Land-release Information Management: Advocating for a Collaborative Approach

Land release aims to improve the efficiency of survey and clearance operations. The application of an efficient land-release methodology, however, addresses more than purely operational processes. Among other enabling factors, information management plays a key role in supporting consistent and efficient decision-making in the operational process. 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).

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. 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. 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.

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 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.

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...
should hence aim at supporting informed decisions with-
when they are able to balance factors that raise confidence
whether it is up to a satisfactory level. That level is reached
technical revision of existing data and information needs is to
motes, which only resorts to full clearance as a last option.
lation type. Land-release information management must
the nature of the hazardous areas and the contamina-
ding 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 val-
ues 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 infra-
structure 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 manage-
ment should ensure maintainable dashboards for this
purpose. In Balanced Scorecards & Operational Dash-
boards with Microsoft Excel®, Ron Person says that dash-
boards are the maps and measures that show how to
accelerate success (see Figure 5 next page).3
While operations staff will assure that the national-
ly defined processes and procedures meet quality stan-
dards4 on a daily basis, senior management will focus on
operational performance and productivity through se-
lected 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.5
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 meet-
ing cancellation and release-of-land governing criteria.
Upon indicators, senior management may see room for
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 op-
erational planning may not see a need for it. Recording
“intended land use,” for example, might be of less rele-
ance for a land-release task than it can be for strategic
management purposes and prioritization. The infor-
mation-management capacity must hence be shaped to
properly measure all information needs and liaise with
different components of a mine-action program. Indica-
tors can aim at measuring any of the following:
• Impact of the field activities should measure per-
tance for a land-release task than it can be for strategic
management may not see a need for it. Recording
• Field-activity productivity should measure if
the maximization of resource and asset alloca-
tion is met.
• Field-activity progress should measure percent-
age of accomplished work versus work left to do.
• Status of the defined business rules should
measure accomplished status of the interrelat-
eded.
• 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 develop-
ment of the Information Management System for Mine Ac-
tion Next Generation was undertaken in response to the
needs expressed in the field. IMSMA® 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® configuration. 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® de-
sign is to offer a tool that would open access to infor-
mation outside the information technology cell. This
approach has given the system two benefits:
• The subject-matter experts, who hold the knowl-
edge of the reality that the data depicts, control the
data quality.
• High system user-friendliness through an intui-
tive interface allows users with limited computer-
literacy to execute common tasks.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Productivity</th>
<th>Progress</th>
<th>Status</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sq. m. of released land or in use for agriculture</td>
<td>Total number of mines destroyed by DHA</td>
<td>Percentage of sq. m. cleared</td>
<td>Total number of completed NTs</td>
<td>Total number of mines cleared by sq. m.</td>
</tr>
</tbody>
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Figure 5. Indicators can be presented in a digital dashboard for an overview of what has been done and what is left to do.
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 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

Daniel Eriksson, Ph.D., is Head of the Information Management section at the GICH. Eriksson was introduced to mine action during the Swedish military service as an explosive ordnance disposal specialist. After completing his mandatory service in 1997, he was invited to research and implement 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.

Aurora Martinez provides support to mine-action programs using IMSMA, and works on the development of information-management publications and course curricula. Martinez joined the Geneva International Centre for Humanitarian Demining in 2008. She previously served as the GICHD’s Outreach Officer for the implementation of a communications plan. She holds a master’s degree in economics 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 Support Officer
Geneva International Centre for Humanitarian Demining
Avenue de la Paix 7bis
CH-1211 Geneva (Switzerland)
Tel. +41 022 906 1655
Fax: +41 22 906 1601
E-mail: d.eriksson@gichd.org
Website: http://gichd.org

Section Head, Information Management
Geneva International Centre for Humanitarian Demining
Tel.: +41 22 906 1650
Fax: +41 22 906 1651
E-mail: d.martinez@gichd.org
Website: http://gichd.org

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. 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.2 A further interview with ambulance drivers conducted by HRW discovered that cluster attacks occurred before 14 April 2011.3

The U.S. Department of State funded two contractors that were tasked with various assignments. Infrastructure creation and staffing were assigned to RNCOD Consulting Corporation, a leading international demining company, and database creation was tasked to FGMI, Inc., an information-technology company from Washington, D.C. (U.S.).

Initial Configuration

The problem had been identified; the experts were in place to provide staffing and infrastructure, and U.N. Department of Peacekeeping Operations provided the software.

At the time, the database-management system was the U.N. preferred Borland Paradox® and the recommended GIS software was MapInfo®. That software combination shaped the entire Bosnia and Herzegovina Mine Action Information System’s existence. MapInfo proved to be a good system for networking a database and the program language was simple enough for new database administrators/programmers to learn in less than a week. The database continues to use Paradox (version 11) today, but the program has had many upgrades and has evolved into a more sophisticated information system.

The other half of the “software marriage,” MapInfo, proved to be an excellent tool for mapping and cartography in general. In the beginning, the Geographical Section General Staff of the British War Office provided a gazetteer, which provided basic conditions for spatial queries. Paradux 11 and MapInfo 10 continue to work well together.

Initial Challenges

According to their obligations prescribed by the Dayton Peace Accords, former warring factions provided more than 16,000 minefield reports to NATO implementation task forces. Data were entered and submitted to BHMAC (then known as UNMAC), together with some 1,100 mine incident data reports also entered into the database and charted on GIS. The puzzle became more complex on a daily basis. At the time, procedures for demining were mostly unclear. The peculiarity of BHAC’s

by Zoran Grujic | Bosnia and Herzegovina Mine Action Center |

The life and blood of a mine-action program is the information system. It is one of the most critical, yet frequently used mine-action tools. The Bosnia and Herzegovina (BiH) mine-action information system program, originally called “The Database,” started in 1996. At the time, Microsoft’s “Windows” 95 made networking simple and a must, but the geographic-information systems that were available created a challenge for information-systems teams.

The BiH team was tasked with developing a network-based information system that could handle scanned images. In addition, there was a need to develop standard database operations and provide abilities to use SQL statements (relational queries). Last but not least, the system would need real GIS capabilities to make accurate, quality and clearly readable maps in less than 20 minutes from the request time.

The data workload was described by the Annex 1A, Chapter 4, Parts I and II of the Dayton Peace Accords, forcing former warring factions to remove minefields and submit their data on remaining minefields and booby traps. The deadline was short, so the system needed preparation and full operation from Day One.

It was immediately clear that BiH had no indigenous resources that could cope with the problem; therefore, help was requested from the international community during the London Peace Implementation Conference.

The international community agreed to support the effort and program implementation began in March 1996. The U.S. Department of State funded two contractors that were tasked with various assignments. Infrastructure creation and staffing were assigned to RNCOD Consulting Corporation, a leading international demining company, and database creation was tasked to FGMI, Inc., an information-technology company from Washington, D.C. (U.S.).

The Bosnia and Herzegovina Mine Action Information System

With technological advancements in mind, the Bosnia and Herzegovina Mine Action Center has maintained a current and efficient mine-action information system, working through a variety of difficulties. BHMAC has developed a system to accommodate a growing collection of demining reports and maps to aid efforts to cleanse the nation of mines and other explosive remnants of war.

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