



**NMAS 03.30**

**Guide to the Research of Mine Action Technology**

**March 2020**

**Edition 2.1**

**Lebanon Mine Action Center-LMAC**

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This document has been released on the date shown on the cover page. The National Mine Action Standards (NMAS) of Lebanon are subject to regular review and update, so users are advised to consult the most recent version. To ensure that you have access to the current version, contact the Lebanon Mine Action Center (LMAC) through the [www.lebmac.org](http://www.lebmac.org) website or by sending an email to [info@lebmac.org](mailto:info@lebmac.org).

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## Foreword

The National Mine Action Standards (NMAS) of Lebanon were first developed in the form of Technical Standards and Guidelines (TSG). After the Lebanon Mine Action Policy was released in 2007, these TSG were edited into the first edition of the NMAS in 2010 and were written to concurrently comply with the first edition of the International Mine Action Standards (IMAS). Since then, the scope of the IMAS has been expanded to include more components of mine action and amended to mirror the most recent changes to standards as required in today's operations. These changes, as well as changes in the local context of Lebanon, have necessitated a review and update of the NMAS.

As detailed in the National Mine Action Policy of 2007, the Lebanon Mine Action Center (LMAC) has the responsibility to execute and coordinate the Lebanon Mine Action Program (LMAP) on behalf of the Lebanon Mine Action Authority (LMAA), including the development and amendment of standards. Such standards shall be developed in a participatory approach that shall involve international, governmental, and nongovernmental organizations.

The NMAS shall be reviewed as needed to reflect amendments in the IMAS as well as incorporate changes to international obligations and local requirements. Such revisions shall be regularly made available on the LMAC's website [www.lebmac.org](http://www.lebmac.org) or can be obtained through contacting the LMAC via the email [info@lebmac.org](mailto:info@lebmac.org).

## Acronyms

BI	Business Intelligence
ERW	Explosive Remnants of War
HDRP	Humanitarian Demining Research Program
HMA	Humanitarian Mine Action
IA	Implementing Agency
IMAS	International Mine Action Standards
IPR	Intellectual Property Rights
LA	Local Authority
LMAA	Lebanon Mine Action Authority
LMAC	Lebanon Mine Action Center
LMAP	Lebanon Mine Action Program
MoU	Memorandum of Understanding
NMAS	National Mine Action Standards
OA	Operational Analysis
R&D	Research and Development
RSHDL	Regional School for Humanitarian Mine Action in Lebanon
SON	Statement of Operational Need
TSG	Technical Standards and Guidelines

## **Introduction**

Mines and explosive remnants of war (ERW) continue to threaten the lives and livelihoods of innocent civilians in Lebanon, inflicting horrific and indiscriminate injury on victims, and in many cases resulting in death. To act against this indiscriminate threat, the Lebanon Mine Action Center (LMAC) has been assigned the responsibility to execute and coordinate the Lebanon Mine Action Program (LMAP) on behalf of the Lebanon Mine Action Authority (LMAA). Noting the limited resources available for Humanitarian Mine Action (HMA), in parallel to implementing, assigning, monitoring, and controlling HMA interventions, the LMAC shall make all reasonable effort to encourage Research and Development (R&D) designed to increase operational safety, efficiency and effectiveness.

R&D into new or more advanced technologies for use in HMA programs is of fundamental importance for both Lebanon and other mine-affected communities around the world.

## Guide to the Research of Mine Action Technology

### 1. Scope

NMAS 03.30 provides principles and guidance for the implementation of research into mine action technology in Lebanon, and the appropriate/expected conduct of Implementing Agencies (IAs) or Research and Development (R&D) organizations that engage in such initiatives.

The LMAC, IAs, and bodies commissioned by the LMAC to conduct R&D into mine action technology shall at all times abide by the standards provided in NMAS 03.30.

### 2. References

A list of normative and informative references is provided in Annex A.

Normative references provide cross-referencing to other standards referred to in this NMAS, and which form an integral part of the provisions of this standard.

Informative references provide a list of documents that may be consulted for a clearer understanding of this standard.

### 3. Key Terms and Definitions

The following terms and definitions relate to R&D and are used in this NMAS:

- *Applied research*: research conducted into a specific technology with the aim of solving a precise and clearly defined problem.
- *Feasibility*: an assessment of whether or not a certain technology can be applied to solve a specified problem or accomplish a specific aim.
- *Pure research*: research which aims to provide or establish general theories or principles for the improved understanding of mine action technology. Pure research may eventually lead to the development of a new technology but the primary and initial aim is to establish broad, general principles.
- *Statement of Operational Need*: a standardized form detailing the needs of a user (most likely, in this context, to be an IA) in relation to mine action technology.

In addition to the above terms, NMAS 04.10 provides a glossary of terms and definitions used across all standards.

As in the IMAS, the terms 'shall', 'should' and 'may' are used across all standards to indicate the required degree of compliance. For any organization working in Lebanon, the use of 'shall' indicates a compulsory requirement. The term 'should' indicates the national

preference which may be varied with LMAC approval. The term 'may' indicates a suggestion that is not obligatory.

#### 4. General Principles of Research Activities

Irrespective of funding availability, as a general principle, all R&D into mine action technology in Lebanon shall require prior approval of the LMAC.

After approval is obtained, applied research into mine action technology should adopt the following cycle: analysis of the problem; analysis of constraining factors; analysis of potential technologies; communication of research results.

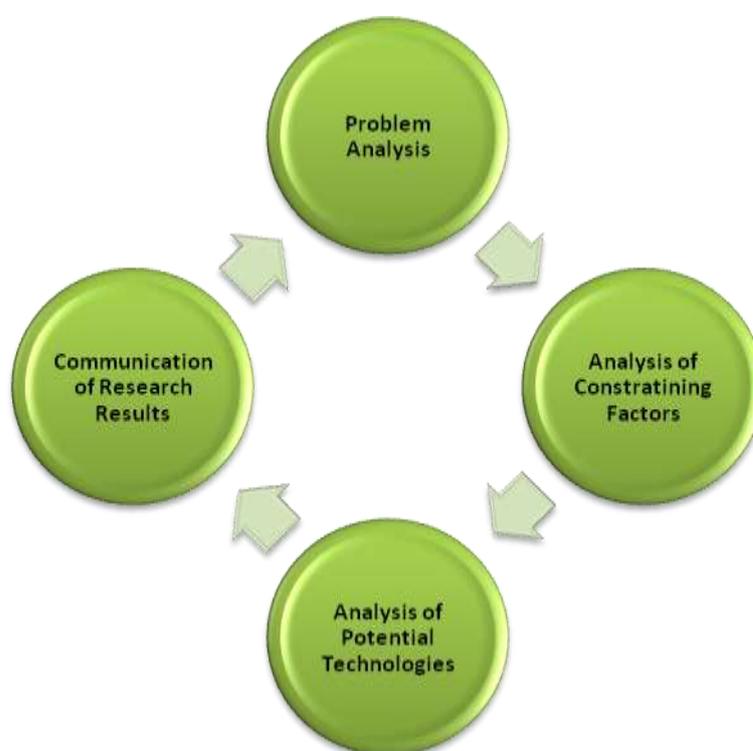


Figure 1: Applied Research Cycle

This cycle may often be repeated in an iterative development process.

Pure research should include submission of a research proposal form and make appropriate provision for the communication of research results.

Concept trials involving the use of mature technologies that may have been combined for a new use may be presented as short term R&D proposals.

##### 4.1 Analysis of the Problem

R&D organizations or donors may submit proposals to the LMAC for research into mine action technology in Lebanon without necessarily identifying a specific problem, i.e. pure research. Annex B provides a sample of a Standardized Research Proposal Form that may be adopted.

After receiving a research proposal, the LMAC shall respond in a timely manner, approving or rejecting the request following discussions with appropriate advisors.

Upon identifying a new and emerging operational need in the field of HMA, IAs should submit timely, coherent, and clear Statements of Operational Need (SON): an example format is provided in Annex C.

A SON may also be generated for other reasons such as a change in policy, a need to replace equipment, a need to improve effectiveness or safety, or in response to new or emerging threats.

Following receipt of a SON from an IA, the LMAC should conduct a full analysis of its relevance and applicability. The LMAC may authorize one or more R&D organization to take on the research outlined as necessary in an approved SON.

Research into mine action technology should only be approved by the LMAC following the analysis of either a SON or a formal research proposal. Exceptions may occur when the proposal is to gather performance evidence of a relatively mature technology, or combination of existing technologies, that have been repurposed and/or combined for use in mine action.

## **4.2 Analysis of Constraints**

The R&D organization should include an analysis of factors that may constrain their work in any proposal. Examples include environmental conditions, the type of mine/ ERW hazard, manufacturing constraints, or the availability of in-country support (including maintenance and repair).

## **4.3 Analysis of Potential Technologies**

After potential constraints are identified and assessed, the R&D organization should conduct an analysis of any potential technologies being researched in terms of their suitability, availability, and affordability in Lebanon. A risk assessment should also be conducted detailing the associated risks of using new technologies, new components, new materials, new procedures and/or unproven software.

## **4.4 Communication of Research Results**

The R&D organization shall communicate the results of the research to the LMAC, reporting on the interim and final results, including updates of the constraints analysis. Whatever the outcome, the LMAC may disseminate the results to ensure a wide benefit but shall endeavor not to reveal details of commercial value.

#### **4.4.1 Pure Research**

In the case of pure research, the research may be communicated to the LMAC via a process of peer review, involving academic journals or scholarly conferences producing documents that explain the applicability and validity of findings.

#### **4.4.2 Applied Research**

In the case of applied research, the results of the research shall be submitted to the LMAC in a formal report that includes at least one independent evaluation of the potential uses of the technology and that fully explains the 'product'.

### **5. Research Facilities**

#### **5.1 Academia**

Universities and technical institutions of higher learning often have access to high quality facilities that enable them to conduct valuable work. R&D organizations conducting research may wish to partner with universities or other higher educational institutions to conduct research into mine action technology in Lebanon. In this case, the university or institution shall be pre-approved by the LMAC to engage in such research.

#### **5.2 Industry**

Organizations and bodies working in a wide variety of industries in Lebanon may wish to conduct, facilitate, or host research into mine action technology. All organizations conducting, facilitating, or hosting such research shall be pre-approved by the LMAC prior to such activities taking place.

#### **5.3 Regional School for Humanitarian Demining in Lebanon (RSHDL)**

The Regional School for Humanitarian Demining in Lebanon (RSHDL) acts as a hub for documentation and knowledge sharing in the Arab-speaking world. Taking advantage of this capacity, the LMAC may enlist RSHDL assistance in assessing research proposals and may direct applicants to this valuable national capacity for advice.

### **6. Operational Analysis (OA) and Business Intelligence (BI)**

Within HMA, R&D shall support the generation of Business Intelligence (BI) whenever appropriate. BI are collective trends, patterns, and relationships processed from operational databases and other sources of information gathered from internal and external sources to give organizations the ability to make effective, important, and strategic decisions. To obtain BI, R&D shall utilize Operational Analysis (OA), which is a field of research that applies quantitative and qualitative analysis tools and techniques to assist management decisions.

In HMA, OA examines current and historical performance of the technology, tools and procedures used and measures their performance against pre-established parameters in

an effort to identify ways in which results could be better achieved in terms of safety, speed and cost-efficiency.

## **7. Funding**

Research into mine action technology is often a long-term commitment, and lack of funding can be an issue, particularly midway through R&D initiatives. The LMAC shall exert all efforts within its capacity to assist R&D organizations and/or IAs conducting approved research to mobilize resources from international and national donors so that the R&D activity can be completed. Donors wishing to fund research and development initiatives in support of mine action may approach the LMAC to suggest ongoing and/or upcoming research initiatives/concept notes that appear worthy of support.

In this context, donors should not deposit funds earmarked for the R&D of mine action technology in Lebanon to any organization or institution before receiving the approval of the LMAC. Similarly, IAs or R&D organizations should not submit calls for funding, or begin utilizing funds from donors for R&D into mine action technology in Lebanon before receiving the approval of the LMAC.

## **8. Direction and Control**

Prior to conducting any part of the HMA research activity inside Lebanon, the MAC's approval must be sought and a Memorandum of Understanding (MoU) should be drafted and signed between the donor, the R&D body, and the LMAC clarifying issues including intellectual property rights (IPR), insurance and other legal obligations.

The LMAC should offer coordination and guidance to R&D organizations and donors regarding the conduct of research into mine action technology in Lebanon, in line with the standards laid out in this NMAS. The LMAC may also assist with elements of the research when staffing constraints permit, and when the outcome may predictably be of significant value within Lebanon.

## **9. Roles and Responsibilities**

### **9.1 Role of the LMAC**

The LMAC shall:

- maintain and oversee the implementation of the standards for R&D into mine action technology as laid out in this NMAS;
- respond to proposals for R&D in a timely manner approving or rejecting the proposals following due consideration;
- offer coordination and guidance to R&D organizations and donors and agree a tripartite MoU with the donor and the R&D organization when applicable; and

- be responsible for appraising and considering for accreditation any new mine action technology or procedure resulting from the research.

## **9.2 Responsibilities of Implementing Agencies (IAs)**

In their capacity as R&D organizations or in supporting R&D initiatives, IAs of mine action technology shall:

- produce timely, coherent and clear Statements of Operational Need (SON), after having identified existing, new or emerging operational needs in the field of HMA;
- obtain prior approval from the LMAC before starting any R&D activities in support of mine action in Lebanon;
- not submit calls for funding, or begin utilizing funds from donors for R&D in support of mine action in Lebanon, before receiving the approval of the LMAC;
- submit timely and comprehensive progress reports to the LMAC on a bi-annual basis, starting 6 months after the start of research activities in Lebanon, or as agreed with the LMAC; and
- aim to establish complementary and focused, rather than competing, areas of research.

## **9.3 Responsibilities of Donors**

Donors to R&D initiatives for mine action technology in Lebanon shall submit a request to the LMAC prior to providing funds for any R&D that will be conducted in Lebanon.

	LEBANON NATIONAL MINE ACTION STANDARDS		Edition 2.1	NMAS 03.30
	<b>ANNEX A: Normative and Informative References</b>			
				<b>March 2020</b>

The documents listed below constitute normative references which form an integral part of the provisions of this standard:

- Current LMAC and IMSMA reporting formats (request copies from the LMAC);
- NMAS 07.11 Guide for Land release;
- NMAS 12.10 Mine/ ERW Risk Education;
- NMAS 13.10 Mine Victim Assistance; and
- NMAS 04.10 Glossary of Mine Action Terms, Definitions, & Abbreviations used in the Second Edition of the NMAS.

In addition to the normative references listed above, the following informative references may be consulted:

- *Lebanon National Mine Action Policy 2007*;
- *IMAS 01.10 Guide for the Application of International Mine Action Standards (IMAS)*;
- *Convention on Cluster Munitions*;
- *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*; and
- *The 1997 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction*, which is often abbreviated to the Anti-Personnel Mine Ban Treaty or the Ottawa Convention.

	LEBANON NATIONAL MINE ACTION STANDARDS		Edition 2.1	NMAS 03.30
	<b>ANNEX B: Standard R&amp;D Proposal Template</b>			
<b>March 2020</b>				

**Address Block**  
**Date**

**Standardized Research Proposal [Title]**  
**[Reference number]**

**1. Introduction**

Provide a general background and reason(s) for this proposal.

**2. Proposed Research/Development Field**

This section should summarize briefly the proposed research field, including sector of mine action and objectives of research.

**3. Justification**

Describe the contribution of this research to the overall field of humanitarian mine action (HMA) field in Lebanon.

Refer to any relevant studies and OA that quantify the need for such research.

Outline any similar or relevant research conducted by the organization.

**4. Schedule**

State the urgency and outline a proposed work-plan.

**Signature Block**

**Annexes:** As required.

**Distribution:** As required.

	LEBANON NATIONAL MINE ACTION STANDARDS		Edition 2.1	NMAS 03.30
	<b>ANNEX C: Example Statement of Operational Need</b>			
<b>March 2020</b>				

## Address Block & Date

### Statement of Operational Need [Title] [Reference number]

#### 1. Introduction

Identify the general background and reason(s) for this new or changed operational need. The need may come from a change in policy or procedures requiring a new or modified capability, or the need to replace inadequate or obsolete equipment, or in response to new or re-defined mine/EO hazards. You may also list associated projects and other related SONs.

#### 2. Operational environment

Describe the:

- Geographic environment;
- Security environment; and
- Mine and ERW, including unexploded sub-munition contamination and its impact.

#### 3. Proposed operational need

Summarize briefly the operational need in terms of the overall objective(s) of the mine action program and the necessary tasks and processes. Proposed solutions should not be detailed; rather, emphasis should be given to 'defining' the 'problem situation'.

#### 4. Limitations of current solution(s)

Mention the limitations of the current method of meeting the operational need. Limiting factors may include:

- safety;
- inadequate equipment, procedures, logistics or training;
- affordability / cost-effectiveness; and/or
- lack of standardization / harmonization.

#### 5. Justification

Describe the contribution of this SON to the overall capability stating whether the operational need critical, significant, or just marginal to the overall mine action objective.

## NMAS 03.30, Edition 2.1: Amendment Record

The NMAS are subject to a comprehensive or partial review by the Review Board periodically. Changes in the context as well as safety requirements and efficiency considerations may necessitate amendments to individual NMAS standards more frequently. If this occurs, such amendments shall be given a number, dated, and detailed in the table below. The amendment should also be indicated on the header under the NMAS edition number.

Whenever the formal review of the NMAS is completed, a new edition shall be issued. Amendments that have taken place before the review date shall be incorporated in the new edition and the amendment record table cleared. Consequently, the recording of amendments shall start again until the next review.

The most recent revisions of the NMAS shall be posted on the Lebanon Mine Action Center (LMAC) website on [www.lebmac.org](http://www.lebmac.org).

<b>Number</b>	<b>Date</b>	<b>Amendment Details</b>
1	March 2020	Minor revisions throughout.