GICHD INNOVATION AWARD 2025

THEMATIC FOCUS: RISK MANAGEMENT IN MINE ACTION

PROBLEM STATEMENT 2

Topic: Quantifying residual risk in land release

Residual risk in land release is the risk of an explosive ordnance remaining present after the land release activities, whether non-technical survey (NTS), technical survey (TS) or clearance. It is currently assessed based on historical data, field assessments, and expert judgment, remaining mostly qualitative and subjective. In risk averse contexts, this typically leads to higher ratios of land cleared to land released and higher cost per item of explosive ordnance found. In practice, it means land is being cleared where there is very low risk of explosive ordnance contamination. These are key performance indicators pointing to inefficiencies in resource allocation.[1] Residual risk is closely tied with the concept of all reasonable effort.[2]

By quantifying residual risk in land release (for example, adopting mathematical and statistical risk models), mine action programmes could adopt objective data-driven decision making about risk treatment and allocation of resources to NTS, TS and clearance.

How might the mine action sector adopt mathematical models to quantitatively estimate the residual risk of land released through NTS (cancelled), TS (reduced) and clearance (cleared), enhancing the risk decision-making process and promoting a lower ratio of land cleared to land released?

Rationale and impact

By analyzing variables such as type of explosive ordnance contamination, accident history, clearance depth, terrain features, and land release records and methods, statistical risk models can provide more accurate evaluation and cost models of residual risk. This can meaningfully contribute to address the following challenges:

- Improving NTS/TS and clearance decisions by more objectively comparing operational and residual risk costs, as well as by conducting opportunity cost analysis.
- Standardizing risk assessment methodologies to align with international standards, such as ISO 31000 and IMAS, ensuring consistency, transparency, and accountability.
- Improving operational efficiency key performance indicators, leading to faster advance of the release of land and accelerating the achievement of treaty obligations.

These models may allow better quantification of all reasonable effort in the given context and the definition of liability of the parties regarding the residual risk.

[1] For more information on key performance indicators, please refer to the GICHD Operational Efficiency in Mine Action study.
[2] To learn more about the concepts of residual risk and all reasonable effort, please refer to IMAS 07.11 – Land release