



Odyssey 2025: drones to accelerate humanitarian demining

"We can now confirm we are able to locate mines buried in the desert using drones equipped with infrared cameras. It is quite remarkable! It now takes us minutes - rather than sometimes weeks using conventional methods - to collect visual information of a hazardous area and search for signs of explosive devices. A sound grasp of these new methods will accelerate demining operations and ultimately land release for local populations."

Emmanuel Sauvage, Director of Armed Violence Reduction at HI

ODYSSEY 2025: DRONES AT THE SERVICE OF DEMINING PROJECTS

Between September 2018 and March 2020, HI and its partner Mobility Robotics studied and tested the application of drones to its demining operations within the framework of the Odyssey 2025 project¹. The tests were carried out as part of a vast demining programme in northern Chad².

¹ Project funded by the Belgian Directorate-General for Development Cooperation and Humanitarian Aid (DGD).

² HI implements demining operations, supervised by the National High Commission for Demining (HCND) as part of the "Support for the demining, development, and social protection of vulnerable people" project (PRODECO) funded by the European Union and supported by the Chadian government.

A SUSTAINABLE AND REPLICABLE APPROACH

The challenge of that project is intended to help achieve a mine-free world by 2025. HI develops sustainable solutions adaptable to developing countries and countries in conflict. Our teams adjust their activities to local conditions and challenges (weather, regulations, and acceptance of technology) and meet real-field needs. For example, how does drone technology apply to operations in practice?

This agile approach will enable HI to export Odyssey2025 to any country or context.

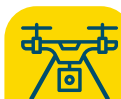


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FRUGAL AND EFFICIENT

DEMINING IS A TWO-STAGE PROCESS:

- 1 / The first phase is to precise identification of areas to clear of contamination (non-technical surveys).** The types of explosive devices likely to be encountered are also identified shortly after this stage.
- 2 / The second is metre-by-metre explosive ordnance clearance with extreme caution.**



DRONES ARE A MAJOR ASSET FOR THE NON-TECHNICAL SURVEYS

Drones provide additional visual information and save on the deployment of deminers for non-technical surveys. They also significantly reduce the number of clearance days.

ENHANCED SECURITY FOR DEMINERS

Using drones equipped with different categories of sensors, deminers obtain aerial images and maps of suspected hazardous areas without even setting foot in them.

Eye in the sky

Deminers use these images to:

- Understand the topography of a site, vital for planning clearance operations, especially those involving demining machines;
- Detect potentially hazardous objects (e.g. a bomb);
- Spot indicators of potential contamination: a burnt-out military vehicle suggests there was an explosion which may have scattered explosive remnants around a site; the wreck of a tank or car, ammunition, or a crater may indicate an explosive impact, etc.

Deminers use information from drones to better plan clearance operations and prepare for their deployment in the field.

Disruptive technology

More sophisticated cameras can be attached to drones and tested in hazardous areas. We used an infrared sensor to locate hundreds of mines buried in an actual minefield. This discovery is a world-first and could lead to radical changes in humanitarian demining methods.

AN INNOVATIVE TECHNOLOGICAL SOLUTION ADAPTED TO HUMANITARIAN CONTEXTS

Low-cost and accessible to local teams in mine-affected countries, drones are a solution adapted to humanitarian contexts.

Frugal technology

Drones do not have to be expensive or complex. Commercial off-the-shelf devices can already produce highly accurate images and thermal analyses of extensive areas. This is sufficient to help locate suspicious explosive devices, establish more precise security zones, and better plan demining operations.

Skills transferred to local actors

The drones used are widely available and easy to operate, even by inexperienced pilots. In Chad, HI transferred drone skills to staff from the National High Commission for Demining (HCND). HI's deminers - all seconded from HCND for its operations in northern Chad - were trained to operate the drones. HI also trained two employees from HCND headquarters.

Project gradually adapted to the situation in the field

At the test stage, HI regularly adapted and readjusted the project to the local context - particularly the climate (regular sandstorms, extremely high temperatures, etc.).

For example, pilots initially controlled the drones by using a digital tablet for real-time viewing of in-flight images taken by a drone-mounted camera. However, temperatures can exceed 50 degrees in Chad, making it impossible to use tablets. They were replaced by more robust remote-control devices.

The drones used are classic models.



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Drone piloting session in the Chadian desert.



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HI KEY FIGURES:

COUNTRIES WHERE WE WORK*

58 COUNTRIES

*April 2020



DIRECT BENEFICIARIES IN 2019

2 871 722 PEOPLE,

(people receiving goods or services from a project implemented by HI or its operational partners in 2019)



STAFF MEMBERS** WORLDWIDE IN 2019

4 237

EMPLOYEES,

** Expressed as annual full-time equivalents.

OF WHICH:

3 401 national staff members in the field

347 international staff members in the field



Explosive remnants of war caused more than 8,000 casualties in 2019.

A threat to 60 million civilians in more than 60 countries and territories.

HUMANITARIAN IMPACT

Emmanuel Sauvage

Director of Armed Violence Reduction at HI

"By making demining operations easier, we hope the use of drones will help humanitarian demining organisations fulfil their promise of a mine-free world by 2025, as stated by members of the Mine Ban Treaty,"



"TESTIMONIAL"

Kheira Djouhri

Head of the Chad innovation project at HI.

"HI faced two challenges in northern Chad. A large number of dromedaries had been killed by explosive devices, which suggested the region was heavily contaminated, and we needed to investigate a very wide area. To understand why so many dromedaries had died at the same time, we used a drone to gather information on the circumstances surrounding the accidents. The superzoom of the drone-mounted camera revealed the presence of **bounding mine**³. A single dromedary can activate a bounding mines which projects fragments over a range of up to 100 metres. This explained the death of an entire herd of dromedaries. It is vital the head of operations knows about this type of mine so we can adjust our security measures."

³Bounding mine: when tripped, a small propelling charge launches the body of the mine into the air and spreads the white-hot fragments horizontally in all directions at waist height.



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