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Clearing Areas Right; Clearing the Right Areas

by Håvard Bach (GICHO)

Although land release 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.

I s land-release methodology useful? The answer to this question requires insight into what land release is as a concept and how it can be applied in the field. The term land release is not entirely new, and it has gradually found its way into mine action, as well as the lexicon of most governments and organizations. It is now widely used, and while a few criticize the term, most embrace it. Rather than being an indication of a problem with the term itself, this criticism is perhaps related to the differences in understanding what it implies. Misuse of the term to support specific agendas related to the differences in understanding what it implies may also have added to the backlash.

In the past, the practice of releasing land was based on a subconscious and subjective decision-making process by demining organizations in the field. There is, in principle, nothing wrong with informal decision-making, but when it causes excessive clearance, and subsequently a waste of resources, there is a need to reflect on whether current practices are efficient and for the coordination of education activities to prevent accidents with mines and UXO. While it is not always the case that mines or UXO. While it is not always the case that mines do not know their exact locations—nor even where there are, or the actual size of the mined areas; the problem occurs far too often to be ignored.

Often in the field of mine action, we know there are mines but do not know their exact locations—not 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 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 conservative decision-making include:

• Flawed use of success indicators
• Pressure by local authorities

Agricultural land that has been plowed for planting by animal or mechanical means for two years without any evidence of mines

Areas where the local population has freely moved for two years without evidence of mines

Areas where surface vegetation has been removed by hoe for planting of cereal or other crops, where seeds are planted about 30 centimeters (12 inches) apart, for five years without evidence of mines

Areas used intensively as pasture (e.g., cattle grazing) for two years without evidence of mines

Forest areas cleared by powered logging equipment without evidence of mines should be cleared immediately

Forest areas used for gathering wood for fuel, roots, etc., without evidence of mines should be investigated further

Areas sufficiently checked by Technical Survey without finding any evidence of mines

When the local population and a technical team agree that there is no evidence of mines

The IND will finalize the standards and detailed criteria in discussion with the demining operators active in Mozambique. This will provide the framework to implement land release and increase the efficiency of mine action in Mozambique. These changes will improve the national program and may provide an interesting paradigm for other national programs and organizations.

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The figure illustrates how land can be released by non-technical survey (NTS), if it provides sufficient confidence that land is mine-free. As shown, the assumption of no mines is not necessarily correct. 38 | Focus | The Journal of ERW and Mine Action | August 2009 | 13.2 | Annual Issue

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Although land release 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.
• 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 survey 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 offered these important recommendations:

• Land can be released by Non-technical means, Technical Survey and clearance.

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.
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 General Survey, Polygon Survey, Level One Survey or Baseline Survey. It is a non-intrusive investigation into whether a site is mined or not.
- **Technical Survey** is a technical investigation using demining assets to collect information for further assessment. The purpose of the survey 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 limit 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 Technical Survey and a polygon that defines the boundaries of the suspected area.

** 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, weighting 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 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** is the product of a Technical Survey. A DHA is the area that will end up cleared regardless of whether it was initially defined by Technical Survey.

**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 that relies on 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 firsthand 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, and even clearance. Convincing evidence provided by Non-technical Survey will require much less supplementary evidence from Technical Survey before land can be released.

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

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 provided that this will 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 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

Manual mine clearance is the most accurate survey tool. All mines are normally found when manual demining is applied. Using two accredited animals to detect mines is also considered clearance by IMAS. Confidence in the survey, however, is due to the accuracy and the quantity of information.

IMAS defines the use of two accredited animals as clearance, but how much information will one accredited animal provide? The quality and accuracy of animals differ considerably between organizations, impeding the process of defining a generic scoring value for the use of one animal. The fact that less reliable mine-detecting dogs are currently used in survey assessments is a concern, but it is more a management problem than a generic problem with dogs. If we assume only well-trained, tested and accredited dogs are allowed for use, we can define confidence in the use of one animal in Technical Survey as fairly high. Evidence suggests that well-trained animals will find most mines, if not all.

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 slash off 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 requirement for 30-percent ground coverage when using a flail is even higher (approximately 70 percent). If the requirement for Technical Survey varies (which will depend on the type and amount of information already provided by the Non-technical Survey or clearance activities), the proportional increase of ground-coverage requirement by other assets can be defined. If there is only 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 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.

- Mined land may be reclassified 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 an asset 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 clearance, the required documentation and handover process is required. If verification 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
Conclusion

Land release systematically captures several current but isolated activities and clarifies how each of them is related. A structured assessment of these relationships can lead to improved efficiency. Consistent use of the term and all its facets has the potential to improve the quality of the individual components. It will inevitably take some time before land release is universally understood, as there is no one uniform method for its application. Land-release methodology is, however, a useful instrument to better define and subsequently resolve the land-mine problem. Ottawa Convention States Parties may find this tool particularly useful when assessing their own compliance with the Convention or when there is a need to prepare extension requests.

See Endnotes, page 62

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Could Local Agricultural Machines Make a Country ‘Impact Free’ by 2010?

by Emanuela Elisa Cepolina [Small-Aid—Technology for Development] and Matteo Zoppi [University of Genova]

Many countries affected by landmines are also facing food crises, underscoring the necessity of cost-effective mine removal. Converting agricultural machines already available in many mine-affected countries for use on mine-action projects saves not only time but also money by speeding up the removal process and turning the land back into an agricultural resource.

General and Technical Survey

In light of the need to fulfill Ottawa Convention obligations and the pressing need to return cleared land to local populations, the land-release concept aims to use current resources more efficiently by better managing information and defining the actual size of minefields so that expensive resources and equipment can be devoted to high-risk areas. Clearance is generally limited to only 3 percent of the entire Suspected Hazardous Area processed. The remaining area that is released through General and Technical Survey is not physically cleared, or at least not completely, and therefore contains an element of risk that explosive hazards may remain. Full clearance activities will not guarantee that an area is completely free of mines, and land released after area reduction is generally considered to contain a higher residual risk.

Nevertheless, area reduction through General and Technical Survey is increasingly being used in many programs around the world, such as Cambodia and Mozambique. This important shift toward the acceptance of a residual risk after clearance allows for treatment of the problem in terms of risk management and the substitution, at least partially, of full clearance activities with a combination of cheaper and less thorough (and thus less reliable) methods to lower the risk to a tolerable level. A tolerable risk is defined as a risk that is accepted in a given context based on the values of the society being assisted, and a re-definition of the problem from a global to local scale.

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 ITF.

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