)

it is donating all royalties from the volume to a nongovernmental organization that provides financial and technical support to local organizations rehabilitating victims in mine-affected countries. Although it is neither an easy read (but not a difficult one either) nor an inexpensive book, this work deserves an honored place on the shelf of every scholar of international humanitarian law as well as that of mine-action centers worldwide. 

Dr. J. Peter Pham is Director of the Nelson Institute for International and Public Affairs at James Madison University. He has written nearly 200 essays and reviews and is the editor or translator of over a dozen books. Among his recent publications are Libya: Portrait of a Failed State (Reed Press, 2004) and Child Soldiers, Adult Interests: The Global Dimensions of the Sierra Leonean Tragedy (Nova Publishers, 2005). He teaches the international law modules in the United Nations Development Programme-Senior Managers Course organized by the UN Mine Action Information Center.

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book reviews

Eming programs have evolved considerably since the first pro-
gram for humanitarian demining, the Mine Action Programmes
for Afghanistan, began in 1988. Likewise, the legal bases for
dealing with the problem of landmines have developed autono-

mously from the minimalist 1980 Protocol II to the Convention on the
Prohibition or Restriction on the Use of Certain Conventional
Weapons which May Be Deemed to Be Excessively Injurious or to
have Indiscriminate Effects, which entered into force in 1983, to the
Convention on the Prohibition of the Use, Stockpiling, Production,
and Transfer of Anti-Personnel Mines and on Their
Destruction (also known as the Anti-personnel Min Ban Convention
or the Ottawa Convention), which was adopted September 18, 1997,
and entered into force March 1, 1999.

The Ottawa Convention opted for a more radical approach to humani-
tarian law than previous agreements, bringing the disarmament
element into the total prohibition of anti-personnel mines. While the
objective of the Convention is clear, some of its core provisions can be
subject to ambiguity. For example, Article I stipulates a State Party
‘undertakes never under any circumstances to use anti-personnel mines.’ The
use of a weapon is repeatedly a single action where no distinction can be made
between the actor and the beneficiary of the action (e.g., pulling the trigger
on a gun). However, with anti-personnel mines, the weapon is designed
with a time-lag: one person may lay the mine, another may use it tactically.

Hence, would a military unit that moves into an area where mines were
deployed and avalanching for its defensive permanence violate the
prohibition on use if the unit in question was that of a State Party?

For non-missignificant questions such as this one, we are fortunate to
have Stuart Madden’s contribution to the prestigious Oxford Commentaries on
International Law series, edited by Professors Philip Alison of New York University and Vaughn Lowe of Oxford University. This work, the first volume of a projected line of commentaries on arms-control treaties, offers a comprehensive article-by-article interpretation of the Mine Ban Convention, as well as a thorough overview of the Convention as a whole and the unusual fast-track negotiation—the “Ottawa Process”—that led to its adoption. Likewise, very useful is the inclusion of a long introduc-
tion describing the development and use of anti-personnel mines, assessing
their military utility and reviewing the historical and legal antecedents to
the Convention.

While jurists will undoubtedly quibble at the margins with particu-

lars about this paragraph or that parenthetical, Madden knows his material
well—he was a member of the UNICEF delegation to the First Review
Conference on the 1980 Convention on Certain Conventional
Weapons (1995–1996), as well as a member of the International Committee of
the Red Cross delegation to the Oslo Diplomatic Conference, which adopted
the AP Mine Ban Convention—and is clearly passionate about the subject

S. Ehsani, page 112
Brazilian photographers Vinicius Souza and Maria Eugênia Sá provide a glimpse of hope through their camera lenses in Angola—The Hope of a People. After many years of mindless civil war, these 48 powerful black-and-white and color images capture both the “new face of Angola” and the hope of the people to create a new identity. In September and October 2002, Souza and Sá traveled to Angola in hopes of photographing the oppressed Angolan people in the streets of Luanda, the schools and hospitals of different suburbs, and in the refugee camps of Huambo. They encountered older people who were apprehensive of being photographed, fearing in whose hands the photograph would end up, and adolescents who would often and enthusiastically asked, “Hey, friends! Could you take a picture of us, please?”

Each photograph expresses the different facets of the Angolans’ lives: from families walking for days to wait in line for food donations from the International Committee of the Red Cross to children bathing under bridge crossings despite the dangers of the ever-present landmines. The photographers’ unorthodox style focuses on the eyes and facial expressions of the subjects, rather than where they are or what they are doing, and offers a glimpse of who these people are and what they have been through. Despite their hardships, the Angolans wear smiles of strength and courage, displaying the true face of Angola.

For more information on the project and the photographers, please visit this Web site: http://mediaquatro.sites.uol.com.br.

News Brief

Tissue-regeneration Research

The Defense Advanced Research Projects Agency has awarded a US$3.7 million grant to the University of Pittsburgh’s McGowan Institute for Regenerative Medicine and a $1.2 million grant to the University of Massachusetts Lowell. The grant money will fund research into the structure and functions of lost or damaged tissues.

Researchers are optimistic that the knowledge gained will advanced studies into the possibility for tissue regeneration. The teams will investigate how tissues and cells in certain animals, like salamanders, allow for the complete regeneration of lost tissue. Researchers will begin the large, multi-center program by examining the cellular and molecular processes that allow for regeneration—while humans respond to injury with scar tissue, salamanders and similar animals develop progenitor cells that will eventually develop into specialized cells of bone, muscle, skin and nerves.

To a certain extent, humans already are capable to repairing damaged cells—liver and red blood cells self-renew—but are incapable of reforming whole limbs.
Explosive Harvesting Program

The Explosive Harvesting Program is a research and development program funded by the U.S. Department of Defense Night Vision and Electronic Sensors Directorate Humanitarian Demining Research and Development Program. The concept was designed by Golden West Humanitarian Foundation and is being jointly developed with the Cambodian Mine Action Centre.

by Roger Hess [ Golden West Humanitarian Foundation ]

For many mine-action agencies, the three most expensive components of a clearance program can be referred to as the ‘Three E’s:’ equipment, expertise, and explosives. Procurement in a post-conflict region is often one-third of an operational budget and this often becomes one of the most difficult issues to resolve.

Program Background

The Explosive Harvesting Program was designed to alleviate this problem. The effort mobilized as a joint project between Golden West Humanitarian Foundation and the Cambodian Mine Action Centre in March 2005 with the following goals:

• Develop a deployable, cost-effective means to remove explosives from munitions such as artillery, anti-tank mines and anti-personnel land mines.

• Develop the methodology to convert the recovered explosives into neutralization and/or disposal tools for demining and explosive-ordnance-disposal teams.

The initial concept involved using three 6-meter (20-foot) Interchangeable Cutting Organizers for Standardization (ICOS) for explosive ordnance disposal shipping containers, incorporating all the equipment required to conduct operations. The local support would be fuel, water and an unpolluted location from which to work.

Instead of building the system in a Western country and then shipping it abroad, Golden West elected to construct and develop the system in Cambodia, importing only those critical items that could not be found locally. The reason behind this approach is simple: research and development efforts designed in developed countries sometimes fail once they are sent to the field. The most common reasons are logistics and spare parts. By assembling the system in the field, Golden West identified the logistical/spare part system during the development process and overcame those; when it is deployed elsewhere, enough spares are on hand to support the operation and a functional reuse system is in place for consumables.

Since January 2006, the on-site team has moved the EHP from development into refinement.

The initial program design was based on using industry-standard equipment for cutting explosive-loaded munitions with some specialization needed to complete the process.

The team had previously established that recovering explosives from excess ordnance and constructing disposal charges can be accomplished safely in a field environment. It is in focusing its efforts on assessing if this equipment is the most cost-effective and supportable means to safely accomplish this task.

We are looking for ways to evaluate whether explosive recovery is a cost-effective approach, as opposed to importing explosives. As we

Before purchasing the cutting system, we completed an extensive market survey, and we found the BHR/Djadi Osprey was the best price available. Following extensive testing, the Royal Ministry of Defence selected this machine as a standard, which aideds us in our decision to purchase the Osprey.

While developing this new system for harvesting explosives, we found it important to ensure the hydro-abrasive cutting system can be supported in field conditions. This objective includes the ability to work in remote locations where resupply is difficult, local man-power has minimal skills and only the bare essentials, such as fuel and water, are available. While the Osprey is a fine machine, it is moderately complex and the operator must be certified by a factory-authorized trainer. It also requires a large supply of imported 100-micron abrasive sand to work effectively, the sand found in Cambodia was not suitable even after screening to the correct micron size.

With this in mind, on projectiles up to 122 mm, between 150 and 200 grams (5-7 ounces) of explosive is lost in the water run-off. If only one or two projectiles were to be cut, this would not be a major concern. However, for a production line processing many projectiles, the water must be trapped and evaporated and residue destroyed to avoid an environmental contamination problem.

Metal-cutting saws. Based on all of these issues with the hydro-abrasive method, we determined a different approach should be identified and tested. While looking at alternatives, we found an African ammunition manufacturer that had been using modified metal-cutting saws with great success. Further investigation revealed other test centers have also used metal-cutting saws on explosive ordnance. Our research showed that over 3,000 pieces had been cut using this process, and only one accident occurred when a power hack saw ran out of cutting fluid and was not shut down.

While cutting the explosive main charge immediately after it was cut with the modified band saw; the case and main charge did not exceed ambient temperature. The exact time varies with the projectile sizes and fillers; however, for processing stockpiled ordnance and converting it into disposal charges, the initial results show a 75-percent decrease in capital equipment costs with a 150-percent increase in production capability.

The sustainability in remote locations is greatly improved and training requirements for local staff are minimal. This approach also eliminates the overall concerns of the hydro-abrasive system, and the hazardous waste stream of the production line is all but eliminated.

EHP Operations

Explosive recovery. Along with reducing the time required to cut open a projectiles, our Cutting, Melting and Cutting Manager improved the steam adapter used to extract the explosives from the ordnance casing. Compared with our previous “hot melt” technique, this new process reduced the time for extracting the explosives by over 25 percent. The exact time varies with the projectile sizes and fillers; however, a broad average for TNT- and Composition B-loaded projectiles between 122 and 152 mm (5-6 inches) in diameter is now only three minutes. The explosives drop free from the projectile casing as a solid piece. Once the explosives have been allowed to dry and cool, they are weighed and inventoried.

Casting operations. As cast TNT is not sensitive to standard blasting caps, the team has analyzed mixes of TNT and other commonly available military explosive charges to see what individual charges and to make the recovered explosives go as far as possible. For larger charges, boosters with detonating cord types are first cut, then TNT cast over the booster, which ensures full contribution of the TNT. Maximum use is being made of locally available, low-cost containers that allow the permanent marking system to be employed for accountability and reliability tracking. Once marked, the individual charge can be traced back to the date it was made, who made it and from what type of projectile the explosive was recovered.

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Figure 1: An early prototype of the 100-gram (3.5-oz) “caseless” charges produced by the EHP. The detonating cord initiation system is cast into the charge, so the demining operator only has to attach a blasting cap to the free end. The red arrow indicates where to place the fuse to control the length of the blast. Photo courtesy of M. Hess, EHP.
pressed TNT-filled projectiles. Our team noticed a substantial difference between the texture and density of Russian and U.S. TNT. Working on a hunch, our Explosive Ordnance Disposal Supervisor created a detonator well in a small piece of Russian TNT for a standard blasting cap and tested it against a 20-mm (1-inch) steel witness plate. It detonated with full contribution.

Research revealed that the Russian manufacturers used a process called “screw loading” for filling large-caliber projectiles with TNT. This makes what the Western technicians would call “period TNT.”

This fact was not referenced in any of our manuals, however when this specific type of ordnance is available, the harvesting process becomes far simpler. The recovered explosive can be quickly converted into half-moon or wedge charges without complete recasting, producing disposal charges that are extremely well-suited for explosive ordnance disposal and demining operations.

As of October 12, 2006, the Cambodian Mine Action Centre and The HALO Trust have destroyed over 5,000 landmines with these charges, repurposing a nearly 100-percent success rate.

**EHP Achievements**

**Stockpile Reduction.** EHP’s working relationship with the Royal Cambodian Armed Forces is excellent, and they are fully cooperating with the program, turning over large stacks of their excess ammunition for processing. This not only identifies a good internal source of disposal explosives to support the long-term clearance efforts in Cambodia, but it also lessens the ammunition storage risks for the general public and reduces environmental damage caused by bulk demolition of ordnance.

**FFE Metal.** As of October 2006, nearly 6,000 kilograms (6.6 tons) of “free from explosive” metal has been returned to the RCAF. The empty shells are heat-treated for four hours, exposing the metal to temperatures exceeding 1,000 °C (1,832 °F). These procedures ensure all explosive residues are destroyed and that metal is completely safe to reuse.

Figure 4: A 15-kg generator carried in the back of a Toyota Hilux pickup—all that is required to run the “fly away” kit.

Figure 5: Explosive mining to obtain “fly away” capability. Cast TNT (left), RDX (centre) and CTNT (right). Photo courtesy of R. Hess, GWHF.

The Future of EHP

There are still some development issues required prior to the EHP becoming a functional, cost-effective package. Recognising this, the U.S. Army Night Vision and Electronic Sensors Directorate has provided funds to continue the research and development through 2006.

The team has already made successful progress on the development of a “fly away” version of the EHP. The intent is to develop a smaller, less expensive package to support and supply small teams. This system is designed to fit into a single 8×10-foot (2.4×3-metre) ISO shipping container for air/sea transport, or sent by individual component boxes that can lead into a single three- to five-metric-ton (3.3-5.5-US-ton) cargo truck.

The modified hand saw already reduced our size, weight and cost requirements, however, the steam generator was the other major item that required attention. The current unit is 4.8 meters (6 foot) tall, weighs 600 kg (1,385 lbs), and requires a 110-kg generator (see Figure 7 on previous page). Other commercial units were not suitable, so our Caring, Melting and Casting Manager built a system specific to the EHP needs that runs from a 10-kVA generator.

The smaller steam unit and generator reduce the overall costs, particularly shipping costs and fuel consumption. Figure 8 (see previous page) puts this into perspective: the unit in the track is 10-kVA, which is suitable for the basic fly-away kit.

Overall cost reductions. With the recent developments, the capital expense and logistical support required to assemble and support a “fly away” version has substantially decreased. These price reductions have brought this specific version to a level that is cost-effective for non-governmental organizations to procure the required equipment and train their personnel in its use.

Long-term goals. Working with the U.S. Department of Defense NVESD, the U.S. Department of State Office of Weapons Removal and Abatement has recently committed funds to support explosive-ordnance-disposal capability of the program in 2006 and to support EHP basic operation in the Cambodian province of Kampot Chhnam in 2007.

Between the support of NVESD and WLA, the Golden West EHP team can continue training its CMAC counterparts in proper explosive identification, ordnance curation, main charge removal and charge production while providing support and assistance to the demining, EOD and stockpile-reduction efforts in Cambodia.

Given the success of the initial Explosive Harvesting Program, there is an opportunity to construct a second EHP site in Kampot Chhnam specifically designed for processing large-capacity air-dropped bombs and to field mobile “fly away” kits, as well as permanent units, in other locations around the world.

See Endnotes, page 112

**Australia Increases Aid to Middle East**

The Australian government recently announced it will increase humanitarian aid for relief and recovery efforts in the Middle East by AUD$13 million (USD$10.25 million). This will bring the total funding by Australia to the region to AUD$129.5 million (USD$102.2 million).

Four U.N. organisations will receive AUD2 million (USD1.57 million) directly because they are actively involved in immediate recovery efforts in Lebanon.

- The United Nations Development Programmes will receive AUD$500,000 (USD$390,000) for the Quick Delivery-High Impact Initiative, a high-impact fund that helps repair infrastructure and make other improvements to the restoration of civil functions.
- UNICEF and the World Health Organization will each receive AUD$500,000 in funding for medical and health programs.
- Finally, the U.N. Mine Action Service will receive AUD$500,000 for the removal of unexploded ordnance.

UNICEF will also receive AUD$2 million (USD$1.6 million) for emergency health services in the Palestinian territories.

Further reconstruction assistance will be forthcoming as the governments of Australia and Lebanon coordinate efforts.

-- Roger Hess

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Roger Hess has been involved with explosives, landmines and explosive ordnance disposal for over 28 years. He retired from the U.S. Army EOD field in 1986 as a First Sergeant and went directly into civilian landmine and UXO clearance operations. He has worked extensively in Africa, the Middle East, the Balkans and Southeast Asia, supporting both commercial and non-profit demining and EOD organizations.

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News Brief

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I nternational Test and Evaluation Program for Humanitarian Demining (ITEP) has conducted trials all throughout the world, testing and evaluating detectors that will help in the area of humanitarian demining. ITEP has partnered with different organizations to follow through with these various trials. Current activities include the testing and evaluating of various metal detectors and metal detector arrays described below.

Test and Evaluation Activities

Systematic test and evaluation of metal detectors (ITEP Project 2.1.2.7). The first two of the three originally planned regional trials in Tansui, Mozambique and Croatia to evaluate the current fleet of available metal detectors were carried out during 2005 by the Joint Research Centre of the European Commission in cooperation with several ITEP partners. The corresponding final reports are available at the ITEP reports website. The third and last regional trial was originally proposed by the JCRC and then cancelled. The Roundaswals for Materialprüfung und -prüfung took on the responsibility of running the remaining STEMID trial during October 2006. They were assisted by ITEP members from the Netherlands, the Netherlands and the Croatian Centre for Testing Development and Testing. This last STEMID trial was combined with another trial (ITEP Project 2.1.2.8), evaluating two metal-detector arrays for humanitarian demining.

Evaluation of metal-detector arrays for humanitarian demining (ITEP Project 2.1.2.5 and 2.1.2.6). Two metal-detector arrays tested during the winter of 2006 have been in the works since the beginning of 2006. The first project (ITEP Project 2.1.2.5), which started at the beginning of the year, is in collaboration with other ITEP members. The second project (ITEP Project 2.1.2.6), to be led by the Netherlands (partners still to be defined), aims at continuing this testing in less controlled conditions (different soil types) and in mine-effected areas. The latter project will probably start in mid-2007. The HISTAMIDS operational field trials and demonstrations project (ITEP Project 2.4.2.3). The three planned field trials that started at the end of 2004 have been finalized. The main objective of the trial, to evaluate the performance and suitability of the handicapped Stand-Off Mine Detection System (HISTAMIDS) dual-sensor detector in multiple humanitarian-demining environments, was fully accomplished. Trials were carried out in Thailand, Namibia and Afghanistan. A final trial report was expected to be released at the end of 2006. In the course of 2006, Long-term Operational Evaluations of the HISTAMIDS took place in Cambodia (started in April 2006), Afghanistan (started in July 2006) and Thailand (started in September 2006). During these evaluations, the system was operationally employed as a primary and sole detector for extended periods (up to a year) by local deminers in minefields in a variety of environments and with varying levels of threat. Local demining entities are collecting data on system and operator performance and will provide periodic status reports.

Additional Projects

Planes also exist to update the CWA on test and validation of metal detectors (ITEP Project 2.1.2.7), including, among other things, recent developments in the area of soil characterization for electromagnetic detectors. Next to the above collaborative test and evaluation activities, there are numerous trials run by the individual ITEP members for which information is made available through the ITEP channels. They include APNO-Prototype for Assisting Rational Activities in Demining using Images from Satellites field tests (ITEP Project 2.4.2.5), an evaluation of conditioned bees for detection of buried landmines (ITEP Project 2.3.2.5), test and evaluation of mag- nes (ITEP Project 2.5.2.6), and the test and evaluation of the improved “MINE STALKER” NIITEK Ground Penetrating Radar system (ITEP Project 2.2.2.5).

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See Endnotes, page 112


2. See Endnotes, page 112

3. Assessment of the dual-sensor detector MINEHOUND (2005). Photo courtesy of QinetiQ Ltd.


5. Testing of the Bozena-5 medium flail (ITEP Project 3.4.2.4), the MineWolf mini-flail (ITEP Project 3.2.4.6) and the MV-10 flail vs. silt (ITEP Project 3.2.3.9) and the MV-20 + Mini-flail (ITEP Project 3.2.3.6). A set of mechanical-demining equipment, mainly flail and combined flail/flitter equipment, was tested during the spring and summer 2006 by Canada, in collaboration with Sweden. The trials were run in Croatia using the Croatian Centre for Testing Development and Training (HCR-CTR) in Crikvenica (test site with assistance from Croatian test engineers of the HCR-CTR). Next to completing the data set on baseline CWA 10144 machine performance and survivability characteristics, the tests were also intended to further evaluate the CWA 10144 test protocol in order to formulate an update of this protocol at the beginning of 2007. The MV-20 trial had to be suspended because of test site layout logistics, but might be carried out in the future by the HCR-CTR.

6. In-country trial of the MV-4 and Bozena-4 mini-flails (ITEP Project 2.5.2.4). Canada, in close collaboration with Sweden and the United Kingdom, carried out a trial of the MV-4 and Bozena-4 mini-flails on 2–4 October 2006, at the International Mine Action Training Centre in Kineta (Nairobi). The main trial aims were to evaluate the in-country performance of the MV-4 and Bozena-4 and to quantitatively assess the effect of hammer wear on the flail performance.

CEN Workshop on a test methodology for personal protective equipment for use in humanitarian mine action (ITEP Project 5.1.2.4). CEN Workshop 26 held its first meeting at the Geneva International Centre for Humanitarian Demining on 5–6 September 2006. The second and third meetings will be held in December 2006 and March 2007 respectively. The responsibility for the workshop is equally carried by the Standardsvereniging Sverige and the GICHD. Manufacturers, end-users and test centers were all represented during the meetings. Several ITEP members are also participating.

ITEP Test and Evaluation of Humanitarian Demining Equipment, 2006

The ITEP Work Plan 2006 compiles all test and evaluation activities that will be carried out during 2006 by the ITEP member countries, either as single-country activities or as ITEP collaborative efforts. The following summary provides an update on collaborative test initiatives undertaken during 2005 and continuing in 2006, including some of the new test and evaluation efforts envisaged.

The International Test and Evaluation Program for Humanitarian Demining on behalf of the International Test and Evaluation Program for Humanitarian Demining Secretariat.

by Franciska Borry (International Test and Evaluation Program for Humanitarian Demining Secretariat)
Visor Scratch Repair and Prevention

Severe eye injuries occur in 30 percent of demining accidents.\(^1\) Visors are known to be effective when worn properly, but deminers often lift or remove their visors because glare or fog make them hard to see through, or because they are hot, heavy and uncomfortable to wear.\(^2\) Addressing each of these specific design problems could increase visor use and prevent a significant number of debilitating injuries. This paper presents methods for preventing and eliminating scratches on demining visors.

\(^{86}\) | research and development | journal of mine action | winter 2006 | 10.2

These are a number of well-known methods for polishing polycarbonate surfaces. These include:

- **Dry sanding**, buffing, applying solvents (by dipping, wiping and vapor deposition) and heating with a flame or hot air or by baking. Several of these techniques were considered in an effort to identify a process that was effective and inexpenosive, and thus suitable for demining teams to use in the field. Polishing by buffing the plastic surface with a heat gun was determined to be the most effective and is discussed in detail in the next section.

Several polishing techniques that mechanically contact a surface were tried including sanding and buffing. However, these methods were found to produce inadequate, satinished finishes and could damage the shield if the operator was imprecise.

Scratch repair requires the use of chemicals that soften the plastic's surface. Most of these techniques were eliminated from consideration due to the difficulties associated with the chemicals involved, including significant health and safety hazards, as those associated with using methylene chloride for vapor polishing.\(^1\)

Nevertheless, we did experiment with dipping polycarbonate samples in acetone. This technique removed fine scratches from the samples but made fluid flow marks that would distortion

Visor Repair

Visor shields are typically made of polycarbonate, which is relatively soft and easily scratched. Scratch-resistant coatings are difficult to use in demining visors because they harden the material, making them more brittle and likely to fracture in the event of an accident. Scratch-resistant polycarbonate is also difficult to thermoform into a visor shape.

Visor repairs in polycarbonate require a significant amount of time and effort. A simple method is to use heat to melt the plastic. The following process to repair a heavily scratched polycarbonate shield may need to be adjusted for different visors, equipment or environmental conditions. In any case, experimentation with scrap materials is advisable.

\[\text{Wash the shield.}\]

After disassembling a visor, wash the shield with a drop of non-abrasive, liquid dish soap applied with the fingers. Rinse the shield until the soap and any debris are removed. Pat the shield dry with clean cloth. Wiping is necessary to remove dirt marks, which an operator can mistake for scratches in the removal step, potentially causing him to overheat the plastic. Furthermore, dirt could become permanently embedded in the plastic when it is heated.

\[\text{Dry the shield in an oven.}\]

This step is optional for removing light scratches and haze, but must be used to prevent bubbling in the plastic if medium or heavy scratches are to be removed. Preheat an oven to 120 C (250 F) for a five-millimeter (quarter-inch) think shield. Place the shield in the oven without allowing the optical surface to touch the rack. Dry the shield for 24 hours. The drying time is a function of material thickness and must be obtained from the material supplier or through experimentation. Instructions for drying different grades and shapes of plastic are available from plastic material suppliers.\(^4\) A five-millimeter-thick dried shield can be stored for up to 24 hours in moderately humid conditions (50 to 60 percent humidity) and still be treated effectively.

\[\text{Cool the shield.}\]

Remove the shield from the drying oven and let it cool for 20 seconds before handling it with the touch. If an intermediate cooling step is necessary to avoid heat buildup during the scratch repair step, which can lead to overheating and damage.

\[\text{Position the shield.}\]

Hold the shield up to a light source with one hand so that you are looking at the scratched side of the shield and towards the light (see Figure 2). Scratches are easiest to see when illuminated from behind. However, an operator must be careful to not mistakenly try to remove a scratch that is visible through the plastic front side of the shield.

\[\text{Remove the scratches.}\]

With the other hand, use a heat gun set to a high setting with its outlet 10 to 20-centimeter (one to two inches) from the surface of the shield (see Figure 2). Move the tip of the heat gun in a constant circular motion so that heat does not build up in any one location. As soon as the scratches disappear from one location, move to a new location and continue until all small to medium-sized scratches are removed (see Figure 3a). Drying with the gun in one location for 10 seconds or more on undamaged plastic will

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\(^{96}\) Marta Luczynska ([Massachusetts Institute of Technology]) and Mark Scott ([Cambridge University]).

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\(^{1}\) Developing an effective visor-shaped blast shield that is effective, cost-effective and can be easily manufactured and deployed in the field.
cause it to bubble (see Figure 3b). Dried plastic will not bubble, but it will get soft enough to distort and create a wavy surface. Waves create an undesirable lens effect that significantly distorts the image seen through a shield.

This process was used successfully in an environment with temperatures ranging from 15 to 27°C (60 to 80°F) and 50 to 60 percent relative humidity. Heat guns rated for 1,000 to 3,500 watts were used successfully, as were conventional and spot-circling ovens. It may be difficult to find ovens in some areas large enough to hold shields without putting plastic too close to a heating element.

Performance
A heat gun is highly effective at removing all haze and small scratches from polycarbonate visors (see Figure 4) and can be used effectively with medium-sized scratches with the addition of pre-drying. Deep scratches are reduced somewhat but not eliminated by the process.

To verify the process, a sample visor was heated and then treated using the full set of steps including pre-drying. The scratches were created by rubbing and pressing the face of the shield into a tray of mixed-sized gravel and sand until it was not possible to see through it and as a range of small, medium and large scratches had formed. The treatment removed the smallest and medium scratches and treated the large scratches to a clear state comparable to a new visor with only a few large scratches remaining.

To prevent scratches and haze from an undried visor did not create any additional stress concentrations in the treated shield, which were visualized using sheets of polarizing film (see Figure 3). Drying and treating heavy scratches in a different visor did produce some residual stress. It is not known to what extent the stress concentrations will affect the performance of the visor and could lead to failure in the field. Security Devices (PVT) Ltd., the maker of the visor, is subjecting the treated shield to a V50 ballistic test. A possible solution is to add a stop at the end of the process in which the drying oven is also used to anneal the plastic. The effect of multiple treatments on performance is not known and could degrade performance. It is possible multiple treatments could result in yellowing of the plastic, as this is a known issue with heating polycarbonate.

From a cost perspective, the equipment needed is not expensive. The heat gun was purchased for US$70, which is roughly the cost of one or two visors. If the heat gun treatment doubled the life of a visor, the payback time for this equipment would be as short as the time to treat two visors. The process could be used on some training practice, but this cost could be spread out over many visors. A drying oven is not required for repairing haze and minor scratches; it could be as basic as a kitchen oven. A more elaborate facility, with a drying oven and a technician, could perform more extensive repairs, and allow more badly scratched visors to be re-used.

Scratch Prevention
The alternative to repairing scratched visors is protecting the polycarbonate from scratching. A natural way to remove a visor during a break or at the end of the day is to place it face down on the ground, yet this repeated action could cause severe scratching. The addition of a wrap-around rigid bar or “roll bar” (see Figure 6a on next page) above the deminer’s field of view can prevent scratches resulting from contact with the ground and the transportation and storage of the visor (see Figure 6b on next page).

Several geometries and materials for a roll bar were tried. Promising results were achieved using round aluminum tubing bent into a shape square and fastened to the visor using the bolts that secure the headgear. A strip of polycarbonate was found to be too flexible to reliably protect the visor surface, and other shapes, such as a round arc, allowed the visor to rock back and forth when placed face down.

Rocking is undesirable because the visor could come into contact against an abrasive object, or possibly tumble out of a demining lane. The roll bar as shown is easy to form, weights 80 grams (3 ounces), and provides a central ground clearance of three centimeters (1.2 inches). Demining equipment should not further endanger a deminer in the event of an accident involving a blast, so the roll bar was blast-tested on a dummy using a 240-gram (half-pound) charge of 50 percent TNT and 50 percent PETN to simulate a blast mine. As a result of the explosion, the roll bar was pushed up to the top of the visor, but did not deform or detect, which shows anchoring it firmly to the helmet leaves a secure enough location and the bars do not add to the weight or debris hazard of the blast.

The roll bar has advantages over some other methods for protecting polycarbonate visors from scratches. For instance, a thin sacrificial layer of plastic can be placed over the basic visor shield. Once this layer becomes scratched, it is easily removed, doubling the life of the visor. However, this method introduces extra material through which the deminer has to see. Sacrificial layers are especially problematic if dirt or moisture becomes trapped between the layers. Also, as the sacrificial layer gets scratched, visibility gradually degrades until the layer is removed. The roll bar reduces scratching on any optical surface, whereas the sacrificial layer collects the scratches on a disposable surface. Legs protruding from the sides of the visor have also been implemented in the past. However, the roll bar offers a protective geometry for a wider range of surfaces and situations that legs do not.

MIT “Design for Demining”

The research on this project was conducted in the “Design for Demining” class taught at the Massachusetts Institute of Technology. The primary goals of the course are to teach students about product design, increase their knowledge of the complex topic of demining and have them create and deploy products that are appropriate for the demining community. When the students develop a product or process that show promise, they distribute it by publishing the details in the public domain so the idea can be used on a wide scale as possible. Giving away intellectual property is a fast and effective alternative to the more conventional route of patenting and selling an invention.

We would like to thank the National Collegiate Inventors and Innovators Alliance, the MIT Public Service Center and MIT Edgerton Center for funding the class. Terre Thomson of Security Devices Ltd. for supplying visors, Andy Smith for technical advice, and numerous MIT demining students that worked on visors—Harmen Gill, Anna Rastino, Ryan Jones, Jeremy Wallace and Tom Smith. See Endnotes, page 112.
Throwing Out Mines: The Effects of a Flail

by Ian McLean, Perséphone Sargisson, Johannes Dirschler and Havard Bach | Geneva International Centre for Humanitarian Demining |

The authors discuss a study conducted on Flail machines to prove the effectiveness of this technology in destroying anti-personnel mines.

Recent tests and trials on the clearance capability of Flail machinery have shown that if machines are adequately operated and the operating environment is favorable, Flails are able to achieve clearance rates approaching 100 percent. However, some field-operators have experienced clearance rates as low as 50–60 percent. The main reason for the discrepancy is that a proportion of aged mines have faulty detonation mechanisms. Having failed to detonate, some may also remain apparently intact after flailing. When found by quality-assurance teams, these mines are reported as missed because examining their firing mechanism is time-consuming and dangerous. The resulting under-representation of clearance capability suggests that Flail machines should only be used as ground preparation for subsequent demining, a conclusion that we believe to be inappropriate.

To satisfy the requirements of statistical analyses, tests on clearance capability of Flail machines require a large number of mines. Real mines are scarce and dangerous, mine mimics are expensive, and testing may be constrained to using too few mines to support statistical analysis. Despite such resource constraints, a continued effort to test machines is desirable and should be prioritized. Clearly, any study designed to explore the proportion of mines that are initiated or broken up by a machine will need to use real mines. However, some research questions allow testing without using real mines (or mine mimics).

Here, we investigate the pattern of throw-out for mines that are not broken up or destroyed by a flail. The study used unbreakable “mine-mimics,” as is explored in Section 2.1 below. The results address issues about the direction and distance mines are likely to be thrown and their visibility after flailing, in relation to standard treatment factors in mine clearance (soil type and mine depth).

Methods

The study was conducted at the Swedish Explosive Ordnance Disposal and Demining Centre test site in Eskjö, Sweden, in December 2003. All test fields were laid out in the same way: a strip 5 m wide and 80 centimetres wide within a soil platform 5 metres wide (see Figure 1 on next page). The “mines” used were made of hard plastic material and similar in dimensions to hockey pucks or small round cans of tuna. The 60-mm puck had a height of 35 mm, the 90-mm a height of 50 mm and the 110-mm a height of 80 mm. A metal washer had been screwed into the puck to make it searchable. Twenty were laid in a standard array in each strip, giving a sample size for each treatment combination of 20 (or slightly fewer in a few cases of missing data).

The treatments variables were:

• Three soils (sand, gravel, topsoil)
• Four depths (0, 5, 10 and 15 centimetres)
• Three sizes of mines (60-, 90-, 110-mm diameters)

Sand and gravel were tested with all mine sizes and depths. Topsoil was tested with 60-mm mines only, although at all treatment depths. Depth was tested at 10-centimetre intervals. The machine, a DOKING MV-4, is described in detail in the Mechanical Demining Equipment Catalogue and is shown in the picture above. It was run once only along the strip in one direction, which is treated as “north” for analyses of the throw angle. The machine has a clearance width of 1.725 metres, thus the test clearance strip of 80 centimetres gave a margin of error of about 65 centimetres on each side. Depth was tested at 10-centimetre intervals. Parameters measured were:

- Distance the mine was thrown
- Directions the mine was thrown
- Visibility of the mine after flailing

The angle (direction) of throw required some adjustment for statistical analysis and visual representation for the following reasons:

• The mean of several angles might not portray a sensible conceptual pattern. For example, if one mine is thrown forward (20 degrees) and another is thrown backwards (160 degrees), the average throw direction for these two mines (90 degrees) does not portray a meaningful direction in absolute terms. The data given in Table 1 are means and are useful for statistical comparison between treatments, but they should not be used to represent typical throw angles.

• A similar problem applies to mine thrown to the left or right. Mines thrown at 20 degrees and 340 degrees are thrown at equivalent angles in terms of throw direction, but the mean (180 degrees) is clearly inappropriate. To address this problem, the data were adjusted for analysis so that all mines were treated as if they were on one side only.

The throw angle is therefore presented as frequencies rather than means, calculated from equal-sized (45 degrees) sectors of one side of a compass.

Results Summary

A typical throw-out result, seen in Figure 2 (see page 102), is for 60-mm mines buried at 15 centimetres in the three soil types. In this figure, the 0.00 point is the original site at which the mine was laid, and the datum points indicate where the mine was thrown after flailing. Most mines remained close to and slightly behind where they were laid. If these were real mines, they would likely be compressed into the soil (although they might be exposed due to soil disruption),
The proportion of 60-mm mines visible after flailing did not vary significantly in relation to depth (X²=2.6, d.f.=3, P=0.45; see Figure 5).

Results for All Mine Sizes
Distance thrown. Mines thrown to the right and gravel, there were no significant effects on throw distance of either mine size (F1,452 = 0.37, NS) or mine depth (F1,452 = 1.19, NS). The interaction between size and depth was not significant (F2,452 = 1.07, NS). Thus mines of all sizes and depths were thrown similar distances in sand and gravel.

Angle of throw. A large number of 60-mm mines in all three soil types (lumped), mines of all sizes were thrown more to the right than to the left in sand and gravel (L.R, 65:148; X²=16.8, P=0.00) and in gravel (L.R, 85:136; X²=5.8, P=0.016).

The angle of throw for all mines is summarised in Figure 6. Included in sand and gravel are mines of three sizes (60, 90 and 110 mm), whereas only 60-mm mines were included with topsoil. Adjacent data (all mines thrown to one side) were used for this analysis.

In general, most mines were thrown either directly forward (0–45 degrees) or directly backward (136–180 degrees), with a higher proportion of mines thrown backward overall. Very few mines were thrown linearly, although forward (46–90 degrees). The highest proportion of mines thrown forward was from topsoil.

No relationship between angle of throw and soil type was found for 60-mm mines (as mentioned above). However, when data for all mine sizes were used (sand and gravel only), mines were thrown behind significantly more in sand than in gravel (F1,452 = 4.21, P=0.04; data in Table 1—see page 101).

Visibility of all mines after flailing. Figure 6 shows the proportion of mines visible in sand and gravel after the flail had completed its run for three mine sizes. Mines were increasingly likely to be visible with increasing size, with small mines being mostly buried and large mines being mostly visible. The pattern was highly significant using data lumped by original burial depth (X²=31.3, 2 d.f., P<0.00).

Figure 7 suggests that original depth of burial affected visibility, with deeper buried mines being more visible after the flail. The effect was not significant using data lumped across mine size (X²=3.9, 3 d.f., P=0.27).

Visibility of mines increased with distance thrown (see Figure 8). This effect was expected for mines thrown longer distances, as those mines were thrown outside the clearance strip. Many of the mines that moved less than one metre were lightly compressed into the soil, whereas mines that moved several metres were more likely to have been lifted out of the ground before being deflected back downwards by components of the flail, and therefore ended up string on the surface.

Discussion
The flail is designed to prevent mines from being thrown large distances, and the effectiveness of that design can be seen in the high proportion of mines left close to their original laying site. A proportion of those mines would likely be compressed into the soil without being initiated or broken up. However, repeated passes with the flail should ensure that all mines are lifted safely, in that the initiators are unlikely to be working.

Mines that were thrown up to several metres are likely to have been lifted out of the ground by the chains, and then deflected back downwards by the deflector plate or other components of the flail. Although many remained in the clearance strip, such mines are more likely to be visible than mines that were compressed, because they were lifted out of the ground rather than beaten into it. Mines that are pulled out of the ground are less likely to be broken up or initiated, might therefore be in better condition after flailing, and are potentially still live.

A small proportion of mines were thrown big distances, presumably because the chains hooked the mine past the deflector plate. Clearly, the flail design is not entirely effective at preventing long-distance throws. There are safety implications for the operators whether the machine is throwing mines or rocks, as this machine is routinely operated using a safety distance of 50 metres. Mines were more likely to be thrown forward, presumably due to the forward rotation of the chains and the protection behind the chains. Such mines could be thrown into previously cleared strips, or outside the minefield. Repeated passes are less likely to re-process such mines, particularly if the field is flawed in sectors. The MV-4 is
a small machine. Whether larger machines could throw mines even greater distances than the maximum seen of 65 meters remains to be tested, as throw distance is a function of length of chain, design of chain head, speed of rotation, and amount of protection around the flail head. Larger machines have longer chains but may use a slower rotation speed.

This flail tended to throw mines to the right. Given that it is impossible to prevent throw completely, it might be possible to adjust the action of the chains and design of the flail to allow for even higher proportion of throws to one side. Whether the variability of throw is a characteristic of this individual flail or of the model generally does not matter. What matters is that with variability of throw known, the machine can be deployed to ensure that the main direction of throw is into areas that are not yet processed. For example, this machine would be best deployed either in a clockwise direction from the perimeter of the minefield, or an anti-clockwise direction from the centre. With respect to mine throwing, working back and forth along parallel lines would not be a good way to use this machine.

Soil type was the primary factor determining throw patterns. Mine size and depth were relatively unimportant. The depth setting of the flail is likely to affect some values in the data, but the overall trends found for mine size and depth should be similar.

Clearly, more tests of this sort on different makes and sizes of flails are desirable. The Geneva International Centre for Humanitarian Demining plans to continue these tests, but the manufacturers can also conduct tests so they can give advice to purchasers on variability of throw, proportion of mines thrown beyond the flail, and likely maximum throw distance under different operating conditions. Consideration should be given to including information about throw patterns in the Mechanical Demining Equipment Catalogue, and eventually to developing a standard test to be incorporated into the International Mine Action Standards.

We thank the Swedish EOD and Demining Centre for supplying equipment, resources and the field site to support the study. Funding was provided by the governments of Germany, Norway and Sweden. See Endnotes, page 112.
Recording. Tests performed on the MineWolf included the following:
- Video recording from outside
- Video recording inside the driver's cab
- Blast pressure measurement inside the driver's cab
- Acceleration measurement inside the driver's cab
- Measurements taken by the ATD
- Pictures of damage to flail and tiller
- Pictures of flail and tiller repaired

Remote-control Tests
Tests performed remotely using the flail and tiller apparatuses were conducted with AT mines TM 57 (6.5 kg TNT), TM 62 P3 (6.5 kg TNT) and DM 21 (5 kg TNT).

The remote-control tests were necessary to record the physical effects and potential risks for the operator and MineWolf. These effects were measured by means of an instrumented test dummy, in order to be able to perform a human-related biomechanical assessment.

To record the measured values, an ATD was placed on the driver's seat and was fitted with various sensors to measure human-relevant impact information.

A total of six remote clearing tests were conducted against live AT mines. Four of these tests led to detonation, and the mines were crushed. Little or no flail repair work was necessary after the unmanned test. Damage to the tiller device is shown in Figures 4 and 5. The repairs shown in Figure 6 are mainly welding work, which could be performed on-site the same day.

Biomechanical Results

The remote-control tests were a necessary prerequisite to performing the manned tests. The results of the biomechanical assessment and the blast-pressure measurement had to rule out any hazards to the operator when clearing live anti-tank mines.

The results of the biomechanical measurements with the fully instrumented dummy were within a very acceptable range. This statement applies to the examined AT mine types DM 21, TM 57 and TM 62 and refers to mine detonations that occurred in the area of the clearing device.

The assessment of the blast pressure load in the driver's cab showed that the blast pressure load is very low in the cabin and damage to the car is not expected if adequate car protection is worn.

In summary, it can be stated that the operator in the driver's cab of the MineWolf is not subjected to an intolerable risk of injury by the explosion of a DM 21 or TM 57 antitank mine if the mine detonates in the area of the mine-clearing device (both types were successfully detonated during the test). The risk of injury is very low and far below the allowed limits for mine-protected vehicles of the German Army, which are based on international standards. Even in the case of repeated successive loads, no serious consequences are expected. Temporary light disturbances like headaches or muscular pain, however, cannot be excluded.

During the four tests, all human-related criteria were tested to the extent that they could be evaluated. Due to the principle of operation of the MineWolf, the detonation of a mine underneath the vehicle hull or a track during mine-clearing is not very likely but cannot be ruled out. Based on the available measured data, the effects that an explosion underneath the hull or a track would have on the vehicle and the mounted operator cannot be assessed. It is definitely possible, however, that this would lead to critical loads. It is therefore recommended that these cases be investigated—e.g., detonation underneath the vehicle hull or a track—by static contact detonation tests to ensure the highest degree of safety for the MineWolf operator.

Manned Tests

Tests performed conducted the manned tests with the AT mines TM 57 (6.5 kg TNT) and TM 62 P3 (6.5 kg TNT).

As the biomechanical measurements with the fully instrumented dummy did not show any risk, manned tests were approved by the firing controller.

Tests were tightened by clearing mines off-centre—detonation occurred on the left- or right-hand side of the demining tool with both flail and tiller—to find out whether the drive train would suffer irreparable damage and whether the demining quality would be affected.

The three consecutive manned tests, using the tiller to clear live AT mines, were carried out, without repair after each detonation. This was to find out whether tiller, drive train and the quality of demining were still acceptable. Two typical examples of consecutive tests, taken from the German Federal Armed Forces Technical Center for Weapons and Ammunition’s Final Report: MineWolf Clearing of Live Mines, are described below.

The AT mine TM 62 P3 detonated on-site upon contact with the mine-clearing device. The hit occurred approximately 0.5 meters (1.6 feet) off the left-hand side of the device.

Due to the principle of operation of the MineWolf, the detonation of a mine underneath the vehicle hull or a track during mine-clearing is not very likely but cannot be ruled out. Based on the available measured data, the effects that an explosion underneath the hull or a track would have on the vehicle and the mounted operator cannot be assessed. It is definitely possible, however, that this would lead to critical loads. It is therefore recommended that these cases be investigated—e.g., detonation underneath the vehicle hull or a track—by static contact detonation tests to ensure the highest degree of safety for the MineWolf operator.
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Damage to the clearance machine included one worn chisel and two bent cross-spars (the cross-spars, or surf walls, were deformed by an area of 30 by 130 centimeters [11.8 by 51.2 inches]). The damage seemed to be more as compared to the previous tests with the TM.5. The mine crater in the ground was of normal size. There was no cleaning despite the damage it suffered.

The TM.5 also demonstrated an on-site contact with the mine-clearing device. The tilt was approximately 0.2 mm (0.066) off the right-hand edge of the tilt.

Damage to the MinWolf included one outer tooth that was bent outwards and four cross-spars that were deformed by an area of 30 by 130 centimeters (11.8 by 51.2 inches). Two cross-spars were torn off at the end of the weld seam. The depth control device was bent outwards but still functioned. After some provisional working about 15 minutes, a run was torn with the tilted trailer. The tilt performance was still sufficient. The mine-clearing and drive train with power hands were still in repairable conditions. The clearing quality was still good as shown by the ground appearance.

Fragmentation Mine Tests with AP Mine DM 31

two continuous fragments with AP Mine DM 31 were performed. The mines were placed on solid ground 10 metres and five metres (32.8 and 16.4 feet) from the trailer on the left-hand (fully armed) side of the mine-clearing vehicle and the mine fuze DM 56A1 was initiated by a detonator at about 150 seconds, approximately 30 to 40 meters (98 to 131 feet) in the clearance vehicle.

In the 16.4-foot distance, the fragment hit the cabin glass. At a five-meter (16.4-foot) distance, the fragment hit the cross-spars in the mid-line, causing only minor damage that could be repaired with a limited effort or not did not require any repairs at all. The use of the litter against live anti-tank mines, however, resulted in considerable greater damage, which could only be repaired with a substantially greater effort than those caused with the litter. The repairs, mainly welding work, would be performed on-site that same day.

The load on the mine clearance system is not the probable acceptable and acceptable range. This finding is a result of the biomechanical evaluation of ADT dummy measurements and through question of the three operators. It applies to the examined mine type DM 56A1, TM 62 and TM 57 and only to mine detonators that occur in the area of the clearances device.

In addition, taking into account the results achieved by MinWolf during operations in Bosnia-Herzegovina, Croatia and southern Sudan, these results confirmed that the new concept is the basis for developing the demining process from ground preparation to mine clearance and shows improvement over other methods and systems with regards to effectiveness, quality and cost.
Cluster munitions and their effects in Lebanon

Most of the submunitions were dropped in just 72 hours of conflict “when we knew there would be an end” (source: Jan Egeland, U.S. Under-Secretary-General of Mine Action; and Imperial, M420, M36, M71, and LAU-61 (US) submunitions. It is estimated that up to four million submunitions may have been dropped and scattered (source: Handicap International).

- Over 850 cluster munition strike sites with up to one million unexploded submunitions are estimated, covering over 32 square miles (7900 km²) as of November 12, 2006.

- Up to 280,000 displaced Lebanese cannot return due to danger from UXO as of November 1, 2006 (source: United Nations High Commissioner for Refugees).

- Between August 14 and December 14, 2006, 26 people died (six of them under the age of 18) and 160 others were wounded (57 under 18) by unexploded submunitions.

- Clearances of unexploded ordnance and submunitions is estimated by the UNMACS to take anywhere between 12 and 15 months.

Action against cluster munitions and what’s being happening since August 14, 2006

- Campaigns in Certain Conventional Weapons (CCW), Protocol V, are ongoing regarding post-conflict clean-up of unexploded ordnance and abandoned explosive ordnance (aeros ERW other than landmines and booby traps, which are covered by Amended Protocol II), ignores voluntary protective measures. Protocol III was signed on November 22, 2006.

- Discussions continue on further steps to take in order to reserve cluster munitions and decrease failure (dud) rates. Third CCW Review Conference was held November 7–12, 2006, and during that time efforts were made to address cluster munitions and the threat unexploded submunitions hold for civilians. The conference failed to reach a deal to restrict the use of cluster munitions, instead agreeing only to keep talking about the issue.

- After failing to reach such an agreement within the framework of the CCW, civil society actors and countries (led by Norway) have called for a new international treaty separate from the CCW that would control or ban cluster munitions.

- Two U.S. congressmen, Duncan Hunter (CA) and Patrick Leahy (VT), try to stop U.S. production of cluster bombs, but the measure was defeated on September 6, 2006, by a vote of 78-30.

- Lebanon’s National Demining Office in partnership with the Mine Action Coordination Centre of South Lebanon is collecting information and coordinating the activities of the International Mine Action Conference, the United Nations, the Lebanese Mine Action Service, MAG, Swedish Rescue Agency and BACTEC.

- UNIC is supporting the National Demining Office to implement mine risk education.

- Along with many other USAID, UNHCR and Handicap International is being provided. http://www.usaid.gov/locations/asia_near_east/middle_east/

- “34-day war” in Lebanon and northern Israel, occurring from July 12 to August 14, 2006.

- Israeli government vs. Hezbollah (Lebanon-based Islamic militant group).


- Lebanon and Israel are reportedly at war.

- Hezbollah, founded in 1982 as the political wing of the Shia militant group Amal, is recognized by the United Nations as a guerrilla movement.

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Military action in Lebanon, taking account of the situation in Lebanon.

- The United Nations Mine Action Service: MAG, Swedish Rescue Services Agency and BACTEC.

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