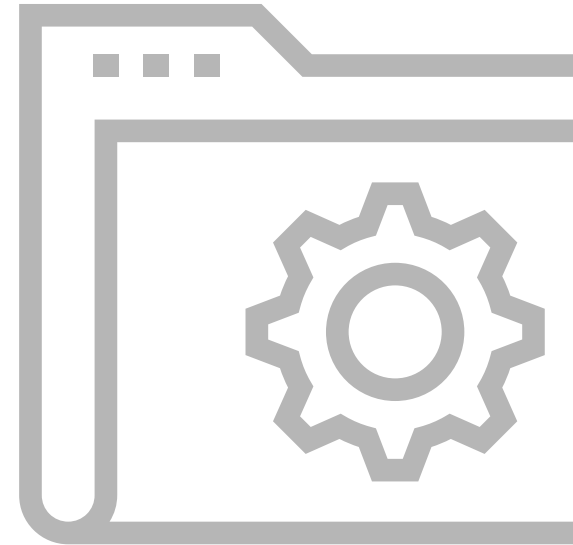


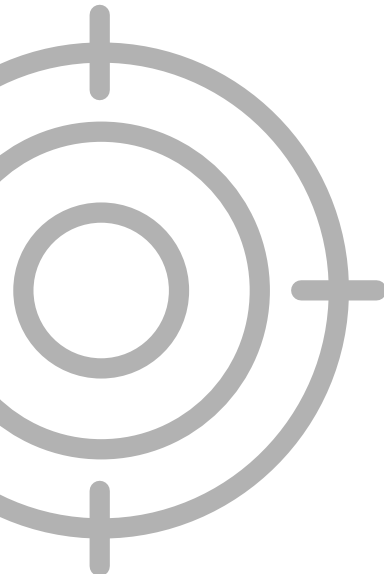
METHODS OF CLEARANCE



- 1 Mine Action and IEDs
- 2 Traditional IED clearance methods
- 3 Noteworthy technical innovations
- 4 Need for innovative methods in IED clearance
- 5 Challenges and considerations in urban environments
- 6 Involvement of women in the efforts of clearance of IEDs
- 7 Future Directions and Conclusion



MINE ACTION AND IED CLEARANCE

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- IEDs are not new to Mine Action. IEDs have been a persistent presence in mine action for decades, being a recurrent component of explosive ordnance (EO) contamination. But their increased use and impact on the civilian population puts them in focus more than ever before.
 - Mine Action includes efforts to clear landmines, unexploded ordnance, and IEDs to create safe environments for affected populations. It's crucial for post-conflict reconstruction, enabling the return of displaced communities and supporting long-term development.

TRADITIONAL IED CLEARANCE METHODS



Manual

- High risk to operator
- Specialised training
- Time consuming



ADS

- High risk to animal
- Specialised training
- Not always practicable



RC and MECHANICAL

- Not always practicable
- Expensive
- Environmental considerations

NEW APPROACHES



Artificial Intelligence and Machine Learning

- Developing concept
- Processing large amounts of data in a short time, and offering a level of predictability
- Specialised training
- Ethical concerns and liability



ADS

- Possible integration with the technology



RC and MECHANICAL ++

- Rapid developments in robotics allowing for better accessibility and manoeuvrability, increased safety to humans, better visuals and remote sensing

NEW APPROACHES

New approaches are visible not only in conducting field operations but also in developing training aids and methods, allowing for better preparation of teams and better response to the ever-evolving threat.



NEED FOR INNOVATIVE METHODS IN IED CLEARANCE



The evolving IED threat landscape necessitates the development of innovative solutions to effectively counter new and sophisticated explosive devices. However, we do need to recognise and account for the limitations and the fact that not all IEDs are of high complexity.

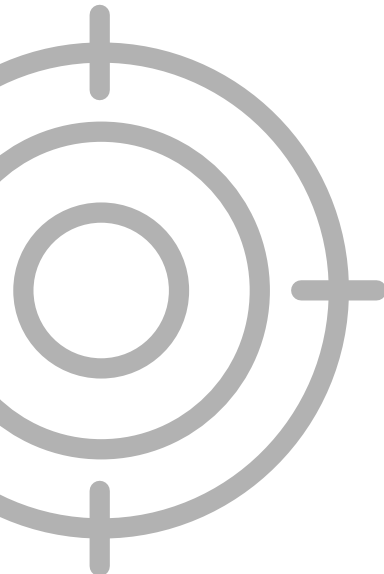
Integration of AI looks promising. However, AI-based decisions are susceptible to inaccuracies, discriminatory outcomes, and embedded or inserted bias; therefore, **humanitarian principles and ethical considerations must always be in place.**

CHALLENGES AND CONSIDERATIONS IN AN URBAN ENVIRONMENT

The challenges of working inside structures in conflict-affected areas that are intact or damaged require a different operational framework and distinct methodologies from those for clearance of open areas. In both cases, all EO should be removed and destroyed. However, the restricted three-dimensional context of buildings adds a level of difficulty to any mine action operational response. (IMAS 09.13)



INVOLVEMENT OF WOMEN IN THE EFFORTS OF CLEARANCE OF IEDS



The involvement of women in IEDD is part of the bigger question related to women's empowerment, equal opportunities, imparity and social and cultural norms.

Field-based technical positions are still more occupied by men than women, although the sector has positive changes overall.

Conducting gender and diversity analysis and having a gender and diversity-sensitive approach, are crucial for every step of Mine Action activities.

The future appears promising thanks to technological advancements and innovation. Nevertheless, we have not yet reached that future, prompting us to contemplate how to reach it and determine the roadmap. Highlighting the importance of increased support and investment in **innovation** and data sharing is essential. However, it is equally crucial to maintain a balance by supporting existing efforts and operations in the interim.

GICHD plays an important role in research, information sharing, and capacity-building to mitigate the risks associated with IEDs.



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