



CASE STUDY

Humanitarian Aid

This customer story focuses on The HALO Trust, a non-profit organization that has been working since 1988 to clear landmines and other explosive remnants of war in countries recovering from conflict.

Immediate post-war demining allows refugees to return home and humanitarian aid to be delivered safely, but for many years after conflict the debris of war remains a deadly legacy, causing civilian casualties and preventing access to land for farming, housing, and development.



Problem

A DANGEROUS LEGACY

In Cambodia, almost 20 years after the last mines were laid, 1,000 square kilometers of land in the northwest are still contaminated by small plastic anti-personnel mines which can sever limbs and larger anti-vehicle mines, which can destroy a farmer's tractor and kill passengers—there have been thousands of civilian casualties in the past decade.



Searching for a Solution

MAKING A DIFFERENCE

HALO employs over 1,000 Cambodian staff as professional deminers, to survey and clear minefields, in most cases using metal detectors assisted by ground-penetrating radar. GIS is critical to managing the process, from first identifying an area as hazardous and mapping it, through to demarcating the cleared area and handing it back to the local community.

There is a lot of ancillary work to demining, including risk education sessions in schools and villages, monitoring visits after clearance to see how land is being used, site inspections for planning and identifying priorities for clearance, and following up reports from members of the public when they find explosive items. All of this needs to be recorded and reported – internally to improve efficiency and effectiveness, and externally to local authorities, donors, and the government departments which oversee the demining process.



The widespread use of smart phones and the ability to create dual-language Khmer-English apps in Fulcrum has made training and implementation straightforward (New survey staff being trained in HALO's Siem Reap headquarters).

Results & Benefits

THE IMPACT OF FULCRUM

Until last year, HALO's activities in Cambodia generated over 3,000 pages of paper reports every month, all of which had to be entered manually into an internal operations database and the national database. This was a process bedevilled by the problems inherent in using paper forms, such as trying to match hand-written village names against a gazetteer of thousands. Over the past year, 70 per cent of this workload has been transferred to Fulcrum. Teams now deploy with Android tablets and dual-language Fulcrum apps in Khmer and English. Data is then brought into HALO's own database and also converted into an XML format used by the national database.

The huge reduction in manual data entry means more of the GIS department's time can now be spent on verifying the quality of data and providing analysis. The simplicity of setting up Fulcrum apps and exporting and analysing the results also means HALO has been able to conduct one-off studies, such as a recent survey to assess the effectiveness of risk education campaigns, which would previously have been too resource-intensive.

Mobile data collection is now being used by HALO's operations in Cambodia, Sri Lanka, Laos, Zimbabwe, and the West Bank. The uses include conducting detailed household surveys to assess the impact of landmines in a particular area, collecting data on the locations of cluster munitions to help identify strike footprints, recording ordnance found and destroyed, logging daily risk education sessions, and recording internal quality assurance forms.

A side benefit to introducing tablets to the field has been the opportunity to provide offline maps to staff. This was previously done using \$1,000+ Windows Mobile devices or printing large maps on plotters. Now the teams are able to view tile packages showing minefields and cleared areas in Fulcrum when offline, as well as map services from ArcGIS Server when online, all on a device costing less than \$200.



Left: Using Fulcrum with MBTiles allows field staff to access all the information they need even when out of coverage— blue polygons show cleared areas, red polygons show remaining minefields. This post-clearance assessment app is used to monitor how land is being put back into use 12 months after clearance and helps HALO, the government, and donors to target demining resources most effectively.

Center: Part of a call-out report, showing two anti-vehicle mines found and reported by a farmer and destroyed by a HALO Trust survey team. This Fulcrum report is exported and converted to XML for import into the national database. HALO teams complete 150 – 300 call-outs a month – where mines are found, the area is also mapped and recorded as a minefield.

Right: Collecting monitoring data from people affected by landmines is essential to ensuring that limited clearance resources are allocated where they are most needed, such as poor communities with limited access to safe agricultural land.