STRENGTHENING EVIDENCE-BASED SURVEY UNDER DEVELOPMENT OF LAND RELEASE IN BOSNIA AND HERZEGOVINA
Significant changes in the nature of the mine contamination

1. The last twenty years we have dealt more with problems of known minefields than unknown minefields, so it will be more difficult to identify the remaining minefields

   • **Consequences:**
     
     • Traditional non-technical survey will not be effective. Current procedures, working methods and criteria for land release are not adapted to nature of remaining mine contamination.
     
     • There is needs to reconsider purpose and use of traditional procedures of technical survey with systematic investigation.
     
     • Non-technical survey as tool for definition of confirmed hazardous areas designated for clearance is not effective anymore.
     
     • There is needs to integrate non-technical survey with limited use of clearance resources through technical survey.
     
   • **Key question:** How to strengthen the evidence-based approach with the same resources available to BiH for the release of land?
2. The remaining minefields are mainly in hilly and mountainous areas largely covered by forests.

• **Consequences:**
  
  • It is expected gradual reduction of mechanical ground preparation in demining operations which will decrease productivity and increase cost price of currently dominant approach of technical survey (systematic investigation) and clearance in BiH
  
  • More needs for small mobile machines
  
  • Development of techniques for use of dogs in high BiH forests
  
  • More manual clearance could increases cost of mine action significantly. Technical survey with targeted investigation to apply wherever is possible instead of systematic investigation.
  
• **Key question:** How to fit technical survey with targeted investigation in the existing model release land in Bosnia and Herzegovina, in order to ensure the principle of continuity in the field operations?
3. Priorities in release of land have changed.
   • Consequences:
     • In BiH, the size of released area through clearance and technical survey was important as long as the reconstruction of infrastructure, the return of the population and other urgent priorities were actual.
     • It was reason for extremely high contribution of technical survey with systematic investigation in BiH demining operations (85-90% technical survey, 10-15% clearance).
     • Development and use of advanced techniques for assessment and identification of minefields is crucial to speed-up release of remaining suspected hazardous areas in BiH.
   • Key question: Are existing techniques (working methods) applicable in technical survey with a targeted investigation and what should be improved?
4. Although the new standards for land release, non-technical survey and technical survey adopted at the beginning of 2016, still have not defined the criteria for the release of land.

- Consequences:
  - There is a need to improve national criteria for releasing of land are adopted.
  - Lack of indicators for strategic planning without set of criteria for releasing of land.
  - Slows down the development of standard operating procedures

- Key question: How to face the risks of changes in BiH concept of release land? How to understand changes (challenge of knowledge); how to include the existing stakeholders in these processes (process challenge); and how to establish effective communication and information sharing between stakeholders (challenge of communication skills)? (Rowan, 1991, according Lundgren R.: Risk communication: a handbook for communicating environmental, safety, and health risks, 1994)
Evidence-based decision making process

IMAS 08.20 Technical survey; IMAS 08.21 Non-technical survey; IMAS 07.12 Quality Management in Mine Action;

An essential component of the survey and land release methodology is to assess and classify land based on the evidence (amount and reliability) of mines/ERW.

An evidence based decision process can help in making appropriate and credible decisions, and in defining a minimum requirement for non-technical survey in order to further release land.

An evidence based decision making process that aids future decision making on the required level of mine action support should be considered.
NPA VIEW ON DEVELOPMENT OF LAND RELEASE CONCEPT IN BIH

Non-technical survey, 2002
Identifying and updating of suspected hazardous areas
General assessment of situation
Re-assessment of risk
Releasing of land
Non-technical survey, 1999
Defining confirmed hazardous areas
Releasing of land
Darvin Lisica, Regional Director for South East Europe
IMAS: "all reasonable effort"
IMAS: "clearance requirements"

Technical survey, 2004
Systematic investigation
Defining confirmed hazardous areas
Releasing of land
5-30% of areas treated with clearance techniques
Technical survey, 2015
Targeted investigation
Identification of position of minefield/footprint
Defining confirmed hazardous areas
1-3% of areas treated with clearance techniques
Combined with non-technical survey

Clearance, 1996
Releasing of land
100% of areas treated with clearance techniques
IMAS: "all reasonable effort"
LAND RELEASE PROCESS IN BOSNIA AND HERZEGOVINA

1. Desk study on evidences identified through NTS
   - Criteria for defining SHA met
     - Yes
     - No
   - List of evidences
   - Are all reasonable efforts spent within NTS
     - Yes
     - No
   - List of confirmed and non-confirmed evidences

2. Analysis of missing data
   - Criteria for defining SHA met
     - Yes
     - No
   - NTS execution task

3. Preparation for field investigation
   - Criteria for defining SHA met
     - Yes
     - No
   - NTS report
   - BHMAC data base

4. Dana gathering and measuring
   - Criteria for defining SHA met
     - Yes
     - No
   - BHMAC data base
   - NTS report

5. Data processing and analyzing
   - Criteria for defining SHA met
     - Yes
     - No
   - BHMAC data base

6. Mapping and recording
   - Criteria for defining SHA met
     - Yes
     - No
   - BHMAC data base

7. Assessment of area for systematic investigation
   - Criteria for defining SHA met
     - Yes
     - No
   - BHMAC data base
   - NTS report
   - Priority setting

8. Development of execution plan for clearance
   - Criteria for defining SHA met
     - Yes
     - No
   - BHMAC data base
   - NTS report
   - Clearance report
   - Certifying and handover

9. Field systematic investigation
   - Criteria for defining SHA met
     - Yes
     - No
   - BHMAC data base

10. Mapping and recording
    - Criteria for defining SHA met
      - Yes
      - No
    - BHMAC data base

Legend:
- Non-technical survey sub-process
- Technical survey sub-process
- Clearance sub-process
- Other processes
Task “MSP Vlašić-1”, 1,825,000 m², status in BHMAC data base before TS with targeted investigation

Through NTS BHMAC defined 4 CHA for TS with systematic investigation
1. 66,120 m²
2. 142,600 m²
3. 53,430 m²
4. 51,970 m²
Total: 314,120 m²
“MSP Vlašić-1”, 1,825,000 m²,
Filed targeted investigation after completed:
1. Desk study on evidences on existence of mines and explosive remnants of war;
2. Selection of the targets for investigation;
3. Preparation of the execution plan for targeted investigation
Applied techniques:

1. Manual clearance leading working lane/working lanes towards a specific target;
2. Detection dogs search towards a specific target:
   1. leading a dog on a leash up to 30 m and
   2. leading dogs without a leash by focusing on target,
   3. leading working lane in traditional way – one working lane/two dogs;
3. Recording (and observing) using drones:
   1. directing the drone to target for visual verification of the existence of mines and
   2. setting directions of drone search, which can give additional information that
      could not be collected through non-technical survey.
4. Mechanical clearance focused on targets or forest pathways/roads
5. VIDEO CLIPS: USE OF DOGS AND DRONE FOR TARGETED INVESTIGATION

Dog      Drons
### CASE STUDY: COMMUNITY OF POTKRAJ, TRAVNIK, BIH
**CONSUMED RESOURCES FOR TECHNICAL SURVEY WITH TARGETED INVESTIGATION IN „MSP VLASIC”**

<table>
<thead>
<tr>
<th>Phases of targeted investigation/Techniques of investigation</th>
<th>Checking targets</th>
<th>Determination of the geographical characteristics of targets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of targets</td>
<td>Searched area</td>
<td>Number of targets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>m²</td>
<td>%</td>
</tr>
<tr>
<td><strong>Manuel clearance</strong></td>
<td>11</td>
<td>2,555</td>
<td>58.8%</td>
</tr>
<tr>
<td><strong>Dog search</strong></td>
<td>6</td>
<td>1,790</td>
<td>41.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11</td>
<td>4,345</td>
<td>43.6%</td>
</tr>
</tbody>
</table>

Norwegian People’s Aid

Darvin Lisica, Regional Director for South East Europe

12
CASE STUDY: COMMUNITY OF POTKRAJ, TRAVNIK, BIH

“MSP Vlašić-1”, 1,825,000 m², new status after TS with targeted investigation combined with NTS

Identified minefields
CASE STUDY: COMMUNITY OF POTKRAJ, TRAVNIK, BIH

“MSP Vlašić-1”, 1,825,000 m², new status after TS with targeted investigation combined with NTS

Legend
- CHA designated for clearance
- SHA designated for additional work through TS
- Task border MSP-Vlašić 1

Clearance and Technical survey (systematic investigation)
<table>
<thead>
<tr>
<th>Activities</th>
<th>Size of area (m²)</th>
<th>Contribution in SHA</th>
<th>Spent clearance resources (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OLD APPROACH (an estimation according previous result of non-technical survey)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical survey (systematic investigation) after non-technical survey (NTS) only</td>
<td>314,120</td>
<td>17.21%</td>
<td>94,236</td>
</tr>
<tr>
<td>Estimated area for clearance after technical survey (systematic investigation)</td>
<td>4,670</td>
<td>0.26%</td>
<td>4,670</td>
</tr>
<tr>
<td><strong>Total released land – old approach</strong></td>
<td>318,787</td>
<td>17.47%</td>
<td>98,903</td>
</tr>
<tr>
<td><strong>NEW APPROACH (according land release conducted by NPA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical survey (targeted investigation) combined with non-technical survey</td>
<td>1,685,798</td>
<td>92.20%</td>
<td>9,961</td>
</tr>
<tr>
<td>Clearance after technical survey (targeted investigation) and NTS</td>
<td>20,430</td>
<td>1.10%</td>
<td>20,430*</td>
</tr>
<tr>
<td>Technical survey (systematic investigation) after clearance technical survey (targeted investigation) and NTS</td>
<td>118,772</td>
<td>6.70%</td>
<td>21,621</td>
</tr>
<tr>
<td><strong>Total released land – new approach</strong></td>
<td>1,825,000</td>
<td>100%</td>
<td>52,012</td>
</tr>
</tbody>
</table>

*Total: 199 Landmines and 5 UXO (Average number is 97.4 mines per hectare which is 9 time more than national average of found mines per hectare in 2015 (10.8 mines/ha)
1. Development of methodology and application of standard operational procedures for technical survey with targeted investigation

1. Development of advanced techniques for targeted investigation, 2013-2014 (NPA)

2. Description of process and writing standard operational procedures for technical survey with targeted investigation, 2014 (NPA), approved by Demining Commission and BHMAC on beginning of 2015

3. Pilot project on testing of applied techniques and standard operational procedures, (NPA, BHMAC) 2015

4. Application of technical survey with targeted investigation in regular operations (2016-ongoing)

5. Workshops on application of new approach in land release (2017)
2. Improving technical survey with systematic investigation, (NPA, BHMAC), 2017-2018
   1. More scalable approach 5-20% of areas treated with clearance techniques instead 20-30%.
   2. Multi-phase approach supported with advanced techniques for investigation and assessment

3. Adjusting non-technical survey to current nature of contamination by mines and cluster munitions and the principles of evidence-based survey, 2017 (BHMAC)

4. Country assessment of residual suspected hazardous areas

5. Education of stakeholders (BHMAC, NPA), 2018