**FEATURE**

**Military Role in Mine Action and Explosive Ordnance Disposal**

Some countries have always used the military as their primary explosive-ordnance/landmine-clearance operators. Others are seeking new ways to integrate military clearance operators into national mine-action plans (including the incorporation of military-sponsored or -provided survey activities, information management and mine-risk education). How has this integrative approach changed clearance operations? Is the military’s role changing? If so, how? For instance, do they provide train-the-trainer programs, training centers, logistical support, or planning and support services to countries in need? How are priorities for training or clearance set? How do civil-military partnerships affect mine-action activities? Do these priorities impact local or community demining teams?

**SPECIAL REPORT**

**Novel Approaches to Landmine/ERW Remediation**

What new or innovative methods are being used to return land to its owners? How were these novel approaches developed? Have they been proven effective? Have innovative practices in land release/annulment, risk management, integrating mine action into development projects, information management and others been successful? How have communities been affected by these approaches?

**SUBMISSION GUIDELINES**

**Article length:** 1,000–2,000 words, submitted in digital format (i.e., Microsoft Word). R&D articles can be up to 3,000 words.

**Images/photos:** Photos must be scanned at 300 dpi or better. Line art, graphics and charts should be scanned at 600 dpi or better. Submit all graphics by e-mail or CD.

**Important:** Please do not include images in your documents. The quality is too poor for printing.

**Contact information/bio:** Articles must contain each author’s name and full contact information at the end of the article (i.e., phone, e-mail and mailing address). Please include a headshot photo and biography (up to 60 words) of each author for inclusion at the end of the article. Consider including credentials, books authored and other biographical information.

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Submit all materials to:
Editor-in-Chief, The Journal of ERW & Mine Action
James Madison University, MSC 4902
Center for International Stabilization and Recovery/MAIC
800 S. Main Street
Harrisonburg, VA 22807 / USA
Phone: +1 540 568 2503 / Fax: +1 540 568 8176
E-mail: editormaic@gmail.com
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60 Glossary/Endnotes
Welcome to our first annual issue of The Journal of ERW and Mine Action. We are excited to present this issue, which covers one topic, Land Cancellation and Release, in a bit more depth. We hope you enjoy it.

You’ll notice that the layout of this issue is a bit different. We wanted to set it apart from our normal issue. In addition to having longer articles, we have increased the typeface size and printed the magazine two-color instead of full color. Some of the design changes will continue into our fall issue. We have also added a new feature with this issue: a glossary of common terms used in many of our articles. It is currently a fairly short list, though it may become more robust in the future as necessary. While not meant to be all-inclusive, the list takes the place of many of the endnotes we previously used repeatedly, and we hope it provides the information in a more reader-friendly format. Please have a look at the list of terms on page 60.

Please let us know what you think about the articles, design or any other issue related to The Journal. As always, we look forward to your feedback.

May peace prevail on Earth,
Los Carter Fay
Editor-in-Chief, The Journal of ERW and Mine Action
editormail@jmu.edu

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A Conversation about Land Cancellation and Release with H. Murphey “Murf” McCloy

by John E. Stevens [PM/WRA]

Land Cancellation and Release in mine action is looked at by many experts as the next logical step to the safe and time-effective return of mined areas. This interview examines the benefits of the land-release method and addresses its criticisms.

Humanitarian mine action is poised for another step forward via the Land Cancellation and Release approach. Unlike previous mine-action developments that were largely systemic (e.g., Landmine Impact Surveys) or technical (for example, the HSTAMIDS mine detector), Land Cancellation and Release is essentially conceptual. It balances surveys with risk-management assessments in order to speed the rate at which Suspected Hazardous Areas can be deemed safe and returned to productive use. In some cases, Land Cancellation and Release may occur without any clearance.

Since the term humanitarian demining was introduced by American and other practitioners (United Kingdom, France, etc.) or people in Afghanistan in late 1988, its doctrines and practices have matured as it spread to other conflict-affected countries. Many of its technical approaches can be traced to World War II and the extraordinary post-war clearance of mines and explosive remnants of war that rendered western Europe largely impact-free a mere five years later. What distinguished humanitarian demining—later expanded to the more holistic humanitarian-mine action—in the latter half of the 20th century from its World War II roots was an approach that sought to calculate precisely the scope and nature of the problem in advance, followed by more rigorous clearance and quality assurance. This approach, ultimately codified in the first edition of International Mine Action Standards in 2001, assured that mine-affected populations could occupy their lands again safely and that deminers would minimize risk to themselves.

The problem was that mine clearance that adhered to IMAS inevitably increased demining costs and times. IMAS’ high standards often introduced tensions between those donor nations, such as the United States, which encouraged IMAS at every step, and mine-affected nations eager to speed economic development and resettlement of populations while accepting greater human risk. I must confess that when I was Program Manager for Vietnam, I insisted that IMAS be followed to the letter.

Land Cancellation and Release will change mine action again. To learn more, I approached my colleague, H. Murphey “Murf” McCloy, a humanitarian-demining pioneer. Among other accomplishments, McCloy started the first United States humanitarian-demining program in Bosnia and Herzegovina in 1996 in cooperation with United Nations mine-action authorities. This program morphed into internationally supported programs in several Balkan countries that saved lives and contributed to regional confidence-building. Our conversation about Land Release and Cancellation follows.
Stevens: What exactly is land release?
McCloy: The latest draft of IMAS 08.20 (Land Release), approved by the IMAS Review Board and that should soon be published, defines it as “… the process of applying all reasonable effort to identify or better define Confirmed Hazardous Areas (CHA) and remove all suspicion of mines/ERW through Non-technical Survey, Technical Survey and/or clearance using an evidence-based and documented approach.”

Stevens: What role do surveys play in the land-release process?
McCloy: Surveys play a central role in the land-release process, for good and for bad. On the “good side,” well-conducted surveys lay the groundwork for efficient and cost-effective mine action by narrowing the size of the areas that are genuinely hazardous and that need to be subjected to expensive, full-cleanup measures. Doing so has two major benefits. First, scant demining resources are expended only on land that contains explosive threats. Second, some areas may be returned to safe use through the application of much less expensive survey measures alone—Non-technical Survey being the least costly, and Technical Survey being more costly but much less expensive than full clearance.

On the other hand, inaccurate or inadequate surveys can distort the mine/ERW picture. This can result in an exaggeration of the explosive threat in an area, causing unnecessary expenditure of clearance resources. Even worse, a “false clear” conclusion can divert the application of more definitive survey/clearance measures from potentially dangerous ground, thereby unnecessarily putting land users at risk.

Stevens: Given the need by donor nations, nongovernmental organizations and individual contributors to prioritize their limited funding, how do mine-action programs determine the appropriate “end state” to be reached?
McCloy: Programs don’t determine end state; stakeholders do. The decision varies with the stakeholders. The key stakeholders are the national authorities of a mine/ERW-affected nation and the international donors that support the mine-action efforts of those authorities with funding and other assistance.

For the national authorities, the end state may be that point at which the explosive threat to the population has been reduced to impact-free or mine-free status, both of which involve a commitment to a long-term effort. The impact-free approach that the United States pursues envisions an end state in which “the last citizen has been rendered safe from the effects of mines.” The mine-free end state, favored by advocates of the Ottawa Convention bas on anti-personnel mines, envisions victory “when the last mine (anywhere) has been cleared/destroyed.”

For the foreign government (donor) stakeholder, the end state can take a variety of forms, depending on the resources that the donor has, and the donor’s assessment of the needs and chances of success (defined in the donor’s terms) in entering into a collaborative effort with the host nation and other international supporters. Each stakeholder must determine the appropriate end state for itself, whether it is pegged to the achievement of Ottawa Convention commitments, such as eliminating all mines within the national territory, or to shorter-term, pragmatic capacity-building goals (as is the case of most U.S. humanitarian mine-action assistance programs). These goals are oriented toward creating a host nation’s independent capability to plan, manage and execute its own mine-affected nation’s demining effort. The impact-free approach entails a commitment to a long-term effort. The impact-free approach can and should establish an end state in mind from the start. Making changes from a known point of reference is easier and more economical in terms of the expenditure of time, resources and political capital. It also provides a useful launch point from which to elicit and gauge cooperative efforts from host-nation authorities and other stakeholders.

Stevens: Can these end states be defined early in the process to make it feasible to determine successful completion?
McCloy: Stakeholders/donors can and should establish their initial end state during the mobilization phase while they are collecting information on the situation in the host nation and marshaling assets to bring to bear on the problems known to exist. Planning an end state gives focus and purpose at the outset to the coordination and execution of the assistance that will be provided. This end state represents a goal to be achieved; objectives and other concrete measures of effectiveness can be derived and measured using this goal.

Initial end states are not immutable; an initial approach to mine-action assistance can be revised. Conditions can change within the political, socioeconomic security framework of a post-conflict country, as can the end-state goals of the individual donors/stakeholders. The important thing is to have an end state in mind from the start. Making changes from a known point of reference is easier and more economical in terms of the expenditure of time, resources and political capital. It also provides a useful launch point from which to elicit and gauge cooperative efforts from host-nation authorities and other stakeholders.

Stevens: What is an acceptable level of residual risk?
McCloy: An acceptable level of residual risk is the area of dispute between national mine-action authorities and other international organizations: it is residual risk, as defined in IMAS 04.10 Glossary of Terms (second edition, 1 January 2003), “... in the context of humanitarian demining, the risk remaining following the application of all reasonable efforts to remove the residual risk ...”
by the demonstrated reliability over time of the nation-
mal mine-action authority, mine-action center and local/
international demining organizations to return areas
to “safe use” when no safe use and to remove risk consti-
tuting the desired level of confidence that the land is free of mines/ERW.” Depending on the evidence of explosive contamination gathered from the survey techniques applied to a particular piece of ground, “all reasonable efforts” can vary from “no fur-
ther efforts are required to release the land” to “more
surveying is required to make a final determination,”
all the way to “full clearance measures must be applied
to this land before it can be returned to safe use.” It is
the responsibility of the various national mine-action
authorities to develop a national land-release policy, to
prepare and publish standards and guidelines govern-
ing the land-release program, and to include a defini-
tion of the criteria for “all reasonable efforts” for their
respective countries.

Stevens: Can people be confident that landmines/ 
ERW in a community have deteriorated sufficiently
to eliminate the risk of explosion? 
McCloy: No. Landmine deterioration is a function of
many variables, including those induced by local soil
movement, depth of burial, exposure to sunlight and
other weather phenomena, type of construction (her-
mely sealed; plastic, metal or wooden casing; firing
mechanism, etc.), composition of the explosive charge,
aging, unsupported sand-filled containers, and other
factors. There is no set of conditions that will guarantee
that all mines, even of the same type, will deteriorate to a
equivalent degree. In fact, the presence of mines under cer-
tain conditions to deteriorate to an unstable state that
renders them more sensitive/susceptible to unintended
detonation than when originally manufactured.

Stevens: Can people be confident that all of the
landmines/ERW have been removed? 
McCloy: No. In spite of the best efforts of human de-
miners, mine-detecting dogs and machines, there is al-
ways the possibility that an area exposed to formerly and
other ERW hazards within a specified area to a
specifed depth. There are no 100-percent guarantees.

What the members of a mine-/ERW-affected commu-
nity can be confident in is that if a thorough, well-docu-
mented and supervised process has been undertaken (i.e.
all reasonable effort has been expended), this process will
reduce the residual risk to a “tolerable level” (i.e., a level
of threat that is not deemed a threat to the local civilian
community). This confidence is generated in the local population
and then perimeter-marked by fencing or other means.
The final connection between “destroying all mines” and
using “all available methods” (i.e., “non-technical Survey
and clearance”) to release land that was previously
in a more cost-effective manner is provided by a paper
titled “Applying All Available Methods to Achieve the
Full, Efficient, and Expedition Implementation of Arti-
cles 5 and 6 of the Mine Ban Treaty” at the Ninth Meeting of States Parties

Two of the key conclusions of this paper are that,
first, the States Parties acknowledge that land reassess-
ment and release through non-technical means, when
undertaken in accordance with high-quality national
policies and standards that incorporate key principles
highlighted in this paper, is not a shortcut to imple-
ment Article 5.1 but rather a means to more expedi-
tiously confuse with confidence at one time deemed
to be mined. Second, many mine activities can be undertaken to
assess and, where applicable, to release land that has
been previously identified and reported as part of a
“mined area”: Non-technical means, Technical Survey
and clearance.

Note that it is the responsibility of the national au-
thorities of the mine-affected countries to make this
work. This responsibility is also reflected in the duties of
the national mine-action authority as set forth in the
land-release-related IMAs.

Annex C of IMAS 08.20 states that while proponents of
the Ottawa Convention have tried to make a simi-
lar connection between survey and the elimination of
mines/ERW for the Convention on Certain Conven-
tional Weapons (to which the United States is a State
Party), the implied connection between “all reasonable
efforts” and “survey and clearance” is tenuous.

Stevens: At the humanitarian mine-action
workshop hosted by China in April 2004, several
Western demining organizations intimated that
Chinese demining procedures at the time were not
up to IMAS standards, imperiled both deminers
and the affected populations, and were harmful to
the environment. The Chinese defended their
approach as “practical and cost— and particularly suited ”
for mine-cleanup in developing

countries. This approach was rejected by the Western participants, in part because it implied that the lives of people in developing countries were not as worthy as those in richer countries. Doesn’t the new Land Cancellation and Release IMAS
essentially echo the Chinese approach?

McCloy: Land Cancellation and Release IMAS
were definitely low-cost, they were not in accordance
with the IMAS. In the case of the Land Cancell-
The three scenarios below help to explain some of the dilemmas mine-action authorities face when implementing Land Cancellation and Release policies.

**Angola.** Here is a hypothetical scenario drawn from real situations. A key dirt road connects two towns in Angola. It was reportedly mined and the adjoining areas may well be mined. Yet, for the past year residents have used this road without encountering a mine. They feel that the fact that a farmer has plowed certain ground without encountering a mine may be due more to luck than to the actual absence of explosive threats, and, therefore, would require more stringent (and costly) final proofs to release land plowed only once, but would require less costly (and proof) release land plowed twice times or more. Similarly, while the roadbeds of well-traveled sections of road may be considered for release short of full clearance, the fact is that there is much less compelling evidence that there are no explosive threats present on the adjacent slopes. Consequently, the roadbeds may be defined and released after less costly and time-consuming measures while the accompanying verges of these same sections of road may require much more work to achieve release. In the end, it will all depend on the proofs/procedures specified by the national mine-action authority of the respective country.

To further illustrate, a national mine-action authority may feel that the fact a farmer has plowed certain ground without encountering a mine may be due more to luck than to the actual absence of explosive threats, and, therefore, would require more stringent (and costly) final proofs to release land plowed only once, but would require less costly (and proof) release land plowed twice times or more. Similarly, while the roadbeds of well-traveled sections of road may be considered for release short of full clearance, the fact is that there is much less compelling evidence that there are no explosive threats present on the adjacent slopes. Consequently, the roadbeds may be defined and released after less costly and time-consuming measures while the accompanying verges of these same sections of road may require much more work to achieve release. In the end, it will all depend on the proofs/procedures specified by the national mine-action authority of the respective country.

**Cambodia.** Here is another hypothetical situation inspired by actual scenarios: One or more polygons on a Landmine Impact Survey of a district in Cambodia indicate that the areas in question are mined. Yet, for the last three years farmers in this allegedly mined area have been intensively cultivating their rice paddies and have not suffered any injuries or deaths.

**Sri Lanka.** The above photo depicts a freshly cultivated field on the Jaffna Peninsula, directly adjacent to some red minefield demarcation stakes. The area was cleared in one day. When the deminers arrived the next day, a farmer had already plowed to the red stakes, in this case, one could say that the farmer conducted *de facto* quality assurance/quality control. What is the Sri Lankan national mine-action authority to do?

Should the Cambodian national mine-action authority still make an effort to survey the land before declaring it safe, or should they use their limited resources to clear other land that is definitely mined? In all three cases, the answers to the real-world situations described above would have to be provided by the countries’ national mine-action authorities. The national mine-action authorities could all release areas “empirically cleared” based on the evidence available. There must still be a process undertaken to define the actual limits of the areas declared tolerable free from the risk of mines. The use of the land without adverse consequences in the three examples cited above does provide evidence (and here I stress evidence, not proof) that these areas contain no explosive threats and may not need to be subject to full clearance in order to be returned to safe usage. Nevertheless, these areas still need to be accurately defined in terms of grid coordinates and turning points (like any other piece of cleared ground), and officially released only after being subjected to the land-release processes and procedures specified by the national mine-action authority of the respective country.

The Chinese level of risk was defined by default, or lack of adherence to appropriate international standards. The new IMAS land-release level of risk is a function of conscious design with the savings in time and money carefully weighed against safety, and it is contingent on the thoroughness of the various survey and clearance processes.

Stevens: Which would you rather visit: a known mined area that had been cleared to traditional IMAS standards, or a once-suspected mined area that had simply been released following a data-collection exercise with accuracy and thoroughness certified by the host government but unknown to you?

McCloy: All things being equal, naturally, I would feel confident that the residual-risk potential would be lower for an area subjected to full clearance than for that released through survey alone. However, if I trusted in the abilities of each link in the mine-action chain, I would not hesitate to visit either area you described, although I would probably be more “situationally aware” in the survey-released area.

If I were a local that needed the land to feed my family, I would probably feel the same way. Above all, I think that the risk management inherent in the land-release process is far superior in terms of lower risk/higher safety than doing it yourself village demining (or informal demining) as it is now called, which is what many inhabi-
Survey and Land Release: Lessons from Recent Country Experience

by Charles Downs [Downs Consulting]

Suspected Hazardous Areas bring fear to local communities and hinder socioeconomic development, but in most cases the majority of the land contains no mines at all. Survey for land release may put an end to this fear, and it allows for an accelerated solution to the landmine problem.

Miners kill, clearing mines saves lives. With the dramatic fall in the number of new victims in most mine-affected countries, however, the primary justification for mine action today is to support development. Suspicion that land is mined interferes with community and national economic development, poverty reduction, reestablishment of communities, and private-sector investment. Suspected Hazardous Areas reflect community fear. Land release supports development by eliminating this fear.

Unnecessary Practices

The total area suspected of being mined is too large for the resources available for clearance throughout the world. The process of fully clearing all such areas is slow and expensive, and it requires many decades to complete. Most suspect land has no mines; in my experience, less than 5 percent of SHAs prove to have any mines in most countries, and many clearance operations find none at all. Two-thirds of the clearance tasks concluded by Handicap International–Mozambique in 2008 found no mines/explosive remnants of war. Landmine-hazard information is essential for planning by community and development operators—if their project crosses through a suspected-mined area, they want it cleared. For government ministries and the vast majority of area cleared has no mines at all?

Surveyors frequently respond to community concerns and uncertainty by identifying SHAs where the community fears them to be, even though more complete information might indicate there was no hazard.

Until recently, it was customary for Norwegian People’s Aid–Angola to clear 100 percent of any area identified as suspected of containing landmines. This policy resulted in the clearance of many areas without mines and a low ratio of mines found to hectares cleared. Since early 2008, NPA (with the support of the Geneva International Centre for Humanitarian Demining) has been developing a land-release approach to Technical Survey in Angola.

According to a concept paper by NPA–Angola, “In the past, no risk-management assessment was ever made to evaluate this risk, and the alternative option chosen was to manually clear ever-increasing areas of land, almost always without finding any mines. This ‘safe’ option was in fact a wasteful use of mine-clearance resources. These resources, which are often scarce, should be used to the benefit of the local people with actual landmine problems. Land-release concepts similar to the model used by NPA will ensure an efficient clearance of minefields and a higher percentage of land returned safely to society.”

Landmine Impact Survey

Land release does not save lives directly, since the land released generally had no evidence of mines in the first place. Clearing land without mines is an expensive way to enable development and is a poor use of resources. It is reasonable to clear all mines, to release all areas that are not mined, and to investigate further those areas that are doubtful in order to determine which areas have evidence of mines and which areas do not, and to clear or release them accordingly. The land-release approach is a significant change to both the strategic and operational roles of mine action. It centers on the collection and use of improved information to more effectively apply demining assets and return more land to safe use at a quicker rate.

The mine-action database, often based on a national Landmine Impact Survey, contains the best information available at the time it was collected. The LIS is, however, based primarily on local suspicion about potential hazards on land not in use. It indicates the extent of the problem, the area affected, the number of victims, the number of communities and people affected by landmines, and the socioeconomic activities blocked. How can it be that well-documented SHAs turn out to contain no mines or ERW, and the vast majority of area cleared has no mines at all?

The strength of the LIS is the focus on the impact of landmines on communities, but it tends to provide large and imprecise estimates of SHAs. These surveys were always conducted with the expectation of technical follow-up for operational planning. On the other hand, there is substantial evidence that the local population does not use some parcels because they suspect that mines may be present, even though the site proves to contain no hazards. In the absence of complete information, surveyors frequently respond to community concerns and uncertainty by
identifying SHAs where the community fears them to be, even though more complete information might indicate there was no hazard. At the same time, there is substantial empirical evidence that local populations make use of land previously recorded as hazardous. In some cases this may be in spite of the hazards, while in other cases it may reflect local knowledge that the specific parcel does not contain hazards. The Information Management System for Mine Action created certain distortions in the data; for example, repeat identification of the same SHA due to its influence on more than one community may appear as “pancakes” on IMSMA-produced maps. When the LIS is conducted by teams trained and equipped to produce more precise SHAs, the results are dramatically better. For example, during the Angola LIS, one of the six implementing partners included precise polygon figures as a task of the survey teams. As a result, the average size of SHAs produced in their area of operation was only one-ninth the average size for all other implementing partners combined. Adding this task to the survey teams required slightly more time in each mine-affected community but did not measurably increase the calendar time required for the survey fieldwork as a whole.

Better Information

It is important to periodically resurvey and continually update the national database with improved local information. Improvement improves with follow-up surveys for one or more reasons, including the following: more sources will be available to provide more complete information and more accurate descriptions; local populations will have learned more about their situation; local resources will have been used as parts of the SHA, and in the process, encountered or not encountered evidence of mines; local populations and/or clearance operators may have conducted clearance in the area; and General Survey teams may be trained and equipped to more precisely estimate the boundaries of the SHA.

For example:
- In Bosnia and Herzegovina, the original estimates of SHAs were revised upward in 1996 of 4,200 square kilometers (1,622 square miles) has been repeatedly revised downward to reflect improved information and clearance. The beginning 2008 estimate was 1,755 square kilometers (678 square miles), with only about 100 square kilometers (39 square miles) expected to require full clearance.
- In Cambodia, MAG and the HALO Trust identified nearly 800 square kilometers (309 square miles) of LIS-suspect land reclaimed for use by villagers, while the Cambodian Mine Action Centre determined that, in the high-casualty districts which it resurveyed, 76 percent of the LIS SHAs were no longer suspect, although another 46 percent not originally included in the LIS should be added.
- In Azerbaijan, based on systematic review on the ground with district administrators, the Azerbaijan National Agency for Mine Action reduced the total SHA to 306 square kilometers (118 square miles) from 746 square kilometers (288 square miles) in the LIS, with the further estimate that only 29 square kilometers (11 square miles) will require full clearance.
- Ethiopia provides the most dramatic example of change: resurvey of 1,018 communities in 2008 (two-thirds of the 1,492 affected communities identified by the Ethiopian Landmine Impact Survey) confirmed 892 communities as mine-free, including 28 with mine problems eliminated by spot-clearance activities of the survey teams, and cancelled over 95 percent of the SHA.

How is this last example possible? Was Ethiopia’s LIS severely flawed? Is it simply that the local populations are better informed and more accurately delimit a demining task area. In so doing, it may release large amounts of land listed as suspect in the national database but sometimes used by the local population. This data also supports local planning efforts for land use, economic development and investment, as well as for mine-action priority-setting among SHAs.

If there is a reason to believe that the area and number of mines are small, the Technical Survey operator will often clear the hazardous area within the framework of the Technical Survey.

Technical Survey for Land Release

While the specific General Survey criteria applied in each country are based on national experience, individual countries tend to incorporate many of the same criteria: local use of the land in a way that would have encountered mines if they were present; indications of past military activity in the area—including military installations and evidence of the presence of mines—and community conviction that the area is free of or affected by mines.
High-quality standards, standard operating procedures and professional judgment must be exercised to deter- mine whether the information collected is sufficient to warrant the release of an area. Examples of criteria considered by different programs include:  
- Locals have used the land in question for farming, cattle grazing or other agricultural activities for a specified period (e.g., three seasons) without evidence of mines

Experienced staff in each of the programs affirmed that their programs could advance more rapidly without sacrificing safety if they were allowed to adjust the interpretation of standards based on acquired experience.

| focus |
- Land in question has been plowed completely to a specific depth at least three times
- There have been no mine/ERW incidents reported for at least a specified period of time
- No emplanting of mines was reported or observed
- There are no military confrontations in this area
- No evidence of mines or ERW has been found
- Survey team checked high-suspicion spots and found no evidence of mines
- Locals are confident that the area contains no threat

Several countries have concluded that it is beneficial to include qualified denuming/explosive-ordnance-disposal (EOD) General Survey teams in order to verify information and to resolve small tasks. The Bosnia Herzegovina Mine Action Center uses deminers on General Survey teams to check the spots where incidents have been reported. The Ethiopian Mine Action Office found that experienced deminers were an essential component to enabling General Survey teams to disconfirm many entire SHAs and to resolve about one-third of valid SHAs caused by small-arms contamination.

The purpose of Technical Survey for land release is to provide confidence that a specific area contains no mines. Assets are applied according to nationally ac- cepted standards and standard operating procedures for “all reasonable efforts” to identify areas with ev-idence of mines. These SOPs are “lighter” than for clearance, providing a six-step method to facilitate the decision-making process. Based on the assumption that a specific area contains mines, the Technical Survey operator will perform a thorough examination to verify the existence of mines.

Standards for Land Clearance and Release

In Ethiopia, areas within the polygon produced by Non-technical Survey are identified as risk and low-risk areas. Risk areas are understood to be minefields that require clearance. Low-risk areas are ones without suf- ficient information to classify as risk areas or to rule out such areas. Sampling and other verification methods are applied to low-risk areas to determine whether they contain mines or can be released. Since the purpose is to find any evidence of mines, the most likely locations are all checked (e.g., paths, water sources, clumps of trees, or walls). The corresponding action (release or clearance) will be determined for the area. In this way and released as an “area without evidence of risk” unless specific evidence of mines is found. When evi- dence is found, nationally accepted SOPs are applied to determine the extent of area to be cleared, only a small portion of the initial task area.

Developing national standards and procedures for Technical Survey involves the application of professional judgment gained through years of experience in the national programs. Experienced staff in each of the programs affirmed that their programs could advance more rapidly without sacrificing safety if they were allowed to adjust the interpretation of standards based on acquired experience. Some of the options included: partial ground clearing, simple clearance and sequential single- dog searches, coverage of sites by flails or brush cutters, faster detector sweeps and less sweep overlap.

Some programs adjust the extent of “light” methodologies according to the degree of confidence in the suspicion that an area contains mines. NPA–Angola established a six-step scale extending from “certain there are mines” to “certain there are no mines,” with clearance priorities. The six steps include mechanical preparation of the full site, or lanes provided by machines or mine-detecting dog teams, with extensive visual inspec-tion or checking by a single dog. If the suspicion is confirmed, the area is subjected to full clearance, building on relevant actions already taken during the Technical Survey. In practice, if there is a reason to be- lieve that the area and number of mines are small, the Technical Survey operator will often clear the hazard- ous area within the framework of the Technical Survey. However, if the suspicion is that the area may be released as an area without evidence of risk. To the ex- tent that this is practical, the amount of clearance and cost will be lower than with full clearance of the entire task area. In Azerbaijan, the Azerbaijan National Agen- cy for Mine Action has found that the cost per square meter of releasing land through Technical Survey is about one-third the cost of traditional clearance.

Improved Mine-action and National Standards

In addition to the value of a land-release approach to General and Technical Survey, recent country expe- rience highlights several related measures to improve the support of mine action for development:

- With increased release of land without full clear- ance through Non-technical and Technical Survey methods, there is a need for appropriate documen- tation related to a clearance certificate that declares the land to be an “area without evidence of risk.” This documentation may be a legal requirement for many development organizations. It is not a statement that the area is mine-free, because it has not been cleared; it is a statement that a reasonable effort was made to find mines and no evidence of mines was found. Lagardère states that the release of cleared areas is not simply a faint hope that no mines are left and that the area can be used in a context where it is not easy to confirm the nonexistence of mines. In this situation, the release of cleared areas is a statement that a reasonable effort was made to verify the absence of mines. This can help to establish a new normal that includes the use of cleared land, which can be valuable for development purposes.

- With increased release of land without full clear- ance through Non-technical and Technical Survey methods, there is a need for appropriate documen- tation related to a clearance certificate that declares the land to be an “area without evidence of risk.” This documentation may be a legal requirement for many development organizations. It is not a statement that the area is mine-free, because it has not been cleared; it is a statement that a reasonable effort was made to find mines and no evidence of mines was found. Lagardère states that the release of cleared areas is not simply a faint hope that no mines are left and that the area can be used in a context where it is not easy to confirm the nonexistence of mines. In this situation, the release of cleared areas is a statement that a reasonable effort was made to verify the absence of mines. This can help to establish a new normal that includes the use of cleared land, which can be valuable for development purposes.

- Number of mine-clearance tasks without mines

Community/end-user information is essential to determine when the mine-clearance effort is finished. The work of the mine-action program is not complete without the use of end-users, because they are not confident that it is safe. An excellent example of how to ensure that land has been effectively released from mines and suspicion is provided by the 2004–07 HALO Trust–Mozambique mine-impact-free districts project. Convinced that clearance of all mined areas in the four northern provinces of Mozambique was nearly concluded, HALO conducted a correlation study with the government of Mozambique to determine whether there were any remaining mined areas affecting the communities, to clear any that might be identified and to obtain written acceptance from the community and local authorities that their areas were now mine-impact- free. In the process, HALO identified 74 previously unknown SHAs and cleared an additional 176 mines, which were not an immediate step toward demining the areas and thus might be considered residual. The number of cleared mines increased from 18,000 to 52,000, with 2,000 additional mines to be cleared. The project resulted in the clearance of 52,000 mines and an increase of 1,000 additional points of mine action. This would be an additional 6 percent of the total number of mines (two-thirds of which proved to contain no mines) and a 0.2 percent increase in total mines cleared in

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http://commons.lib.jmu.edu/cisr-journal/vol13/iss2/1
the four provinces. Communities previously not comfortable using the land were prepared to use it once their suspicions had been removed by these actions. This situation is a good example of the need to remove community suspicion of mines as part of the professional completion of mine action. Most programs have paid only very limited attention to this issue. However, as programs near completion at the national and local level, it is important to document this progress with the community, donors and other stakeholders.

In order to take full advantage of Technical Survey and land-release approaches, there is a need for a national strategy on the subject, national standards and SOPs to implement it and supportive IMAS. Similarly, the type of quality assurance appropriate to Technical Survey needs to be determined—ground sampling is still appropriate for clearance, but not as relevant to survey as information-gathering. National standards and quality-assurance procedures should be adapted to permit careful development, testing and wider use of land-release procedures to increase the effectiveness of mine action. The Survey Action Center is currently working with the National Demining Institute to make the land release in Mozambique operational.

Conclusion

Effective implementation of the land-release approach will accelerate solutions to the landmine problem through improved information-gathering. Experience has shown that large areas and numbers of SHAs can be released from suspicion by teams combining General and Technical Survey skills, resulting in more effective use of clearance assets by ensuring they are concentrated, as much as possible, on areas likely to have mines. Land release is a better way to ensure that more communities and development projects benefit sooner from a solution to the landmine problem. This article draws on research the author conducted for the GICHD (“Survey and Land Release”), and the Survey Action Center (“Mine Action Program Use of LIS Information Several Years after Survey Completion” and “Use of Minefield Information by Development Operators”). The opinions expressed are those of the author, and do not necessarily reflect those of the GICHD, SAC or of individual programs cited (Angola, Azerbaijan, Bosnia and Herzegovina, Cambodia, Ethiopia, and Mozambique). See Endnotes, page 62. For additional references related to this article, see http://tinyurl.com/kexfy.

Is it Time for New Terminology in Land Release and Technical Survey?

by Robert Keeley [ RK Consulting Ltd. ]

Overlapping terminology has contributed to confusion in the demining process and stunted the development of Technical Survey as a potentially effective concept. This article points out places where ambiguity exists and suggests ways that the terminology can be clarified.

News Brief

Geneva Call Holds Second Meeting

Geneva Call, a non-governmental organization dedicated to working with armed non-state actors to facilitate compliance to international law regarding civilian rights, held its second meeting for the Deed of Commitment for Adherence to a Total Ban on Anti-Personnel Mines and for Cooperation in Mine Action. More than 40 representatives from 28 signatory groups, representing 26 countries, attended the meeting in Geneva on 18 and 19 June 2009. The meeting was held to discuss the challenges that NSAs face in implementing humanitarian norms, in particular the banning of landmines. The meeting was the first of its kind to allow participants to express their own views on how they could implement a wide array of humanitarian issues, with particular interest paid to the protection of women and children in conflict-ridden areas.

In 2009, Geneva Call has successfully convinced non-state actors—internationally recognized and partially state-recognized groups—to sign the Deed of Commitment. According to Geneva Call, four separate groups have signed the document since March 2009, and since the inception of the document in 2001, 39 non-state actors have banned the use of anti-personnel mines. Most of the NSAs operate in conflict-termed regions in Africa and the Middle East.

but three deminers in a room together and you are likely to get five definitions of the term Technical Survey. Disagreement about the exact definition of Technical Survey exists because the term has not been clearly defined. This ambiguity is problematic for two reasons: 1. Technical Survey and land release can improve the productivity of demining. If deminers choose a different method because of the ambiguity in Technical Survey terminology, they may resort to manual de-mining. Manual demining is slow, expensive, and in areas where the contaminated land is of marginal value, it can mean that the cost of remediation outweighs the economic benefits of clearing the land. As a result, there is considerable incentive to improve the productivity of demining. 2. Where one finds ambiguity in a concept’s definition, there is, theoretically, the possibility of turning to the International Mine Action Standards for guidance. Unfortunately, while the current edition of the relevant standards (IMAS 08.20) provides excellent advice on the color and spacing of marker posts once a survey is completed, it provides little advice as to how a Technical Survey might actually be conducted. This manifest weakness damages the effectiveness of what is otherwise a very helpful set of guidelines.

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to describe a clearance project where full clearance techniques are used, but where it is recognized that the project will not be able to deal with all of the landmine/UXO contamination—exactly the converse of the definition described in Table 1. Similarly, the term land release is sometimes used to describe a comprehensive suite of processes rather than simply “cancellation” of land already in use.

**“Join the Dots” and Related Sampling Techniques**

One of the main issues with the lack of clear terminology is that it allows conflicting concepts to coexist without a critical analysis of the problem. Technical Survey aspires to do the job faster and cheaper. However, just because the idea behind efficient Technical Survey exists, it does not mean the techniques necessary to achieve these goals have materialized. This can be demonstrated through a critique of the process called “join the dots” in Table 1. At first glance, this technique, when sketched out on a scrap of paper, appears effective. However, this technique can only work where the density of the mine contamination has a maximum, not average, distance between mines that is less than the width of the breaching lane, or the breaching party would go right through the minefield by mistake.

This can be verified by anyone with access to a computer running Microsoft® Windows software. Simply select the custom option of Minesweeper, the computer game that comes with Windows, and vary the density of the mine pattern. Then prepare a plan for playing the game as if it were a breaching exercise. See what pattern you would have identified and how it compares with what was actually in the game; the lower the density of the actual contamination, the less effective the breaching plan will be. Statisticians would approve of this rather simplistic test because Minesweeper generates random numbers better than any sketch drawn by a human on a piece of paper. An analysis of 10 iterations of Minesweeper provides the results as set out in Table 2 (next page).

While more games would improve the statistical significance of the results, the mean percentage of mines discovered in the defined areas as a result of this sampling process can be rounded up to around 68 percent, with a confidence interval of around +/- 8 percent (i.e., the process will find between 60 percent and 76 percent of mines at this density and search pattern) and a confidence of 95 percent in the overall result of these calculations.

Please take a look at the Minesweeper screenshots on page 22. In the first screenshot (top left), the custom Minesweeper is set to gather information about the land to be cleared, but not about how to perform the clearance process. It may be the multiple roles for Technical Survey that lead to some of the confusion in its terminology.

I have found at least eight different Technical Survey (or closely related) concepts in mine action. These are summarized on the next page in Table 1. Readers will see that definitions 1–3 are most strongly related to clearance, local soil conditions, and the vegetation characteristics.21 The phrase “including the area(s) to be cleared” suggests a role for Technical Survey in defining the limits of the area to be cleared, but not about how to perform the clearance process. The breaching technique would have found five out of the 10 mines (50 percent), but use of the “join the dots” boundary marking

**Table 1: A taxonomy of Technical Survey processes.**

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<tr>
<th>Item</th>
<th>Game</th>
<th>No. of mines found</th>
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One can imagine that eventually a sampling pattern is set so dense (in order to cover every mine), that it is actually cheaper to set out a simple clearance task. In the final screenshot (bottom right), the game is replaced, allowing Minesweeper to generate another random pattern of the same density. In this case, our standard breaching grid not only identifies 50 percent of the mines, but also makes a significant error in estimating the boundary of the definitely-mined area. Thanks to Minesweeper, this thought experiment is easy to replicate independently. It is unlikely that a potential customer of this process or beneficiary of this mined land will be content with these percentages. Remember, recognizing that risk is a function of activity means that a single missed mine is very significant when turning this land (which previously was not used due to a fear of mines) over to a population and encouraging them to use it. Their risk is increased because they have a greater chance of encountering a mine than if they continue to remain outside the perimeter, where they are at zero risk. Given that, in this model, where 37.5 percent of the area would have been searched, the cost is probably not cheaper than a full clearance project, which would have been simpler to administer and manage.

The model is based on a very high density of sampling—one lane in five—so it is conservative compared to "typical" suggested breaching patterns of one lane every 25 meters (82 feet), and it is evidently questionable even in areas of comparatively high mine density. Lower densities of contamination would provide even less impressive results. In short, sampling for mines is only likely to work where it can be strongly predicted that the mines are laid in patterns. Circumstances of "uncertainty" (e.g., random-patterned minefields and submunition-strike footprints) do not seem to lend themselves to sampling.

As an aside, I’d like to note that we often use the terms risky and uncertain interchangeably, but statisticians have recognized a conceptual difference for some time. For example, when asked to predict the “risk” of drawing the Queen of Spades from a new, "fair" pack of cards, it can be easily calculated as 1:52. This is because one knows where in the pack of cards the Queen of Spades is, we do know that there is only one of them and there are 51 other cards in the pack. Now imagine a situation in which the dealer is seen to take an unknown number of cards from the pack and place them in her pocket, before asking you again to draw the Queen of Spades. We now do not know how many cards are still in the pack and even if the Queen of Spades is present at all. Thus, we are not able to use statistical methods of predicting the risk as we don’t have enough information about the circumstances, and are in a condition of "uncertainty." In the context of demining, whereby minefields are laid in regular patterns, one can imagine being able to use a statistical method to calculate the risk of encountering a mine with a particular sampling method, but where there are unknown numbers of mines in irregular patterns, conditions of uncertainty exist.

A critical reader might ask about the relatively small number of casualties in land that has been sampled under these unclear concepts. Personally, I know of at least three accidents that have occurred after this type of land sampling. While even one accident is too many, there are several explanations as to why there are few reported casualties. The main reason is that most of the land is not mined. In such circumstances, even a poorly executed procedure can appear effective because there is no potential for casualties anyway.

**New Set of Concepts and Terminology**

So far, examples of overlapping terminology that exist in the domain of mine action have been reviewed.

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<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Definitely Clear</td>
<td>Land that has been cleared to IMAS or relevant national standards and has an available clearance certificate. The boundaries of the cleared area are clearly defined and identifiable.</td>
<td></td>
</tr>
<tr>
<td>Probably Clear</td>
<td>Land that is in general use by the local population, and does not contain casualty reports or other indicators of contamination. May also include cleared land that does not meet the full criteria of &quot;Definitely Clear.&quot;</td>
<td></td>
</tr>
<tr>
<td>Probably Mined</td>
<td>Land that is not in general use, or does not otherwise meet the definition of &quot;Probably Clear,&quot; but with only indirect indicators of actual contamination.</td>
<td>May include contamination but the boundaries of the actual contaminated area cannot be defined.</td>
</tr>
<tr>
<td>Definitely Mined</td>
<td>Land that can be identified as mined by the presence of one or more direct indicators and where the boundaries are clearly defined.</td>
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Table 3: Land-contamination definitions.
Where definitions are not mutually exclusive, problems of ambiguity can be found and, therefore, need to be redefined. However, we should first review a few of the core concepts. One problem, presented by the discussion above, is a different acceptable end state from various survey processes than is expected from full clearance. While this may not be acceptable from a customer’s or beneficiary’s perspective, there can be no clear debate while the terminology is so disordered.

When discussing concepts and terminology, the principles in Table 3 (previous page) are suggested as a possible set of concepts. The list is ordinal where the least contaminated land is located at the top and the most contaminated land is located at the bottom. This table is more logical than presently used terms, such as Suspected Hazard Area, Confirmed Hazard Area and Defined Hazard Area. It is also useful because it helps establish an end state for a survey or area-reduction process. For example, the use of these concepts would enable us to define the requirement of an area-reduction process much more clearly by identifying probably mined areas as either definitely mined or definitely clear. Area clearance, however, would be a process that turns definitely mined into definitely clear areas. In the same concept, one could describe a land-cancellation process as one that identifies which parts of a suspect area are probably clear and, therefore, can be disregarded for further action.

One can then establish a hierarchy of mutually exclusive terms that covers the full spectrum of the concepts, which might help remove ambiguities. This proposed hierarchy of terms, with tentative definitions, is set out in Table 4 (below).

These concepts are ranked sequentially—in increasing order of time required to accomplish these tasks, but also in increasing order of expense and effectiveness. In terms of dollars per square meter, area clearance is far more expensive than a land-cancellation process, but it may be able to release much more land per intervention. It also allows the term Technical Survey to be saved for use in only one part of this series of processes. Indeed, it is now possible to consider the revised concept of Technical Survey as being an optional process only to be used when necessary. Note also that sampling is not recognized as being a generally applicable technique in this hierarchy of concepts.

Conclusions

The term Technical Survey has been an ambiguous concept in the mine-action community. Redefining the term can help streamline the land-release process and avoid further confusion. To improve the Technical Survey definition, it must be separated from other concepts and be used to simply refer to the investigation of suspect areas for information-gathering purposes. This also allows room for the use of a series of new terms (or perhaps old terms used in a different way) that are mutually exclusive and fit into a simple hierarchy of land-release concepts. Technical Survey becomes a term to describe just one of these concepts as opposed to being an umbrella term for multiple concepts. The discussion on this topic is far from finished. Hopefully this article has helped clarify a few concepts for others to continue this conversation.

This article was written prior to the release of the new draft Internationally Mine Action Standards related to Technical Survey and Land Release. Readers can view the new draft IMAS at http://tinyurl.com/newIMAS.

See Endnotes, page 62
Land-release Policies and Human-security Complexities

by Kjell Björk | University of York

This article reviews the need for transparency and community participation in the land-release process. Participation is a fundamental part of post-war reconstruction, and the author argues that combining reconstruction with transparent participation will contribute to the quality, accountability and national ownership of the land-release process.

Mine action, and especially mine clearance, has become increasingly effective and efficient since its emergence as a humanitarian discipline in the late 1980s. The most significant improvements have been due not to substantial developments in technology but to the methodology applied to operations. Mine-action implementers have learned to assess the expected outcomes of clearance, victim-assistance and mine-risk-education activities while reaching goals effectively and efficiently. The technical improvements of metal detectors and mechanical-clearance and ground-preparation equipment, as well as increased knowledge of mine-detection-dog capacity and training, must be recognized. Still, the way we deploy assets effectively and prioritize tasks has been the most significant contribution in ensuring that mine-action operations have a relevant impact on affected communities.

General and Technical Survey have been available for decades but have now become essential elements of land release for rectifying faulty identification of suspected hazardous areas.

Land release is a continuation of mine action on the same principles, but in the context of better identification of areas needing clearance and of the implementation of the Ottawa Convention. General and Technical Survey have been available for decades but have now become essential elements of land release for rectifying faulty identification of suspected hazardous areas. National authorities must oversee land-release activities; however, a paucity of strong international guidelines increases the likelihood of unsound practices and miscommunication between stakeholders.

If mine-affected countries are to develop realistic plans for implementing the Ottawa Convention, land release must be central to these plans. There is a need for a land-release concept that allows national mine-action authorities to conduct a well-informed and efficient reduction of SHAs while improving cost efficiency in operations. This article proposes an approach to land release that emphasizes a high level of community participation and transparency to ensure access to viable information about SHAs. It also examines at the land-release process congruent with communities’ perception of acceptable risk and Ottawa Convention requirements.

A Guide to Land Release

Responsible land release is an issue of effective information-gathering and risk management. These concepts are dependent on transparency and participation by all relevant stakeholders. A transparent process fulfills two requirements for successful land release as defined in the Geneva International Centre for Humanitarian Demining publication A Guide to Land Release:

1. The possibility of a high degree of community participation
2. The likelihood of decisions made in the land-release process

The possibility for communities and authorities not involved in mine action to participate in the process is essential both in terms of ensuring relevant information is gathered and analyses on threats posed by SHAs are well-informed. Transparent processes—those in which subjective decision making is minimized, and actions and conclusions are documented and related to a legislative process—fulfill three main purposes:

1. A quality-control system to prevent mistakes rather than later having to rectify them
2. Accountability and liability for actions undertaken in the land-release process

3. Acceptance of the land-release process among affected communities

First of all, requiring a documented process in which all stakeholders contribute to a system that prevents nonconformities rather than correcting past mistakes ensures all steps to gathering and analyzing information are followed. In other words, the documentation of the process should be designed to ensure that all steps in information gathering and analysis are completed and of adequate quality to prevent land from being released on faulty assumptions. Preventing nonconformities from reaching and affecting the end user is an essential part of a quality-control system (such as ISO 9000) and can, in the case of land release, have mortal implications.

Second, transparency fulfills two essential purposes in terms of liability. As an employee of Norwegian People’s Aid once said, “In this business, it is not a question of if an accident will happen; it is a question of when.” Mine action has come a long way since the 1980s in terms of quality and safety. Still, accidents happen, and at some stage, some released land will contain landmines. If land has been mistakenly released because of negligence or a faulty process, it is important that the process is well-documented. This way, information can be corrected or, in the worst case, people will be held accountable for their actions. It is equally important for land-release staff to document their actions to prove their diligence in the event that mine contamination is discovered.

Third, in its conclusions, A Guide to Land Release defines seven broad principles for land release:

1. A formal, well-documented and recorded process of investigation into the mine/explosive remnants of war problem
2. Well-defined and objective criteria for the reclassification of land
3. A high degree of community involvement and acceptance of the decision-making process
4. A formal process regarding the handover of land prior to its release of land
5. An ongoing monitoring mechanism after the handover has taken place
6. A formal national policy addressing liability issues
7. A common set of terminology to be used when describing the process

All of the above principles benefit from transparency both in terms of gaining confidence in the process among end users and providing accountability for its implementation. To promote national ownership, the land-release process must take terrain, land use, cultural communication and the national legislative system into consideration, as well as accuracy in the assessment of SHAs. To a large extent, creating an effective national land-release

Accidents happen, and at some stage, some released land will contain landmines.

Operations Coordinator, Mine Coordinator, Sector Coordinator and other members of a survey party review future mine-clearance tasks for Norwegian People's Aid personnel near the northwest border of Jordan, 22 April 2009. All photos courtesy of Sanna Ekberg Niclas. 

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process depends on national authorities’ capacity to govern the process to meet human-security needs, as well as developmental and economic requirements for risk-sharers.

Community participation is an undeniably essential part of basic governance. If a mine-action authority is to make land-release decisions that support the community’s perception of acceptable risk, the communities must be involved in the initial decision-making process.

Areas without Obvious Risk vs. Areas Reclaimed or Cancelled

Norwegian People’s Aid’s Mine Action Team in Bosnia and Herzegovina had heated debates regarding the use of terminology to be used to differentiate areas initially suspected to be mined from those selected based on survey data for an actual clearance task. These discussions took place before the concept of land release had been defined, but served as a precursor to it since, in effect, it was an early effort by the Bosnia and Herzegovina Mine Action Centre and other operators to better define which areas were actually in need of clearance. The debate then focused on the issue of whether unused areas adjacent to or in close proximity to known minefields could be deemed safe for use because there was no indication of mines in those specific locations.

In a country such as Jordan, which has organized minefields, it might be feasible to deem areas safe because of information indicating an absence of landmines. In countries such as BiH, where warfare was conducted over an extended period of time and included random and small clusters of landmines being emplaced, more extensive survey methods must be used.

While clearing areas that had been used for years as pasture grounds or low-intensity farming, the demining teams often found small clusters or individual mines untouched by animals and humans using the area. On the other hand, in areas where the non-existence of landmines cannot be verified through information indicating an absence of landmines, in countries such as BiH, warfare was conducted over an extended period of time and included random and small clusters of landmines being emplaced, more extensive survey methods must be used.

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Yemen refer to information from the end users of the land release process. Yemen uses the term “hazardous areas” to indicate areas where unexploded ordnance may be present. This term is used by the authorities to describe areas that are not cleared unless the existence of mines is confirmed. A common practice is to plow the top layer of the road, check the debris for UXO and mines, after which the new foundation of the road is laid and the road constructed. The methodology provides adequate safety for road construction and future traffic. This level of verification is not adequate if the road might lead to a growth in activities at intersections or along sides of the road. An area initially intended simply for road construction can develop into an area where people undertake construction, perform agricultural work and move on foot.

A Model Solution

A functional land-release process must not only include a rigorous system of accessing and analyzing available data; it must also ensure that end users have an understanding of and confidence in the process as a whole. Of the countries reviewed in the GICHD guide, Croatia presents the most detailed and comprehensive system for land release. In its criteria, “conversations with contact persons” is listed; however, no specific reference is made to the affected communities included. Cambodia and

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Participation will naturally bring additional work and require more time than a simple survey. In conflict and post-conflict situations, displacements and refugee movements will hinder end-user participation. When it is feasible, however, participation and transparency will be productive for two main reasons: first, the quality of the land-release process is dependent on information regarding SHAs, as well as perceived tolerable risk levels, to which end users can be key contributors; second, accountability and acceptance of the land-release process are essential for its sustainability. By involving the end user throughout the process as a partner, both issues are effectively addressed.

Kjell Björk has worked as Programme Manager in Bosnia and Herzegovina and Iraq, and as a consultant in Africa and the Middle East. Currently, he is completing a doctorate, titled “Governance Indicators and Key Factors for the Implementation of an International Mine Action Protocol.” He is the senior editor of “Post-war Reconstruction and Development: East and West.”

Kjell Bijek
Post-war Reconstruction and Development Unit
Derwent College
University of York
YO10 5DD, York / United Kingdom
E-mail: Mine-Action@york.ac.uk
Gender and Land Release: The Responsibility of the Mine-action Community

by Marie Nilsson, Virginie Rozès and Juliane Garcia [Swiss Campaign to Ban Landmines]

In many countries, men are considered the sole landowners, leaving women with few property rights. Yet women are disproportionately affected when men are killed or injured by landmines, as they can be left with few resources after such tragedies.

Land is a basic source of wealth, social status, power and well-being. It is also a major source of employment in rural areas. When land is affected by landmines, however, the use (and sometimes ownership) of it is modified, as key land is blocked and access to services is limited. Women, girls, boys and men living in mine-affected communities can no longer fulfill their daily activities without the risk of becoming victims of landmines. Thus, the main objective of humanitarian mine action is to clear land with the aim of releasing it to the civilian population as quickly, safely and cost-effectively as possible.

Gender and Land Release: The Responsibility of the Mine-action Community

In many countries, men are considered the sole landowners, leaving women with few property rights. Yet women are disproportionately affected when men are killed or injured by landmines, as they can be left with few resources after such tragedies.

To that end, the land release process triggers many challenges from a gender perspective. Women and men have to leave or stop using the land because mine contamination makes it too dangerous on which to live and/or conduct daily activities. But what happens once the land is cleared and ready to be returned to citizens in the communities? Are women and men equally involved and consulted in the process of releasing the land? Who decides how the cleared land is going to be used and by whom? Do women and men have an equal say in these decisions? What are mine-action organizations’ impact and responsibility in this process? This article will try to answer these questions by exploring the importance of integrating the perspective of gender into land-release procedures.

Women’s Disadvantages and Mine Action

Land policy is a delicate issue to which there are many gendered aspects. In some countries, land legislation favors males. Under customary law, which exists in many societies, males are in most cases considered to be the owners of the land. In those situations, women may only have access or rights to use the land because of their relationship with a male relative. These cultural rules greatly impact women as they prevail over written laws, which may actually allow them to own land. In cases in which the law recognizes and protects women’s rights to land (such as property- and land-ownership rights, equal inheritance rights for daughters and sons, and marital property for women), enforcement of these laws is difficult. In Colombia, for example, due to the armed conflict, both women and men face problems accessing their land. Women, however, are discriminated against in a disproportionate manner; although legally they are entitled to land ownership, in practice they struggle to exercise this right. As a consequence, when de-mining activities take place and land is released, women often lose access to their land as a result of gender-based discrimination. Moreover, profits made from these land areas seldom benefit women. Statistics reveal that women own less than 5 percent of the world’s titled land.

Furthermore, women do not always have access to information about their economic and legal rights, and if they do, they are often reluctant to exercise them and powerless to effect change or to participate in any decision-making process. Due to illiteracy (proportionally higher among women as compared to men) and, in many cases, their secondary social status, women do not feel confident enough to stand up for their rights. Thus, daughters would rather concede their rights to brothers to avoid conflict, and wives and daughters may not insist on having their names included on the title to household land because of potential conflict with their husbands or families.
In such a context, it is problematic for mine-action organizations to carry out their work without taking into account the discriminatory environment in which land release is taking place.

Challenges for female-headed households. The challenges relating to gender and land release are even more acute for female-headed households. Since most direct victims of landmines are men, women living in mine-affected communities become heads of households or caregivers to their injured husbands—a role they have not been prepared to undertake and for which the laws on land ownership are not suited. The head-of-household role raises many questions, including what happens to women injured by landmines who become de facto heads of households as a result of abandonment or divorce, and what happens to those who become widows due to their husbands’ deaths. They will be deprived of their access to land as they do not have the legal right to inherit it? These issues should be a concern for mine-action actors and be taken into account in land-release procedures.

Discriminatory mine-action practice. Land release does not start when the clearing is over—it starts much earlier and is part of the initial prioritization process. The land goes through general-assessment activities which consist of collecting and analyzing information and, if necessary, performing clearance. Analyzing information, i.e., the Technical Survey, is the technical verification of the presence or absence of landmines. The process ends with the handover of the land once it has been cleared of landmines deemed releasable due to the absence of a landmine threat. Ideally, in line with arguments that view gender equality and equity as crucial for a balanced outcome, and in the different phases of land release and decision-making processes. Stereotypically, the mine-action process often operates in a way that is not always sensitive to female workers. A mine-action organization or a national mine-action authority (generally represented by a man) meets the community or the local representative (another man) to discuss the elaboration of land-release procedures. In this male-dominated, homosocial environment, women are often unable to meaningfully express their views will be reflected. Authorities must actively seek the different views will be reflected. Authorities must actively seek this information.

Linking mine action to development. Demining organizations often operate under a single mandate to clear a specific, marked area of landmines and other explosive remnants of war. What happens at the end of this process is often not controlled or within the organization’s mandate. Mine clearance, regardless of who is undertaking the activity—national teams, commercial

**Gender Issues in Land Release**

To ensure fair land-release procedures, mine-action authorities and other responsible land-release organizations need to adopt a gender-sensitive strategy. This approach requires a gender analysis to be implemented regarding the access and use of the land by all members of society and that gender-disaggregated information is systematically collected. This process implies looking at many crucial issues such as:

- Women’s legal right to own or utilize land for long periods of time
- Women’s customary and socially accepted right to own or control land
- Women’s ability to claim and/or enforce their legal rights, in particular, in the special cases of single, divorced or widowed women, as well as polygamous relationships
- Women’s access to information
- Gender training for staff. In order to carry out the process described above in a gender-sensitive manner, mine-action staff should be trained on the gender dimensions of mine action. Staff, both at headquarters and in the field, need to be aware that mine-action activities do not benefit males and females equally and that gender equality does not happen by itself but only if active measures are undertaken to ensure an equal and fair outreach. Gender training must therefore be mandatory and considered just as important as other technical competencies needed to fulfill the goals of mine action.

**Land-release certificates.** Mine-action organizations should investigate if procedures required to receive land certificates or post-clearance titles act as barriers for women to receive land. If the land was purchased by a couple, land-release authorities should register land certificates in both spouses’ names to ensure legal ownership for both women and men, instead of titling the land only to male household heads, as is often done. There may also be administrative barriers regarding issuing these certificates to women who may not have either access to the valid information or the knowledge (e.g., literacy) or the power to claim the land.

**Advocating for a change.** Mine-action authorities, responsible land-release organizations and donors should formulate specific gender-related conditions for the implementation of the land-release process and/or the disbursement of funds. The first step would be that mine-action organizations explicitly commit themselves to gender equality as a fundamental principle for all their work. This commitment could also imply integrating the land, housing and property rights of women into the land-release agreement, making sure that governments are trained with technical assistance to abolish laws or practices that discriminate against women on issues concerning inheritance and ownership and raising awareness in the community on the topic.

An effective consultation process. Mine-action organizations should evaluate the needs of all the members of a community. Furthermore, the economic and social impact of the land-release process for these groups at an early stage by consulting both women and men, ensuring not only quantitative but also qualitative participation. If all voices are not heard at the outset, it will be very difficult to hear them once the handover of the cleared land is taking place. Some questions that need to be addressed include: Whose needs are taken into account? How will the land be used and by whom? Will the activity for which the land will be released be equal and fair to men and women?

It is also necessary to ensure that women and men in mine-affected communities receive information that land has been cleared and is ready to be used. Women and men might not have the same access to information, so the channels for conveying this message should be broad and include a variety of methods. For example, informational material must be distributed through as many means as possible, including services exclusively used by women, for example, through midwives or women’s groups. As women often suffer illiteracy to a greater extent than men, communication methods should include verbal/auditory, visual and other non-written forms.

Before the actual release of land takes place, a formal handover ceremony should occur. This procedure involves thorough documentation signed by the future users of the land, the local community authorities, representatives from the organization that carried out the assessment and the national authorities. It involves meetings with local authorities and representatives from the populations who will use the released land. However, just meeting the community leaders or local authorities regarding issuing these certificates does not necessarily mean that all views will be reflected. Authorities must actively seek this information.

**Women’s access to information**

- Women’s customary and socially accepted right to own or utilize land
- Women’s ability to claim and/or enforce their legal rights
- Women’s access to information
- Gender training for staff.

**Women’s rights to lands and properties**

- Women’s legal right to inherit
- Women’s customary and socially accepted rights
- Women’s access to information
- Gender training for staff.

**Women’s control over resources**

- Women’s ability to control
- Women’s access to information
- Gender training for staff.

**Women’s participation in decision-making**

- Women’s ability to participate
- Women’s access to information
- Gender training for staff.

**Women’s access to livelihood opportunities**

- Women’s access to livelihood
- Women’s access to information
- Gender training for staff.

**Women’s access to education and training**

- Women’s access to education
- Women’s access to information
- Gender training for staff.

**Women’s access to health services**

- Women’s access to health
- Women’s access to information
- Gender training for staff.

**Women’s access to justice**

- Women’s access to justice
- Women’s access to information
- Gender training for staff.

**Women’s access to credit**

- Women’s access to credit
- Women’s access to information
- Gender training for staff.

**Women’s access to technology**

- Women’s access to technology
- Women’s access to information
- Gender training for staff.

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Making Land Release in Mozambique Operational

by Antonio Balcić [Instituto Nacional de Desminagem] and Charles Downs [Downs Consulting]

Mozambique’s national program for land release has cleared many Suspected Hazardous Areas in the past eight years, but the Instituto Nacional de Desminagem (National Demining Institute) aims to make the program even more effective. In March 2009, IND collaborated with the Survey Action Center to host a workshop at which land release terminology and concepts were discussed, hoping that improved survey methodologies would lead to a more efficient land-release process. The workshop resulted in the creation of national land-release draft elements and criteria that will help to develop practical land-release standards in the near future.

The Workshop

Discussion regarding land release in Mozambique began in 2008 when IND managed, with the support of the Geneva International Centre for Humanitarian Demining, introduced the subject within IND and with other stakeholders. As a second step, IND invited the Survey Action Center to help develop a policy approach and facilitate a workshop for its operations/quality-assurance staff. The purpose of the workshop was to develop operational procedures related to the land-release process, as well as to improve the efficiency and progress of the national program as a whole.

Marie Nilsson

Programme Manager, Swiss Campaign to Ban Landmines

3 bis Chemin des Pontets
1212 Grand-Lancy
Geneva, Switzerland
Tel: +41 22 879 1052
Fax: +41 22 879 1051
E-mail: m.nilsson@scbl-gender.ch
Web site: www.scbl-gender.ch

Juliane Garcia

Gender and Mine Action Programme

Swiss Campaign to Ban Landmines

Juliane Garcia joined the Gender and Mine Action Programme as Programme Assistant in January 2008 for a five-month period. She has a master’s degree in public international law and is currently studying at the Academy of International Humanitarian Law and Human Rights in Geneva. She previously worked on the disarmament of weapons of mass destruction. Previous positions included internships at International Center for Human Rights in the Conference on Disarmament, Switzerland.

Juliane Garcia

Programme Assistant

Gender and Mine Action Programme

Swiss Campaign to Ban Landmines

E-mail: g.jacobi@scbl-gender.ch

E-mail: a.nilsson@scbl-gender.ch

Marie Nilsson is a Gender Programme Manager for the Swiss Campaign to Ban Landmines. Before joining the Swiss Campaign she worked as Gender Advisor at the Swedish Rescue Services Agency and was responsible for the gender sensitization of humanitarian actions with task ranging from field analyses through the development of gender toolkits and training events to organizing seminars and contributing to gender-aware recruitment systems.

Virginia Rucchet

Programme Officer

Swiss Campaign to Ban Landmines

E-mail: v.rucchet@scbl-gender.ch

Virginia Rucchet is a Programme Officer with the Swiss Campaign to Ban Landmines Gender and Mine Action Programme. In January 2009 she took over as Program Director. Previously, Rucchet worked as a Women and Civil Research Assistant at International Committee of the Red Cross where she undertook research on sexual violence in armed conflict. Earlier positions also include researching sexual and gender-based violence for United Nations High Commissioner for Refugees and gender history for the Academic Research Center on Gender Studies in Lyon, France.

E-mail: v.rucchet@scbl-gender.ch

E-mail: a.nilsson@scbl-gender.ch

Possibilities for Change

Mine action is currently in a transition process in which the focus is shifting from the number of square meters cleared to the beneficiaries, i.e., all affected stakeholders in mined communities. However, despite positive recognition that gender equality is a precondition for successful mine action, many actors are still reluctant to redefine the sphere from purely technical to one that takes a greater responsibility for sustainable development. In this regard, mine-action organizations need to be aware that women may have different needs, preferences and priorities related to community land.

Since women and men usually perform different activities, the land use may not necessarily benefit both genders equally. In patriarchal societies, men may not have the knowledge or understanding to address women’s concerns, and women may not be encouraged to talk about the issues.

Frequently excluded from peace processes and mine-action activities, women are likely to suffer continued violence and discrimination in reconstruction and rehabilitation activities, as well as human-rights violations. Many displaced women returning home after a conflict face difficulties securing access to housing, land and property. In fact, they may be culturally and legally denied access to it. If there is no involvement or participation of both genders in a community from an early stage of the mine-action program, these programs not only carry the risk of sustaining existing inequalities, but more dangerously, may exacerbate them. A sound mine-action plan takes precautions to ensure that land-release processes benefit all members of society equally.

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The Workshop

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land release, particularly through Non-technical and Technical Survey, for quality assurance of the process, and for the documentation of results. These issues are particularly relevant in Mozambique, since land-release activities will most often be carried out by demining operators, with the IND providing quality assurance and acceptance of the results. Thus, IND staff would need to understand the typical operator steps to conduct land release through survey and the appropriate measures for quality assurance of that process.

The workshop effectively combined conceptual discussions, working groups and site visits. The training centered on a few key topics: quality management and quality assurance for mine action, concepts and methods for land release, land release through Non-technical and Technical Survey methods, specific criteria for land release relevant for Mozambique, and practical use of the criteria. This resulted in agreement on draft elements for two important documents: "Elements of National Standards for Land Release" and "Criteria for Release of Suspect Areas Through Survey." This resulted in agreement on draft elements for two important documents: "Elements of National Standards for Land Release" and "Criteria for Release of Suspect Areas Through Survey." Additionally, the workshop resulted in the revision of the terms of reference, procedures and forms for quality assurance of demining.

The participants evaluated the workshop in very positive terms. They believed that the combination of theory and practice provided a level of understanding and technical capacity that will enable them to participate in the field with operators and communities to objectively and responsibly evaluate and validate suspect areas proposed to be cancelled, confirmed or cleared. Participants emphasized the need for quality assurance teams to be directly involved with the reclassification of SHAs, that this should be done in permanent dialogue with the local communities and operators on the ground, and that this will result in greater confidence in the data eventually contained in the official information-management system.

**Implementation**

The next steps for starting to use the land-release approach in Mozambique include:

1. Finish the current internal IND discussion regarding the draft norms and criteria
2. Expand the discussion to include humanitarian and commercial operators active in the country
3. Refine the draft norms and criteria
4. Determine how the operators will apply the norms

This will lead to a pilot application of the interim standard, criteria and procedures for land release, which will be evaluated after a period of six months.

The implementation of the methodological principles of land release through survey is expected to provide greater rigor and objectivity both in the process of reduction/cancellation of suspect mined areas and in the treatment of information regarding newly identified SHAs.

The IND leadership looks forward to the improvements this may bring to the national program as well as to the communities, institutions and individuals whose lives and work are still affected by the remaining landmine problem in Mozambique. This experience should also bring useful lessons for other programs.

The IND staff in the workshop concluded that the IND should take the lead in developing national land-release standards and procedures in full discussion with operators and other stakeholders, and that the national database should be promptly updated to reflect land-release decisions.

**Draft Elements and Criteria**

Draft elements for national land release standards include the following:

* Each specific SHA should be identified and investigated; that is, the process is not simply completed by general actions or adjustments to consolidated totals in the database.
* Objective criteria should be established to decide whether a given area will be reclassified or kept as previously defined. The criteria should not be applied mechanically; they may be applied to entire SHAs or to portions thereof.
* Local communities must be involved in the land-release process, both as sources of information and in the acceptance of any decision regarding released land.
* The decision to cancel a SHA should be made in agreement between the IND, the operator and the community. Cancellation should not be forced on any party and should be reflected in the signature of representative parties on the corresponding documentation.
* Areas should be handed over by IND to the community promptly after conclusion of work.

Draft criteria for release of specific parcels of land through survey developed in the workshop for further discussion included:

* Any specific area that has been used regularly for at least five years without evidence of mines
Clearing Areas Right; Clearing the Right Areas

by Håvard Bach | GICHD |

Although land-release methodology is a widely used term, its definition is not universally understood. There are various approaches to mine clearance with different survey steps taken before conditions of safe land release are met, and some techniques are more efficient than others. This article examines ways of improving land-release methodology to more effectively define and ultimately resolve the landmine problem.

The Problem

Often in the field of mine action, we know there are mines but do not know their exact locations—nor even how many there are, or the actual size of the mined area. In the absence of a more detailed framework for completing the task, it is left to operators and contractors—guided by rigid criteria to leave no mines behind—to assess the task at hand and decide where to use scarce demining resources. The absence of a proper framework for defining and guiding mine clearance has inflated the perceived landmine problem, while allowing inefficient mine-removal practices. Clearing mines is actually the least difficult aspect of mine action. The real challenge lies in defining the task and determining the location of the mines, but there has been reluctance to find effective solutions. There are many approaches to mine clearance with different survey steps taken before conditions of safe land release are met, and some techniques are more efficient than others. This article examines ways of improving land-release methodology to more effectively define and ultimately resolve the landmine problem.

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Clearing mines is actually the least difficult aspect of mine action. The real challenge lies in defining the task and determining the location of the mines, but there has been reluctance to find effective solutions. Relevant factors that promote inappropriate and controversial decision-making include:

- Flawed use of success indicators
- Pressure by local authorities

Press releases and contractors’ discussions often provide insufficient, ambiguous, and incorrect information. It is the responsibility of mine action programs, operators, and contractors to ensure that the information they provide is accurate and transparent. This article examines ways of improving land-release methodology to more effectively define and ultimately resolve the landmine problem.
• Faulty survey concepts
• Fear of making wrong decisions
• Unclear use of terminology
• A lack of an evidence-based survey approach
• Poorly understood role of clearance assets in Technical Survey
• Failure to combine Non-technical and Technical Survey results
• Poor documentation procedures

Definition of Land Release
No clear consensus on the meaning of land release exists, and this lack of understanding has led to numerous misguided discussions. Using basic definitions in the context of mine action, land release should be understood as an evidence-based process of defining, and subsequently removing, suspicion of landmines or other explosive remnants of war.

Cleanup of Databases
Land release is often confused with the process of cleaning up incorrect entries in databases after a previous Landmine Impact Survey. The polygons from a Landmine Impact Survey or other non-evidence-based surveys are, however, incorrectly perceived as the boundaries of mined areas. Governments should not use impact-based data (such as from a LIS) to define the geographical extension of a mine problem, but should rather use data from an appropriate Non-technical Survey process. Non-evidence-based data may be a useful indicator of where further investigation is required, but it does not remove the need for a Non-technical Survey process.

Political Framework
The majority of mine-affected countries—and most international donor countries—have signed the Ottawa Convention (ban on anti-personnel landmines). The Convention has had a positive impact on all mine-action stakeholders, despite some countries’ refusal to sign it. At the Ninth Meeting of States Parties in November 2008, a policy paper on land release should be clarifiﬁed or not used at all.

States Parties that are required to prepare extension requests should explain how clearance and other forms of land release will be applied during the period of the extension.

States Parties are encouraged to release more land by survey processes.

The release of land by Non-technical and Technical Survey is not a shortcut to implementing Article 5.1, but rather a more appropriate way to fulﬁll obligations, provided that the survey can conﬁdently conclude that land is mine-free.

The Ottawa Convention requires the removal of all known mines in a speciﬁed timeframe while acknowledging the need to prioritize different areas in this process. The Convention is a political instrument that does not directly interfere with the operational aspects of mine action, but the focus on Ottawa timeframes has drawn discussion on whether current operational practices are adequate.

Purpose of Land-release Methodology
Any land-release concept should provide an appropriate framework for decision-making, a method of addressing legal and policy aspects, a way of deﬁning appropriate technical solutions, and the promotion of sector-wide use of land-release principles. It should also prevent future inﬂation of the landmine problem by offering methods that more accurately deﬁne the real boundaries of mined areas before clearance assets are employed. A good land-release concept does not always need to be detailed and formalized. A balance is between the need for simplicity, the validity of the concept and increased efﬁciency. The simplest form of land-release methodology is already in use, but it has repeatedly failed to be efﬁcient. For example, Non-technical Surveys have typically failed to collect and assess information in order to justify the release of land or deﬁne the minimum Technical Survey requirements.

International Mine Action Standards
Three IMAS drafts on land release have been developed in response to growing concerns about excessive clearance of mine-free land. The IMAS Review Board has reviewed and accepted the drafts, and they are currently awaiting final endorsement from the Inter-Agency Coordinating Group for Mine Action. According to the IMAS Web site, where the drafts are currently posted, “The content has effectively already been accepted by the mine action community and as such they can be used with immediate effect.” Minor changes may still occur, but the bulk is likely to remain unchanged.

IMAS 08.20 explains the principles of land release and details the responsibilities of donors, governments and operators in the context of land release. It further explains how the different

Overall conﬁdence in survey can be a product of conﬁdence provided by the Non-technical and Technical Survey. It can lead to a clearance requirement or to the release of land.

If an Impact Survey or non-evidence based survey (such as an initial assessment) has been undertaken prior to a Non-technical Survey, the difference in size between the two areas (the SHA minus the CHA), may be reported as Cancelled land.

If a new Non-technical Survey replaces an old, and the new CHA is smaller, the difference may be reported as Land Released by Non-technical Survey.

If systematic Technical Survey has been applied, the area that was inspected as well as the areas that were not inspected may be reported as Land Released by Technical Survey. The targeted inspection has increased the conﬁdence for the entire area from which target areas were selected.

If systematic Technical Survey has been applied, the exploration lanes and the intervening areas that were not physically veriﬁed may be reported as Land Released by Technical Survey if no mines were found. The exploration lanes have increased the conﬁdence for the entire area subjected to systematic inspection.

If mines are found during the Technical Survey, clearance will be undertaken. It may be considered part of the Technical Survey because it helps to deﬁne the boundaries of the Deﬁned Hazardous Area (DHA). A CHA (mined area including buffer zone) may be reported as Land Released by Clearance.
components of survey and clearance should be viewed and how they can be combined to ensure efficient land release.

- IMAS 08.21 explains the principles of a Non-technical Survey and how and when land can be released by it.
- IMAS 08.22 explains the principles of Technical Survey and how the requirement for it can be defined by building on evidence already gained through the Non-technical Survey process.

Once endorsed, the three IMAs stay. Lords will form a useful framework for a wider use of land-release methodology.

**Terminology**

Attempts have been made in the draft IMAS to resolve issues relating to terminology by introducing new terms, providing definitions of the most commonly used terms and discouraging the use of redundant ones. The proposed terminology aims to promote a broader understanding of land-release principles. The most important terms are discussed below:

- **Non-technical Survey** is the new IMAS term for what was previously called Clearance Survey or Baseline Survey. It is a non-intrusive investigation into whether an area is mined or not.
- **Technical Survey** is a technical investigation using demining assets to collect information for further assessment. The purpose is to develop more accurately defined mined areas while also building sufficient confidence that the remaining areas are mine-free.
- **Clearance** should be the method of last resort in the land-release process. An effort should be made to release as much land as possible by survey processes in order to achieve land clearance to well-defined mined areas.
- **Suspected Hazardous Area** is an area with some indication of mines/explosive remnants of war but that has not been appropriately surveyed to provide an evidence-based survey conclusion.
- **Confirmed Hazardous Area** is the product of a Non-technical Survey. It is a HA is the area that will end up cleared regardless of whether it was initially defined by Technical Survey.

### Basics of Evidence-based Survey Components

The crucial question in both Non-technical and Technical Survey is how to define when there is enough information or evidence to confidently consider an area mine-free or mined. In the absence of appropriate decision-making criteria, the estimated size of a SHA is easily exaggerated because there is no incentive to do the opposite, but there is apprehension that the area is too narrowly defined.

A sufficiently high confidence that no mines/ERW exist in an area is a pre-condition for land release, and the meaning of the term thus needs to be clearly defined and consistently used. Terms like mine proofing, mine verification and risk reduction typically describe processes that lead to increased confidence in an area or a road being mine-free, but they are seldom quantified and would not lead to formal release of land or roads.

There are inherent inaccuracies in any Non-technical Survey and it may not capture sufficient information to justify many defined levels of confidence. Moreover, if it is impractical to use more than a few Technical Survey levels, a Non-technical Survey defining more levels of confidence is redundant. Overall survey confidence can be defined by assessing the value of information provided by the informants, weighing each and adding them to determine an overall rating of confidence. The scoring and the value of the survey rely on two factors:

1. **Quantitative indicator**: The amount of information (basis value of informant)
2. **Qualitative indicator**: The accuracy of information (degree of trust in individual informant)

Confidence-scoring tables can be used to capture all possible survey levels:

- **High confidence** means that no mines/ERW exist in the area.
- **Medium confidence** means that the area is more likely to be mined or not, but the boundaries are not properly defined.
- **Low confidence** means that the area has the potential to define the minimum requirements for clearance, but the boundaries are not properly defined.

The three processes of Non-technical Survey, Technical Survey and clearance are in fact of ten concurrent activities, each of which increases confidence that an area is mine-free.

**Terms like mine proofing, mine verification, and risk reduction** typically describe processes that lead to increased confidence in an area or a road being mine-free, but they are seldom quantified and would not lead to formal release of land or roads.

### Defined Hazardous Area

A HA is the area that will end up cleared regardless of whether it was initially defined by Technical Survey.

- **No mines and high confidence** could be as the main criteria for land release because a sufficient amount of reliable information suggests that there are no mines.
- **No mines and low confidence** requires some degree of Technical Survey to boost the confidence to high and allow land release, if no mines are found (which is the likely outcome).
- **Mines and low confidence** requires a higher degree of Technical Survey to accurately define the location of mined areas and possibly allow the remaining parts of the area to be treated as “no mines” with high or low confidence.
- **Mines and high confidence** could be as the areas where full clearance is required because the boundaries have been defined.

High and low confidence would allow for two Technical Survey levels:

1. **A limited Technical Survey** if the Non-technical Survey concludes there are likely no mines.
2. **A more in-depth Technical Survey** if the Non-technical Survey concludes there are likely mines, but at the same time fails to define the exact boundaries.

Increasing the number of confidence levels to three would allow four levels of Technical Survey instead of two. Further increasing the number of confidence levels to four allows each level of Technical Survey to probably exceeding the accuracy of the Non-technical Survey.

The Geneva International Centre for Humanitarian Demining has therefore developed models using three levels of confidence. In these models, the output from the Non-technical Survey is defined as mined or not mined, combined with three levels of confidence defined as low, medium and high.

If the Non-technical Survey suggests there are mines but the boundaries are not properly defined, the main purpose of the Technical Survey is to assist in defining these boundaries. If the boundaries can be defined, clearance is required to gain full confidence that there are no mines in that area. After clearance, the final classification could theoretically be “no mines, high confidence,” justifying the release of that land. Clearance is, however, often undertaken before the boundaries are defined, and the result of the clearance process is the main instrument in defining these boundaries. The clearance process is thus part of the evidence-based survey process. The three processes of Non-technical Survey, Technical Survey and clearance are in fact of ten concurrent activities, each of which increases confidence that an area is mine-free. The overall output from a broader survey is the product of evidence, of or confidence levels, provided by the Non-technical and Technical Survey, and even clearance. Convincing evidence provided by Non-technical Survey will require much less supplementary evidence from Technical Survey before land can be released.

### Non-technical Survey

The purpose of a Non-technical Survey is to collect information that will determine any Confirmed Hazardous Area, and assist priority setting and the planning of subsequent Technical Survey, clearance, marking and mine-risk education. The output from a Non-technical Survey is purely based on a non-intrusive information-collection process. The survey has the potential to define the minimum requirements for Technical Survey.

Land is not always released by a Non-technical Survey, since it is often the first step in the chain of the evidence-based assessment of the problem. Land can, however, be released if the survey replaces a previous, less accurate Non-technical Survey and the new Confirmed Hazardous Area is smaller. If not, the survey will simply define reasonably accurate boundaries of hazardous areas and provide information that will assist further mine-action activities.

A way to define confidence in a Non-technical Survey is to develop a survey to an extent which each source of information is given a confidence score and the sum of all scores provides the overall confidence rating. Information provided by those who laid mines, mine victims or others who physically observed where mines were laid could, for example, be grouped as first-hand information. Information with decreasing levels of confidence will be classified in the remaining three categories, depending on circumstance.

If three levels of confidence are used to define the accuracy of the Non-technical Survey, six potential outcomes exist:

- **No mines, high confidence**: Land may be released.
- **No mines, medium confidence**: A need for limited Technical Survey before land can be released if the Technical Survey provides further evidence of no mines.
- **No mines, low confidence**: A need for normal
Technical Survey before land can be released if the Technical Survey provides no evidence of mines.

- **Mines, low confidence.** A need for increased Technical Survey before land can be released if the Technical Survey provides no evidence of mines.

- **Mines, high confidence.** Land needs to full clearance The boundaries have been defined.

A Confirmed Hazardous Area may be classified as one of the above, but there may be additional gain by subdividing a CHA into several sectors and giving them a unique classification based on the amount of evidence for each. There is thus an opportunity to reduce the requirement for Technical Survey in some sectors based on what the survey reveals in the previous sectors.

A CHA could in theory be divided into an unlimited number of sectors, and several sectors may be given the same classification. It may, however, be useful to limit subdividing a CHA per sector to be treated as unique and will require a separate analysis and quantification of information in the survey report.

### Technical Survey

Clearance and verification assets are used during Technical Survey, but the intention is to collect information that can be assessed for planning purposes. There are few, if any, universally accepted principles of Technical Survey, and there is scope for significant streamlining of most Technical Survey concepts.

Technical Survey, like Non-technical Survey, can provide measurable evidence and confidence about whether mines are present in an area. The amount and quality of evidence can be used to define levels of confidence in the effectiveness of the survey. Information provided by Technical Survey should be viewed in conjunction with information provided by the Non-technical Survey or by clearance (if some has occurred in the area). The type and amount of Technical Survey will then depend on how much additional evidence is required after Non-technical Survey to gain sufficiently high confidence that an area is mine-free.

It can be difficult to agree on generic scoring values of information in Non-technical Survey, and this process is no easier in Technical Survey. A combination of test results and empirical evidence can form the basis for developing credible Technical Survey solutions. Governments and organizations should consider establishing “expert groups” to analyze and define the accuracy of assets in survey. Once agreed upon, a more streamlined Technical Survey concept can be developed, preferably in conjunction with a Non-technical Survey concept.

### Accuracy of Assets: Qualitative Indicator

**Accuracy of Assets:**

A similar algorithm can be used for machines. A crushed mine, while acceptable in clearance, may not provide any recordable information in survey. Thrown-out mines, while unacceptable in clearance, can normally be spotted on the ground and recorded during survey. Testing of flails shows that most of them will crush or detonate between 94 and 98 percent of all anti-personnel mines and a high number of anti-tank mines. They typically fail to detonate unexploded ordnance, but they often smash the fuze. Experience in the field, however, suggests fewer mines are crushed or detonated than during trials. There may be a discrepancy because flails are sometimes used on rugged or rocky terrain, or the fuzes are broken and no longer detonate on impact.

More important in survey is how much information flailing will provide. It is necessary to balance the difference in accuracy with an increased ground-coverage requirement during the survey.

The accuracy of other assets like tillers, rollers and low-sensitivity metal detectors (large loops, etc.), can be similarly defined by using a mix of tests and empirical evidence and, as in Non-technical Survey, a scoring table can be developed. The figure on the previous page is an example of how assets can be analyzed and grouped in accordance with the relative level of confidence (accuracy).

If there is a requirement for 50 percent ground coverage by manual mine clearance, the required ground coverage when using one dog is higher (approximately 60 percent). If there is a need to cover 30 percent of an area by manual mine clearance, it may be necessary to cover 40 percent of the same area with one dog to gain the same confidence.

While initially it may be a challenge to develop a concept as discussed above, using it can be fairly simple and straightforward in the field. One advantage is that decisions about how much ground to cover are given by concept alone, and do not need to be defined by field managers for each new task.

### Documentation and Handover of Released Land

In the possible event that landmines are found in areas that have been released, the quality of documentation acquired during the decision to release the land may well determine whether an organization should assume liability. Appropriate documentation is important when areas have been released and “handed over” to the local population or authority after the completion of a survey and/or clearance task. Since land may be released by a combination of concurrent activities, the decisions may change as work on a task progresses, and there is a need to document every step in the decision-making process.

Moved land may be re-located from the layer in the database that defines the mine/ERW problem, but information about how land has been released should be maintained in different database layers for the purposes of quality control, potential investigation, and operational management and assessment. Just as land is reported released by clearance, land should be reported released by Non-technical and Technical Survey, showing the detailed methods of survey and a documented decision-making process. Many current databases are not configured to capture land released by survey, an issue that needs to be addressed.

### Potential Gray Areas

While land release is typically illustrated as a straightforward progression from Non-technical Survey to Technical Survey to clearance, the field process is more composite, and the potential exists for inconsistent reporting and documentation. Some of the gray areas are discussed below:

- **Land may be released by the activity that provided the last piece of evidence (confidence) that an area is mine-free.** If it was Technical Survey, land may be released by Technical Survey while it may, in fact, have been the Non-technical Survey that provided most information and made up for most of the confidence.
- **If clearance leads to the removal of suspicion of adjacent land, clearance arguably justifies the release of adjacent land, since it provided the last piece of evidence.** It is better to view the information provided by the clearance activity as Technical Survey and thus report adjacent land as released by Technical Survey.
- **If buffer zones around a cleared area are verified by anything less than the clearance process, the information is deemed appropriate and sufficient, these buffer zones should be reported released by Technical Survey if no mines are found.** If exploration lanes are made by manual demining teams in Technical Survey, the size of these lanes could be recorded as clearance. Reporting exploration lanes as cleared could discredit the survey process because questions may be legitimately asked about why clearance was applied in one
sessions were held in the hopes of building Georgia’s capacity for a mine-action program while furthering the partnership held training operations for the Georgian Ministry of Defense and Ministry of Internal Affairs through July and August. These finally, ANAMA specialists, in joint cooperation with the International Trust Fund for Demining and Mine Victims-assistance, Disaster Management Agency Department of Mine Clearance, visiting each other’s mine-action centers. To help Afghanistan ANAMA also worked with Afghanistan in the summer of 2009, with officials from both ANAMA and Afghanistan’s National ANAMA Working with Intergovernmental Agencies The Azerbaijan National Agency for Mine Action has been active in 2009, working alongside numerous intergovernmental agencies in training and support for mine-action initiatives. The summer of 2009 saw ANAMA work directly with mine-action programs in Afghanistan, Tajikistan and Georgia, helping to train their personnel, as well as providing direct assistance to mine-action officials. In July 2009, four members of the Tajikistan Mine Action Centre, including mine-victim and mine-education specialists, visited ANAMA to develop skills and knowledge on mine action. These specialists went through training with ANAMA officials and toured the ANAMA office, where they received a certificate of completion for their training. ANAMA also worked with Afghanistan in the summer of 2009, with officials from both ANAMA and Afghanistan’s National Disaster Management Agency Department of Mine Clearance, visiting each other’s mine-action centers. To help Afghanistan sustain a national mine-action program, ANAMA will hold job trainings for national management-level positions. July and August saw these first training sessions take place, with ANAMA holding mine-clearance training on its regional bases. Finally, ANAMA specialists, in joint cooperation with the International Trust Fund for Demining and Mine Victims-assistance, held training operations for the Georgian Ministry of Defense and Ministry of Internal Affairs through July and August. These sessions were held in the hopes of building Georgian’s capacity for a mine-action program while furthering the partnership between ANAMA and the IETF.
Survey must be able to process the ground and to resist—or not be severely damaged by—only one explosion at a time, while keeping the operator safe. Thus, the specifications to which dedicated demining machines are designed are unnecessarily strict for Technical Survey. Stringent requirements for demining machines, including being able to withstand hundreds of explosions in one trial, are the main reason for high prices and limited use. As production is also limited, demining machines have to address the widest variety of scenarios possible, resulting in highly complex mechanics and poor local maintainability. They represent a solution to the problem that is more global than local; therefore, while a demining machine’s cost and robustness can justify its use where full clearance is needed, other less expensive and more widely available machines need to be developed for gathering the information required to release land through Technical Survey.

Local Agricultural Technologies for Land Release

In this context, it is important not to introduce newer technologies dedicated to demining, but to use locally available ones whenever possible. Machines developed or re-adapted locally have lower initial costs, shorter downtime and lower repair costs. It stands to reason that machines produced outside a local area would also be underutilized due to the lack of spare parts or the expertise needed to fix them. Local machines are also much more sustainable than imported technologies, which are often designed with little consideration for local conditions.

Demining Machines

According to the Mechanical Demining Equipment Catalogue, produced by the Geneva International Centre for Humanitarian Demining in January 2008, there are fewer than 650 demining machines working in mine-action programs around the world. The market for humanitarian-demining mechanical technology is small and driven by donors rather than program coordinators. Machines are marketed in the same way as military equipment, and prices are often part of packages that are negotiated in private. Therefore, cost and number of units are not comparable to those of other demining technologies directly bought by programs, such as sensor technologies. The performance test described by Comité Européen de Normalisation Workshop Agreement 15044 estimates that a single machine can withstand 450 landmine explosions in the same trial. Machines to be employed in Technical Survey mainly need to verify the absence of mines in the given area. If they encounter an explosion, the area needs to be re-categorized and fully processed by proper clearance. This means that machines used in Technical
Survey. They could develop the modifications required to effectively address the demining problem locally, then acquire these machines and provide assistance.

Agricultural machines have long existed and can be repaired in every developing country in local workshops. The adaptability of agricultural technologies is another advantage; the same tools can be mounted on different tractor units and replaced by dedicated agricultural tools when demining operations are over. Involving local technicians in the redesign of new or improved technology also helps reduce dependency of local communities on donor assistance, as well as facilitates local human development—satisfying basic human needs and capabilities.11

Empowerment is an integral part of many poverty-reduction programs. It is essential not only for the state to provide resources and opportunities, but also for citizens to take responsibility for self-improvement. It is desirable and necessary for local entities to assume mine-action activities so that a local capacity may be developed for the use of agricultural technologies in land-release activities.

**Adapting Agricultural Technologies to Technical Survey**

Agricultural machines need to be adapted to the demining task. Special tools for ground processing at the required depth might be attached to standard linkages, such as three-point linkages on tractor units. In many cases, the explosive threat a SHA poses will be known before operations start. Information collected from local sources can help define the specific threat an area might contain. Even if not designed to withstand anti-tank landmine explosions, machines must keep the operator safe. This aim can be achieved in two ways: by operating the machine remotely or by isolating the operator from the machine structure when driven manually. While a simple remote-control system can be realized in a modular way, relatively inexpensive12 and semi-autonomous machines are considered a key element in improving total quality management in mine action.13 To keep the operator near manual machines, either on board or driving it by handling...
it from behind, it is necessary to install shock isolators between the handler or driving wheel and the machine structure. If supporting an on-board operator, the seat must also be isolated from shock waves caused by explosions.

Another key issue in adapting agricultural technology to Technical Survey is armoring. If the machine is equipped in a way that supports tools at the front, only a light shield may be needed to protect the delicate parts. Otherwise, if the machine is originally conceived to support tools at the back, as is frequently the case, then a system to protect the undercarriage from possible damage caused by the explosion of mines must be implemented. A good approach in this case is to design special blast-resistant wheels that do not transmit the shock associated with an explosion to the chassis either by deforming flexibly or by releasing energy through frictional pins. Research on blast-resistant wheels, shock isolators and modular remote-control systems, if flexible enough to be adapted to different agricultural machines, would benefit Technical Survey processes enormously.

The Case of BiH

According to the Landmine Monitor Report 2008, 170 square kilometers (42,000 acres) of land were released to public use through area reduction in Bosnia and Herzegovina in 2007, using 21 accredited demining machines. The estimated area that still needs to be cleared consists of 1,738 square kilometers (430,000 acres). If we look at the number of agricultural tractors in the country, approximately 30,000 units, and we imagine temporar-ily equipping 300 of them, i.e., 1 percent of all units available, with low-cost ground-processing tools and light armoring for assessing the presence of landmines, assuming that each one could have the same productivity of one of the 21 machines used for area reduction in 2007 (around eight square kilometers [three square miles] per year), the problem of landmines in BiH could be potentially solved or drastically reduced to small, confined, highly contaminated areas in less than one year.

Conclusion

As under-developed countries continue to be affected by the world food crisis, the need for arable land is increasing. Research into more responsible agricultural practices is also becoming an imperative to fight the dramatic consequences of climate change. Investing in the redesign of local agricultural technologies can both speed up mine clearance and improve the future for mine-affected countries by addressing these other challenges simultaneously. By approaching the issue on a local instead of global level, more appropriate, sustainable and reasonable solutions can be achieved while fostering the empowerment of local populations. See Endnotes, page 62.

More Information

Emanuela Elisa Cepolina recently completed her doctoral in mechanical engineering. She has been researching technologies for humanitarian demining since 2003—first at the University of Genoa, and recently as president of the nascent nonprofit association Snail Aid—Technology for Development. Emanuela Elisa Cepolina

Snail Aid—Technology for Development
Via Cabella 10/12, 16133 Genova / Italy
Tel: +39 256 8064 819
Mobile: +39 333 6656 589
E-mail: emacepo@snailaid.org
Web site: http://www.snailaid.org

Matteo Zoppi is a researcher in the Department Mechanics and Machine Design at the University of Genoa, PMARlab Robotics Group, with research lines on development, design, fabrication, and testing of mechatronics and robotics systems for industrial and service applications, application-oriented synthesis and design, and methods for analysis—in particular kinematics and singularity analysis, and design of Micro Electrical Mechanical Systems.

Matteo Zoppi
Researcher Department of Mechanics and Machine Design University of Genoa Via All'Opera Fio 16A 16145 Genova / Italy Tel: +39 010 3532 837 E-mail: zoppi@dimec.unige.it

Emanuela Elisa Cepolina and Matteo Zoppi

Are the methods currently used for land mine surveys effective? How can we improve them for better results? It is important to consider the local context, the type of mine, and the environmental conditions.

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Cepolina EE. Mining and singularity analysis, and design of Micro Electrical Mechanical Systems. Department of Mechanics and Machine Design. University of Genoa. Via All’Opera Fio 16A. 16145 Genova / Italy. Tel: +39 010 3532 837. E-mail: zoppi@dimec.unige.it

Zoppi M. A researcher in the Department Mechanics and Machine Design. University of Genoa. PMARlab Robotics Group. Research lines on development, design, fabrication, and testing of mechatronics and robotics systems for industrial and service applications, application-oriented synthesis and design, and methods for analysis—in particular kinematics and singularity analysis, and design of Micro Electrical Mechanical Systems. E-mail: zoppi@dimec.unige.it

An Unusual Discovery

Looking at a map, one would assume that the farmer’s land would also be free from another common risk, UXO. The nearest bombing was over five kilometers (three miles) away and, although the available data is incomplete and inaccurate, it generally gives a positive correlation among accidents, contamination and poverty. UXO Lao’s management team at Thakhek, the provincial capital of Khammouan, thought this land would have a negligible threat of UXO and suspected that the farmer’s fear was based on vague “rumors” that circulated among the locals. On meeting with the survey team, the farmer pointed out the boundaries of the land and explained why
In the past year, I have joined several such surveys with UXO Lao. In most cases, the need for full clearance is beyond question. There are, however, occasional requests for the threat level requires clarification by Technical Survey or which no further action is required. This depends on the land user’s willingness to accept the decision, as the goal of land release is to instill confidence that land is safe for use based on a thorough assessment. Technical Survey and clearance are more productively directed toward situations in which UXO contamination is highly suspected.

Major international nongovernmental organizations, such as The HALO Trust, have made significant inroads into reducing “exaggerated” contamination records using sensible field survey and database review. Across the humanitarian sector in general, such credible efforts have tended to be in isolation; most surveys have focused on capturing all Suspected Hazardous Areas. Lao PDR is different—there is no comprehensive database of polygons. The raw contamination data is based on 40-year-old U.S. Air Force bombing records, the accuracy of which is mediocre at best, given the technological limits at the time of the fighting. The original Landmine Impact Survey conducted by Handicap International in 1997 has never been followed by a comprehensive attempt to measure or record UXO contamination. Despite the stipulations in Article IV of the Convention on Cluster Munitions, which Lao PDR has signed and ratified, no such effort is planned. Perhaps the condition of the databases in other mine-affected countries serves to dissuade rather than encourage “baseline survey.” The sheer quantity and impact of bombing and ground fighting in Lao PDR far exceeds that of most other countries.

**Land Release**

Land release is the process of changing the status of known or Suspected Hazardous Areas to released land using Non-technical Survey, Technical Survey and/or clearance in the most relevant, effective and efficient manner. Land can be released within a former SHA by gathering sufficient information to confirm the absence of mines or UXO in the area with a high degree of certainty and, therefore, recommending that suspicion of mines/UXO should no longer prevent the local population from using the land. The concept of land release re-distribute limited clearance capacity: It’s not just about reducing polygons using a checklist.

Farmers in Lao PDR regularly find “bombies” in fields that have been used for several years.

In the past year, I have joined several such surveys with UXO Lao. In most cases, the need for full clearance is beyond question. There are, however, occasional requests for the threat level requires clarification by Technical Survey or which no further action is required. This depends on the land user’s willingness to accept the decision, as the goal of land release is to instill confidence that land is safe for use based on a thorough assessment. Technical Survey and clearance are more productively directed toward situations in which UXO contamination is highly suspected.

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release emerged because many clearance operators constitute a relatively expensive and time-consuming clearance exercise. Such decisions may be done under limited or no mine risk analysis. In many cases, the original data reflected the best information and tools available at the time. Subsequent to metal detection, clearance operations have changed and shifting indigenous notions regarding risk and mine-action concepts changed the perception of these recorded areas. In other cases, an inaccurate original survey is blamed for over-stating the contamination; land release has generally resulted in the reduction of land requiring expensive area clearance. If someone suspects land is contaminated, we have to do some-thing but not always the correct answer. Non-primary clearance tools such as machines and canines are also used as land-release methods.

While land release in itself is not a new concept, incorporate it as a national policy including survey is new. Land release by clearance has been the only available response option in many countries, including Laos until 2007. Although commercial organizations have applied land-release methodology for decades in their own operations, only recently has it been recognized by some host governments. The notions of a consistent methodology and thresholds of risk tolerance among developing countries are only just emerging in several countries, even those with long-established mine-action programs. The challenge facing the sector is to make sure it does the right job, without adding extra layers of confusion.

**Government and Clearance in Laos**

Broadly speaking, clearance in Laos is reactive rather than proactive. Some international NGOs and community-based organizations have emerged in several countries, even those with long-established mine-action programs. The challenge facing the sector is to make sure it does the right job, without adding extra layers of confusion.

**Tolerance**

The periodic review of risk-tolerance thresholds is important. “Targets” must be avoided. Land-release performance is not measured in square meters but in the quality of the decisions. Right now, the tolerance-to-action correlation is the key. There is no substitute for a well-supported, sensibly-recruited and sustained management with good “field time,” as well as administrative competence. An informed staff is needed to visit the field, review decisions and ask, “Are we doing the right job, the right way?” The good news is that the cost of maintaining such capacities is, in the long run, dwarfed by the cost of ineffective solutions to seemingly endless polygons or “dodgy requests.” The need for consistent oversight of field operations increases with organization size. In UXO Lao’s case, with 960 staff, “strong central “ownership” of operational policies is important. Recognizing the need to encourage reform, the United Nations Development Programme, NPA and UXO Lao embarked on this 10-year journey. Demining began to collaborate on two main projects. In 2005, NPA and UXO Lao conducted a study called “Enhancing the Technical Survey.” This led to the Enhanced Technical Survey project, aimed at supporting UXO Lao as it embraced effective land-release. The first step was to introduce a Technical Survey that would encourage full clearance if no UXO was found. Second, the Geneva International Centre for Humanitarian Demining began to collaborate on two main projects. In 2005, NPA and UXO Lao conducted a study called “Enhancing the Technical Survey.” This led to the Enhanced Technical Survey project, aimed at supporting UXO Lao as it embraced effective land-release. The first step was to introduce a Technical Survey that would encourage full clearance if no UXO was found. Secondary, UXO Lao embarked on a new attitude toward risk—and a new approach to risk management and effective application of land-release concepts. Finally, many of these wrong means may occur. Land releases driven by several foreigners who have put it on themselves to encourage our counterparts to adopt a seemingly-aliens policy. This is a policy that puts their heads, rather than Technical Advisers’ heads, on the block for key decisions. I can see why it has taken some time to implement this, but in the long run, it will be worth it.

GICHD, UNDP and NPA have invested time, effort and generous donor resources into encouraging land-release policy. Different methodologies have been employed and the end result has been a sustained focus on sound risk management and effectiveness of clearance work. UXO Lao now has a policy of land release consisting of not only clearance but Technical and Non-technical Survey. The methodology incorporates the GICHD risk model as well as elements of NPA’s project formerly known as Enhanced Technical Survey. Ideally, it will be used consistently and with a self-critical eye to ensure effectiveness.

**Conclusion**

This tale is not a complete success story; it is ongoing. Enabling our national counterparts to adopt a new attitude toward risk—and a significant change in the norm—will have many benefits. It has resulted in a sustained management focus on UXO Lao’s area-clearance tasks. Between 1999 and 2004, a sample of 2,000 records showed only two-thirds of UXO Lao’s area-clearance tasks yielded no UXO, by 2007 and 2008, over 98 percent did. The positive implications for aid effectiveness are obvious—UXO Lao is the largest recipient of bilateral donor funding in Laos PDR and is a significant recipient of international NGOs and community-based organizations. This does not signify that a perfect land-release model has been achieved by UXO Lao by a handful of international advisers; it shows those precious resources are still having a considerable impact. UXO Lao has come a long way in using donor resources, especially in the past four years.

Stephen Pritchard
Former Program Manager, Norwegian People’s Aid Laos & UXO Lao
E-mail: stevepritchard5@hotmail.com
Web site: http://www.npaaid.org
http://www.uxolao.gov.la

E-mail: stevepritchard5@hotmail.com
Website: http://www.uxolao.gov.la

http://commons.lib.tamu.edu/index.php/journal_of_conventional_weapons_destruction

See Endnotes, page 62
Land Cancellation and Release

by Parviz Mavlonkulov [Tajikistan Mine Action Centre]

In the land-release process, initial surveys play an important role, providing the main information regarding the impact of mined areas. All plans regarding Technical Survey, clearance, mine-risk education, victim assistance and other mine-action activities are developed according to the data collected during the initial survey. If the data is accurate and reliable, it will be used throughout the duration of the mine-action program’s existence. If the data is inaccurate, the areas will be unable to be considered fully cleared (though it is possible that a large percentage of the area is safe), and it will be time-consuming to re-conduct survey operations in the areas that have already been surveyed. Though multiple survey operations require additional expenditures, they are necessary and should be conducted periodically for verification, confirmation, cancellation or reduction of areas, according to the applicable criteria.

Extent of the Problem

In Tajikistan, 456,790 people approximately currently live in mine-affected areas, approximately 70 percent of whom are women and children. Hazardous areas are usually located in hills and mountains where most villages are located, causing a negative impact on development in these locations. Usually the threat from mines and unexploded ordnance, including unexploded cluster munitions, is greatest in the summer, from mines and unexploded ordnance, including unexploded ordnance, etc. According to the Impact Survey, from 2003–2005 identified 146 hazardous areas, covering 50,668,272 square meters (12,520 acres). Due to the inexperience of the initial survey teams, lack of minefield records and other important information, and paucity of proper survey equipment, the first Impact Survey did not yield high-quality results. The sizes of SHAs were miscalculated and their descriptions were not clearly recorded. In addition, because the Tajik-Afghan border was guarded by Russian forces, access to border areas was limited. Likewise, access to areas along the Tajik-Uzbek border was and remains limited. For this reason, resurvey of these areas is necessary.

Using minefield records, TMAC is conducting resurvey operations along the Tajik-Afghan border. By the end of 2009, resurvey operations there will be completed and the mine-action program will have full and reliable information on mine-contaminated areas in the region, as well as in the country. Currently there are approximately 6 square kilometers (2 square miles) remaining to be surveyed. TMAC estimates that approximately 5–6 percent of mine-cleaning funding goes to land release by survey teams.

Land-release Results

Since the beginning of operations, Tajikistan has made great efforts to release SHAs. As of December 2008, the TMAC has released 44,538,387 square meters (11,006 acres) of land, and in the process, has destroyed 42,268,367 square meters (10,445 acres) of UXO. Of this total, 42,268,367 square meters (10,445 acres) were released as safe through resurvey and land-release projects and 2,279,020 square meters (563 acres) were released through clearance. During resurvey operations, 18 SHAs were cancelled because they were found to be safe, and 92 new mined areas with an approximate size of 2,925,746 square meters (723 acres) were identified.

According to the Tajikistan National Mine Action Standards, all mined areas or SHAs should be 100 percent cleared. Surveys of cleared areas showed that cleared lands are being used by the local population for agriculture, gardening, pasturing, etc. According to conversations with local authorities and inhabitants, as a result of observing clearance operations, people are confident that cleared lands are safe for use and that all landmines and UXO have been removed.

Conclusion

Considering the potential errors in the initial surveying process, it is an absolute necessity to resurvey SHAs if the land is ever released. Despite limited funding, minimal equipment and inexperience, allocating funds for surveys to ensure full clearance is a highly productive enterprise, especially when contrasted with the starting alternative.

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Common Terms and Definitions

Anti-personnel Mine Ban
See Ottawa Convention.

CCW, Amended Protocol II

CCW, Protocol V
Protocol V of the Convention on Certain Conventional Weapons addresses the effects of explosive rem-

nants of war, including unexploded cluster munitions, on civilians after conflicts end.

Convention on Certain Conventional Weapons (CCW or CCCW)
Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects was opened for signature in Geneva, Switzerland, on 10 October 1980. For more information: http:// disarmament.org/ccw/

Convention on Cluster Munitions (CM)
A complete ban on cluster munitions with victim-assistance and decontamination information standards, the CCM was adopted in Dublin by 107 states on 30 May 2008. See also Oslo Process. For more infor-

Convention on the Rights of Persons with Disabilities
Adopted by the U.N. General Assembly on 13 December 2006, the Convention on the Rights of Persons with Disabilities was opened for signature on 30 March 2007, and entered into force with the 20th ratifi-

Disarmament,Demobilization and Reintegration (DDR)
Considered a successful strategy for peacekeeping operations, disarmament refers to the physical removal of weapons from ex-combatants; demobilization refers to the breaking up of armed groups; and reintegra-
tion entails the reintroduction of former combatants to society without the threat of future armed conflict.

Explosive Remnants of War (ERW)/Landmines
Some organizations consider mines and explosive remnants of war to be separate entities, since they are regulated by different legal documents (the former by the Ottawa Convention and Amended Protocol II of the Convention on Certain Conventional Weapons, the latter by CCW Protocol V). However, since clusters are explosive devices that have similar effects to other ERW, and it is often impossible to separate the two during clearance operations, some in the community have adopted a “working definition” (as opposed to a legal one) of ERW. This working definition is a blanket term that includes mines, UXO, abandoned explosive ordnance and other explosive devices.

Geneva Conventions
The Geneva Conventions are international treaties on the laws of the conduct of war. For more information: http://www.genevacoventions.org/.

Human Development Report
This report is an annual milestone publication by the United Nations Development Programme. For more information: http://hdr.undp.org.

International Mine Action Standards (IMAS)
The IMAS provide the framework of international standards and guidelines for mine clearance and were developed to improve effectiveness, efficiency and safety in mine action. For more information: http://www.mineactionstandards.org.

Irregular Warfare (IW)
According to the U.S. Department of Defense, irregular warfare is “a violent struggle among state and non-state actors for legitimacy and influence over the relevant populations. IW favors indirect and asymmetric approaches, in contrast to a legal one) of ERW. This working definition is a blanket term that includes mines, UXO, abandoned explosive ordnance and other explosive devices.

Land Release
According to the most recent IMAS (8.20 Draft Edition, 10 June 2009), the term Land Release describes the process of applying all reasonable effort to identify or better define Confirmed Hazardous Areas and remove all suspicion of mines/ERW through Non-technical Survey, Technical Survey and/or clearance. The criteria for deeming an area “land release ready” is defined by the national and aided governments involved. See also International Mine Ac-
tion Standards (IMAS), Non-technical Survey, Technical Survey.

Landmine Impact Survey (LIS)
A LIS is a community-based national survey that measures the extent of the impact of the landmine problem in a country, based on the number of recent victims, socioeconomic blockages and type of mines/ERW.

Landmine Monitor
Landmine Monitor is an initiative providing research for the International Campaign to Ban Landmines and the Cluster Munitions Coalition. Landmine Monitor provides systematic monitoring and assessment of the in-
ternational community’s response to the problem caused by landmines, cluster munitions and other explosive rem-
ants of war. Landmine Monitor publishes annual reports in October that detail the landmine and ERW developments during the past year. For more information: http://lm.icbl.org.

Meetings of States Parties (abbreviated RMSM, RSM, etc)
The Meeting of States Parties is a formal meeting of the Member States that have accepted the 1997 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction. For more information: http://www.icbl.org/meetings-of-states-parties/index.html

Millennium Development Goals (MDGs)
On 18 September 2000, the United Nations General Assembly adopted Resolution 55/2, the United Nations Mil-

ennium Declaration. At the United Nations Millennium Summit, world leaders agreed to a set of time-bound and measurable goals and targets for combating poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women. Placed at the heart of the global agenda, they are now called the Millennium Development Goals. The Summit’s Millennium Declaration also outlined a wide range of commitments in hu-
manship, good governance and democracy. For more information: http://www.un.org/millennium

Millennium Development Goals/Mine Action Projects
Some countries and mine-action organizations are using the term mine-free, while others are espousing the term mine-safe or impact-free. Mine-free covenants a condition in which all landmines have been cleared, whereas the terms mine-safe and impact-free refer to the condition in which land-
mines no longer pose a credible threat to a community or country.

Non-technical Survey
According to the most recent IMAS (8.20 Draft Edition, 10 June 2009), Non-technical Survey involves collecting and analyzing new and/or existing information about a hazardous area. Its purpose is to con-
firm evidence of a hazard or not, to identify the type and extent of hazards within any hazardous area and to define, as far as possible, the perimeter of the actual hazardous areas without physical intervention. A Non-technical Survey does not normally involve the use of clearance or verification assets. See also Inter-

Oslo Process
The Oslo Conference on Cluster Munitions, also known as the Oslo Process, was the first step in a process toward creating an international ban on cluster munitions. See also Convention on Cluster Munitions (CCM). For more information: http://www.noomega.org/policy/OsloConference/osloClusterMunitions.htm.

Ottawa Convention
The Ottawa Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-personnel Mines and on Their Destruction, was opened for signature in Ottawa, Canada, 3 December 1997, and is commonly referred to as the Ottawa Treaty. For more information: http://www.icbl.org/home.htm.

Ottawa Convention, Article 4
Article 4 of the Ottawa Convention requires each signatory to destroy or ensure the destruction of all stockpiled mines it owns or possesses, or that are under its jurisdiction or control, as soon as possible but no later than four years after the Convention is in force for that State Party. For more information: http://www.icbl.org/treaty/text/english/4

Ottawa Convention, Article 5
Article 5 of the Ottawa Convention requires that signatories identify all mine or mine-suspected area, ensure these areas are marked, monitored and protected to effectively exclude civilians; and destroy or ensure destruction of all mines in these areas as soon as possible and no later than ten years after the Convention’s entry into force for that State Party. For more information: http://www.icbl.org/treaty/text/english/5

Small Arms/Light Weapons (SA/LW)
Among conventional weapons, SA/LW are particularly problematic because they are relatively simple to use and are easily accessible. The term “small arms” refers to a category of weapons designed for individual use, including pistols, shotguns, rifles and submachine guns. Small arms and light weapons (SA/LW) “Light weapons” typically include conventional weapons designed for operation by a group of two or more indi-
viduals (although they may be operated by individual combatants as well). These weapons include heavy machine guns, grenade launchers, anti-tank missiles and rocket systems, and small portable air-defense sys-
tems (MANPADS). Moreover, they are often the weapons of choice of non-state actors, including terrorist organizations and paramilitary insurgent groups.

Technical Survey
According to the most recent IMAS (8.20 Draft Edition, 10 June 2009), Technical Survey is a detailed intervention with clearance or verification assets into a Confirmed Hazardous Area, or part of a CHA. It should confirm the pre-

ence of mines/ERW, leading to the definition of one or more defined hazardous areas, and may indicate the absence of mines/ERW, which could allow land to be released when combined with other evidence. See also International Mine Action Standards (IMAS), Non-technical Survey, Land Release.
A Conversation about Land Cancellation and Release with H. Murphey "Murf" McCoy, Stevens [from page 11]


Survey and Land Release: Lessons from Recent Country Experience, Downs [from page 18]


2. The mean number of mines found per hectare treated by Technical Survey or clearance, however, has fluctuated more widely, and in one case it was actually lower in 2005 and 2007 than it had been prior to the introduction of Technical Surveys. This suggests that while Technical Survey has improved the narrowing of limits on the actual mined areas cleared, General Survey may have become less effective and now includes larger areas for Technical Survey than it left previously for clearance. http://www.rpaad.org/. Accessed 8 July 2009.


4. A higher concentration of mines reflects improved targeting of clearance assets.

5. Fewer tasks without finding any mines reflects improved release of non-mined areas and better targeting of clearance of mined areas.


2. A list is effective when it is (a) exhaustive (i.e., contains everything) and (b) mutually exclusive (i.e., when an item can only appear in one category in the list). The list in Table 1 fulfills both these criteria.

Land-release Policies and Human-security Complexities, Bjork [from page 29]


Gender and Land Release: The Responsibility of the Mine-action Community, Nilsson, Ronés, Garcia [from page 34]


Clearing Areas Right, Clearing the Right Areas, Bach [from page 46]


Could Local Agricultural Machines Make a Country ‘Impact Free’ by 2010?, Cepolina and Zopps [from page 52]


10. According to NABARD, this is the estimated power needed to significantly improve agricultural activities in India.


Reflections from the Field: Laos PDR, Surveys and Land Release, Pritchard [from page 57]

1. This was a non-technical survey team, collecting and analyzing new and extant information on the specific hazard area.

2. Polygons are a geo-spatial visual representation on a map of specific areas of interest, such as minefields or suspected areas containing UXO.

3. The 80/20 Rule, also known as the Pareto Principle, states that 80 percent of effects should be credited to 20 percent of causes.

Land Cancellation and Release, Marvinkulor [from page 58]