GICHD

Difficult Terrain in Mine Action

Problem statement

- Difficult terrain (DT) increasingly affects land release in many countries and territories.

- State parties have been requesting deadline extensions due to slower progress caused by DT(e.g. Croatia, Lebanon, Laos, Tajikistan).

- DT tasks are left to be released the last, contributing to increased costs closer to the end of the MA programme lifecycle.

Image: The HALO Trust

Methodology

- Visits to 5 MA programmes (Serbia, Tajikistan, BiH, Croatia and Kosovo).
- Interviews with representatives of authorities and operators from 10 MA programmes.
- Open-source information from the Landmine and Cluster Munition Monitor and Mine Action Review, national treaty reports and extension requests.
- Information obtained by the GICHD during studies, research, assessments and field visits conducted previously.

***Exclusion**: Soil composition, depth of contamination, destruction caused by explosive weapons in populated areas, and security concerns.*

"Difficult terrain is land where inflexible physical constraints or human factors render it challenging to access or release suspected or confirmed hazardous areas"

Categories of Difficult Terrain

Physical constraints

High elevation, steep slopes and cliffs

Dense vegetation

Sandy dunes and beaches

Water obstacles

Seasonal variation and weather

Remoteness

Categories of Difficult Terrain

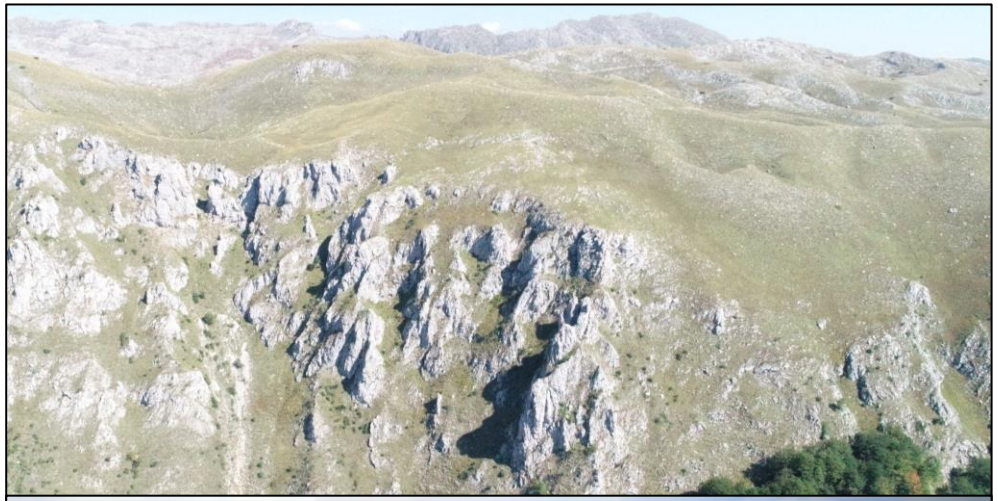
Human factors

Main Observations and Recommendations

- The concept of Difficult Terrain is frequently used inconsistently where the challenge seems to be elsewhere.
- There is a need to balance legislation and efficiency.
- Allocate time and resources for data collection and planning.
- Technological solutions need to be promoted.
- Incorporate local knowledge.
- Lessons learnt globally need to be better captured and used.

Challenge seems to be elsewhere

In country A SHAs are classified as difficult terrain due to time required by standards to get to nearest hospital.



Many other MA programmes have tackled this issue by better onsite medical support, or cooperation with government to get air evacuation support.

Challenge seems to be elsewhere

In country B - National standards mandate sub-surface clearance of all cluster strikes, even in the so called fade-out / buffer areas.

In other countries NMAAs permit operators to amend the criteria and adjust it to the topography. For example, on sheer cliff, a surface search (as opposed to a subsurface search) may be acceptable.

In such cases, the use of remote-sensing and imagery analysis may also be incorporated into the decision-making process.

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ANNEX: GOOD PRACTICE MATRIX

H – high elevation, steep slopes and cliffs, **V** – dense vegetation, **W** – water obstacles, **S** – sand dunes and sandy beaches, **E** – seasonal variations and weather, **R** – remoteness, **L** – legislation, **C** – social and cultural

Type(s) of difficult terrain	Challenge(s) related to the difficult terrain	Potential solutions or key considerations
All instances of physical constraints (H, V, W, S, E, R)	**Accessibility of the terrain to machines and effectiveness of animal detection teams**	Conduct a cost–benefit analysis prior to committing to significant capital expenses.
		Research local supply chains, to ensure efficient support to the deployment assets, including local expertise, spares, fuel, food and water supply chains.
		Adopt the most effective solution in the mine action toolbox. Understand the advantages and limitations of all assets in the toolbox and ensure all requirements will have been met by the proposed solution.
		Check whether environmental conditions might affect the performance of animals or mechanical assets in detecting mines and other explosive ordnance.
		Check the feasibility of deploying mechanical assets. Give preference to machines with tracks rather than wheels on soft or wet ground. Have a plan and the means to recover assets if they get stuck.
	Displacement of mines and other explosive ordnance away from where they were laid/fell	Analyse historical photographs and question local population to ascertain how the topography of the hazardous area may have changed (owing to the wind, floods, human interventions etc.) since contamination.
H, W, S, R	**Evacuation routes for casualties that are long or potentially blocked**	Ensure that there is a possibility for air evacuation, ideally as part of a whole-of-government approach.
		Ensure that medical staff are adequately trained and equipped to meet the unique requirements of the land release / explosive ordnance disposal teams.

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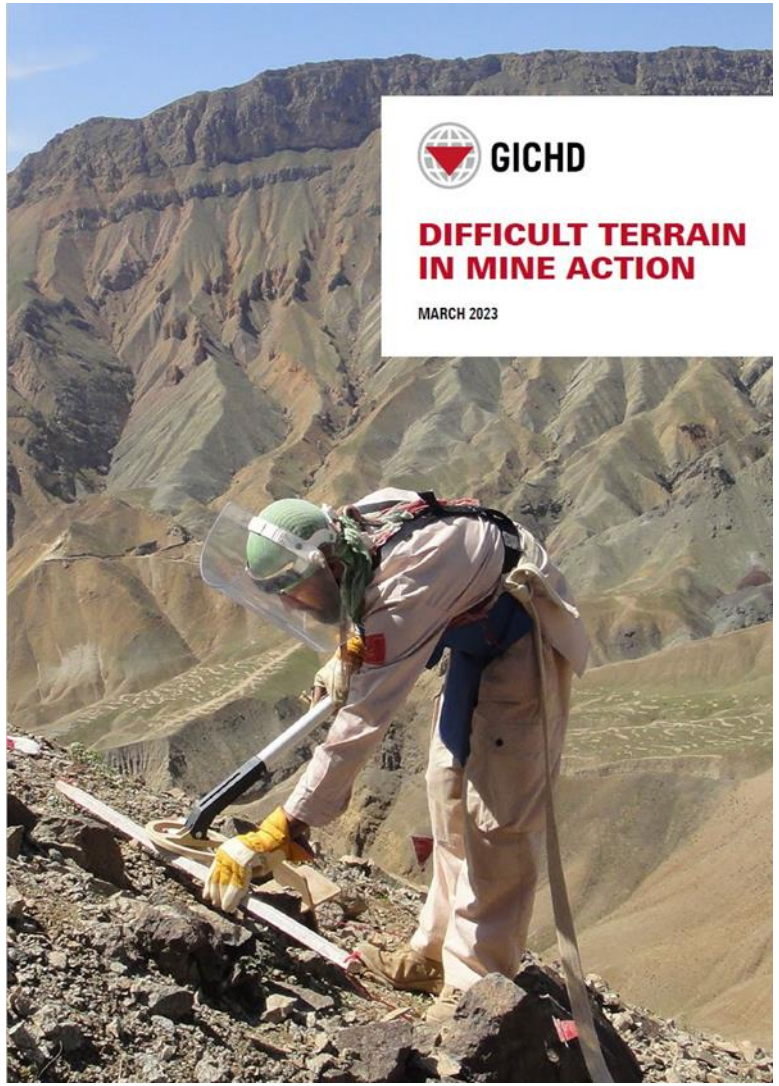

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