Journal of Conventional Weapons Destruction

Volume 15
Issue 2 *The Journal of ERW and Mine Action*

Article 19

July 2011

Land-release Information Management: Advocating for a Collaborative Approach

Aurora Martinez
GICHD

Daniel Eriksson
GICHD

Land-release Information Management: Advocating for a Collaborative Approach

For land release to become more efficient and less dangerous, operations on the ground need accurate information. Collaboration between information management and operational planning will help increase safety while working toward releasing more land. The most challenging aspect of land release is the identification of boundaries around contaminated areas, and using new information technologies will aid not only operation managers in the area, but also senior managers setting long-term goals.

by Aurora Martinez and Daniel Eriksson [GICHD]

Land release aims to increase the efficiency of survey and clearance operations. The application of an efficient land-release methodology, however, addresses more than pure operational processes. Among other enabling factors, information management plays a key role in supporting consistent and efficient decision-making in the operational process.[1] Effective operational decisions rely on the quality and quantity of information. The more reliable the information, the higher the confidence in the operational decision-making process, and as a direct result, more efficient land-release decisions can be made. This relationship promotes the maximization of Non-technical and Technical Survey approaches which heighten the understanding of the nature of a hazardous area. This basis allows clearance activities to focus on areas genuinely contaminated and ensures the application of the most economical methods for land release (see Figure 1 above).

Figure 1. Toward better definition of the contamination through NTS and TS. Clearance is conducted on the DHA.

Land release is mostly considered at an operational task level. Nonetheless, the ultimate goal of the process is to release communities from mine/explosive remnants of war contamination. Information management should serve the needs of on-site operational planning and execution as much as those of the mine-action program on a broader scale. The latter will be mostly concerned with overseeing progress toward set objectives, proving efficiency of the selected methodology and confidently declaring communities released from mine/ERW contamination. On-site operational planning, on the other hand, requires considerably more detailed technical data to take operational decisions. As is the case for any other activity, the information needs for land release must be carefully assessed before information gathering occurs in order to avoid recording inadequate quantities of information or low quality information. Effective land-release information management should strive to provide the right information at the right time without it being cumbersome for any user and should concurrently link together the needs for all levels of a mine-action program.

An Iterative Process

Land-release information management must overcome considerable challenges to properly support the overall decision-making process. The land-release approach is defined as iterative as opposed to sequential.[1] This means that the order of the connected steps (workflow) designed to achieve land release can vary from case to case. Unlike a sequential approach, where the workflow follows all steps of a defined process in a linear way, the land-release approach entails adaptation according to circumstances. It is not the removal and destruction of mines/ERW but rather the precise identification of the contamination boundaries that is the most challenging aspect for mine-action operators.[1] Efficient operational planning and execution depend on an iterative cyclic process of information gathering and analysis to help better target clearance assets. Appropriate adjustments to plans when operations are underway are expected to occur as additional evidence is gained. This stresses the fact that information is actively sought throughout the duration of a task.

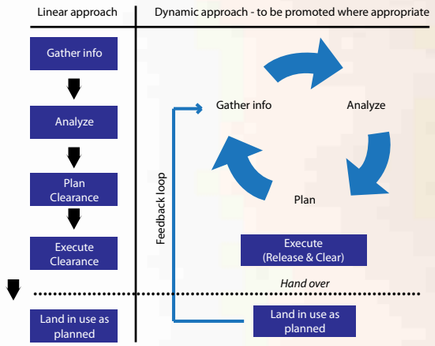

Figure 2. Linear versus dynamic approach (where information gathering and operation adjustments are made).

A dynamic approach (see Figure 2 above) that aims to define as precisely as possible the location of mines/ERW requires clear documentation procedures stipulating mandatory fields, such as the exact location of contamination. By doing so, a useful audit trail is created. Future decisions on land release may have to refer to past data, which should remain traceable throughout. At the same time, land release also requires mindful data management to avoid data overlaps and duplications that may confuse. This is particularly true with the initial storing of suspected hazardous areas in a database. Therefore, the application of a more stringent process subject to quality assurance[1] is strongly advised when recording a SHA in a database.

Increasing Collaboration

Operational planning and execution will gain efficiency through a methodical collaboration with information management. As the holders of the knowledge on the data accuracy and relevancy that is collected, operations staff should have an active role throughout the cyclic information-management process, from collection needs to analysis, including data recording. With information management lies the responsibility to advise on how to best manage the data to properly serve needs, including implementation of technological support tools where appropriate (see Figure 3).

Also, the information manager should point out the cost of delivering the requested information and other implications, such as skills and availability of the operations staff at each step of the information-management cycle. For example, operations normally conducts data collection (whether on paper or digital). The information-management professionals will then have to match the complexity of the data entry form to the capacity of the survey team or provide training to ensure clear understanding on how to fill out the forms properly.

Strong data-ownership by operational staff is a key factor in ensuring data quality, in particular when it comes to deciding which data should supersede the other. The actual task of recording data, verifying its accuracy and analyzing it should be undertaken by operational staff (the domain experts). Domain experts are in the position to interpret and analyze all information brought together to either validate or call for complementary details. Information managers use their knowledge to the benefit of the domain experts—for instance, designing data-entry quality filters and building report templates that compile data into readable formats for the operations staff. It is very important that operations staff clearly express what information needs to be compiled for them to analyze it. Starting from the expected information output, information-management staff should then work counter-clockwise.

Figure 3. The inforamtion-management cycle.

Defining Information Needs

Planning and prioritization often start with baseline data from broad national surveys. Not only is that data often improperly used to describe the extent of national contamination, it also fails to address the needs

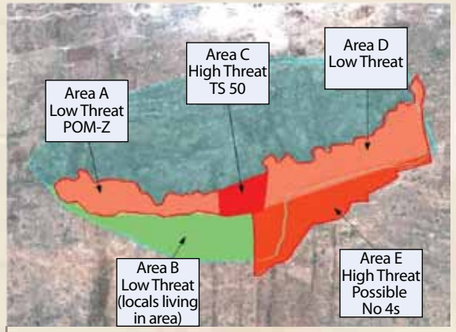

Figure 4. Example of polygon division into sectors (South Sudan).

of site-specific operational planning. Therefore, it is strongly advised that no operational planning starts until operational staff with technical training perform an initial screening of all available information. As part of this revision, the given priorities will also undergo a technical evaluation to determine which areas warrant mine-action follow-up. It may happen that data sought for analysis was already collected. However, it may not have been properly extracted and may consequently not be visible in a compiled report. Information-management staff should support this initial step by filtering data, querying and extracting information to help identify gaps (see Figure 4 above).

This technical exercise should identify where data quality and quantity need improvement for operational planning purposes. It entails reviewing the data-collection forms, ensuring they are well designed to capture reliability and evidence data that builds understanding of the nature of the hazardous areas and the contamination type. Land-release information management must support the escalating system of survey activities[1] it promotes, which only resorts to full clearance as a last option. What operations staff will want to achieve through technical revision of existing data and information needs is to have an overview of the evidence data and to determine whether it is up to a satisfactory level. That level is reached when they are able to balance factors that raise confidence for releasing land without being subject to clearance and for appropriately applying survey approaches to areas with suspicion of contamination. Data collection details should hence aim at supporting informed decisions within an operational concept.

A Non-technical Survey data-collection form, for example, should include historical evidence provided by military and civil informants, physical evidence of mine presence and evidence from land use. Additional technical surveying will depend on the values provided by some of the following criteria: nature of contamination, asset types deployed, methodologies used, delimited sectors within boundaries of a hazardous area[1] and areas where assets were deployed. The suitability of the technical survey assets used to confirm the presence or absence and type of contamination require assessment of further technical details, such as age and condition of mines, burial depth of mines, soil and ground conditions, vegetation cover, natural obstacles, terrain and seasonal changes. With that information, operations staff are in a position to balance the performance of a given asset against its highest probability of finding evidence.[1] The purpose of accurate collection and analysis of these values is to enable further evidence-based planning.[2]

Apart from core item categories useful for operations such as hazards and processes, it is equally important to consider auxiliary data for comprehensive operational planning and execution. Those data types may include road access, evacuation plan, medical access and infrastructure like bridges or heliports. Auxiliary data can vary considerably from case to case, so keeping this list up-to-date is important.

Filtering Information

A mine-action program's senior management should aim to measure its land-release efficiency along with progress achieved toward set objectives. Senior management should ensure maintainable dashboards for this purpose. In *Balanced Scorecards & Operational Dashboards with Microsoft Excel®*, Ron Person says that dashboards are the maps and measures that show how to accelerate success (see Figure 5 next page).[3]

While operations staff will assure that the nationally defined processes and procedures meet quality standards[1] on a daily basis, senior management will focus on operational performance and productivity through selected indicators. An efficient land-release methodology should result in cleared areas with the highest yield of mines. Indicators also serve the purpose of readdressing priorities by the senior management.[1]

Indicators are often compilations or calculations of available data—for instance, the total number of square meters matching national land-classification schemes or the total number of square meters of land released meeting cancellation and release-of-land governing criteria. Upon indicators, senior management may see room for

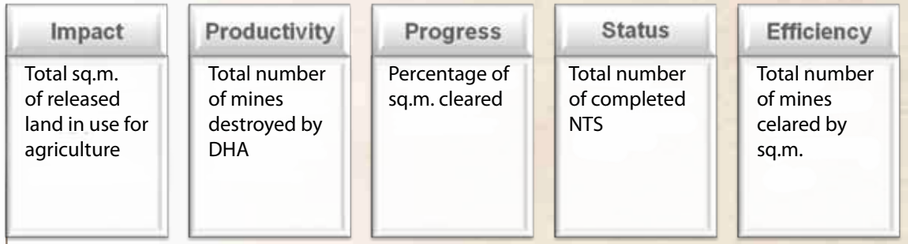

Figure 5. Indicators can be presented in a digital dashboard for an overview of what has been done and what is left to do.

fine-tuning the overall land-release framework if the results do not meet the expected efficiency standards. Information management's role is ensuring the data collection required for specific calculations, even if operational planning may not see a need for it. Recording "intended land use," for example, might be of less relevance for a land-release task than it can be for strategic management purposes and prioritization. The information-management capacity must hence be shaped to properly measure all information needs and liaise with different components of a mine-action program. Indicators can aim at measuring any of the following:

- Impact of the field activities should measure pertinence of the defined priority settings.
- Field-activity productivity should measure if the maximization of resource and asset allocation is met.
- Field-activity progress should measure percentage of accomplished work versus work left to do.
- Status of the defined business rules should measure accomplished status of the interrelated decisions.
- Efficiency of the defined activities and business rules should measure planning costs and logic of the defined interrelated decisions.

Considerations for the Use of Technology

The costs inherent to using information technology should be weighed against the benefits. The development of the Information Management System for Mine Action Next Generation was undertaken in response to the needs expressed in the field. IMSMA[NG] provides a flexible decision-support tool allowing tracking and monitoring capabilities (see Figure 6).

The system was designed to provide users with tools to adapt input forms and output reports in the system to the actual workflows in the organization. Operations staff and information managers, with the technical help of IT specialists, perform IMSMA[NG] configuration.[4] Once they finish this customization in the installation phase, the other functionality of the system is standard. That functionality was primarily designed with the operations staff in mind. The overall objective of the IMSMA[NG] design is to offer a tool that would open access to information outside the information technology cell. This approach has given the system two benefits:

- The subject-matter experts, who hold the knowledge of the reality that the data depicts, control the data quality.
- High system user-friendliness through an intuitive interface allows users with limited computer literacy to execute common tasks.

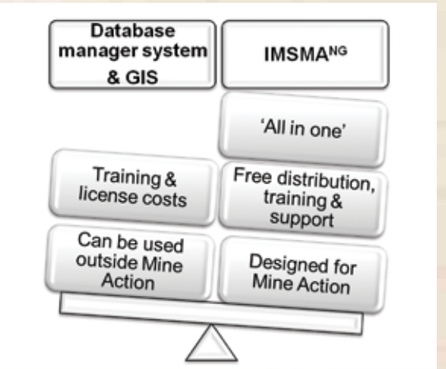

Figure 6. Benefits of separate proprietary software should be weighted against the 'all-in-one' IMSMA[NG] technological advantages.

Risk-management frameworks and other models that determine threat or suspicion levels for land release are sometimes handled outside IMSMA[NG]. Nevertheless, the system does not prevent the inclusion of explicit decisions or solutions supplied outside the system to generate

comprehensive knowledge to inform strategic decisions, coordination and prioritization of the high-risk tasks. The initial configurations performed on the system and the data quality itself will help fulfill the overall objective of efficient land release.

While IMSMA^{NG} can effectively support land-release information management, it should remain clear that it is effective management of information that is fundamental to support land release.

see endnotes page 81

Aurora Martinez provides support to mine-action programs using IMSMA^{NG}, and works on the development of information-management publications and course curricula. Martinez joined the Geneva International Centre for Humanitarian Demining in 2006. She previously acted as the GICHD's Outreach Officer for the implementation of a communications plan. She holds a master's degree in economic and social history from the University of Geneva, and completed a two-year program at Geneva's Graduate Institute of Development Studies.

Aurora Martinez
IMSMA^{NG} Support Officer
Geneva International Centre for Humanitarian Demining
Avenue de la Paix 7bis
CH-1211 Geneva / Switzerland
Tel: +41 002 906 1655
Fax: +41 22 906 1690
E-mail: a.martinez@gichd.org
Website: http://gichd.org

Daniel Eriksson, Ph.D., is Head of the Information Management section at the GICHD. Eriksson was introduced to mine action during his Swedish military service as an explosive ordnance disposal specialist. After completing his mandatory service in 1997, he was involved in research and implementation of information management and decision-support systems in Afghanistan, Iraq and Sudan. His past employers include the Swedish Rescue Services Agency, the European Commission, United Nations Office for Project Services and Vietnam Veterans of America Foundation/Information Management and Mine Action Programs.

Daniel Eriksson, Ph.D.
Section Head, Information Management
Geneva International Centre for Humanitarian Demining
Tel: +41 22 906 1684
E-mail: d.eriksson@gichd.org
Website: http://gichd.org, http://www.imsma.org

SPECIAL REPORT

News Brief

Suspected Cluster-Munition Use by Pro-Qaddafi Forces

The *New York Times* recently reported that pro-Qaddafi forces are using cluster munitions on the civilian population in the city of Misrata.[1] Human Rights Watch's on-the-ground inspection discovered the use of Spanish-made MAT-120 120mm mortars produced in 2007, prior to Spain's signing of the *Convention on Cluster Munitions*, targeting residential areas one kilometer away from front-line fighting.[2] The mortar "opens in mid-air and releases 21 submunitions over a wide area."[2] A further interview with ambulance drivers conducted by HRW discovered that cluster attacks occurred before 14 April 2011.[2] Despite the Libyan government's denial of cluster-bomb use, doctors in Misrata acknowledge that patient wounds are consistent with cluster munitions.[3] HRW describes the danger of these munitions as anti-personnel, as well as anti-materiel, because the munitions are designed to not only hurt people but damage armored vehicles.[2] Libya is not a signatory of the CCM. *See endnotes page 81*

~Zarina Yancheva, CISR staff