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MID-TERM EVALUATION REPORT on the Progress of The Mines Advisory Group (MAG)'s Project

Innovative Approaches to Mine Action in Ukraine: Use of Technical Survey Dogs to Expedite Land Release

In Partnership with Anti-Persoonsmijnen
Ontmijnende Product Ontwikkeling (APOPO)

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Performance & Learning Unit and other colleagues from APOPO and MAG

‘ I love this job with all my soul — I wouldn’t trade it for anything. If we finish in Ukraine and get invited to another country, I’ll go, because how could I not? They helped us, and we will help them . . . ’

– from an interview with the APOPO handlers’ team



Figure 1: Handler with her dog – 15-minute break in the task site

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NOTE

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Acronyms

ADS	Animal Detection System
APOPO	Anti-Persoonsmijnen Ontmijnende Product Ontwikkeling Dutch for Anti-Personnel Landmines Detection Product Development)
BAC	Battle Area Clearance
CASEVAC	Casualty Evacuation
CD	Country Director
CL	Community Liaison
DEORE	Digital Explosive Ordnance Risk Education
DTC	Dog Training Center
EN ISO	European Standard [adopted from] International Organisation for Standardisation
EO	Explosive Ordnance
EOD	Explosive Ordnance Disposal
EORE	Explosive Ordnance Risk Education
EU	European Union
FGD	Focus Group Discussion
GICHD	Geneva International Centre for Humanitarian Demining
GIS	Geographic Information System
GPS	Global Positioning System
HMA	Humanitarian Mine Action
HQ	Head Quarters
IMAS	International Mine Action Standards
IMS	Information Management System
IMSMA	Information Management System for Mine Action
IQC	Internal Quality Control

KII	Key Informant Interview
MAG	Mines Advisory Group
MAT	Mine Action Team [MAG clearance team with 8-10 deminers]
MDD	Mine Detection Dog
MEAL	Monitoring, Evaluation, Accountability, and Learning
MTE	Mid-term Evaluation
MTT	Multi Task Team [MAG clearance team with 5 deminers]
NMAA	National Mine Action Authority
NMAC	National Mine Action Centre
NPA	Norwegian People's Aid
NTS	Non-Technical Survey
OECD-DAC	Organisation for Economic Co-operation and Development – Development Assistance Committee
PPE	Personal Protective Equipment
QC	Quality Control
SESU	State Emergency Service of Ukraine
SNAU	Sumy National Agrarian University
SOP	Standard Operating Procedure
TFM	Technical Field Manager
TL	Team Leader
ToC	Theory of Change
TOM	Technical Operations Manager
TS	Technical Survey
TSD	Technical Survey Dog
UNDP	United Nations Development Programme

Key technical terms¹

Access lane	A marked passage leading through a hazardous area that has been cleared to provide safe movement to a required point or area
Anti-personnel mine	A mine designed to be exploded by the presence, proximity or contact of a person and that will incapacitate, injure or kill one or more persons.
Anti-vehicle mine	A mine designed to be exploded by the presence, proximity or contact of a vehicle.
Battle area clearance	The systematic and controlled clearance of hazardous areas where the hazards are known not to include mines.
Booby trap	An explosive or non-explosive device, or other material, deliberately placed to cause casualties when an apparently harmless object is disturbed, or a normally safe act is performed.
Clearance	Tasks or actions to ensure the removal and/or the destruction of all explosive ordnance from a specified area to agreed parameters.
Clearance in MDD mode	Clearance in MDD (Mine Detection Dog) mode refers to the use of dogs in accordance with strict clearance methodology as defined by IMAS and the project SOPs. In this mode, the dog: - Operates on a long leash (maximum 11m but not up to 30m, see TSD mode); - Works within lane spacing of no more than 1m; - Must be paired with a second dog that re-searches the same area (double search); - Covers the area with 100% overlap. This mode qualifies as clearance because it mirrors the structure and intent of manual clearance operations, whereby the entire ground is searched, and any indication of contamination is investigated or excavated. Technical survey dogs are capable of operating in both survey and MDD modes, their deployment in MDD mode results in slower progress and is not counted toward TSD-specific outputs but rather as clearance outputs.
Cluster munition	A conventional munition that is designed to disperse or release explosive submunitions and includes those explosive submunitions.
Community liaison	Liaison with people in explosive ordnance-affected communities to exchange information on the presence and impact of explosive ordnance to create a reporting link with the mine action programme and develop risk reduction strategies. Community liaison aims to ensure the different community needs and priorities are central to the planning, implementation and monitoring of mine action operations.
Confirmed hazardous area	An area where the presence of explosive ordnance contamination has been confirmed on the basis of direct evidence.
Demining	Activities which lead to the removal of explosive ordnance hazards, including technical survey, mapping, clearance, marking, post-clearance documentation, community mine action liaison and the handover of cleared land.

Explosive ordnance	Encompassing term for the following munitions: mines, cluster munitions, unexploded ordnance, abandoned ordnance, booby traps, improvised explosive devices, other devices (as defined by CCW APII).
Explosive ordnance disposal	The detection, identification, evaluation, render safe, recovery and disposal of EO.
Explosive ordnance marking	A measure or combination of measures, including EO signs, EO boundary markers and physical barriers, to indicate the location of a spot hazard or the boundary of a suspected or confirmed hazardous area to provide a clear warning of EO danger to civilians.
Explosive ordnance risk education	Activities which seek to reduce the risk of injury from EO by raising awareness of women, girls, boys and men in accordance with their different vulnerabilities, roles and needs, and promoting behavioural change. Core activities include public information dissemination, education and training.
Ground preparation	Preparing of ground in a confirmed or defined hazardous area by mechanical means by reducing or removing obstacles to clearance e.g. tripwires, vegetation, metal contamination and hard soil to make subsequent clearance operations more efficient. Ground preparation may or may not involve the detonation, destruction or removal of landmines.
Humanitarian mine action	Activities which aim to reduce the social, economic and environmental impact of explosive ordnance. The objective is to reduce the risk from explosive ordnance to a level where people can live safely; in which economic, social and health development can occur free from the constraints imposed by explosive ordnance contamination, and in which the victims' different needs can be addressed. Mine action comprises five complementary groups of activities: EORE, humanitarian demining, victim assistance, stockpile destruction and advocacy against the use of APM.
Improvised explosive device	A device placed or fabricated in an improvised manner incorporating explosive material, destructive, lethal, noxious, incendiary, pyrotechnic materials or chemicals designed to destroy, disfigure, distract or harass.
Information Management System for Mine Action (IMSMA)	The UN's preferred information system for the management of critical data in UN-supported field programmes. IMSMA provides users with support for data collection, data storage, reporting, information analysis and project management activities. Its primary use is by the staff of MACs at national and regional level. However, the system is also deployed in support of the implementers of mine action projects and demining organisations at all levels.
International Mine Action Standards (IMAS)	Documents developed by the UN on behalf of the international community, which aim to improve safety, quality and efficiency in mine action by providing guidance, establishing principles and, in some cases, by defining international requirements and specifications.

Land release	The process of applying “all reasonable effort” to identify, define, and remove all presence and suspicion of explosive ordnance through non-technical survey, technical survey and/or clearance. Products of each process lead to different outputs, NTS leads to cancellation of areas previously classified as hazardous, TS leads to area reduction, where no EO threat was confirmed, and clearance leads to cleared land, all three combined are the area released.
National mine action centre	Organisation that, on behalf of the national mine action authority, typically is responsible for planning, coordination, overseeing and in some cases implementation of mine action projects. The NMAC/MAC/MACC acts as the operational arm of the NMAA.
National mine action authority	Government entity, often an inter-ministerial committee, in an EO-affected country charged with the responsibility for broad strategic, policy and regulatory decisions related to mine action.
Non-Technical Survey	Collection and analysis of data, without the use of technical interventions, about the presence, type, distribution and surrounding environment of explosive ordnance contamination, in order to define better where explosive ordnance contamination is present, and where it is not, and to support land release prioritisation and decision-making processes through the provision of evidence.
Safety lane	The generic term for any lane, other than a boundary lane, cleared by a survey or clearance team to the international standard for cleared land. This may include access lanes outside the hazardous area or cross/verification lanes inside a hazardous area.
Standard operating procedures	Instructions which define the preferred or currently established method of conducting an operational task or activity. Their purpose is to promote recognisable and measurable degrees of discipline, uniformity, consistency and commonality within an organisation, with the aim of improving operational effectiveness and safety. SOPs should reflect local requirements and circumstances.
Suspected hazardous area	An area where there is reasonable suspicion of explosive ordnance contamination on the basis of indirect evidence of the presence of explosive ordnance.
Technical Survey	Collection and analysis of data, using appropriate technical interventions, about the presence, type, distribution and surrounding environment of explosive ordnance contamination, in order to define better where explosive ordnance contamination is present, and where it is not, and to support land release prioritisation and decision-making processes through the provision of evidence.





Figure 2: Dog sits to indicate possible explosive

Executive Summary

This mid-term evaluation assesses progress to date in the project “Innovative Approaches to Mine Action in Ukraine: Use of Technical Survey Dogs (TSD) to Expedite Land Release”, implemented by the Mines Advisory Group (MAG) in partnership with APOPO, and funded by the European Union’s Service for Foreign Policy Instruments (EU-FPI) with a budget of €2,000,000.

The evaluation covers the first year of the 18-month project, during which most efforts focused on preparatory and adaptive work, with operational deployment of the TSD teams beginning in March 2025. The evaluation was carried out internally by MAG’s Monitoring, Evaluation, Accountability & Learning (MEAL) team, using mixed-methods data collection (quantitative

outputs, interviews, focus groups, and field observation), guided by the OECD-DAC criteria and MAG’s Theory of Change, and applying quantitative and qualitative data analyses.

Key Findings

➤ **Outputs:** established operational, regulatory, and institutional conditions to employ TSD-teams, integrated with clearance teams. Within four operating months, over 830,000m² were surveyed by TSD-teams in Mykolaiv Oblast.

➤ **Relevance:** The innovation pilot project aligns strongly with Ukraine’s National Mine Action Strategy (2024–2033) and meets an urgent national need to accelerate land release for agricultural recovery.

The pilot phase has been instrumental in understanding specific contextual and operational challenges and constraints and adapt the approach before expanding operations.

➤ **Coherence:** The TSD methodology is well-integrated into MAG's broader technical survey and clearance strategy. The approach is interdependent by design: dogs identify areas of potential threat, which are then confirmed and cleared by manual teams. The project represents a strategically sound and operationally valuable preparatory phase for further expansion in the country. It improves operational efficiency but requires further integration, strong coordination and collaboration, and the reinforcement of trust among all project stakeholders to achieve sustainable land release outcomes.

➤ **Effectiveness:** Early field deployment has been limited due to significant regulatory, logistical, and security constraints, yet systems, Standard Operating Procedures (SOPs), and partnerships are now in place. The project has in a very brief operational phase demonstrated that the TSD methodology has potential as an effective TS approach to enhance the efficiency of humanitarian demining in the Ukrainian context. External factors affecting effectiveness require adaptability and flexibility from the teams. If the factors are internal, they must be systematically addressed, including revising coordination processes, improving management quality, and optimising project design. As of the preparation of this report, modes for TSD deployment are being tested in Ukraine to identify various options how dogs can accelerate survey in different contamination settings, combining mechanical, and manual survey and clearance tools.

➤ **Efficiency:** While delays were experienced — particularly in accreditation and tasking — the teams adapted rapidly, relocating operations, re-sequencing activities, and maintaining progress despite external constraints. The project's flexibility

in a volatile operating environment is a key asset. While efficiency of the project was looked into, perspective of contributions to the sector is equally important. For a cost-effectiveness study the operations have been too short. To collect the relevant data during the remainder of the project is key to inform future investment decisions.

➤ **Sustainability:** The project is actively contributing to national capacity development, particularly through support to the accreditation and regulation of Animal Detection Systems by Ukrainian authorities. Through the training of Ukrainian specialists, the creation of training infrastructure, inclusion in national procedures, and recognition at the governmental level, a solid base has been laid for the institutionalisation and future scale-up of the TSD methodology. The long-term sustainability of TSD use will depend on continued institutional engagement and investment beyond the pilot.

Conclusions

Despite operating in one of the world's most challenging mine action contexts, the MAG–APOPO TSD project has successfully established the operational, regulatory, and institutional conditions for meaningful impact.

This innovation project remains highly relevant and strategically sound. While full implementation only began recently, the foundation laid during this initial phase — including the development of SOPs, staff training, and national coordination — positions the project well for achieving its intended outcomes in the months ahead.

Next Steps

Key priorities for the remainder of the project include:

- Enhancing collaboration between TSD and clearance teams
- Continuing to support national institutions on ADS regulation and integration
- Gathering robust cost-effectiveness and productivity data to inform future scale-up

1. Introduction



Background and context

Country overview

Ukraine is currently one of the most heavily mine-contaminated countries in the world, following the outbreak of armed conflict in 2014 and the significant escalation after Russia's full-scale invasion in 2022. Russian forces have used at least 13 types of antipersonnel mines, resulting in extensive explosive ordnance (EO) contamination and widespread civilian casualties.²

By April 2022, approximately 80,000 km² of land was contaminated.³ This increased to 156,000 km² by February 2023,⁴ and by March 2023, the United Nations Development Programme (UNDP) estimated that over 180,000 km²—an area 4.5 times the size of Switzerland—was affected.⁵ According to official data from Ukrainian authorities,⁶ by spring 2025, 35,496 km² had been returned to safe use, thanks to the combined efforts of international partners, humanitarian demining operators, and military units. However, 138,503 km² of land is still considered potentially contaminated. The most heavily impacted regions are Donetsk, Luhansk, Kharkiv, Kherson, Mykolaiv, and Zaporizhzhia.

As of late spring 2025, 6.1 million people remain at risk due to landmines and other EO. A total of 774 individuals have been injured by EO accidents, including 88 children. Since the start of the full-scale invasion, 321 people

have been killed by EO explosions, including 16 children.⁷ These figures reflect accidents since the start of the full-scale invasion in February 2022. The overall number of casualties is higher when including earlier accidents dating back to 2014 and residual contamination from World War II, which still affects some areas of Ukraine.⁸

The conflict has caused over \$143.8 billion in direct damage to residential, non-residential, and infrastructure assets. The agricultural sector alone has suffered \$8.7 billion in direct damages.⁹ Contaminated farmland remains inaccessible, severely disrupting Ukraine's agricultural output and export capacity. As one of the world's largest grain suppliers, Ukraine's challenges have contributed to a global food crisis, particularly affecting African and Middle Eastern countries.

According to the World Bank's Fourth Rapid Damage and Needs Assessment,¹⁰ Ukraine requires an estimated \$7.609 billion for technical survey operations of mined territories between 2025 and 2035. Of this amount, \$53.8 million is allocated specifically for Mykolaiv Oblast.¹¹ This figure pertains solely to technical survey activities. The comprehensive land release process for Mykolaiv Oblast—which includes non-technical survey, technical survey, and clearance—is projected to cost \$164.2 million.



Figure 3: War-related destruction in the Stepova Dolyna village, Mykolaiv Oblast — current operational areas of the project.



Figure 4: Ibid. As of today, only 15 residents remain in the village. Most houses are damaged, with varying degrees of severity

Humanitarian Mine Action in Ukraine

In response, the Government of Ukraine has committed to clearing and returning 80% of contaminated agricultural land within the next 10 years.¹² In August 2023, international funding for demining exceeded \$1.03 billion, with Ukraine receiving the largest share—\$308.1 million.¹³

In its 2024 report on Ukraine's recovery and reconstruction needs,¹⁴ the World Bank, in collaboration with the United Nations and the European Commission, estimated the total cost of demining over the next decade at approximately \$34.6 billion.

In June 2024, the government approved the National Mine Action Strategy (2024–2033) and the Operational Plan for 2024–2026.¹⁵ These documents form a coordinated roadmap for mine action efforts across all actors. In the same month, the National Mine Action Platform¹⁶—a centralised online system initiated by the Ministry of Economy—was launched to provide real-time demining data and improve stakeholder coordination.

The need for rapid, safe, and cost-effective land release is urgent. In humanitarian mine action (HMA), this is achieved through land release, a combination of Non-Technical Survey (NTS), Technical Survey (TS), and clearance. TS—used to precisely identify contamination zones and reduce clearance burden—can be conducted by manual teams, mechanical assets, or Technical Survey Dogs (TSD). This project introduces TSDs as a new tool in Ukraine's land release methodology, building on successful models from other contexts.

MAG and APOPO in Ukraine

In Ukraine, MAG and APOPO have worked in close partnership since 2023. Following APOPO's initial scoping mission and given the existing global partnership that the two organisations have developed over several years in other programs, such as Cambodia and Azerbaijan, the two organisations worked closely to integrate the TSD methodology in Ukraine. This process leveraged the decades-long

expertise of MAG's experience in mine action, bringing significant expertise in liaison with government authorities, donor relations, project design and development and – critically – technical expertise in mine action.

This contribution ensured that there was buy-in and support from the National Mine Action Centre (NMAC) at the outset of the project, that initial funding was secured for the deployment of the first teams and that APOPO benefited from MAG's programme and HQ-based experts. On the APOPO side, their unique contribution to mine action globally, centred on the deployment of animals to detect landmines and EO, made them the ideal partner in the introduction of TSDs in Ukraine.

The decision to establish an operational base in Mykolaiv region was because this area was among the highest priorities in terms of urgent humanitarian demining needs. A large part of the territory within the Kharkiv–Mykolaiv–Kherson triangle had been de-occupied but remains heavily contaminated with landmines and other EO, with many of the fields having seen active combat.

The decision to deploy MAG's operational activities in the Mykolaiv region was based on the fact that this area was among the highest priorities in terms of urgent humanitarian demining needs. A large part of the territory within the Kharkiv–Mykolaiv–Kherson triangle had been de-occupied but remained heavily contaminated with mines and explosive remnants of war — many of the fields had seen active combat.

As of the time of this report, MAG has significant operational capacity in the region, enabling both manual and mechanical demining operations:

- Five Mine Action Teams (MAT), each composed of approximately 10 deminers and a team leader (TL), a deputy TL, a medic, and at least two drivers;
- Six Multi Task Teams (MTTs), each composed of five deminers, one team leader, one medic, and two drivers;
- One Mechanical Team and one

Mechanical Support Team with four mechanical assets (2 MineWolf 240 machines, 1 Robocut, 1 armoured JCB machine);

- Five Community Liaison (CL) Teams, each composed of two CL officers and one CL-TL.

In total, 18 MAG field teams are currently deployed in Mykolaiv, with operational capacity continuing to expand as new projects are launched.

APOPO currently has the largest dog capacity amongst the operators in Ukraine, standing on six teams of eight dogs each. Each team is composed of one team leader, four handlers, kennel assistant, driver and eight dogs. The Central Training Facility was established in early 2024 in Kyiv Oblast, where the operational teams conduct their preparations, maintenance training and monthly testing. It is one of the two existing IMAS compliant dog training & testing facilities in Ukraine, while the second belongs to SESU in Sumy Oblast. APOPO established a support framework for the relatively large dog capacity, in the fields of operational management, maintenance training, animal health & welfare and logistics.

As of the end of April 2025, APOPO has deployed four fully operational Technical Survey Dog teams in Mykolaiv oblast, each led by a dedicated Team Leader. The teams are managed and monitored on site by APOPO Technical Field Manager - Trainer and a dedicated Operations Coordinator.

Regular field visits by APOPO's Program Manager and Trainer ensure close oversight of operations and coordination with partners. APOPO has established purpose-built kennels on the premises of the local police canine unit in Mykolaiv and has formal agreements in place with regional veterinary clinics to ensure proper care and welfare of the dogs.

With the support from the Govt of Flanders in early 2024, APOPO procured and modified vehicles, adding air-conditioned dedicated dog compartments, enhancing the mobility and safety of the TSD teams both for

deployment to operational sites and their maintenance training in the Centre in Kyiv Oblast.

From the outset, MAG and APOPO aimed to integrate the TSD approach into the existing team structures and tasking systems. However, this integration proved more complex than anticipated.

Initial assumptions were based on experience in Cambodia and Azerbaijan, where the conflict had ended years earlier and the scent of explosives in the environment had largely dissipated. In Ukraine, where the conflict is much more recent, nearly every fragment of ordnance still retains a detectable explosive scent. This led to a much higher number of dog indications than expected and, consequently, a greater need for personnel to follow up, and verify these areas. Still, as discussed below, along with other alignments, dedicating one demining team working with one TSD team seems to suffice for most settings.

Operations were carried out both in areas showing signs of recent conflict (BAC — battle area clearance) and in traditional minefields. Areas with high density of anti-personnel mines are not suitable for any ADS due to the fact that the amount of explosive odour might be so great that the animals will struggle to pinpoint on every source, increasing the risk to the animal and reduces the reliability of the search.



Figure 5: APOPO dog with its toy during a break

Mine Action and the use of dogs for land release – technical overview

To objectively present and frame the data collected for this report, it is essential to outline the core methodology behind the use of technical survey dogs. The following section provides a brief description of this method, which is regulated under the framework of the international mine action standards (IMAS)¹⁷ and, within the context of project implementation in Ukraine, by the newly developed national standards (NMAC) and APOPO's standard operating procedures (SOPs) that were certified by NMAC.

Dogs have been used for security purposes and explosive detection for decades, for example at airports, and embassies where a higher level of security checks are required. In HMA, dogs have been in use since the onset in the 1990s, commonly referred to as mine detection dogs (MDDs), for example by the Afghan NGO Mine Detection Dog Centre since 1994, by Norwegian People's Aid (NPA) etc.

APOPO was traditionally working with mine detection rats, but in 2017 decided to train dogs specifically for survey roles, to complement the rats that traditionally do clearance. APOPO established a Dog Training Centre (DTC) in Cambodia co-located with the Cambodia Mine Action Centre where dogs are being trained for global deployment to

mine affected countries. APOPO currently has the largest number of operational dogs in the HMA sector.

Animal Detection Systems (ADS) is an overarching term in use in the sector, when referring to dogs, rats and their handlers (see *Box 1 below*).¹⁸

MDD and TSD require a designated handler as the dog and handler form a bond and are accredited as one (rats don't need a specific handler); deminers/EOD trained staff then investigate the indications found by the animals after they have finished work for the day to maintain good productivity.

ADS Handlers go through deminer training during their animal handling course and it is a mandatory competency. In Ukraine the handlers are individually certified as deminers/sappers but not conducting manual demining operations. This is mainly related to the extent of the operational hours, existing MAG manual teams on site, and the division of responsibilities between the organisations. In more tropical countries where the weather allows the dogs to work 3-4 hours during the cool mornings, each TSD Handler has only one dog, and he/she continues working as a manual deminer after the 3-4-hour morning dog session. In Ukraine, on average the

Box 1: Animal Detection Systems and HMA

A system is made up of interacting processes. An animal detection system (ADS) includes processes ranging from the breeding, selection and training of animals, through accreditation and operational testing, veterinary and welfare support, to operational survey and clearance activities, and the use of performance data to maintain confidence in the validity of the system as a whole and of the outputs it delivers.

An ADS comprises the animals, handlers, supervisors, managers, policies and procedures,

health and logistic support, and training and monitoring, that are combined to offer a reliable means of detecting explosive ordnance. As with any tool used for explosives detection, ADS must meet this standard, providing stakeholders confidence that EO will be detected if present. The term ADS includes systems using Mine Detection Dogs (MDD) and Mine Detection Rats (MDR) as well as other animals, should circumstances arise where their utility in detecting EO justifies their deployment on mine action tasks.

IMAS 09:40, Introduction

climate allows more working hours for the dogs, so each TSD handler has two dogs that can work in rotation, which doesn't leave any time for the Handler to conduct manual demining work.

Dogs are used for clearance and for technical survey (TS) purposes in mine action. They are trained to identify TNT and/or other explosives. The dog will show behavioural changes when picking up the scent and approaching its main source. When the dog identifies the place where the odour comes from, it is trained to sit down next to it. The dogs are trained not to sit on top of the source or to touch the place with their paws.

In operational testing, the maximum allowed distance between the place where the dog sat and the real location of the item is one metre. Therefore, in operational scenario, the default size of the area investigated by manual deminers is 2 x 2 metres.¹⁹

MDDs work with a 10-11m length leash, while TSDs work with a 25-27m leash.

The dogs used for TS are so-called 'high-drive search dogs', a dog that is driven by its genes to carry out specific behaviours or traits, the result of thousands of years of selective breeding for that particular breed and its distant ancestors. APOPO use Malinois, that are selected from experienced breeders in Europe and transported to the DTC in Cambodia to complete their training.

For tracing and tracking dogs during work, APOPO uses the Garmin Astro 430/200i, an off-the-shelf GPS that links with the GPS collars worn by the TSD.²⁰ The Garmin Astro is a system that is intended for hunting dogs and was adapted by APOPO to serve its TS tracing requirements. Using TSD is a relatively new approach compared to the common use of MDD to support survey and clearance in the last 20 years. The first project where TSD were used in operations was held between 2019-2020, while the first long leash MDD were deployed since 2003. Prior to that, MDDs were used on a 1-2 metres short leash.

The use of an ADS is part of the "Toolbox

approach" in clearance, which refers to the combination of mechanical and manual assets with an ADS to increase operational efficiency.

Methodology for the Use of Technical Survey Dogs (TSD)

Technical Survey Dogs are used to accelerate the survey in areas suspected of contamination by landmines or other explosive ordnance. The primary objective of TSD deployment is to confirm the presence or absence of contamination. This makes TSD particularly suitable during the early phases of land release, specifically in technical survey and area reduction. Unlike manual clearance, TSD allow for faster assessment of large areas.

TSD are deployed on long leashes and follow pre-established deployment plans. In systematic TS, dogs typically cover approximately 50–55% of the task area, leaving metre-wide gaps between each search lane. However, in the Ukrainian context — particularly on BAC tasks — the NMAA has required 100% coverage. To meet this requirement, TSD move one metre between search tracks. While this affects the initially proposed outputs — as dogs cover less ground daily compared to standard TS mode (100% vs. 50%) — the approach meets the NMAC requirement. Despite the adjusted coverage rates, the method remains significantly faster than alternative assets.

Before deploying dogs in mine field tasks, safe access lanes are established — either manually, mechanically, or by using dogs in MDD mode, which is the preferred option due to efficiency.²¹ When a dog gives an indication, the handler withdraws the indicating MDD and uses a second MDD to search the area leading up to the indication. After the second search, the handler moves forward, always stepping on land that has been searched by two MDDs and places a marker before reaching the place of indication.²²

For TS, working with one TS dog at a time suffices. Findings are marked by the handler,

and then incorporated into operational maps to support decisions regarding further clearance, area reduction, or the need for additional survey.

It is essential to distinguish between TSD and MDD. While the dogs may be of the same breed or type, their training, operational methodology, and functional purpose are fundamentally different.

MDD are deployed to ‘clear’ land: the same strip or lane is systematically investigated by two different dogs, allowing the land to be officially declared cleared after quality check (QC) procedure in accordance with IMAS and national mine action standards (NMAS).

In contrast, TSD are used to survey land, supporting land release through reduction rather than clearance. This means that their role is investigative and confirmatory, aiming to identify indicators of contamination over broader areas. TSD are trained to operate both on 11-metre and 27-metre long

leashes, with greater independence and adaptability, allowing them to overcome more operational obstacles than standard Mine Detection Dogs.²³ Around 80% of APOPO-trained dogs qualify as TSD. Those that do not may be reassigned exclusively as MDD.

MDD operate solely on 11-metre leashes and always in double-search mode—two separate dogs must search the same area to meet clearance standards. This process is slower and is formally categorised as clearance, not survey. TSD, by contrast, are trained primarily for technical survey, but possess greater operational flexibility. In Ukraine, due to high contamination levels, TSD were at times temporarily assigned to perform tasks aligned with MDD methodology—for example, opening safe access lanes. In such cases, their deployment mirrored aspects of MDD operations.

As a result, some reports include outcomes from both TSD and MDD activities, which

Feature	TSD (Technical Survey Dog)	MDD (Mine Detection Dog)
Primary Role	Technical Survey (TS) & area reduction	Clearance
Leash Length	Up to 27 metres	Up to 11 metres
Deployment Mode	Single dog	Always double search (2 dogs, same area)
Speed of Work	Faster (survey pace)	Slower (clearance pace, still quicker than manual teams)
Terrain Capability	Better adaptability in obstructed/vegetated areas	Requires cleared/safe access lanes (maybe the need for ground preparation if vegetation identified as being too high for MDDs to operate)
Operational Use in Ukraine	Often used flexibly (incl. MDD roles)	Used primarily for confirmation & clearance
Training Outcome	~80% of APOPO dogs qualify as TSD	Others reassigned as MDD-only

Figure 6: TSD/MDD comparison



Figure 7: Belgian Malinois – a reliable partner for deminers

reflect two distinct operational disciplines. However, it is important to note that while TSD can perform MDD-type tasks, their core methodology, deployment logic, and intended purpose remain fundamentally different.

Composition of a TSD Team

A standard APOPO Technical Survey Dog (TSD) team as per Ukraine SOP includes:

- **One Team Leader** (ADS Level 4) — responsible for planning, coordination, operational oversight of ADS unit performance and maintenance training of the dogs in the team.
- **Up to four TSD Handlers** (ADS Level 1&2) — each handler works with two trained dogs in operations and training.
- **Up to eight Technical Survey Dogs (TSDs)** — Two dogs per handler to maximise productivity throughout the available working hours.
- **Kennel Assistant** — responsible for the dog care outside of the team working hours, and the overall maintenance and disinfection of kennels.
- **Geographic Information System (GIS) Officer** — in charge of collecting and processing tracking data using Garmin Astro and ArcGIS systems (in Ukraine, 1 GIS officer for all teams, due to the workload APOPO is currently recruiting an additional GIS assistant)
- **Medical Support, including casualty evacuation (CASEVAC)** — mandatory, either as part of the team or provided through shared operational support (in Ukraine, provided from MAG).
- **Clearance personnel** (in Ukraine provided from MAG) and **EOD Level 2 specialist** (in Ukraine provided via the State Emergency Service of Ukraine, SESU) — required to ensure safety and handle any explosive ordnance found.

Project Overview

Project timeline – from design to implementation

MAG and APOPO began discussions on the potential deployment of TS dogs in Ukraine in mid-2023, driven by the unprecedented scale of EO contamination, the urgent need for innovative land release tools, and the existing collaboration between the two organisations.

MAG and APOPO agreed to pursue a fully integrated operational model for the Ukraine project. This approach would embed TSDs directly within MAG's land release operations, supported by joint planning, shared SOPs, coordinated tasking, and unified deployment strategies. The aim was to introduce a replicable, scalable model for TSD integration within MAG's land release framework and contribute to Ukraine's broader mine action system.

In 2023, APOPO's Head of Mine Action visited Ukraine twice to assess the feasibility of TSD use in the Ukrainian context. This assessment included a review of contamination types, operational conditions, and potential partnerships. Sumy National Agrarian University (SNAU) offered its collaboration to facilitate the necessary training areas in its vicinity. During this period, MAG and APOPO were already integrating TSD into mutual operations in Cambodia and Azerbaijan. Between November 2023 and January 2024, MAG and APOPO worked collaboratively to develop a Concept Note for Ukraine, which was shared with the donor community. Both the EU and UNDP confirmed their interest in the project. From January to April 2024, the partners focused on proposal development, including strategic planning, procurement preparation, recruitment planning, and the drafting of tailored SOPs. APOPO began establishing its training areas in SNAU. In March 2024, APOPO SOPs were formally submitted to the NMAC, and after a thorough review process and following practical certification on 20 September, APOPO received official accreditation on 10 October 2024. This accreditation marked the first time that a new mine action innovation

had been approved since the start of the full-scale invasion; a milestone in legitimising the use of ADS as part of Ukraine's national mine action system.

The European Union approved funding for the project in April 2024 with a budget of €2,000,000. Implementation of the project formally commenced on 1 May 2024. Between May and October 2024, the project underwent an intensive adaptation phase: following the security-driven withdrawal from the initial training site in Sumy Oblast in the north-east of the country, APOPO swiftly relocated its training base to Krasylivka in Kyiv Oblast. By July, an 86-target²⁴ IMAS-compliant training and testing ground was established, and parallel efforts were made to train and accredit²⁵ both handlers and dogs (see above on accreditation). With APOPO's full accreditation, MAG and APOPO initiated coordination with SESU to plan for tasking and operational deployment (see *Figure 7 for project timeline*).

Key project stakeholders

Under the agreed operational model:

- MAG leads on task planning, site selection, operational coordination, tasking approval, field safety, and integration with mechanical and manual clearance assets.
- APOPO provides the trained dogs, handlers, kennel infrastructure (dog shelter), veterinary support, and technical ADS expertise.
- SESU is engaged in the project as the national authority authorised to carry out the disposal of explosive ordnance. Since MAG does not hold an accreditation for EO disposal in Ukraine, SESU is responsible for conducting these activities as part of the joint operations.
- The NMAC,²⁶ under the Ministry of Defence of Ukraine and based in Chernihiv, is the sole authorised state institution responsible for accrediting and coordinating

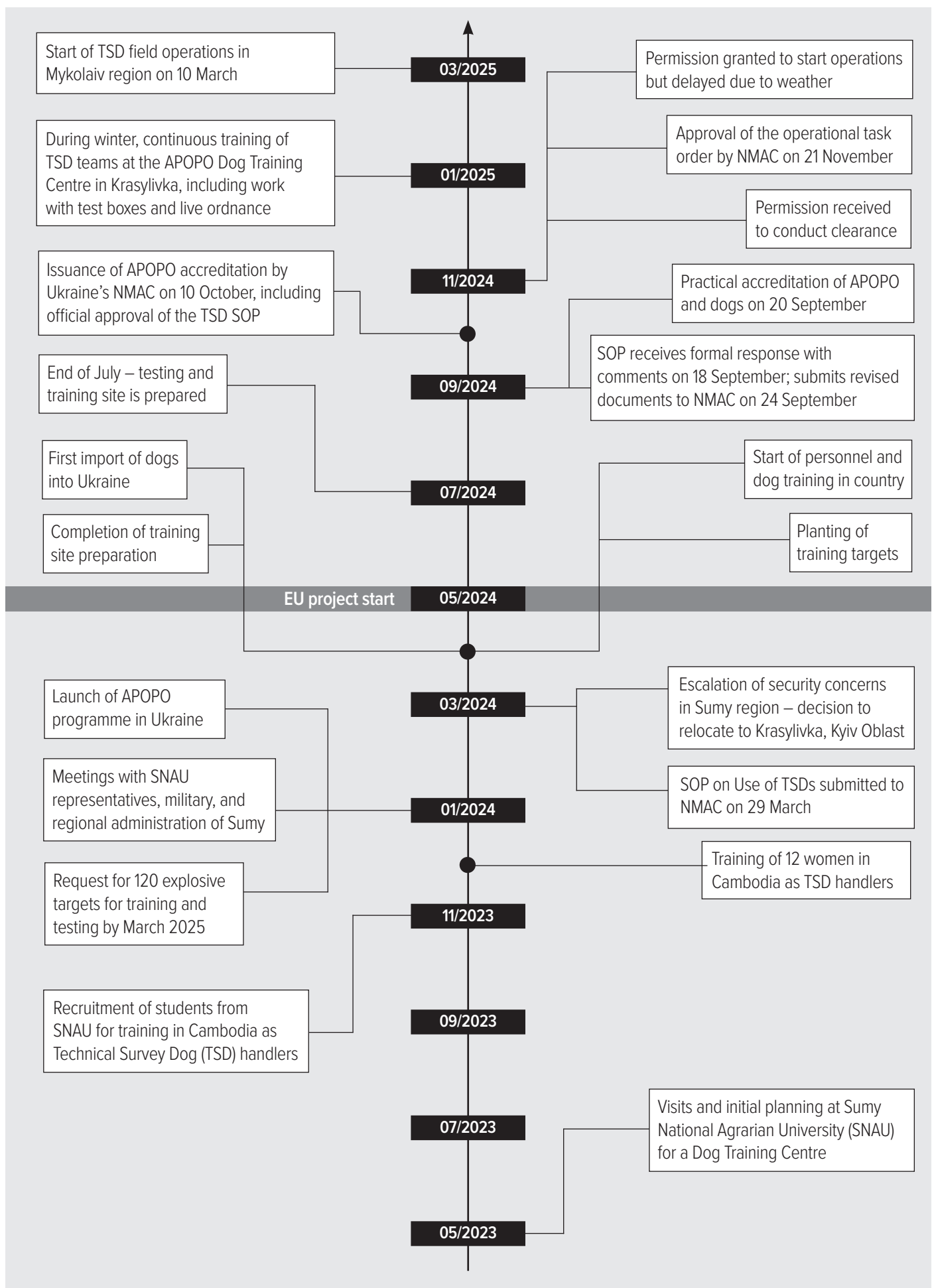


Figure 8: Project timeline

humanitarian mine action operators in Ukraine. Within the framework of this project, NMAC provides activity accreditation to participating organisations, receives regular progress reports on the implementation of operations, and conducts final inspections, quality assurance, and acceptance of released land in accordance with Ukrainian national standards.

Note that in parallel, the Humanitarian Demining Centre was established in 2023 under SESU as a state-funded institution. It plays a key role in improving coordination among mine action actors — including operators, donors, local authorities, and international partners — and performs analytical, planning, and administrative functions such as managing the land release registry, overseeing public procurement of demining equipment, and supporting compensation schemes for farmers.

Project aims and objectives

The project “Innovative Approaches to Mine Action in Ukraine: Use of Technical Survey Dogs (TSD) to Expedite Land Release” is funded by the European Union Service for Foreign Policy Instruments (EU-FPI) and implemented under a formal partnership between MAG and APOPO. The EU has provided support for the TSD project in Ukraine starting from 1 May 2024, for a period of 18 months, ending 31 October 2025. The grant agreement with the EU was signed on 20 June 2024, with a total budget of €2 million, and a subcontract between MAG and APOPO was concluded on 21 June 2024.

The project aims to contribute to Ukraine’s land release efforts by introducing the use of TS dogs to improve the speed, accuracy, and cost-effectiveness of technical survey in large, open contaminated areas. By integrating TSDs with manual and mechanical assets, the project seeks to develop and validate an innovative land release methodology capable of addressing the unprecedented scale of contamination resulting from Russia’s full-scale invasion. This ‘toolbox’ approach is not yet institutionalised in Ukraine but is being discussed as a potential best-practice framework. However, it is contingent on

terrain suitability, access to mechanical tools, and careful planning of asset sequencing. The project aims to generate evidence and lessons for the national mine action sector, supporting the potential future inclusion of TSDs within Ukraine’s long-term land release strategy.

The project is designed to achieve three main outcomes:

1 Sustainable nationally owned mine action through improved governance and increased local implementation

Key activities:

- Deployment of one Monitoring, Evaluation, Accountability and Learning (MEAL) team
- Conducting a one-day workshop to share evaluation findings
- Sharing mid-term and final evaluation reports on TSD use with sector stakeholders
- Supporting NMAC in drafting accreditation protocols and quality management methodology for ADS

2 Safe and productive land enables freedom of movement and access to livelihoods, basic services, and natural resources

Key activities:

- Accreditation of two Technical Survey Dog (TSD) teams
- Deployment of the two TSD teams

3 Risk of harm reduced through safer behaviour and clearance

Key activities:

- Dissemination of risk education messages via partner social media channels (reaching 10 million people)
- Publication of at least four press releases related to the project

The aim is not only to test the dogs’ operational performance in a new context, but also to assess how TSDs can be integrated into national systems over time and contribute to Ukraine’s long-term demining strategy.



Figure 9: Explosives search dog training. DTC (dog training centre) Krasylivka, Kyiv Oblast, November 2024

Mykolaiv Oblast is the current Area of Operation for the project. For this project the initial tasks are in Stepova Dolyna, a village in the south-east of the oblast, located approximately 35km east of Mykolaiv city. The village played a key role during the war due to its proximity to key routes leading toward Kherson and was under Russian occupation until November 2022. Before the war, the village population was around 300 people, while currently only 15 people reside in the village.

Results to date

By 30 April 2025, the EU-funded project had:

- Recruited eight locally contracted APOPO handlers and completed their induction.
- Imported and housed 16 fully trained TSDs.²⁷
- Trained eight additional handlers in Ukraine.
- Developed and received national acceptance for APOPO SOPs on the use of TSDs.
- Built mobile kennel facilities for the TSD and completed base infrastructure at MAG's operations site in Mykolaiv Oblast.
- Completed TSD deployments in Mykolaiv, including acclimatisation, task-specific drills, and coordination exercises

with MAG's manual clearance teams.

- 205,483 m² surveyed in TSD mode [but to 100% as per NMAC], 62,867 m² were reduced. 1,044 m² cleared in MDD mode.

By the end of June,²⁸ operational results in TSD mode had reached a total of 836,886 m². This significant increase is due to the following outputs in May and June:

- In May, the EU donor enabled the deployment of all four TSD teams, which resulted in 465,924 m² of land being surveyed in TSD mode.
- In June, three teams were deployed, reaching 165,479 m² in TSD operations. Additionally, these teams conducted internal quality control (IQC) on Stepova Dolyna 4, 5, 13, 14, and 15, covering an 76,304 m².

During the deployment period March to June, the dogs made a total of 1,312 indications:

- 39 indications on the Stepova Dolyna minefield 10 and 24, and
- 1,273 indications on the BAC task site Stepova Dolyna 4, 5, 13, 14, and 15.

As of 30 June 2025, of the indications assessed, only one was a landmine and 21 were other explosive ordnance. 550 indications from this period are still being investigated.



Figure 10: After training: handler walks the dog off the field. DTC Krasylivka, November 2024

Evaluation purpose, objectives and scope

The purpose of this mid-term evaluation (MTE) report is to assess the effectiveness of introducing technical survey dogs in Ukraine's mine action context, and to identify early lessons that may inform the use, scale-up, and integration of this method. It aims to provide an evidence-based, objective assessment of the project's progress to date using a mixed-methods approach aligned with the OECD-DAC evaluation criteria and MAG's HMA Theory of Change.

The purpose of the evaluation is to generate actionable learning and early findings that:

- Document the extent to which the project aligns with Ukraine's national demining strategy and operational needs;
- Analyse how effectively the TSD methodology has been integrated into MAG's technical survey model in partnership with APOPO;

APOPO TEAM 1, 2 & 3 PROGRESS MAP 30.04.2025

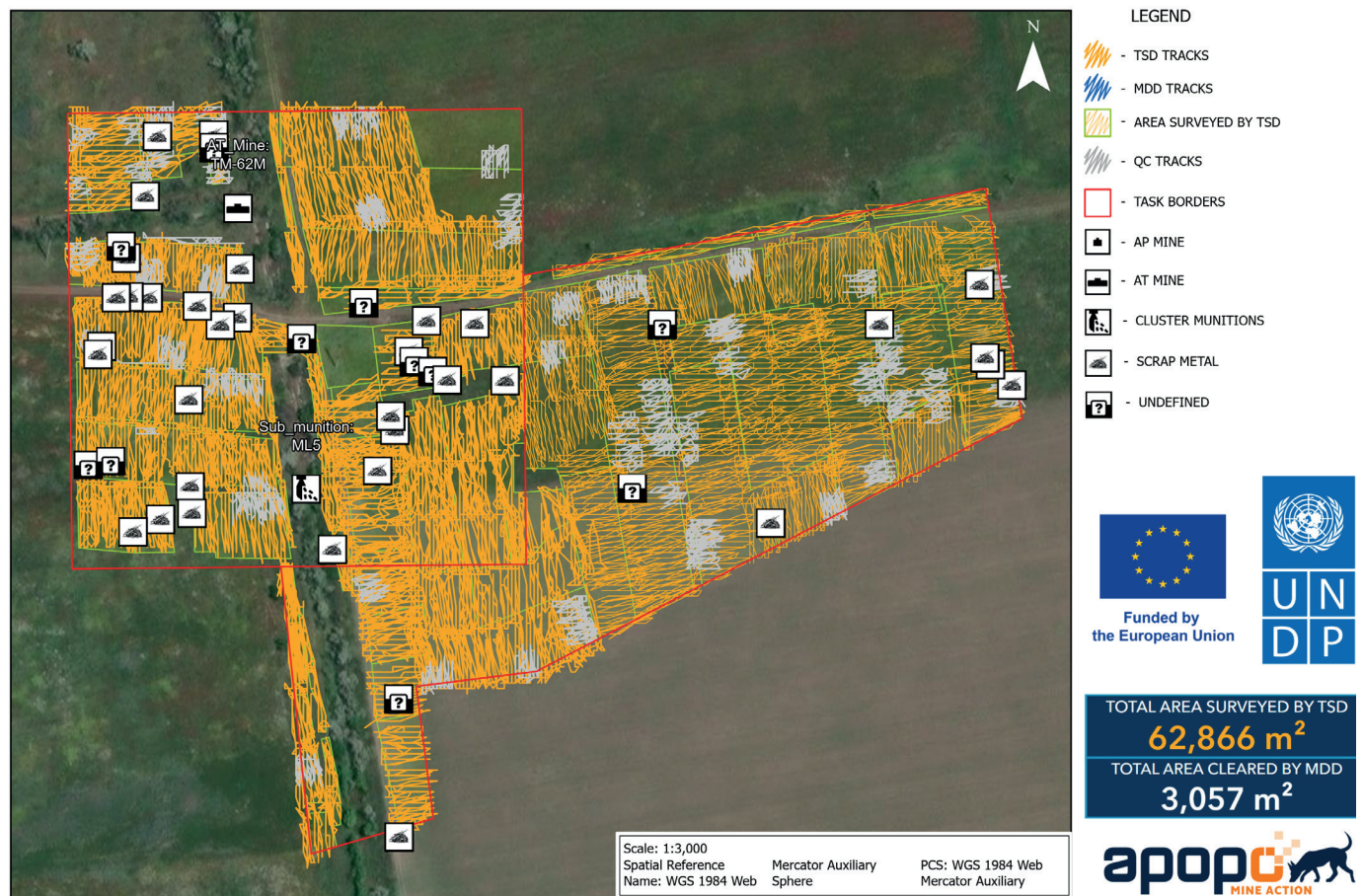


Figure 11: Example of APOPO progress map by end of April 2025. Teams working on this site were funded by the EU and UNDP

- Examine enabling and hindering factors encountered during start-up and implementation;
- Assess contributions to national capacity-building in terms of regulation, standards, and staff training.

In addition, the report provides evidence-based recommendations to inform:

- Agreeing on operational criteria for TSD deployment in relation to other survey methods;
- Strengthening coordination between TSD teams and manual clearance teams;
- Supporting Ukrainian authorities in the institutionalisation of ADS;
- Framing future decisions around scaling, including optimal environments and use cases for TSDs.

This report is not a cost-effectiveness study, nor does it provide a financial efficiency rating. However, it notes the need to collect such data during the remainder of the project to inform future investment decisions.

Given the stage of implementation, this MTE is not assessing the impact of the intervention. The quantitative data available is limited at this stage as the TSDs have only been operational since March. More will be analysed and as part of the next project evaluation.

The evaluation covers the implementation period from 1 May 2024 to 30 April 2025. In addition, the report includes updated operational figures from May and June 2025 to provide further context on TSD deployment progress. However, the evaluation findings, conclusions, and lessons learned are strictly based on the defined evaluation period.

2. Methodology





Figure 12: Armoured JCB vehicle clearing access routes. Mykolaiv Oblast, Ukraine

This mid-term evaluation (MTE) was conducted by MAG MEAL Officer in close collaboration with MAG's and APOPO's Programme and Operations managers in the country and the respective Information Management Units from both organisations. Senior staff from both organisations reviewed and advised on the MTE. The evaluation used a mixed-methods approach,²⁹ triangulating qualitative and quantitative data sources to assess the project's progress to date, identify early learning, and evaluate potential for scale-up. The report was reviewed by Manchester staff of the Programmes Quality Team and APOPO's Head of Programs, Mine Action.

The evaluation is framed against five of the OECD-DAC evaluation criteria³⁰ — relevance, coherence, effectiveness, efficiency, and sustainability — and aligns with MAG's HMA Theory of Change.³¹

For a more detailed technical description of the analysis methodology, data collection and the analysis process itself see *Annex 2 - Analysis Methodology*.

The team applied a combined learning model, integrating: 1) A thematic analysis of technical field dynamics; 2) Stakeholder

perception mapping (trust, integration, role clarity); 3) Systems process tracing (tasking, accreditation, deployment); 4) Institutional and operational documentation review.

The approach was iterative and adaptive. Field insights were continually reviewed and validated through feedback loops with MAG and APOPO operations teams, ensuring findings reflected operational realities.

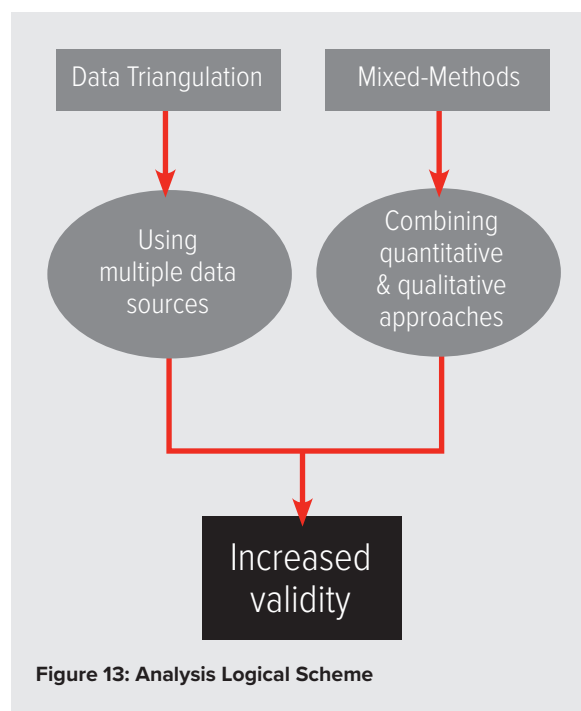


Figure 13: Analysis Logical Scheme

Evaluation questions

OECD-DAC criteria	Evaluation questions
Relevance	EQ1. To what extent does the project align with and respond to national demining priorities and the current context in Ukraine?
	EQ2. To what extent has the project been adapted in response to the conditions in which it is being delivered?
Coherence	EQ3. How does the TSD project integrate with other technical survey methods?
	EQ4. How well is coordination ensured with local and international entities?
Effectiveness	EQ5. To what extent did the programme achieve (or not achieve) intended outcomes and outputs – in line with the proposed approach and MAG’s HMA Theory of Change? What factors have facilitated or hindered the achievement of objectives?
	EQ6. How effective is the use of TSD compared to other demining methods?
Efficiency	EQ7. To what extent were projects delivered in a timely and successful manner given the resources available?
Sustainability	EQ8. To what extent does the project contribute to the development of national capacity in humanitarian demining?

Data collection

Data collection was conducted between January and April 2025 and included the following methods:

- Desk Assessment of available open sources, including official websites of Ukrainian government bodies and other relevant organisations, as well as reports from other humanitarian and non-governmental organisations; and document review of internal documents, including project proposals and initial reports from MAG and APOPO, MAG’s ToC, and MAG and APOPO’s SOPs.

Key informant Interviews and Focus Group Discussions³² were held with 26 persons (13 women, 13 men) from MAG and APOPO:

- Key informant interviews (KIIs): Ten semi-structured interviews with ten persons (two women, eight men) from MAG and APOPO. Respondent data were anonymised and

coded using the format “KII 1-10”;

- Three Focus Group Discussions (FGDs): two with seven APOPO dog handlers (one of 4, the other of 3 participants, five women, two men) across the two TSD teams (FGD_A); one FGD with one MAG demining team, in total nine people (six women, three men) (FGD_M);
- Field Observation site visits were conducted in Mykolaiv Oblast;
- Compilation of data from MAG’s Information Management System (IMS) and field logs (including m² surveyed, number of indications, dog-to-area ratios, handler shifts, weather conditions, and post-deployment follow-up notes).

Additional operational data was added for May and June 2025.

Analytical Techniques

A mixed-method approach was applied, integrating operational data with qualitative inputs from interviews, focus groups



Figure 14: A handler conducts training with a dog in a designated practice area

discussion, group interviews, project documents, and open sources. Analysis was guided by MAG's organisational Theory of Change (ToC),³³ based on the sector-wide Theory of Change for mine action,³⁴ and structured around OECD DAC evaluation criteria.

Semantic³⁵ analysis was used selectively for some indicators (see *Annexes 2 & 4*), with elements of emotional³⁶ and interpretive analysis applied where relevant. Data triangulation ensured the credibility and consistency of findings across multiple sources.

Limitations

This is a mid-term evaluation, and results must be interpreted in that light. TSD teams only began full deployment in March 2025, not as initially planned in September 2024, and outputs accordingly remain modest at this stage, i.e., for this MTE by the end of April 2025.

TSD teams only began full deployment in March 2025, not as initially planned in August 2024, and outputs accordingly remain modest at this stage, i.e., for this MTE by the

end of April 2025. Quantitative analysis was thus limited and focused primarily on process indicators and operational readiness. Other limitations include:

- **Site Scope:** One region (Mykolaiv) was operational employing TSDs during data collection.
- **Seasonal Factors:** Weather limited dog deployment days during the observation window.

Note that for the MTE no interviews were scheduled with the national partners. This is planned for the final evaluation. However, as part of a technical visit in the end of April, attended by MAG's Programme Quality Director and APOPO's Head of Mine Action, there were informal conversations held resulting in some quotes that are included in this MTE.

Nonetheless, the breadth and depth of qualitative and operational data collected provide a strong foundation for assessing progress, capturing lessons, and shaping the summative/end-of-project evaluation focus areas.

3. Evaluation Findings

Findings are presented and analysed along the five OECD-DAC criteria examined: relevance, coherence, effectiveness, efficiency, and sustainability.



Relevance

EQ1. *To what extent does the project align with and respond to national demining priorities and the current context in Ukraine?*

Key findings

1.1 The TSD project aligns with Ukraine's National Mine Action Strategy (2024–2033) and its Operational Action Plan (2024–2026). Its objectives directly support strategic goals.

1.2 There is unanimous understanding of the project's mission across all levels of the MAG and APOPO teams, from management to field staff.

Alignment with Ukraine's national mine action priorities

In response to the scale of contamination caused by EO, the limited awareness of the population, and the chaotic development of the humanitarian demining operator market,

after two years of full-scale war, in June 2024, the Government of Ukraine approved the first National Mine Action Strategy (2024–2033) and the Operational Action Plan for its implementation for 2024–2026.³⁷

This Strategy is a long-term programme document defining the main directions and tasks of the state policy concerning mine action and ways to achieve Ukraine's national interests. The strategy recognises the need for government bodies to collaborate with international partners and humanitarian organisations, mine action operators, business entities (including the agricultural sector) and Ukrainian civil society for its successful implementation. These documents established a set of national priorities, most of which are directly supported by the implementation of this project, as presented in *Figure 15*. Ukraine's National Mine Action Strategy 2024–2033 and its accompanying Operational Plan (2024–2026) emphasise the urgent need to survey and release land for agricultural use, integral to the project

Project outcomes	Ukraine Mine Action Strategy and Plan Related Goals and Tasks from the Ukraine's National Mine Action Strategy 2024–2033 and its accompanying Operational Plan (2024–2026)
1. Sustainable, nationally owned mine action through improved governance and increased local implementation programmes	Development of national capacities and innovation ➤ Stimulating the mine action services market ➤ Developing training standards and educational programmes
2. Safe and productive land enabling freedom of movement, access to services, livelihoods, and natural resources	Safety of the population and territories ➤ Releasing land from EO risk for safe use Recovery of economic potential ➤ Humanitarian demining of agricultural land
3. Reduced risk of harm through safer behaviour and effective clearance activities	Safety of the population and territories ➤ Releasing land from EO risk for safe use Environmental safety and protection ➤ Integrating environmental protection into mine action Food security and export potential ➤ Prioritising agricultural land clearance

Figure 15: Relevance of project objectives in line with the national mine action strategy of Ukraine

designed and a priority echoed by all project stakeholders interviewed. The pilot's focus on surveying large, open areas aligns directly with the strategic objective of releasing 80% of priority farmland within 10 years.

Internally, this innovation project was widely described as a “learning-forward initiative”: a pilot that intentionally combines operational delivery with experimentation, reflection, and evidence generation. Field and HQ staff across MAG and APOPO consistently noted that the project's purpose was not only to deploy TSDs, but to test systems, coordination, and performance under real conditions. This included getting APOPO as a new operator accredited including the national acceptance of SOPs how to use a new asset, TSDs.

“We are trying something new here. It's not just about dogs — it's about how we work together to solve a very big problem . . .”

– KII_3

As international NGOs engaged in HMA, MAG and APOPO, are uniquely tasked with surveying and clearing agricultural land in Ukraine. Unlike national agencies such as the State Emergency Service of Ukraine and the State Special Transport Service, which focus on urban and critical infrastructure clearance, MAG's and APOPO's mandate ensures that agricultural land—critical to Ukraine's economy and global food security—is returned to productive use as swiftly as possible. This prioritisation aligns with the strategic objectives of the NMAC and the Oblast Military Administrations, which assign demining tasks based on urgent needs. In practice, all tasks undertaken by MAG to date in Mykolaiv, Kherson, and Kharkiv oblasts have been agricultural.

“Why do we work? So that farmers can grow their crops and there is bread on my table, so that people don't step on mines, so that they can return to their homes and help rebuild our country . . .”

– KII_G_M

Alignment with MAG and APOPO organisational priorities, mission and vision

The TSD project is highly relevant to the priorities of both MAG and APOPO. Staff at all levels consistently linked their motivation to themes of civilian protection, agricultural recovery, and post-war peacebuilding.

This convergence of responses across all levels of personnel reveals a significant and unanticipated finding of the qualitative analysis. While traditional assumptions in strategic management, organisational behaviour, and change management often suggest a divergence between managerial and operational perspectives—particularly regarding alignment with an organisation's broader mission—this project presents a notable exception. The data demonstrates that both management and field staff are equally motivated by, and committed to, a shared higher purpose.

Importantly, this shared sense of purpose is not focused on immediate operational outputs or even outcome-level goals. Instead, respondents across all roles express a strong alignment with the impact-level objectives, as outlined in the project's Theory of Change. Regardless of their position, participants consistently highlighted the long-term vision of the project (see *Figure 16 and 17*).

For senior managers involved in the design and implementation of the project, all three of the project impact-level objectives clearly aligned to the national strategy of Ukraine. For junior staff, objectives two and three were the most tangible, and related to the national objectives in terms of safety of populations, however concepts such as sustainability were less relevant or understood. This level of alignment across all tiers of personnel is not only rare but strongly supported by organisational theory and strategic management research.³⁸ Studies have shown that when staff at all levels understand and commit to a project's overarching mission and long-term impact, organisational effectiveness, employee engagement, and sustainability of results all improve significantly.



Figure 16: The importance of shared mission understanding across staff levels

Impact-Level Objective (ToC)	Illustrative Quotes
Communities are more resilient to conflict, contributing to stability and peacebuilding	“Why do we work? So that people... can help rebuild our country.”
	“This is our life and our future.”
Communities benefit from inclusive and sustainable socio-economic development	“So that the economy can grow.”
	“So that we have food on the table.”
	“So that people can return to work.”
Communities are safer from explosive ordnance	“So that people can return to their homes.”
	“So that children can go to school.”



Figure 17: Alignment with Impact-Level Objectives: Staff Voices

EQ2. *To what extent has the project been adapted in response to the conditions in which it is being delivered?*

Key findings

2.1 The timeline of the TSD project had to be adapted as a result of external factors impacting the start of the operational phase

2.2 MAG and APOPO staff rapidly adapted their ways of working, demonstrating the importance of this being a pilot project for Ukraine

Adaptation to initial challenges

The TSD project in Ukraine was developed with an understanding of the challenges posed by high levels of contamination and the ongoing phase of conflict. Preparatory activities began well before the official launch of the project, which commenced on 1 May 2024. Nevertheless, the reality on the ground in Ukraine introduced new challenges that required constant adaptation throughout.

Initially, the dog training base was planned to be established in Sumy, Sumy Oblast, on the premises of the Sumy National Agrarian University,³⁹ with which a memorandum of cooperation signed between SNAU and APOPO in January 2024.⁴⁰

The university provided a site suitable for setting up the base, while APOPO planned to install kennels, training areas with explosive targets, fencing and a security system. An agreement was also reached with the Provincial Military Administration to provide explosive targets free from detonators by 25 March 2024 for the preparation of the training area.

Ukraine has a strict legal and regulatory framework⁴¹ governing the handling of explosive materials, which underscores the difficulty of obtaining them for humanitarian purposes, including demining with the use of dogs.

Therefore, the agreement with the military was considered one of the key advantages. However, in March 2024, due to the deteriorating security situation and the advancing front line,⁴² the military withdrew from the project, creating an urgent need for APOPO to find an alternative location and a new supplier or partner for the provision of explosives.

APOPO decided to relocate its base to a safer area — Krasylivka⁴³ in Kyiv Oblast. This base is located at well-established kennels that APOPO were already using as an acclimatisation site for their dogs upon entering Ukraine. However, this change from Sumy to Krasylivka required additional time and resources.

To procure explosive items mandatory for its training areas, APOPO signed a cooperation agreement⁴⁴ with Demining Solutions,⁴⁵ a licensed Mine Action company authorised to handle explosive materials, for the supply of the required training devices.

In accordance with international and national standards for training and testing ADS, all explosive targets must be buried in the ground for a minimum of three months prior to the start of training.⁴⁶ Furthermore, each TS Dog must be trained at least once per month on buried items that have undergone this three-month “soaking” period.

Despite delays, by July 2024, the Krasylivka training and testing site with 86 boxes was prepared.

While Krasylivka became the main training base, MAG received the task order to start working with APOPO in Stepova Dolyna in Mykolaiv Oblast. APOPO knew it had to face another logistical challenge: to find suitable facilities for housing dogs to conduct operations in the south of the country.⁴⁷

For instance, securing kennels in Mykolaiv turned out to be a significant challenge. As one of the informants explained, their persistence and sustained effort in the end paid off:

‘We had a problem finding a place for the dogs in Mykolaiv. The local authorities just said, ‘Well, buy land and build something yourself.’ Then I found a volunteer who was helping stray dogs, and she helped us — she gave us the contact of the head of the police canine unit in Mykolaiv . . . ’

– KII_6

The project also faced bureaucratic and regulatory delays. Difficulties and delays in obtaining operator accreditation, in this case for APOPO, are well known. The Ukrainian authorities acknowledged the existence of this problem in its National Mine Action Strategy.⁴⁸ Among the main causes cited were lack of resources, poor inter-agency coordination, and fragmented and chaotic administrative procedures. Although all necessary documentation for APOPO’s operational accreditation was submitted to the NMAC as early as 29 March 2024,⁴⁹ the certificate was not issued until 10 October 2024.

One of the reasons for such delays are due to the rapid growth of the sector. By the end of 2024, the mine action operator market had shown rapid growth, a trend that continues to this day. While there were more than 60 operators at the end of 2024, by the time of preparing this report, their number had risen to 104.⁵⁰

The process of obtaining approval for demining areas – a ‘task order’ – is inherently time-consuming due to the procedural requirements. The process of obtaining task orders typically takes no less than a month.



Figure 18: Dog kennels in Krasylivka training base

There are specific regulations that govern the submission of documentation for this procedure.⁵¹ Documents are not submitted as a single package of raw paperwork. Each individual document within the package must first be approved at various levels, which adds complexity and time to the process (see Box 2).

Each authority is responsible for reviewing and approving specific aspects of the documents, and this multi-level review process can lead to delays. Although the process is not intentionally delayed, the bureaucratic nature of these procedures, compounded by the need to avoid overlap between operators working in the same areas, resulted in the final approval for specific demining areas being granted to MAG suitable for this project only on 21 November 2024.⁵²

‘ . . . It is about understanding the difficulties in obtaining task orders and addressing other challenges — for example, what happened at the Stepova Dolyna sites, where another state actor began clearance on areas where we were already active, forcing us to suspend operations . . . ’

– KII_5

Unfortunately, by the time all conditions were fulfilled to start operations, weather conditions became unsuitable for working with the dogs, it was too cold (dogs cannot work in temperatures below 5°C, or above 35°C). Nevertheless, training was continued

Continued on Page 36



Figure 19: Dog training in Krasylivka

Box 2: Ukrainian bureaucracy - specific challenges

Limited capacity of national MA authorities

- The operator market is rapidly growing stretching capacities in accreditation and integration of new MA operators
- Ukraine has various MA authorities making a coordinated approach challenging
- NMAC under MoD lacks resources: only three regional centres for the whole country
- Legal framework remains fragmented: mix of overlapping laws and regulations
- Government is working to stabilise the system, but the market remains highly dynamic

Tasking process

- Process is heavily bureaucratic and paperwork-intensive
- Multi-level approvals delay operations
- Cases experienced by MAG where two operators were assigned to the same task order site

Multitude of authorities involved

Authorities Involved in the allocation of clearance sites:

1. Cabinet of Ministers of Ukraine

- Annually, in December, approves the Plan for Humanitarian Demining in De-occupied Territories for the upcoming year.

- Assigns operators for NTS and TS/ clearance activities, including by location and priority areas.

2. National Mine Action Authority (NMAC / ЦПМД)

- Works jointly with the Cabinet of Ministers to approve the national plan.
- Participates in site selection, coordination, and operational oversight.

3. Regional State Administrations (Oblast Administrations)

- Receive documentation for site prioritisation.
- In some regions (e.g., Mykolaiv), the regional administration is the main coordinating body for site approvals.

4. Local Territorial Communities (Hromadas)

- In regions like Kharkiv, communities are directly involved in coordination and initiate site proposals that are then approved by the regional administration.

5. Ministry of Economy of Ukraine (MinE-konomiky)

- Influences prioritisation through the DAR (State Agrarian Registry) system, cadastral numbers, and tenders submitted by farmers. Although currently not directly coordinated with operators, their role in prioritisation is increasing.

What can be done? Join forces to improve the system – all stakeholders, together!



Photo by Glib
Albovsky on
Unsplash



Figure 20: Ongoing dog training session. Krasylivka DTC, Kyiv Oblast

Continued from Page 34

indoors, in winterised facilities provided by another donor.

It is worth noting that each task order is issued for a period of one month only and requires renewal every month. Therefore, the task order from 21 November 2024, had to be renewed several times until MAG and APOPO started operational activities in the area, on 10 March 2025.

Thus, despite thorough preparation, the project faced both anticipated and unforeseen challenges. A detailed

breakdown of key milestones comparing plan against actual delivery is provided below:

APOPO demonstrated great flexibility, swiftly relocating its base, establishing cooperation with new partners, adapting to a complex regulatory environment, and ensuring progress despite external constraints. This adaptability was recognised as one of the main achievements of the first year of project implementation, both by national authorities and international partners. MAG embraced the pilot to integrate TSD teams into its survey process and collaborated closely with the authorities and APOPO to identify the best approach.

Activity	Planned to start from	Actual (as of May 2025)	Status
Inception	May 2024	May 2024	On time
TSDs arrive in Ukraine	May 2024	May 2024	On time
Acclimatisation of TSD	June 2024	June 2024	On time
Training on buried targets	July 2024	August 2024	1-month delay
Accreditation by NMAC	August 2024	10 October 2024	2-month delay
TSD team deployment	August 2024	10 March 2025	6-month delay
MEAL team deployed	July 2024	November 2024	4-month delay
Monitoring reports to EU	July 2024	March 2025	6-month delay
Mid-term evaluation	April 2025	In progress	On track
Project management	May 2024	Ongoing	On time

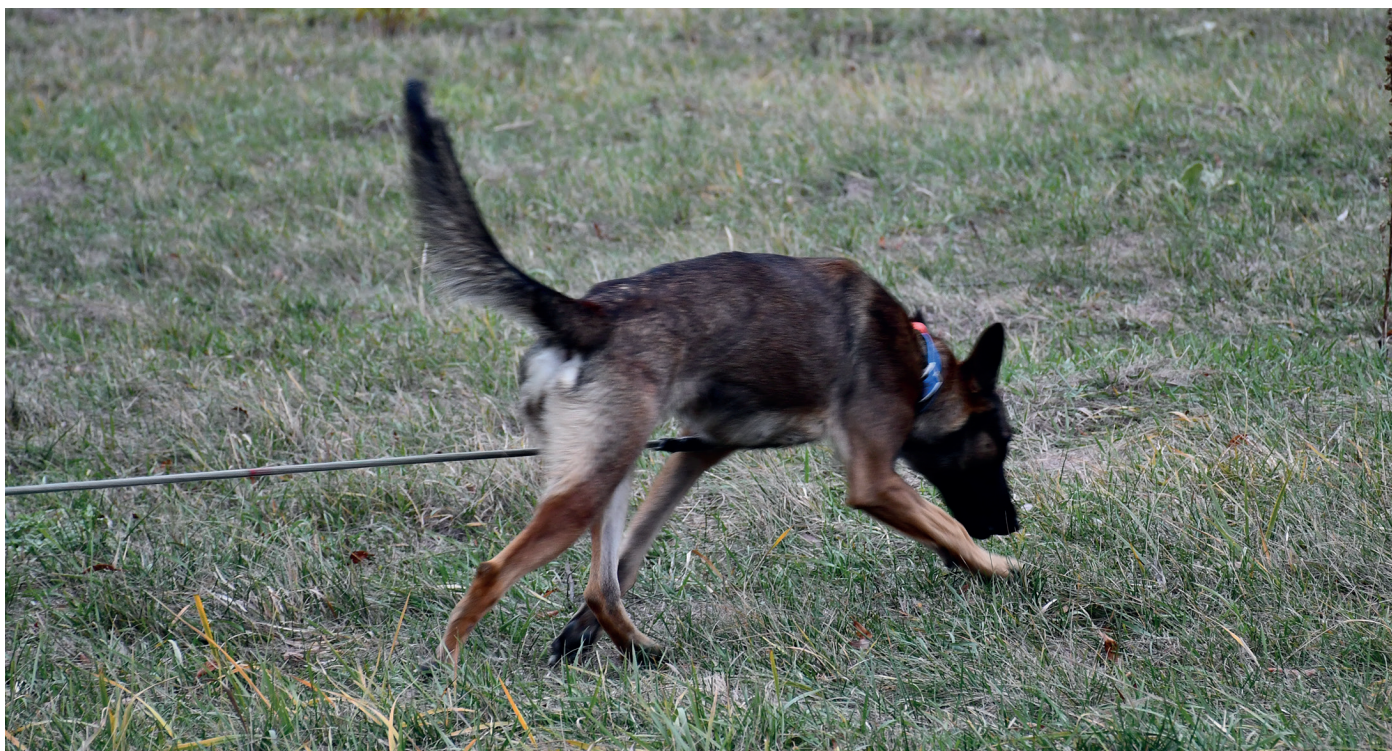


Figure 21: Dog trained to indicate explosives conducts a search on the field

Coherence

EQ3. *How does the TSD project integrate with other technical survey methods?*

Key findings

3.1 Using TS dogs to support technical survey as part of the land release process in Ukraine is feasible under certain conditions. Using TSD for TS has the potential of accelerating TS significantly.

3.2 Using the TSD approach is new, developing the most coherent approaches takes time, and therefore trust in the methodology has to be developed.

TSD teams are capable of effectively and quickly searching large areas and detecting the odours of explosive items. Results from the period 10 March to 30 April 2025 are presented and discussed below under Effectiveness. However, dogs cannot provide information about the exact location, depth, or type of the explosive object encountered. Therefore, any area where dogs indicate a possible threat

must be handed over to deminers for further investigation and clearance. MAG's clearance teams are doing this. APOPO handlers are certified as deminers by the Ukrainian Standard, but the organisation is not accredited to conduct manual clearance. The involvement of the TSD Handlers in investigating their own dog indications using a metal detector depends on the deployment model agreed between MAG and APOPO to as being most effective and efficient (see below under Effectiveness). Thus, while TS using TSDs remains a critical part of the land release process, it has to be complemented by a separate manual demining capacity.

As of end of May 2025, MAG and APOPO are operating jointly in the field, following SOPs and safety protocols. APOPO has deployed four TSD teams (two teams are funded by the EU), while from MAG's side, a single MAT (mine action team) funded by a separate donor, verifies the indications made by the dogs (TS) and clears the land for subsequent land release; MAG also provides project support to APOPO's teams for CASEVAC in case of an accident.



Figure 22: Handlers and their dogs resting on a safe lane. Stepova Dolyna, March 2025

‘We are equally essential to each other. Without us (MAG), the clearance cycle cannot be completed — we provide manual follow-up, marking, and overall operational support. Without them (APOPO), it is impossible to effectively detect hidden threats. This partnership is unquestionable — it is justified both operationally and strategically . . .’

– KII_4

Identifying the most coherent approach to integrate TSD with TS and clearance operations

A potential approach to structuring technical survey and clearance operations—highlighted by several staff interviewed for this evaluation—involves the following sequence: mechanical ground preparation → use of Technical Survey Dogs (TSDs) → follow-up by deminers.

The TS defines the boundary of the actual hazard area; then manual deminers can conduct clearance of the high threat area actual mine row and TSD can conduct the survey of the mech/MDD established boxes - the medium and low threat areas - if low threat areas not just reduced. (See

further discussion in Lessons Learned).

Such a method may offer operational advantages, especially in environments like agricultural land, where dense vegetation doesn't limit the visibility and speed of TSDs. In areas with the likelihood of tripwires TSD cannot be deployed as a primary tool; they require a preliminary mechanical ground preparation. Mechanical ground preparation can help mitigate these limitations by clearing vegetation and removing the tripwire threat, thereby creating favourable conditions for dog deployment. The potential increase in efficiency from this combination, however, remains to be confirmed and can only be extrapolated through future implementation and evidence-based evaluation.

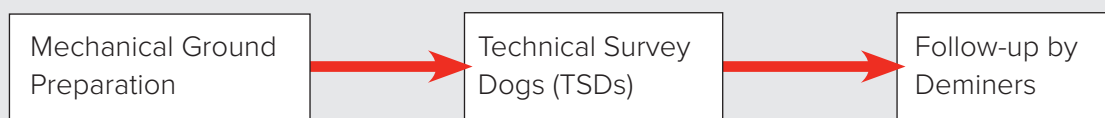
‘Everything can be combined, but it depends on the resources and specific tasks. It needs to be evaluated whether it is rational in terms of time and costs. If the field requires a combined approach, we will do it, but it is important to consider the type of contamination and the danger present . . .’

– KII_9

Box 3: Integrated operational approach to technical survey with TS dogs

Concept Overview

A **multi-layered operational sequence** has been proposed and supported by several practitioners in the field:



Field Feedback & Observations

'Full Toolbox' Concept

- Excellent for large Hazardous Areas (HAs).
- Maximises use of all assets where safety distances can be maintained.
- Reflects a comprehensive asset deployment philosophy.
- Once lanes are established:
 - » High-risk areas → Manual clearance or MDD-based investigation.
 - » Medium/low-risk areas → Reduction by TSDs.

Optimised Sequence Proposal

- Mechanical assets create Technical Survey (TS) lanes, defining hazard boundaries.
- Animal Detection Systems in MDD mode verify these lanes.
- Practitioners indicate that this sequence may represent the safest and most effective operational setup under suitable conditions.
- Each phase reduces risk incrementally, using the strength of each tool in a logical order.

Safety & Effectiveness

Key Assumptions

- Hazardous areas are large enough to allow staged deployment with clear safety distances.
- Terrain and contamination conditions support mechanical and animal operations.
- Access to full set of assets (mechanical, MDD, TSD, manual teams).
- Sufficient data and operational planning exist to differentiate threat levels post-survey.

Potential Benefits

- Improved operator safety through mechanical initial entry.
- Asset efficiency: each tool used at its optimal phase.
- Flexible scalability based on site conditions and threat profile.

While not yet institutionalised, this layered approach could form the basis for a **best-practice model** in large-area technical survey and clearance – especially when supported by **solid threat analysis** and **evidence-based decision-making**.

EQ4. How well was coordination and collaboration ensured throughout the project and with local and international entities?

Key findings

4.1 Coordination with national authorities is fundamental for to the project's success and overall is working well

4.2 Collaboration between MAG and APOPO is essential and has been, on the whole, successful

4.3 Coordination and collaboration with international entities has been sought but was of lower importance in the initial phase of the TSD pilot project

Cooperation with national authorities

Cooperation and collaboration⁵³ with local and governmental structures is a mandatory element of humanitarian mine action projects, as established by both national and international standards.⁵⁴

At the time of launching the project involving Technical Survey Dogs, MAG already had substantial experience in building relationships with authorities, as well as a clear understanding of potential challenges and effective methods for addressing them.

MAG's branch in Ukraine (ФІЛІЯ THE MINES ADVISORY GROUP В УКРАЇНІ) was officially registered on 8 August 2022,⁵⁵ and received its first licence to conduct Risk Education on 24 March 2023.⁵⁶ The charitable foundation "APOPO" (БО "БФ "АПОПО") was registered on 3 August 2023,⁵⁷ and obtained its licence to deploy dog teams for survey and clearance on 10 October 2024.

We (APOPO) were highly praised by NMAC. They really liked it, as it was their first experience of accrediting such an operator. They were amazed at how accurately and clearly the dog can show identification. [...] Everyone is learning, not only the official authorities but also ordinary people. [...] When they see our vehicles and

humanitarian demining, they understand that this is important work and support it. This has been made possible through the efforts of all operators, both national and international. People help at all levels, from the very bottom to the highest . . ."

– KII_6

The TSD project was integrated into Ukraine's existing demining system. MAG, as lead implementer, maintained institutional engagement with bodies such as the NMAC and the SESU. APOPO coordinated local activities and logistics, including placement of dogs in partnership with the Mykolaiv Police canine unit.

The project was seen by SESU and NMAC as a model of technical collaboration, and interviewees emphasised that the use of formal joint SOPs and the integration of TSDs into MAG's broader land release operations were key to building institutional confidence.

We have seen other systems come and go. This one, at least, is part of something. It's built on real partnerships . . ."

– NMAC Representative

MAG and APOPO actively contributed to the development of the National Mine Action Standards on ADS as members of a technical working group convened by GICHD at the request of the NMAA. This working group included key national and international stakeholders such as MAG, APOPO, NPA, Fondation Suisse de Déminage (FSD), and representatives from NMAC.

The final draft of the NMA on ADS was agreed during a two-day workshop held on 26–27 November 2024 and was subsequently submitted for review to the Cabinet of Ministers of Ukraine. As of April 2025, no formal updates on the approval process have been issued. MAG continues to monitor progress and is awaiting confirmation of next steps. Once adopted, these standards will provide the legal and institutional foundation for the broader integration of the TSD methodology into Ukraine's mine action system.

National and regional structures, including NMAC and regional administrations, began to recognise the advantages of using technical survey dogs, especially for areas contaminated with EO.⁵⁸ The speed of the dogs' work and their ability to effectively detect hazardous objects have contributed to growing trust in the project. This growing recognition of the method's effectiveness is helping to strengthen the project's credibility among both local authorities and coordinating bodies.

One remaining challenge is the turnover of personnel within NMAC units responsible for processing reports. As noted by MAG representatives, this sometimes causes difficulties in identifying the appropriate contacts.

Some informants repeatedly emphasised the lack of digitalisation in procedural workflows, noting that this gap often leads to delays and increased administrative burden.

At the same time, Ukraine has made significant strides toward digitising various aspects of humanitarian demining.

Digitalisation could streamline document submission. It would be convenient to have a digital platform, like a dashboard, where operators could access all directives, documents, and priorities in one place, making interactions more efficient . . .”

– KII_9

In addition, in 2024, the Ministry of Economy of Ukraine signed a cooperation agreement with the U.S.-based company Palantir Technologies.⁵⁹ This partnership aims to harness artificial intelligence through the Palantir AIP platform to process large datasets and provide optimised recommendations for explosive ordnance clearance.

Under the National Mine Action Strategy through to 2033,⁶⁰ further digitalisation is planned, including the creation of a national registry of contaminated areas and a digital accreditation system for mine action operators. These steps are expected to significantly improve coordination and



efficiency, particularly in streamlining approval processes.

Figure 23: MAG's information management team

A key component of this effort is the implementation of the Information Management System for Mine Action (IMSMA), developed by the Geneva International Centre for Humanitarian Demining (GICHD). Since 2014, Ukraine has been using IMSMA to collect, analyse, and share data on contaminated areas and clearance operations. In 2019, the Ministry of Defence and SESU began transitioning to the more advanced IMSMA Core system, which integrates GIS capabilities.⁶¹

Nevertheless, challenges remain. The growing number of operators, a complex multi-level approval system, and the overburdening of state bodies such as the SESU and the NMAC continue to affect the efficiency of processes.

Informants repeatedly mentioned an interesting fact: the TSD project has sparked genuine interest among national and local structures. For example, APOPO received calls and inquiries from the Department of Humanitarian Demining, a unit within the Ministry of Economy of Ukraine.⁶²

They contacted us directly. They wrote letters, called, asked about the methodology and the process... we maintain a dialogue . . .”

– KII_6

In this way, the project utilising dogs for technical survey demonstrates successful cooperation and collaboration with local structures. Despite ongoing challenges, the flexible model of engagement with local stakeholders at all levels has helped move the project forward and stabilised the process for future operations.

MAG and APOPO Collaboration

Organisational Turning Point: Navigating Inter-Agency Tension

Cross-organisational partnerships — particularly in humanitarian and innovation-driven projects⁶³ — consistently pass through a critical inflection point often referred to as a *turning point* or *storming phase*.⁶⁴

Storming is the critical phase where tensions and conflicts begin to surface. If navigated consciously, the transitions toward alignment and effective collaboration.

The classic model of partnership development:

Forming → Storming → Norming → Performing → (Adjourning)

Literature in project management and organisational theory confirms that within the first 3–6 months of implementation, operational friction typically emerges. This is not a failure of collaboration, but a predictable stage of integration. According to field research,⁶⁵ successful navigation through the crisis phase is influenced by:

- The presence of joint planning tools;
- Rituals of shared reflection (weekly meetings, debriefings);
- Built-in bottom-up feedback mechanisms;
- The ability to view differences not as problems, but as resources.

In the MAG–APOPO partnership, this moment aligns with early field deployment, where differences in SOPs (One for TSDs, others for BAC, minefield clearance etc.), coordination styles, and organisational cultures surfaced.

Operational Integration and Early Frictions
Despite strategic coherence, early operational deployment revealed expected challenges. MAG deminers and APOPO handlers initially operated in parallel rather than as a fully integrated field unit. Communication gaps were especially visible in areas such as:

- **Task site briefings:** There is a clear need for regular and standardised pre-operational briefings, especially for deminers unfamiliar with TSD operations. As one team member noted, hearing about the procedures is not enough—visual demonstrations and explanations of how dogs work, how marking is done, and what actions to take upon detection are essential. This approach should become standard practice.

I would like us to hold briefings for the deminers before starting operations, especially those who don't know how the dogs work. To explain how the marking happens, what to do when something is found. People have heard things, but hearing is one thing — seeing and understanding is another.... I'd like it to become standard in the future — a demonstration, an explanation, so there's no confusion.”

– KII_8

- **Use of marking systems:** Differences in marking systems between MAG and APOPO teams required full understanding of each other's system in the field. Harmonising or clearly communicating marking standards was needed.

- **CASEVAC planning:** The limited availability of medical evacuation teams from MAG—carried out by MTTs—significantly affects the operational capacity of both TSD and manual clearance teams. For example, in one instance, after deployment had already begun, it became clear that the distance to a potential evacuation point was too great to ensure proper support. As a result, MAG recommended reducing the number of deployed personnel to stay within the effective radius of the evacuation team. This not only reduced productivity but also led to lost time and the need to reassign



Figure 24: APOPO and MAG Technical Field Managers on the Control Point - Stepova Dolyna Task Site



Figure 25: MAG deminer with APOPO handler and dog in the background - Stepova Dolyna BAC Task site

staff. Consequently, the lack of CASEVAC resources limits the ability of teams to operate at greater distances from each other.

➤ **Integration of TSD schedules with manual clearance workflows:** Teams reported poor synchronisation of next day planning between TSD operations and manual clearance workflows. Issues included inconsistent daily planning, limited access to marking stakes, and a lack of clear communication about work schedules.

These frictions were exacerbated by limitations in team availability; as APOPO's Technical Field Manager (TFM) reported,⁶⁶ *"We had to compress our deployment because we didn't have MAG deminers available in time to follow up on dog indications."*

Still, both sides engaged in iterative learning. Daily coordination improved through joint drills and shared field planning. APOPO and MAG team leads implemented feedback loops to identify workflow mismatches and adjust procedures on-site. One APOPO handler remarked: *"We sat down and went through how it should look — task by task. That helped a lot."*

Cultural and Professional Dynamics

The evaluation also surfaced key differences in organisational culture and field norms.

➤ **Communication Norms and Authority Perception:** There are different perceptions of authority and information flow. APOPO

handlers felt empowered to make in-field adjustments; MAG deminers looked for pre-set instructions and clearer supervision. This asymmetry caused misalignment. (See Box 4 overleaf.)

➤ **Decision-Making Disconnect; Management Choices Made Without Field Team Involvement:** APOPO handlers demonstrate notably close and collaborative relationships with their field supervisors — a dynamic that appears to be shaped in part by the nature of their work with live animals. The interactive, emotionally attentive relationship required for effective canine operations fosters a more engaged and communicative team environment.⁶⁷

"Our team leader... I don't know, he's a treasure. A real treasure. We're very lucky..."

– KII_FGD_A (handler)

MAG deminers are more procedure-oriented and maintain more formal relationships with their supervisors, in contrast to APOPO handlers.

"We have our own supervisor, and we direct all our questions to them. We have our own TFM, and they have their own defined tasks, but... There should be some kind of consensus with us, I agree. The norms we're used to don't really apply here — the standards are different..."

– KII_FGD_M

Continued on Page 45

Box 4: MAG and APOPO enhancing collaboration in Ukraine

What works

- Shared mission and strategic alignment
- High interpersonal trust among handlers and deminers
- Adaptive learning in dynamic environments
- Emotional code of caution and professionalism
- Symbiosis mindset



What hinders

- Initial lack of synchronised SOPs and planning tools
- Absence of standard daily briefings and operational demonstrations
- Poor CASEVAC coordination
- Misalignment in task scheduling and preparation
- Communication asymmetries
- Cultural distance in authority norms



What's needed

- Institutionalised joint SOPs adapted to multi-asset deployment
- Routine cross-team briefings and technical demonstrations
- Shared CASEVAC planning and role definition
- Built-in bottom-up feedback mechanisms
- Recognition and integrations of different team rhythms



Collaboration: Trust, Emotional Anchors, and Operational Alignment

Shared Mission, Divergent Rhythms

Across roles, respondents expressed deep commitment to the mission: restoring land, enabling return, protecting lives. However, professional tempos differed. MAG deminers expected structured daily planning; APOPO handlers operated in a more adaptive, real-time rhythm.

Trust as a Functional Bridge

Despite initial frictions, mutual trust became the foundation of daily cooperation.

Emotional Logic: Confidence with Caution

Risk was not denied but normalised as part of the job. Both sides spoke openly about fear — not as weakness, but as a tool for discipline.

Symbiosis as a Shared Identity

The term “symbiosis” surfaced repeatedly in field narratives. Teams see themselves not as parallel units, but as interdependent:

This trust-infused collaboration is not accidental — it reflects a deeper emotional code embedded in the project's daily operations.

I asked, ‘Why are you working alone here?’ He/she (handler) said, ‘My dog doesn’t like it when someone is working behind us . . .’

— KII_FGD_M (deminer)

It’s a different pace — not worse, just new. We’re adjusting . . .

— KII_FGD_A (handler)

Continued from Page 43

There was a sort of a grey area that was left, and unfortunately field staff were in that grey area. They were not given the technical guidance to understand what to do when APOPO's SOP said one thing and MAG's SOP said something else..."

– KII_10

Despite these differences, cultural integration progressed notably. Handlers and deminers reported growing mutual respect and trust. A handler from APOPO stated: *"They trust our dogs, and we trust their safety procedures."* MAG deminers noted the same: *"We don't work separately anymore. We're a joint team now."*

Coherence with other donors

Several international organisations and donors have shown concrete interest in the use of technical survey and clearance methods involving dogs within the framework of humanitarian mine action in Ukraine. MAG and APOPO are making sure to avoid duplications and in being consistent when presenting the TSD approach across the different donors.

1 United Nations Development Programme (UNDP)

From June to December 2024, UNDP funded two TSD teams (16 dogs and 8 handlers), while the other two teams were supported by the European Commission. Although the funding was provided under separate budgets, the joint support enabled APOPO to deploy all 32 dogs simultaneously,

significantly enhancing the scale and visibility of the approach. Co-financing from UNDP also helped strengthen project capacity, localisation, and operational support. Specifically, UNDP funding enabled the purchase and modification of two dog transport vehicles equipped with cages, the construction of kennels, and the setup of winter training grounds—ensuring year-round training and readiness.

2 U.S. Department of State – Bureau of Political-Military Affairs/ Office of Weapons Removal and Abatement (PM/WRA)

This donor approved a comprehensive project initially scheduled to begin 1 December 2024. The project planned for one APOPO dog team to operate in an MDD (Mine Detection Dog) module as part of a broader programme that included mechanical ground preparation, manual demining, and community liaison teams. As of the time of this report, certification of the dogs is ongoing, with deployment set for the beginning of July.

3 The Howard G. Buffett Foundation (HGBF)

Since March 2025, the foundation has been funding a new large-scale project running until December 2026, with a strong focus on the TSD methodology. HGBF support includes: three TSD teams, six MTTs and two CL teams.

This funding is crucial in ensuring the sustainability and expansion of APOPO's operations in Ukraine.



Figure 26: Mechanical ground preparation and demining in Mykolaiv region

Effectiveness

EQ5. *To what extent did the programme achieve (or not achieve) intended outputs and outcomes – in line with the proposed approach and MAG’s HMA Theory of Change?*

Key findings

5.1 Achieved/made progress against Outcome 1 (national capacity) and established a solid foundation for future projects. Limited survey/clearance outputs to date, and thus limited contribution to achieving Outcome 2, Safe and productive land...), but promising initial results.

5.2 Key factors identified that influence feasibility of employing TSD and operations adjusted accordingly

5.3 TSD teams are highly effective when appropriately deployed and integrated into coordinated clearance workflows. They do not replace other methods, but rather enhance them.

Solid foundation established

As of the time of reporting, the programme has achieved a number of key results that align with the stated objectives and the approach outlined in the project proposal and MAG’s Humanitarian Mine Action Theory of Change (HMA ToC).

Outcome 2, as formulated in the project proposal to the donor—“Safe and productive land allows freedom of movement to improved livelihoods, basic services, and natural resources”—is not expected to be achieved through this project itself. Rather, improved technical survey will contribute to land release and Outcome 2.

At the mid-point of implementation, the project has delivered essential building blocks for long-term operational success:

- Two EU-funded nationally accredited TSD

teams fully operational in Mykolaiv Oblast

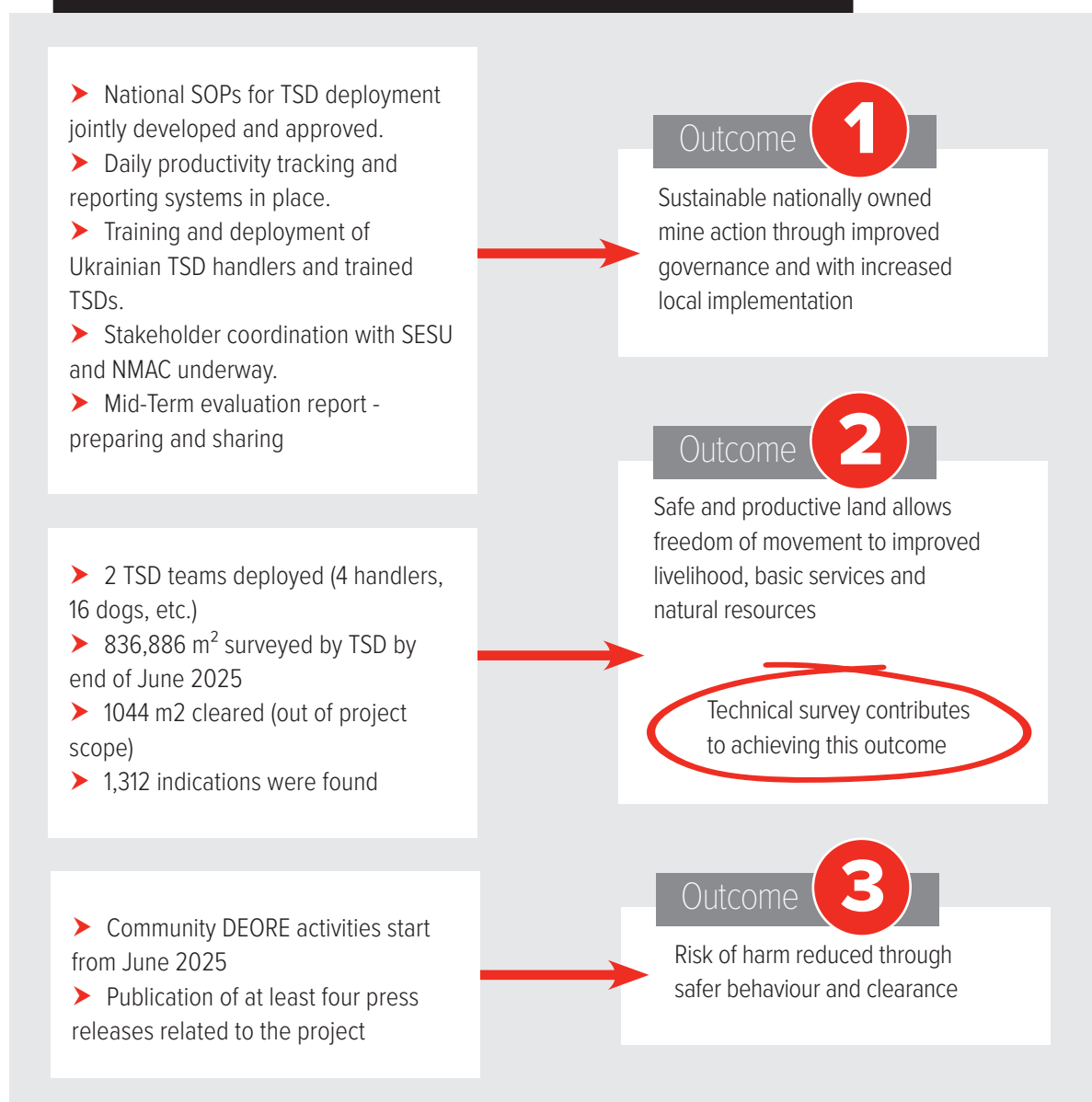
- National SOP 3.1 ‘Use of Technical Survey Dogs’, jointly developed and approved by national authorities
- Training and deployment of Ukrainian TSD handlers and dogs
- 205,483 m² of land surveyed using TSD by 30 April 2025
- Daily productivity tracking and reporting systems in place
- Stakeholder coordination with SESU and NMAC ongoing

Regarding risk education including digital EORE (DEORE)-related activities, no implementation has occurred to date as planned. The communication campaign was scheduled to launch in July 2025.

Two official press releases were published to highlight key milestones in the project’s development by end of May 2025. The first, released on 21 August 2024, covered the launch of the project and the introduction of the TSD methodology in Ukraine. The launch event was attended by representatives from UNDP, NMAC, the Embassies of Spain and the Netherlands, the Deputy Minister of Economy of Ukraine, and staff from MAG and APOPO. The launch received public coverage and officially marked the introduction of the TSD methodology in Ukraine. The second press release, published on 23 April 2025, was focused on the deployment of the TSDs in Mykolaiv. The publication appeared on MAG’s international website and was shared through partner communication channels, ensuring wide dissemination of the pilot project’s results to an international audience.

This project phase was not designed to deliver full land release, but to establish critical preconditions for subsequent clearance operations. Specifically, the project does not include the deployment of manual

Box 5: Project achievements by 30 June 2025



clearance teams, whose engagement is essential for verification and physical removal of identified explosive ordnance. This means that the results generated through TSD-led technical survey cannot, by themselves, result in formal land release; nevertheless, they constitute a vital component in the operational sequence required to achieve the final outcome related to land release.

The programme contributed significantly toward the achievement of Outcome 1 identified in the MAG HMA Theory of Change: “Sustainable nationally owned mine action through improved governance and with increased local implementation.”

Through the development and adoption of

SOPs, the training and deployment of local Ukrainian handlers (eight newly trained TSD handlers), structured data collection and reporting mechanisms, media engagement, and close collaboration with national authorities, the project has helped build long-term national capacity. While these activities were not explicitly listed as output indicators in the original logframe, they represent a substantial contribution to the sustainability of Ukraine’s mine action sector.

Therefore, the project implemented by MAG in partnership with APOPO should be viewed as a preparatory phase focused on establishing both the technical and strategic groundwork for future land release operations, by MAG and potentially by

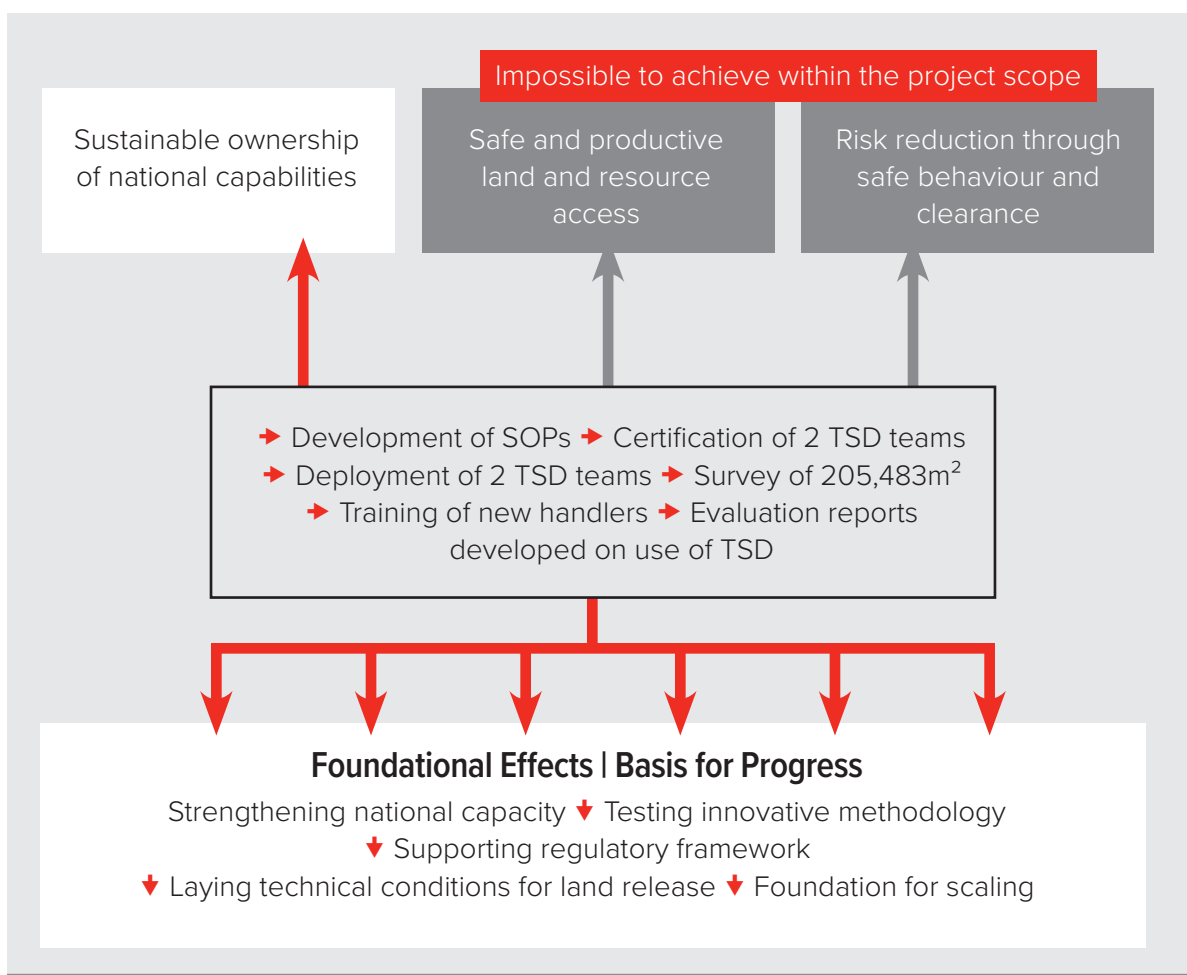


Figure 27: The project achieved its core objective — laying a solid foundation for future scaling up

other operators. In this context, the project meaningfully contributes to the intended outcomes and ensures a solid basis for more efficient, targeted, and locally sustainable mine action activities in Ukraine moving forward. In order to visualise the project process through the lens of the Theory of Change framework, the proposed diagram can be structured as follows — with the foundation already established within the initial 10 months of the 18-month programme duration.

While land coverage surveyed, an area of 205,483m² by end of April, appears low relative to end-of-project targets (5,024,000 m² by end of October 2025), this is acceptable for a pilot focused on systems integration, technical learning, and procedural validation. [Note: By the end of June, this figure increased to 836,886 m².] Setting a target for TS for uncertain task areas covering minefields and BAC areas is not necessarily meaningful, especially for a pilot project.

The initial figure of 5,024,000 m² was based on the standard TSD approach used in other countries, where 50% area coverage is typically applied during technical survey, not 100% as in Ukraine. By the end of this project, 31 October 2025, six more months of operation will yield additional areas surveyed by TSD teams — as the additional progress by end of June demonstrates (see Figure 28).

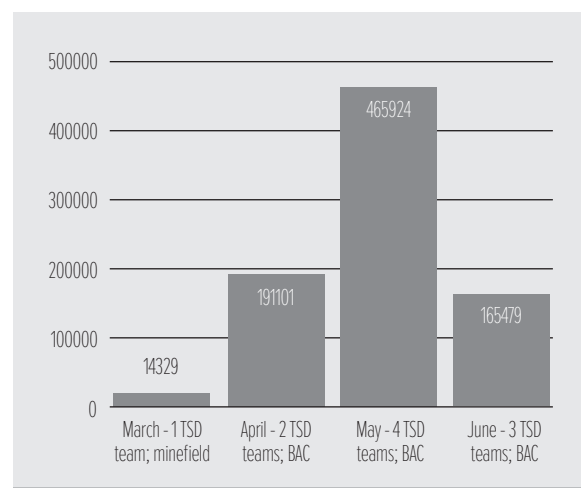


Figure 28: TSD-survey progress in square metres (Including Data Beyond Evaluation Period)

EQ6. *What factors have facilitated or hindered the achievement of objectives?*

Key findings

6.1 Bureaucracy delays some processes but is manageable thanks to good relationship/ coordination with national authorities

6.2 External factors including the security situation, the lack of ADS-related infrastructure, and the weather, impact the project delivery

6.3 Proactively managing the collaboration MAG-APOPO helps integrating TSD teams into land release, improving operational effectiveness

As explained under Relevance, bureaucratic challenges—a growing operator market, lengthy accreditation procedures, difficulties in obtaining permits, and limited capacity of the NMAC—delay processes but can be managed thanks to good partnership with the national authorities (See details in *Relevance*, Box 2: *Ukrainian Bureaucracy*).

However, employing TS dogs in Ukraine faces additional challenges, outside of the control of the operators:

- Operational risks in the context of an ongoing conflict;
- Infrastructure limitations within ADS-related projects;
- Weather constraints (temperature, rain, wind)

Operational risks are heightened due to the ongoing war, bureaucratic demands affect the full-scale rollout of the project, and infrastructure limitations have been identified as persistent challenges.

Factors influencing MDD/TSD effectiveness

Multiple factors influence TSD operations, e.g., they are strictly weather-dependent. Dogs cannot work in temperatures above 35°C or below 5°C, as extreme heat reduces

their endurance, and cold temperatures may suppress the scent of buried EO. Operations are also paused in high winds (above 7 m/s), and rain. Alterations to the terrain impact the dog's capacity to sniff the explosives, e.g., recently burned areas require a seven-day soak period, or areas after recent vegetation cutting require at least 24 hours' pause. Additionally, dogs cannot be deployed in sharp vegetation, wet areas with water surfaces over 1m², steep slopes, or in areas contaminated with chemicals.

Based on the analysis of open sources (see *Annex 3*), including scientific articles, reports by international organisations, key factors influencing the effectiveness of mine detection dogs in humanitarian demining operations can be identified. These factors include environmental conditions, characteristics of explosives, dog training, handler interaction, organisational and logistical aspects, the physical and psychological condition of the dogs, staff motivation, and team dynamics. The operational deployment of the TSD project in Ukraine began on 10 March 2025. At this stage, data are too limited to confirm a stable link between specific factors and operational effectiveness—or reveal a linear or non-linear correlation. Nevertheless, the qualitative data collected through individual key informant (10 people) and focus group interviews (16 people from 3 FGDs) with project participants have provided valuable insights that allow for a preliminary assessment of key aspects influencing performance.

To ensure objectivity in the analysis, the qualitative data were divided into two levels: responses from the management/support tier and those from field teams.

This approach made it possible to examine the factors influencing effectiveness from two perspectives — a “top-down” (managerial) and a “bottom-up” (field-based) view. A partial semantic analysis, including emotional coding,⁶⁸ and content analysis of participant responses revealed the main categories of factors affecting the performance of TSD teams. The results of the analysis are presented in a visualisation that reflects the

Factor	Key Impact on MDD/TSD Effectiveness (see Annex 3 for more detail)
Environmental Conditions	Temperature, humidity, wind, soil composition, and vegetation affect odour dispersion and dog mobility.
Type and Composition of Explosives	Non-standard LEDs and deeply buried mines reduce detectability; some plastic mines are easier for dogs to detect than by using metal detectors.
Quality of Dog Training	Training to IMAS standards, climate adaptation, and breed traits (e.g., endurance) are essential.
Handler Interaction	Experienced handlers and strong emotional bonds enhance accuracy; inexperience or turnover reduces effectiveness.
Organisational & Logistical Aspects	Quality of equipment, veterinary support, transport, and clear SOPs are critical for smooth operations.
Physical & Psychological Condition of Dogs	Fatigue, illness, stress, or lack of motivation significantly reduce detection performance.
Type of Operation & Integration	Dogs can be used in TS, clearance, QC ⁷¹ and verification (following ground preparation); combining manual/mechanical methods increases effectiveness.
Staff Motivation & Team Dynamics	High motivation and trust-based team dynamics improve performance in high-stress collaborative environments.

Figure 29: Key factors influencing MDD/TSD effectiveness based (open sources information)

number of mentions of categories of various factors in the responses and highlights differences in the perception of these factors between the managerial and field levels.

As the TSD project is still in its infancy

in Ukraine, providing a fully objective assessment of the factors influencing operational effectiveness is not possible at this stage. However, several factors mentioned by respondents show a clear correlation with those outlined in the reports and sources referenced above.



Figure 30: TSD and handler working on task site – Stepova Dolyna



Figure 31: Morning briefing before the start of the day's activities

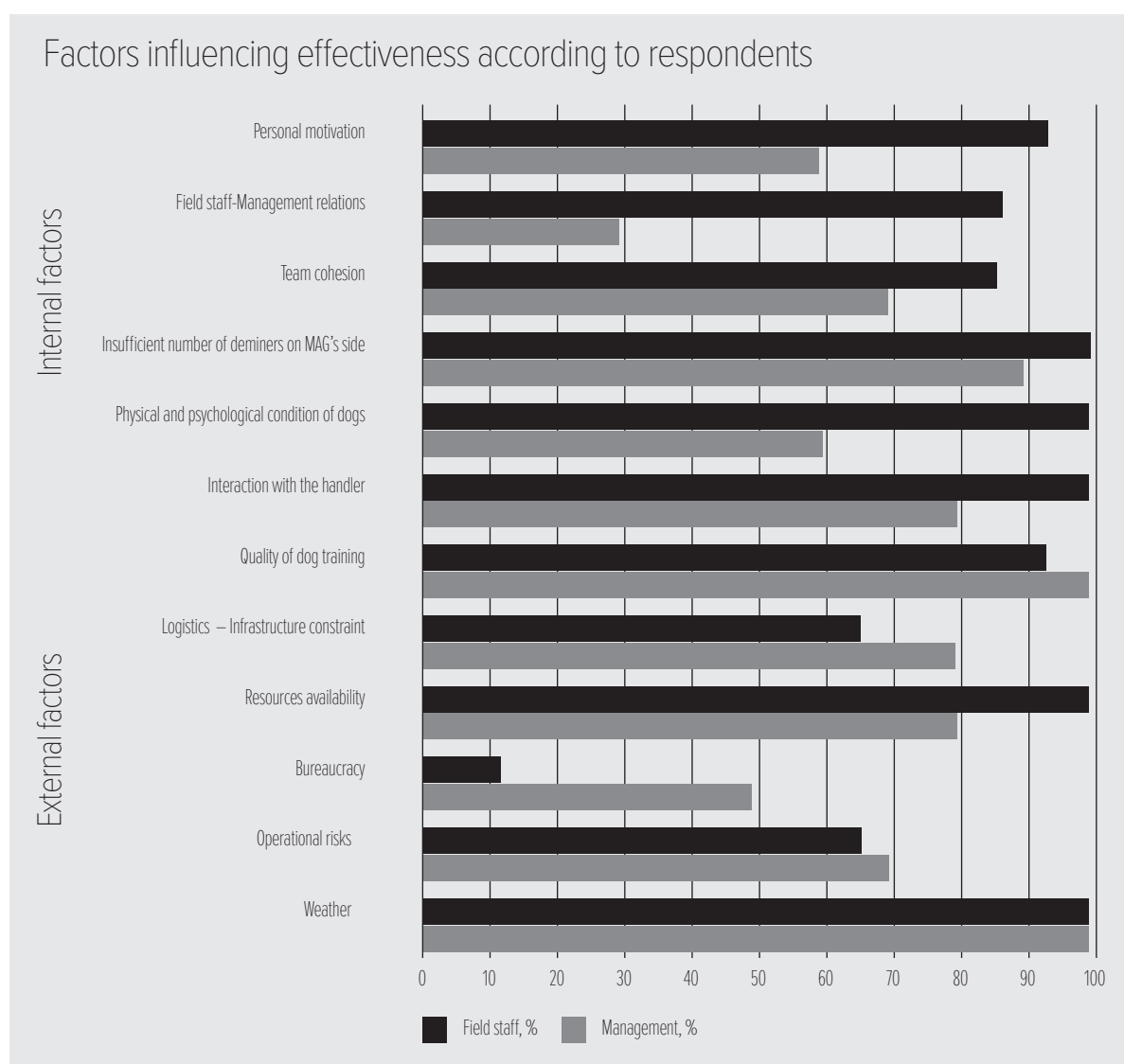


Figure 32: Qualitative analysis revealing field staff and management perspectives on factors influencing TSD effectiveness

Qualitative responses from both field and managerial personnel, using emotional coding to determine attitudes, perceptions, and emotional tone related to key factors affecting the performance of TSD teams. The analysis applied seven sentiment categories: 1) Strongly Positive, 2) Positive, 3) Neutral-Positive, 4) Neutral, 5) Neutral-Negative, 6) Negative, 7) Mixed.

Sentiment analysis findings:

➤ **Positive sentiment** was most prominent in topics related to team interaction, personal motivation, the quality of dog training, handler-dog interaction, and the physical and psychological wellbeing of the dogs — including the handlers' attitude toward them. The analysis confirmed previous findings: staff are genuinely committed to their mission and rely heavily on teamwork. It also demonstrated strong confidence in

the overall project preparation — including the quality of dog training, handler professionalism, and adherence to all animal welfare standards.

➤ **Negative sentiment** most frequently appeared in relation to bureaucratic procedures, logistical constraints, and resource shortages — particularly the imbalance between detection of targets and manual follow-up capacity.

➤ **Mixed emotional responses** were associated with topics such as weather and operational unpredictability — factors acknowledged as unavoidable, yet manageable through adaptability.

➤ **Differences in perception** were noted between field personnel and management: field staff focused more on

practical limitations (resources, fatigue, communication), while managers emphasised structural and procedural aspects (accreditation, coordination, planning).

The full emotional coding matrix, including frequency counts and sample quotations, is presented in *Annex 4*.

 *They trust our dogs; we trust their procedures . . .”*
— **KII_G_A (handler)**

Triangulation of available data — including open sources, quantitative results, and qualitative interviews — shows that the core factors influencing the effectiveness of the TSD project are consistent with the Ukrainian context.

Addressing operational challenges

During the operational phase under review, March–April 2025, MAG and APOPO teams identified key procedural and methodological issues that were slowing down operations. These discoveries were not setbacks — they were expected learning moments that only become visible through real deployment.

The issues were jointly analysed during the technical visit by senior MAG and APOPO staff in the end of April. During this visit, the decision was made to produce a formal Technical Note clarifying sequencing, communication, safety procedures, and task coordination for BAC and minefield contexts.

The following key challenges were addressed:

a. Unclear Task Sequencing

TSDs were deployed across the task site first, followed by MAG deminers investigating indications afterwards. This caused long lags in follow-up work and was based on uncertainty around safety SOPs.

Response: The Technical Note now allows for parallel working, with clear rules on box-by-box separation and handler–deminer distances. This improves time efficiency without compromising safety.

b. Misapplied Clearance Method

Demining teams were applying metal-free box excavation (2×2m) to every indication — a method suited for minefields, not BAC sites. This dramatically slowed productivity and overwhelmed follow-up capacity.

Response: A tiered approach has been introduced. In BAC tasks, teams now begin with preliminary visual clearance, followed by targeted dog deployment and lighter investigation techniques appropriate to threat level.

c. Lack of Pre-TSD Visual Clearance

In early deployments, no preliminary visual sweep was conducted before TSD work began in BAC areas. As a result, dogs were detecting a high volume of easily visible surface scrap, unnecessarily increasing follow-up workload.

Response: The revised approach includes mandatory pre-TSD visual search in BAC areas to remove visible EO and reduce alerts. This aligns with practices observed in APOPO’s Cambodia deployment and standard BAC workflows.

d. Indication Overload and Scent Residue

In some areas, dogs repeatedly alerted on items that no longer contained explosive hazard but retained residual scent.

Response: Teams now track indication clusters,⁶⁹ with handlers and Team Leaders empowered to apply APOPO’s “fade-out” protocols. The Technical Note allows for formal withdrawal of TSDs from oversaturated boxes, triggering handover to manual clearance.

The April technical visit was a key turning point. It led to:

- The drafting of a formal **Technical Note** outlining task-level sequencing and integration principles, including shared coding systems (e.g. grid boxes A1, A2, B1) and daily reporting formats
- Agreement on **updated investigation distances:** one box (50m) buffer required

Box 6: Effectiveness measured in system readiness

A Pilot Measuring Foundations, Not Hectares

The correct frame for assessing this project's effectiveness is not throughput, but **system readiness**:

- Are the right methods in place?
- Are handlers and deminers coordinated?
- Are SOPs clear, flexible, and safe?
- Are problems being surfaced and addressed?

Answer: **Yes**
(but still piloting)

No one in Ukraine has done this before. What matters is that it now works better than it did a month ago ..."
– KII_3

between active dog teams and manual investigation, expandable to 400m when two MTTs are present.

- Introduction of **daily box activity briefings**, visual planning aids, and joint MAG–APOPO coordination at site level.

These changes show that the project has been **responsive, collaborative, and effective** in using early field insights to strengthen technical systems.

We had the right people in the room. We diagnosed the issue, wrote the note, and it changed the work the next day. ..."
– MAG Programme Quality Director⁷⁰

MAG and APOPO improved operational effectiveness in the field

In April 2025, during a joint field visit by MAG's Programme Quality Director and APOPO's Head of Mine Action, key technical challenges were identified that were limiting the effectiveness of the TSD deployment in Mykolaiv. In response, MAG and APOPO drafted a formal Technical Note to clarify team roles, indication investigation procedures, and deployment coordination.

All necessary technical adjustments were

made to improve field efficiency and minimise the impact of limited manual demining capacity. The development of a joint Technical Note, updated deployment protocols, and coordinated field planning successfully enhanced team synchronisation and reduced operational delays. However, one key topic has emerged:

In this project it is intended to rely on existing MAG manual demining teams. But having dedicated manual teams as an integral part to TSD-approach working alongside the TSD-teams seems, at least in Ukraine, the preferable option. Since operations have only recently begun, it is too early to recommend a one-size-fits-all recommendation (See discussion under *Lessons Learned* and this topic will feature again in the final evaluation).

It's not about being fast, it's about being effective. We are fast for a particular reason — the fact that dogs don't identify metal, they just identify explosive contamination. If you were to put manual deminers on that land, you'd be lucky to do 20 m2 a day. With a team of 10 deminers, that's 200 m2 per day, whereas a team of eight dogs would cover 12,000 to 16,000 m2 a day ..."
– KII_2

Box 7: Adapting operational challenges. What was happening and how it was fixed

Before (Early March 2025)



TSD team



WAIT



Slow excavation



Confusion

- TSDs worked first, deminers waited outside the site — resulting in long delays between indication and investigation.
- Every indication was investigated using slow, metal-free box excavation, even in BAC sites.
- No initial visual clearance was done before dogs worked, meaning dogs alerted on surface items that could have been removed manually.
- Inconsistent understanding of safety distances, debriefing formats, and what counted as “finished” work.

What changed since



Visual check



TSD + deminer



Manual team



Shared map

- Simultaneous working is now allowed: handlers and deminers work at the same time, with one-box (50m) separation.
- Faster investigation methods are approved for BAC areas (e.g. light excavation or visual confirmation).
- Teams must now complete a pre-dog visual sweep in BAC areas to remove obvious EO items and reduce unnecessary alerts.
- MAG and APOPO now share a standard grid box system (e.g. A1, A2, B1) for planning and reporting.
- A new daily coordination briefing ensures all teams agree on who is working where, when, and how.

Why this matters

- Less downtime for teams in the field
- Fewer unnecessary alerts
- Faster investigation of indications
- Better safety planning
- Clearer task documentation and oversight

These improvements are a direct result of field learning and joint problem-solving — and they demonstrate the value of piloting new methods carefully, with space for adaptation.

It was a turning point — the teams went from frustration to clarity in two days . . .”
— KII_4

EQ7. *What factors have facilitated or hindered the achievement of objectives?*

Key findings

7.1 Early TSD results regarding speed and accuracy are encouraging.

7.2 Comparisons cannot be done yet; identifying the most effective deployment method of TSDs for TS is the focus at this stage of the pilot.

TS dogs are working to the highest expectations, identifying explosive devices, which is proven by the validation process of each item indicated. Also, when the dogs are employed as MDD, as mine detection dogs, for operational reasons, they are fully effective as proven in the brief operational period under review in this report – March-April 2025.

As effectiveness from the operational standpoint is linked to operational efficiency – are dogs in the end reliable and faster than other methods to do TS or not? – the efficiency of using TSD is assessed in this chapter. This leads to the question, what is the most effective model of employing TSD in TS, as part of land release? Again, this is linked to efficiency but there are other factors to consider, too.

It's about the efficiency of the operation – not just speed, but also maintaining quality. The dogs allow you to either release land or to direct slower, more expensive manual deminers exactly where contamination is, rather than wasting their time elsewhere. So, it always has to be viewed as part of the process of land release – how it accelerates or improves that process . . .”

– KII_2

Provisional Efficiency Comparison Across Methods

The brief operational project period already allows provisional time comparisons between TSD teams and other commonly used assets

(manual and mechanical) across different task types, including the use of the dogs as MDDs when justified. These comparisons are based on operational estimates, informed assumptions, and preliminary data gathered through field deployment, interviews, and MAG/APOPO's prior experience in other countries.

Important Caveats:

- These comparisons are not cost-based and are not derived from finalised task data in Ukraine.
- All figures should be viewed as illustrative models, rather than definitive performance metrics.
- Operational conditions in Ukraine—especially contamination density, metal content, vegetation, and seasonal constraints—may significantly influence real-world results.

Nevertheless, these examples offer early insight into relative time-efficiency, and suggest where the TSD methodology could deliver operational gains, particularly in the technical survey and area reduction phases of land release.

Task Scenarios for Comparison

To begin building a picture of how TSD compare with other methodologies in terms of time-efficiency, this section presents three illustrative task scenarios. While full operational data from Ukraine is not yet available, these examples draw on:

- Actual tasks completed by manual or mechanical teams in Ukraine;
- Estimates of how long the same tasks would take with a TSD team, based on current deployment patterns and APOPO's global experience;
- Tasks already surveyed by TSD teams in Ukraine, with back-calculations of how long they would have taken using manual methods.⁷²

Each example is accompanied by clear workings and assumptions, including estimates of daily productivity, number of teams, and operational working days. These comparisons are not meant to be

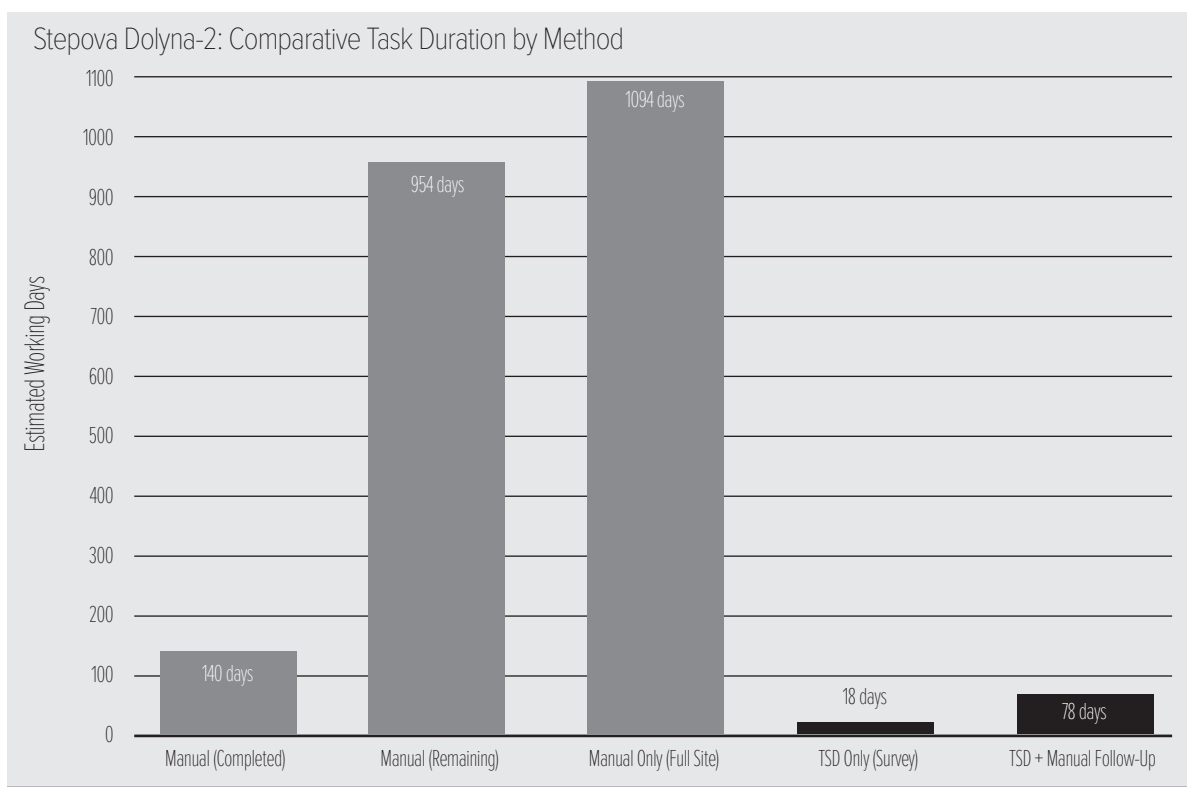


Figure 33: Example 1: Comparison of estimated working days for task site Stepova Dolyna 2 with and without dogs

exhaustive or definitive, but rather to offer indicative insight into potential efficiency gains from the TSD methodology.

The three examples are:

1. Manual Task Comparison

– A real task completed using manual deminers, with a projection of how long it would have taken using TSD followed by manual deminers.

2. TS Task Comparison

– A real task completed using dogs, with a projection of how long it would have taken using manual deminers.

3. Mechanical & Manual Asset Comparison

– A real task using mechanical and manual, with a comparison to TSD performance under similar terrain and coverage assumptions.

Example 1: Manual Task (Minefield – Stepova Dolyna 2)

This example uses real data from a minefield task site at Stepova Dolyna-2, located in a contamination setting broadly similar to where TSDs are now operating. This site was addressed using full manual

clearance, providing a useful benchmark to estimate the potential time-efficiency gains if TSDs had been used to conduct technical survey.

Task Summary

- Total area: 27,948 m²
- Cleared so far (manual): 4,107 m²
- Working days elapsed: 140
- Number of deminers: 8
- Average output per deminer per day: ~3.66 m² (primarily due to high scrap metal contamination and metal detector alerts requiring extensive excavation)

Projected Remaining Time – Manual Approach

- Remaining area: 23,841 m²
- At 3.66 m²/day/deminer → 29.3 m²/day for a full MAT (8 deminers)⁷³
- Estimated time to complete manually: ~954 working days

Projected Time Using TSD

- TSD productivity: 1,200–1,600 m²/day per team (based on recent deployment rates and handler interviews)
- Survey duration: ~18 working days to complete the entire site (assuming ~1,500 m²/day average)

- Follow-up time for indications: Assuming one team working through all dog indications at a standard rate, a maximum of 3 months is projected even in a worst-case scenario involving high alert density and slow verification.

Analysis

Even under conservative assumptions, the TSD approach could reduce task duration by over 80–85% compared to manual clearance. While TSD survey does not equate to clearance and still requires follow-up for any alerts, this example shows how:

- TSD can rapidly cover the entire area to identify areas likely contaminated,
- Manual teams can be more efficiently directed to actual targets,
- Clearance workload can be dramatically reduced by avoiding full excavation of metal-contaminated ground with no confirmed explosive hazard.

This scenario reinforces the core strength of TSDs in minefield contexts with dense metal contamination: they filter out false positives, accelerate area coverage, and improve the overall efficiency of clearance workflows. While the approach still requires robust planning, verification, and documentation, the potential time savings are substantial.

Example 2: Taborivka-1 – Integrating Mechanical and Manual Methods

Task Taborivka-1 was a suspected minefield where MAG conducted technical survey using a tiller machine. MAG was then required

to do manual follow up in the tilled area to the standard 15cm depth, metal free. In this example, we will estimate how long it would have taken TS dogs to work on this site.

Task Overview

- Total task area: 24,899 m²
- Mechanical ground preparation conducted: 7,285 m² – Duration: 10 working days
- Manual follow-up area: 1,200 m² – Duration: 10 working days

From this, we can extrapolate the following:

If the site had been suitable for TSD deployment, a single dog team—working at a rate of 1,200–1,600 m² per day—could have surveyed the entire site in 16–21 working days. With two TSD teams, that timeframe could be reduced to 8–10 working days, offering significant efficiency gains.

If TS dogs were used instead of the manual deminers for the follow-up, this would have taken around one working day and not 10.

In operational planning, sites like Taborivka-1 highlight the potential value of TSDs not just in terms of productivity, but in freeing up scarce manual teams to focus on high-risk or complex areas.

As with all examples, it is important to note that TSD operations support—but do not replace—clearance activities. Follow-up by manual teams is still required for indications.

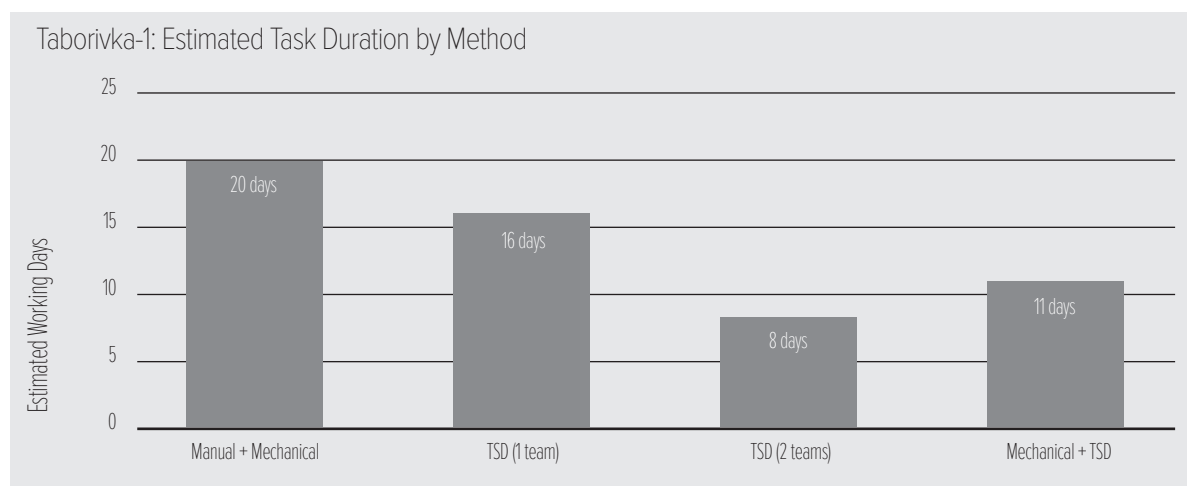


Figure 34: Example 2: Working days in Taborivka 1, comparison employing mechanical means and/or TSD teams

Example 3: Stepova Dolyna 10 & 24 – Time Savings Through TSD Deployment

This example draws on real data from two minefield task sites—Stepova Dolyna 10 and Stepova Dolyna 24—where Technical Survey Dogs (TSD) were deployed to conduct technical survey across large suspected hazardous areas. These sites offer concrete operational evidence of the potential time-efficiency gains from TSD deployment in minefield settings.

Survey Results Using TSD:

- Stepova Dolyna 10: Area surveyed: 48,484 m². Survey duration: Seven working days.
- Stepova Dolyna 24: Area surveyed: 14,382 m². Survey duration: Seven working days. Note, this task SD 24 was surveyed much more slowly by the dogs than SD10 because of a range of task specific factors. This includes saturated ground with a huge trench running through the task site, and blocked access to areas of the site. This example highlights that output predictions remain difficult, due to specific factors on task sites.

This equates to a combined 62,866 m² surveyed in 14 working days using TSDs, with handlers reporting consistent daily outputs.

Projected Duration Using Manual Teams:

To understand the time savings, we estimate how long these tasks would have taken using manual survey methods, drawing on experience from Stepova Dolyna 2 and other minefield tasks. Manual clearance rates vary significantly based on ground conditions:

- **Low productivity scenario** (3.66 m²/day per deminer): Typical in high-metal environments, based on real output at Stepova Dolyna 2.

- **Moderate productivity scenario** (10 m²/day per deminer): A conservative planning assumption in medium-complexity terrain.
- **High productivity scenario** (15 m²/day per deminer): Represents best-case conditions with minimal metal contamination.

Assuming an eight-person manual demining team, estimated durations are detailed in Figure 35 below.

These figures demonstrate that TSDs achieved in two weeks what would have taken manual teams several months—or even years—to complete, depending on ground conditions. Even in optimistic scenarios where manual teams achieve 15m² per day per deminer, the time savings are dramatic.

Consolidated Task Comparison:

Time Estimates and Efficiency Gains

Figure 36 summarises key characteristics and estimated duration for each of the three task examples presented above (Tasks SD 10 and 24 are Example 3). It offers a side-by-side comparison of actual durations, projected timelines using alternative methods, and indicative efficiency gains from the use of Technical Survey Dogs (TSDs).

- Stepova Dolyna 10: Up to 97% reduction in task duration
- Stepova Dolyna 24: Up to 94% reduction in task duration

As this pilot phase progresses, the availability of robust operational data will allow for more definitive analysis of performance, cost-effectiveness, and impact. At present, the comparative insights presented in this report are necessarily provisional—but they are far from inconclusive. Across multiple task types and terrain profiles, early evidence already points to a consistent pattern: Technical

Task	TSD Duration	Manual (3.66 m ² /day)	Manual (10 m ² /day)	Manual (15 m ² /day)
Stepova Dolyna 10	7 days	1,656 days	606 days	404 days
Stepova Dolyna 24	7 days	491 days	180 days	120 days

Figure 35: Estimated clearance durations in comparison for two task sites

Task	Total Area (m ²)	Method Used	Actual Duration (TSD or current)	Estimated Manual Duration (days)	Estimated TSD Duration (days)	Efficiency Gain (Est.)
Stepova Dolyna 2	27,948	Manual	140 (partial)	1094	18 (+ max 60 follow-up)	80-85% faster
Taborivka 1	24,899	Mechanical + Manual	20 (10+10)	200+	16-21 (or 8-10 w/2 teams)	~50% faster (for follow-up)
Stepova Dolyna 10	48,484	TSD	7	1656 / 606 / 404	7	97% faster
Stepova Dolyna 24	14,382	TSD	7	491 / 180 / 120	7	94% faster

Figure 36: Potential efficiency gains employing TSD against key characteristics and estimated duration for task examples

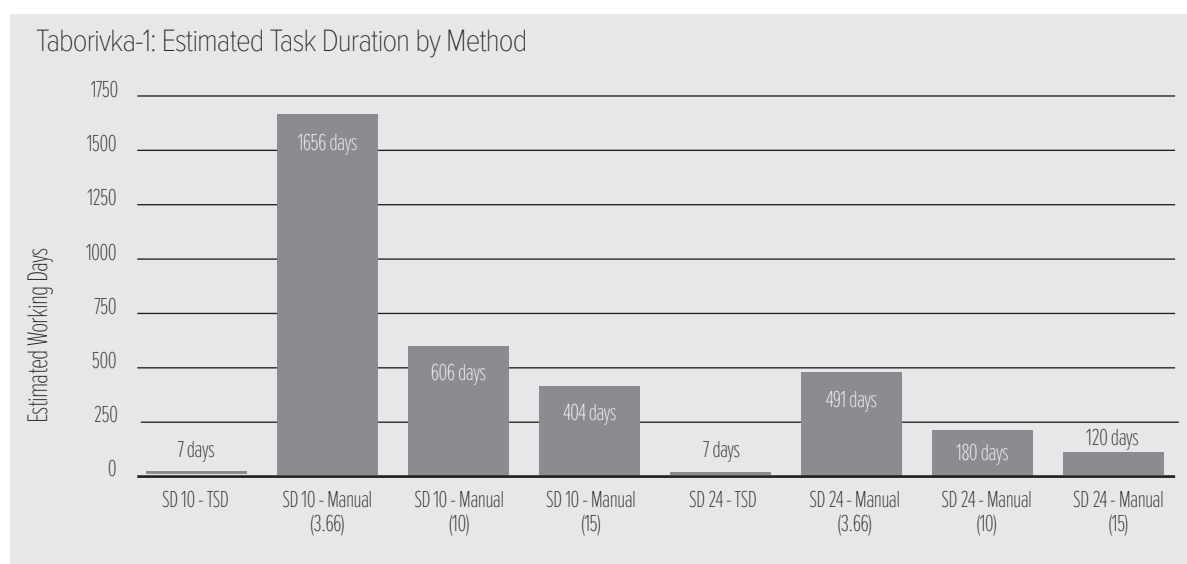


Figure 37: Comparison of differing land release methods by estimated no. of working days in Stepova Dolyna 10 and 24

Survey Dogs (TSDs) can significantly accelerate land release timelines when appropriately deployed and integrated into coordinated clearance workflows.

In environments like Ukraine—characterised by large, metal-contaminated areas, active conflict dynamics, and urgent demands for safe land access—TSDs present a scalable, high-impact solution. They do not replace other methods, but rather enhance them: filtering out false positives,⁷⁴ guiding manual assets more precisely, and enabling limited resources to be deployed more strategically. The ability of TSDs to survey tens of thousands of square metres in days

rather than months marks a step-change in how technical survey can be approached in high-priority zones. As Ukraine's mine action sector continues to grow in ambition and capacity, the strategic integration of tools like TSDs—supported by sound operational planning and national ownership—has the potential to reshape what is achievable within the current constraints of time, funding, and personnel. The case for scaling their use is strong, and growing stronger with each task completed. Comparing the efficiency of using dogs or not, in combination with other survey and clearance methods is too early for this pilot, however, some considerations are presented in *Box 8* below.

Note: Manual duration figures relate to three scenarios, (3.66, 10, and 15 m² average daily clearance depending on terrain

Box 8: Cost-benefit analysis comparing various survey and clearance methods (later)

Limitations of \$/m² Efficiency Metric

Cost-per-square-metre (\$/m²) analysis is often cited in mine action as a straightforward metric for comparing the efficiency of various demining methods. However, this evaluation does not present such a comparison for several key reasons:

1. Lack of Operational Data in Ukraine

At the time of this mid-term evaluation, no task sites in Ukraine have yet been fully completed and released using Technical Survey Dogs (TSD) as the primary methodology. While operational deployment began in March 2025 and preliminary data is being collected, the project is still in its pilot phase. Consequently, there is insufficient real-world evidence from Ukraine to accurately calculate cost efficiency using TSD, or to compare it meaningfully with manual or mechanical methods.

2. Interpretational Complexity of “Cost” in Mine Action

Even where data exists, interpreting “cost” in a standardised way across methodologies and contexts is highly complex. Different operators and projects include vastly different inputs in their cost calculations, such as:

- Whether the capital investment for mechanical assets is included, and how depreciation is handled;
- How breeding, training, and long-term upkeep of dogs and handlers are costed across multi-year periods;
- Whether support structures—such as information management, medical support, and HQ oversight—are considered part of the per-square-metre cost;
- How joint-tasking affects attribution of outputs (e.g., when manual deminers verify dog indications, or when mechanical clearance precedes TSD deployment).

These variations make direct cost-per-square-metre comparisons inherently misleading unless all methodologies are broken down and standardised—something that is beyond the scope of this pilot-phase evaluation.

3. Cost-Efficiency ≠ Cost-per-m²

TSDs contribute to cost-efficiency not simply by being “cheaper per square metre,” but by enabling smarter deployment of more resource-intensive methods. For example, dogs can rapidly identify priority areas, allowing manual demining teams to focus their time and resources where contamination is most likely. This targeted approach reduces wasted effort and accelerates safe land release.

4. Deferred Analysis at Endline

A more nuanced cost analysis will be explored in the end-of-project evaluation, once more operational data becomes available. At that stage, it may be feasible to:

- Conduct task-level comparisons using time-motion and output data;
- Examine costs per actionable signal or target confirmed;
- Assess how TSD changed the cost structure of entire land release workflows rather than isolated clearance costs.

Figure 38:
The dog is waiting for a command before it can take its toy



Efficiency

EQ8. *To what extent were projects delivered in a timely and successful manner given the resources available?*

Key findings

7.1 Accreditation despite obstacles was relatively fast, within 6 months, but delayed the operational start

8.2 Development of the TSD SOP was fast and accepted by national authorities relatively fast

8.3 TSD-teams deployment was delayed by 6 months, due to late accreditation and the winter temperatures

The available resources were used efficiently within the working constraints explained above. The core outputs were achieved, albeit with delays, mostly outside of the control of the operators MAG and APOPO.

The EU's flexibility in grant management allowed adapting to the circumstances as agile as possible. There is a body of authoritative research and analytical reports⁷⁵ confirming that flexibility in the use of donor funds—particularly the ability to reallocate budget lines and access multi-year funding—significantly enhances the effectiveness of humanitarian projects.⁷⁶ Such approaches enable humanitarian organisations to adapt more quickly to changing conditions and improve their response capacity. On one hand, the OECD DAC emphasises the importance of flexibility and adaptability in humanitarian programming.⁷⁷ Its review of evaluation criteria for humanitarian assistance highlights that the ability of programmes to adjust to evolving contexts is a key factor in their effectiveness. On the other hand, operational adaptability is only possible when there is an increase in financial flexibility and a reduction in rigid budget line restrictions.⁷⁸ However, despite broad recognition of its importance, progress toward more flexible

funding in general remains limited to this day.⁷⁹

Assessing the efficiency of project implementation requires consideration not only of classic parameters (timeliness of task execution, achievement of goals, cost-effectiveness) but also the specific conditions under which the project was implemented. In the case of Ukraine, as outlined in detail in the *Relevance* section, the pilot project for the use of Technical Survey Dogs encountered a number of objective constraints, which delayed the operational rollout by nearly a year.

Moreover, the original project design⁸⁰ did not include the cost for MAG's own demining capacity to accompany the TSD units. This decision reflected the nature of a pilot initiative, which focused primarily on testing the methodology of enhancing TS by introducing technical survey dog teams, while having demining teams covered by other donors which can complete the TS and/or assist limited full clearance.

MAG and APOPO demonstrated a high level of flexibility and coordination, securing temporary support from other donor-funded programmes. Still, both parties acknowledge that this arrangement is not sustainable and must be addressed systematically in future project stages.

Without MAG, we couldn't do anything. Without us, they'd take much longer . . .
— KII_G_A (handler)

We're still learning each other's systems, but we're doing it together."
— KII_G_M (deminer)

Given that the operational phase had only been underway for around two months at the time of the midterm evaluation, efficiency must be assessed in terms of how rationally the available resources were used and what institutional and technical foundations were laid.

1. Institutional groundwork established

Throughout 2024, the project successfully completed key preparatory activities: kennels and training base were constructed and equipped, handlers and dogs were trained and accredited, SOPs were developed and endorsed, and cooperation was established with NMAC, SESU and other Ukrainian local entities. These achievements are essential to ensuring the long-term sustainability and scalability of the initiative.

2. Infrastructure and logistical constraints

Ukraine lacks specialised infrastructure for housing mine detection/TS dogs. According to respondents, identifying a functional kennel in Mykolaiv was a matter of dedication, perseverance and a bit of luck. However, parts of the facility's condition require renovation, which entails additional expenditure.⁸¹ The absence of 24/7 veterinary services can create difficulties—especially critical in emergencies, such as when night-time treatment is needed. However, all APOPO staff are trained in basic animal first aid, one handler has some veterinarian qualifications, APOPO has two contracted vet facilities in Mykolaiv and is introducing its own veterinarian, under other donor funding, in July 2025.

These are just two examples demonstrating that critical operational needs continuously emerge during project implementation and

cannot be fully anticipated at the planning stage. Given the context of Ukraine, with its ongoing war, limited local infrastructure, and unstable logistical environment, it is simply not possible to pre-calculate all the resources required to address operational challenges in advance.

As such, unplanned needs like emergency veterinary care or urgent facility repairs become recurring demands on the project's resource base. This reinforces the importance of an adaptive budget model that can accommodate real-time priorities - rather than assuming static cost structures.

3. Operational expenses

Operating costs in Ukraine are highly variable due to the unpredictability of external conditions, including extreme weather and the security situation. In these circumstances, as an example, field operations require regular replacement of protective gear, particularly Personal Protective Equipment (PPE), uniforms and boots.

Heavy use under hot, rainy, dusty, and rough terrain—combined with constant outdoor deployment—accelerates wear and tear. A single set of field clothing can lose its functional properties in as little as six months. Moreover, Ukraine's dramatic seasonal temperature shifts necessitate multiple sets of clothing and footwear for summer, autumn,



Figure 39: Facilities of the kennelling centre in Mykolaiv that need to be renovated



Figure 40: Handlers bandage a dog's paw

Box 9: Efficiency Evaluation – Key Takeaways

Context:

Ukraine TSD Project (Pilot phase, high external uncertainty linked to security)

Facts:

- Project operational start delayed by six months due to objective external constraints
- Resources invested in institutional and operational foundations
- EU donor provided 20% budget flexibility → smoother response to emerging needs
- Adaptive management and strong inter-agency coordination ensured progress
- Continuous challenges: staff turnover, infrastructure gaps, operational risks, bureaucratic delays → required constant adjustments and flexible planning

Conclusion:

Efficiency = building a functioning, scalable model under extreme uncertainty.

Flexible donor funding + rapid adaptability = key success factors.

winter, and spring—adding to procurement and logistical burdens.

International guidelines validate the time sensitivity and logistical fragility of such expenses. IMAS 10.30 mandates regular inspection and replacement of PPE when protection is compromised.⁸² According to occupational safety standards⁸³ (EN ISO 11612 and EN ISO 11611) and leading equipment providers,⁸⁴ protective clothing in high-intensity environments may last only a few months, while boots typically require replacement every 6–12 months depending on terrain and operational use.

Field equipment—including radios, GPS devices, and communications tools—is also prone to failure. These devices are inherently vulnerable to wear and tear, and frequent relocations, overheating, and dust exposure further reduce durability. Such costs are difficult to predict during planning, especially in a pilot phase, but they are critical for operational continuity and must be treated as core elements of the project's adaptive budget—not as unforeseen overhead.

4. Staff turnover and retention

Training qualified personnel requires substantial time and financial investment. However, staff retention in Ukraine remains

limited due to objective constraints.

The country's human resource (HR) capacity is restricted by the ongoing war: most men are subject to conscription and are not allowed to leave the country. This makes it impossible for them to participate in overseas training—such as APOPO's handler training in Cambodia. As a result, APOPO initially focused on recruiting and training women as dog handlers.

Still, of the 12 women who completed APOPO's initial training programme in Cambodia (November 2023 to March 2024), six left the organisation upon completion of the training for a variety of reasons. Even with high-quality training and accreditation, there is no guarantee that trained staff will remain with the project long term.

It is important to emphasise that staff turnover is not unique to this project. It is a common phenomenon in humanitarian programming—particularly in unstable contexts like conflict zones.⁸⁵ Resignations are often driven by personal, family, psychological, or economic factors unrelated to the project's design or management. This necessitates constant monitoring of the staffing situation, flexibility in HR management, and adaptive planning for recruitment and retention.

Sustainability

EQ9. *To what extent does the project contribute to the development of national capacity in humanitarian demining?*

Key findings

9.1 The project’s integration into national processes, cross-level coordination, and support from Ukrainian authorities created a strong foundation for the institutionalisation and further expansion of the methodology, and established the conditions for expansion beyond this pilot project.

9.2 By training Ukrainian handlers and deminers, the project has contributed to increased national ownership and capacity retention in line with Ukraine’s mine action policies.

The OECD-DAC evaluation methodology addresses a comprehensive set of issues regarding the long-term sustainability⁸⁶ of interventions. It requires the assessment of the financial, institutional, social, and environmental durability of results and their resilience to risks.

DAC guidelines emphasise that sustainability is as critical as immediate effectiveness: the ultimate value of any intervention depends on whether its benefits can be maintained and scaled up over time.

National sustainable mine action capacities

Ukraine is making significant efforts to build its own sustainable and professional humanitarian mine action system. This direction is embedded in national policy and strategy, supported by international donors, and implemented through practical, project-level actions (see *Figure 41 for detail*).

According to data provided by Ukrainian authorities, over USD 700 million has been committed by international partners for humanitarian demining projects in Ukraine for the period 2022–2027. Among the key contributors are the United States, Switzerland, Norway, Japan, and various EU countries, including Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Lithuania, Luxembourg, the Netherlands, Poland, Spain, Sweden, and the United Kingdom.⁸⁷ Their assistance extends beyond immediate mine clearance, risk education and victim assistance to encompass the development of institutional sustainability within the sector. Key areas of focus include training Ukrainian specialists, supporting local operators, establishing training infrastructure, and disseminating best practices at the national level.

Ukraine is a country that's taking good ideas and then nationalising those good ideas. So, like, for instance, we brought in a machine called the Robocut machine. Ukraine has already made their own version

Operational Plan for 2024–2026	National Mine Action Strategy ⁸⁹
➤ Development of National Standards ➤ Training Centres and Personnel Development ➤ Technology Adoption ➤ Infrastructure Expansion	Outlines the commitment to developing national capacity — including the creation of national standards, training centres, personnel development programmes, technology adoption, and infrastructure expansion. National authorities (in particular, NMAC ⁹⁰) are actively involved in the evaluation and accreditation of operators, collaborate with international partners, send representatives for training abroad, ⁹¹ and gradually adapt international practices to the Ukrainian context. ⁹²

Figure 41: National Mine Action Capacity Development Plan, 2024–2026

of the Robocut machine.⁸⁸ [...] I think there is very much the opportunity and chance that Ukraine will do this in future with the dog school. [...] They [Ukrainian authorities] will probably see this dog technology, see the value of it and start developing their own national capacities with it... Any nationalisation or even integration at national level will take time to train not only the dogs, but handlers and management staff of it. But it definitely should be there ...”

– KII_2

MAG and APOPO contributed to enhancing Ukraine’s mine action capacities in relation to the use of ADS, by February 2024, hosting a delegation from the Ukrainian government in Cambodia. The visit introduced Ukrainian officials from the Ministry of Defence and the State Emergency Services to MAG’s mechanical assets and APOPO’s TSD methodology. The delegation visited operational sites and met with representatives from the Cambodian authorities to discuss land release approaches and challenges.

The TSD project has laid the institutional groundwork for the application of the methodology in Ukraine. All dog handlers involved in the operation are Ukrainian personnel. Senior staff are international for the time being. APOPO trained an initial group of 12 women in Cambodia in 2023/24, followed by a second course held in Krasylivka, Ukraine, involving male and female students (June-September 2024) and a third training course for male and female handlers in Cambodia between January-April 2025. The handler training lasts 14-16 weeks in accordance with IMAS competencies for animals handlers listed in 07.31/2022. All participants were certified, including the subsequent completion of mandatory deminer courses within Ukraine.

During February 2025 the first two Ukrainian handlers participated in a TSD-MDD Team Leader Course held in APOPO’s DTC in Cambodia. The handlers were certified and returned to Ukraine to continue working with their dogs, with the aim of being promoted to Team Leaders in the 2026 working season.



Figure 42:
Ukrainian
delegation
in Cambodia
meeting MAG
and APOPO staff
– February 2024

In addition, the project has contributed to the development of training infrastructure by covering some operating costs of the DTC. APOPO, with other resources, is currently establishing two additional training areas in Mykolaiv and Kharkiv Oblasts, which would be open to other operators (such as NPA, SESU, and others). This initiative creates important preconditions for the nationalisation of the dog training methodology within Ukraine.

“We don’t see two organisations — we see one project. That is why we supported it ...”

— NMAC Representative

It is important to emphasise that all practical and theoretical knowledge developed during the project remains in Ukraine. The handlers continue to work with the same dogs they trained with and have become carriers of unique expertise. Some of them have already been selected for further training in Cambodia as potential team leaders. Thus, the project not only operates for Ukraine, but also actively develops Ukrainian professionals who will be able to advance this practice independently in the future.

The project aligns closely with Ukraine’s national mine action strategy and donor expectations. It not only addresses immediate technical survey needs but also actively contributes to the sustainable development of the country’s humanitarian mine action

sector, particularly through the innovative use of mine detection/TS dogs. By transferring knowledge, training personnel, establishing infrastructure, and adapting international best practices, the project lays a solid foundation for Ukraine's independent and resilient mine action capabilities.

The dogs are trained, accredited, controlled. That matters to us. It's not someone just dropping in new technology . . ."

— SESU Interviewee

The objectively high demand for accelerated technical survey, considering the scale of contamination across Ukrainian territory, supports the high demand for testing and promoting the use of TS dogs.

The fact that the project followed formal SOP development, national accreditation, and operational integration with manual teams was cited as a major reason for institutional support. Stakeholders described it as “pragmatic innovation” — aligned with national needs and implemented with care.

In the context of this project, a link between

short-term financial stability and long-term institutional development was observed:

➤ **Economic stability as a foundation for institutional development**

Salary payments and direct project investments create (at least for the short term) a stable environment for local specialists to build professional expertise and skills in humanitarian mine action.

➤ **Building human resources and national ownership**

Project staff are potential future team leaders, instructors, and mentors within the national system. This process facilitates the gradual shift from external management to sustainable national control.

➤ **Integrating short-term results into long-term strategies**

The project generates tangible benefits, including job creation, increased incomes, and local economic impact. These outcomes incentivise the government to integrate project mechanisms into national mine action programmes and promote localisation of practices.



Figure 43: Ukrainian dog handlers being trained in Cambodia in 2024



Figure 44: Manual demining

➤ Viewing sustainability as a dynamic process

If sustainability is seen not as an endpoint but as an evolving process, it becomes evident that short-term financial stability serves as the foundation for future institutional sustainability. By delivering immediate economic benefits, the project has laid a solid basis for building long-term national capacity in humanitarian mine action.

Thus, a shared logic emerges: financial stability today shapes institutional sustainability tomorrow.

Diverging understanding of what is meant by sustainability

The evaluation identified an additional dimension of sustainability understanding—the perceptions of MAG and APOPO staff regarding the concept. The analysis revealed notable differences in how sustainability was interpreted across different staff groups.

Field personnel emphasise immediate socioeconomic impact and service to the

country, while management focuses on systemic transformation, donor engagement, and long-term institutional development. Both groups share a commitment to professionalisation and knowledge transfer (See Box 10 for detail).

In Mine Action, we talk about a toolbox approach — we have many different assets we can use: mechanical tools, human teams, dogs, drones, and so on. Right now, agriculture is clearly Ukraine's top priority in terms of reopening the economy and generating income, and that's where all these tools, including dogs, are being prioritised. But once those priorities are addressed, I'm confident dogs will be valuable in other parts of the sector as well. For example, in forested areas where there was fighting, you face challenges like booby traps and tripwires, which are especially difficult for dogs. So, you'll need mechanical tools along with dogs to manage clearance. But yes — there will definitely be use for dogs beyond agricultural land."

– KII_10

Box 10: Staff perceptions on Sustainability

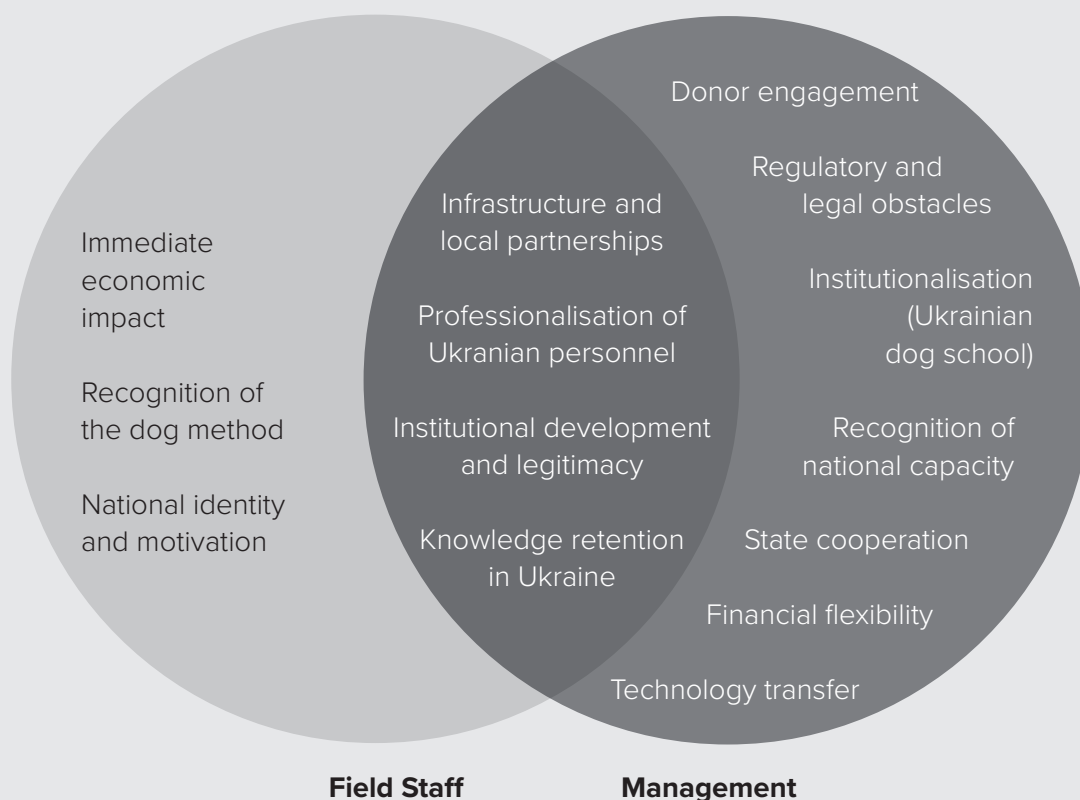
Dialogue Field Staff vs Management: Interpretations of Sustainability

Field staff emphasise the practical contribution: personal motivation, service to the country, and immediate economic impact.

In contrast, **management** focuses on institutional change, regulatory frameworks, donor engagement, and long-term systemic solutions.

At the same time, themes such as knowledge transfer and professionalisation remain common ground, forming points of alignment between the two groups.

Perception of Sustainability: Shared and Distinct Themes



Cognitive analysis: Divergent Perceptions of Sustainability:

Field staff perspective – Practical and immediate contributions. Focus on personal motivation, job creation, and direct economic benefit.

“The project creates jobs already today. People receive salaries and spend them here, in the country — this money instantly works for the economy. Even if, one day, things don’t go in our favour, the funds won’t be wasted: they help people survive right now . . .”

— KII_FGD_A

Management perspective – Institutional and long-term vision. Focus on regulatory frameworks, donor strategies, and national ownership.

“Ukraine is a country that’s taking good ideas and then nationalising those good ideas. So, I think there is very much the opportunity and chance that Ukraine will do this in future with the dog school . . .”

— KII_2

4. Lessons Learned

Note, to avoid repetition this chapter contains additional technical information not covered in the report elsewhere. Nine lessons are presented and specific recommendations made, many of which are not repeated in the final chapter *Recommendations*.



1 The Reductive Logic of Ratios: Context, Not Count, Should Guide TSD–Manual Team Deployment

Lesson

The assumption that an optimal ratio of Technical Survey Dogs (TSDs) to manual demining teams can be defined as a fixed metric has proven reductive and too simplistic. Experience from the Ukraine pilot shows that productivity and operational flow are highly context-dependent, shaped not only by contamination type but also by environmental conditions, working hours, terrain, and the maturity of inter-agency coordination. The most significant safety requirement — and the only non-negotiable co-deployment condition — is the ability to provide CASEVAC support. Beyond this, the need for immediate manual follow-up varies, and should be informed by actual indication density and environmental conditions, not prescriptive staffing models.

Recommendation

Reframe task planning away from team ratios and toward dynamic, context-informed deployment. Integrate contamination-specific planning, real-time coordination, and CASEVAC-specific guidance into task documentation. For example, while TS Dog deployment needs to be planned to have CASEVAC capacity at all times, manual follow up might happen largely at the same time as dogs are present, with teams funded by the same donor, but it can also happen, (i) when dogs have moved off site during hot hours, (ii) when dogs have moved onto a different site, (iii) when the amount of indications means another manual team from another donor can follow up. Where needed, decouple TSD and manual team funding — provided reporting and safety responsibilities are clear and joint task ownership is respected.

2 Site Planning Must Be Contamination-Specific: Minefields ≠ BAC

Lesson

Operational effectiveness is heavily contingent on selecting the appropriate methodology based on contamination type. In the Ukraine pilot, two critical issues emerged:

- The misapplication of indication excavation methods on BAC sites where visual clearance or surface preparation would have sufficed; and
- The frequent shift of TSDs into MDD roles, especially on minefield tasks, which inadvertently reduced efficiency and blurred reporting lines.

In minefield environments (e.g., Stepova Dolyna 10 and 24), deeply buried threats justified the use of 2x2m “box excavation” following TSD indications. However, the same methodology was applied on BAC tasks — despite much of the threat being surface-based. This increased workload unnecessarily and delayed follow-up.

Concurrently, TSDs were often deployed in MDD mode to open access lanes or fill capacity gaps. While technically feasible (TSDs are trained in both roles), MDD-mode deployment is done on shorter range, slower double verification, and 100% coverage — diverging from TSD methodology, which is faster, sample-based, and suited to area reduction.

Recommendation

- Integrate the Technical Note on excavation methodologies into SOPs, with a clear decision-tree separating BAC and minefield task procedures. Emphasize visual clearance prior to dog deployment on BAC tasks and box excavation only where appropriate.
- Minimise the use of TSDs in MDD mode except when operationally essential and track these instances separately in reports.
- Develop internal joint guidance between MAG and APOPO to define:
 - » When TSDs can be temporarily reassigned as MDDs
 - » How this is reported
 - » What impact this has on outputs and contractual obligations

- Ultimately, both contamination type and methodology must be treated as linked operational variables. Adapting deployment



Figure 45: Paramedic and ambulance in Stepova Dolyna, Mykolaiv region

logic to match context will not only improve efficiency and accuracy, but also protect the integrity of TSD pilot data and future funding models.

3 Scent Dissipation and Indication Variability Over Time

Lesson

While explosives contained in a one-piece sealed item will continue to produce vapour and stay detectable for decades, the explosive residue in exposed EO fragments does not remain constant over time. Its detectability is influenced by how long ago the contamination occurred, soil type, climate, and previous ground disturbance. Indication density is not an indicator of efficiency but a reflection of context.

Recommendation

Incorporate contamination age and scent retention factors into pre-deployment assessments. Plan excavation capacity not just based on hectares covered, but on predicted indication density using variables such as explosive type, site history, soil permeability, and weather conditions.

4 Output Attribution: Shared Work, Shared Credit

Lesson

Output metrics remain a key driver for both operators and donors. However, current models used in the Ukraine pilot fail to reflect the shared and sequenced nature of Technical Survey Dog (TSD) and manual team deployments. A common example is when APOPO's TSD teams generate indication points that MAG's manual teams subsequently excavate — yet only the square metres physically cleared are credited to the manual team, despite the initial detection and task generation being enabled by TSDs.

Moreover, there is no formal IMAS guidance on how to apportion area reduction outputs when multiple assets contribute to a single operational output. This creates ambiguity, risks under-reporting of Manual Demining, and undermines incentives for collaboration. For instance, in some cases, TSDs may cover a large area and generate relatively few indications, leading to a smaller volume of excavated square metres by manual teams.

In others, high indication density may result in TSDs being constrained by the pace of manual follow-up. In both cases, the manual team's square metre output alone does not reflect the total area reduced or the combined value of TSD-supported operations.

Recommendation

MAG and APOPO should jointly develop a transparent output attribution protocol that:

- Reflects shared contribution to area reduction, not just indication excavation
- Establishes a proportional system for crediting both TSD and manual teamwork

This could involve assigning a share of the overall area reduced (e.g., based on box coverage or indication clusters, or time spent working on site) to both actors, and explicitly documenting joint task ownership in reporting.

Such a protocol will ensure that:

- Contributions of both TSDs and manual follow-up teams are equitably recognised
- Double counting is avoided
- Donors and national authorities receive an accurate reflection of productivity and partnership dynamics

A well-designed attribution framework would also serve as a model for other operators deploying mixed-method land release approaches, especially in high-tempo or resource-limited environments like Ukraine.

5 Coordination and Operational Integration

Lesson

Joint operations suffered from inconsistent planning tools, unclear field marking protocols, and a lack of shared situational awareness. Most notably, the permissible spread of teams for CASEVAC coverage was never formally clarified, causing operational uncertainty.

Recommendation

Develop a Joint Operations Annex to guide

coordination in the field. This should include:

- Daily shared briefings
- Field marking standards
- Handover procedures for indications
- Clear rules for CASEVAC radius, team dispersion, and communication lines

6 Operational Risks: Wind, Demolitions, and Trust in Decision-Making

Lesson

Dogs are highly sensitive to scent disruptions caused by high winds or demolitions nearby. These factors not only invalidate survey work but require immediate joint decisions to suspend operations. The trust between MAG and APOPO must include shared authority over operational “go/no-go” decisions, especially as task ownership remains with MAG.

Recommendation

Establish a joint weather and contamination response protocol to:

- Pause work in high-wind or post-demolition conditions
- Share responsibility for halting/resuming operations
- Record and justify all suspensions in a joint incident log

This approach will ensure operational integrity, uphold safety standards, and build mutual trust in high-risk environments.

7 Work Hours, Team Welfare, and Deployment Models

Lesson

TSD teams adapt better when housed near task sites, enabling flexible work hours during cooler periods. MAG teams faced constraints due to transport time, curfews, and domestic responsibilities — reducing overlap and real-time coordination with handlers.

Recommendation

MAG and APOPO should coordinate working patterns and staff residencies realistically in advance of project design to reflect different working protocols



Figure 46: A handler and her dog on the way to training, Krasylivka DTC

8 Structured Problem-Solving and Escalation

Lesson

Tensions over roles, markings, and methodologies were not always resolved due to not following the agreed escalation pathways. This led to delays and operational inefficiencies.

Recommendation

- Review and enforce a three-tiered escalation pathway:
 - » Level 1: TFM to TFM resolution in the field
 - » Level 2: CD/TOM–PM resolution
 - » Level 3: HQ-level arbitration

All issues should be logged, tracked, and reviewed monthly to identify systemic patterns.

9 National Standards and Institutional Learning

Lesson

The pilot demonstrated the viability of TSD operations but also highlighted policy and coordination gaps in Ukraine's evolving mine action sector. Lessons on methodology, planning, attribution, and inter-agency operations should be institutionalised.

Recommendation

MAG and APOPO should jointly submit:

- A technical briefing note to the NMAC based on pilot findings
- A proposal to integrate TSD-specific guidance into the National Mine Action Standards (NMAS), including methodology sequencing, operational integration, and data attribution models

This will support broader adoption of evidence-based good practice across the sector.

5. Conclusion



The use of technical survey dogs (TSDs) in this new geographic context has demonstrated its relevance, coherence, and effectiveness, with strong potential for scaling up under Ukrainian conditions. Systematic integration of this approach in future project phases, along with the potential development of national dog breeding and training infrastructure, could significantly improve the efficiency and sustainability of humanitarian clearance operations across Ukraine.

Relevance: The project is highly relevant to Ukraine's demining priorities, with its objectives seamlessly aligned with national goals and directly supporting national authorities to achieve those objectives. The pilot phase has been instrumental in understanding specific contextual and operational challenges and constraints and adapt the approach before expanding operations.

Coherence: Introducing efficient and effective ways of conducting technical survey as part of Ukraine's massive task of releasing EO contaminated areas is coherent with the national MA strategy to expedite technical survey. The project involving the use of TS dogs in Ukraine, requires a coherent technical approach to integrate TS-teams with demining/BAC teams. It represents a strategically sound and operationally valuable preparatory phase for further expansion in the country. It improves operational efficiency but requires further integration, strong coordination and collaboration, and the reinforcement of trust among all project stakeholders in order to achieve sustainable land release outcomes.

Coordination with national authorities and collaboration between MAG and APOPO is fundamental for the project's success. To further increase collaboration between MAG and APOPO, to work coherently as operating partners, it is necessary to continue building transparent communication channels, joint procedures, and a shared culture of collaboration.

Effectiveness: The project has in a very brief operational phase demonstrated that the TSD

methodology has potential as an effective TS approach to enhance the efficiency of humanitarian demining in the Ukrainian context. Factors affecting effectiveness, if external (such as inclement weather or security risks, e.g., military activity near task sites, delays in GPS signal availability, also SESU demolitions⁹³), require adaptability and flexibility from the teams.

If the factors are internal (such as inter-team coordination on deployment timing, quality of planning, and logistics), they must be systematically addressed, including revising coordination processes, improving management quality, and optimising project design. As of the preparation of this report, various modes for TSD deployment are being tested in Ukraine in order to identify various options how dogs can accelerate survey in different contamination settings, combining mechanical, and manual survey and clearance tools.

Efficiency: While delays were experienced — particularly in accreditation and tasking — the teams adapted rapidly, relocating operations, re-sequencing activities, and maintaining progress despite external constraints. The project's flexibility in a volatile operating environment is a key asset.

Comparing the use of TSD in TS processes in Ukraine against other TS processes in use may seem premature; however, the field scenarios presented show significant potential in time efficiency.

Sustainability: The project is actively contributing to national capacity development, particularly through support to the accreditation and regulation of Animal Detection Systems (ADS) by Ukrainian authorities. Through the training of Ukrainian specialists, the creation of training infrastructure, inclusion in national procedures, and recognition at the governmental level, a solid base has been laid for the institutionalisation and future scale-up of the TSD methodology. The long-term sustainability of TSD use will depend on continued institutional engagement and investment beyond the pilot.

6. Recommendations



With few months left until 31 October 2025 to conclude this project, the following recommendations can be made, many of which may not be achievable within this short timeframe but are relevant for the longer term.

For MAG and APOPO

- Continue testing the use of TSD-teams in various scenarios.
- Invest into collaboration to continue seeking the most effective and efficient ways to use mine detection/TS dogs in Ukraine.⁹⁴
- Strengthen team cohesion between MAG and APOPO.
- Aim to allocate funding for integrated teams, covering also the manual clearance teams in future phases of the project.
- Conduct a comparative analysis of the effectiveness of TS teams in TS and land release. It is important to consider operational costs as part of the effectiveness evaluation.
- Engage actively with national authorities: organize workshops, field visits for NMAC and other stakeholders to ensure practical recognition of the methodology's effectiveness.

For the Donor

- Consider the success of the pilot phase as a basis for an extension and/or expansion and scaling up.

- Continue funding pilot initiatives, such as this TSD-project with the flexibility demonstrated.
- Advocate for continued support to mine action, including the use of TSDs, in relevant for a and when interacting with relevant stakeholders including the EU member states.
- Promote among other donors the importance of flexible funding, which enhances the impact of investments, reduces administrative delays, and increases responsiveness in humanitarian missions.

For Other Stakeholders

- Consider using TSD-teams as part of the land release toolbox.
- Promote team cohesion as a critical operational factor.
- Explore the possibility of a 10-day pilot trial in the training field or a low risk area (considering TSD/MDD mode will start to operate after seven days after ground preparation), in partnership with other donors, combining three methodologies: mechanical ground preparation + technical survey by dogs + manual excavation of detected targets, with clear measurement of results.

Annexes

Annex 1: Terms of Reference

Mid-Term Evaluation on the Progress of The Mines Advisory Group's Project "Innovative Approaches to Mine Action in Ukraine: Use of Technical Survey Dogs to Expedite Land Release" in Partnership with APOPO, Funded by the EU.

Introduction

Evaluation Overview

The Mines Advisory Group (MAG) Monitoring Evaluation Accountability and Learning (MEAL) team will prepare a mid-term evaluation report for the project "Innovative Approaches to Mine Action in Ukraine: Use of Technical Survey Dogs to Expedite Land Release" implemented by MAG in partnership with Anti-Persoonsmijnen Ontmijnende Product Ontwikkeling (APOPO), funded by the European Union's Service for Foreign Policy Instruments (EU-FPI).

The evaluation will assess the effectiveness of the Technical Survey Dog (TSD) method in Ukraine and provide recommendations to inform the continuation of the project. The evaluation is scheduled to take place in April and May 2025, and the finalised mid-term report should be submitted to the donor no later than May 29, 2025.

About the EU-FPI

The European Union Service for Foreign Policy Instruments (EU-FPI) is a body within the European Commission responsible for implementing the EU's external policy initiatives. It funds and coordinates projects aimed at strengthening security, supporting stability, and addressing humanitarian needs in partner countries.

As the key donor of the project, EU-FPI provides financial and technical support for demining and safety enhancement efforts in Ukraine. It facilitates the adoption of advanced methods in humanitarian demining, including TSD technology, to improve the efficiency and safety of land clearance operations. Through EU-FPI, the European Union can respond swiftly to crises and implement initiatives that mitigate threats in conflict-affected regions.

EU Support for MAG and APOPO in Ukraine

The EU has provided support to MAG and APOPO for the TSD project in Ukraine from May 1, 2024, for a period of 18 months, until 30 October 2025.

Through the EU-FPI, the European Commission funds the project "Innovative Approaches to Mine Action in Ukraine", implemented by MAG in partnership with APOPO. The project focuses on the deployment of TSDs to accelerate the survey of areas contaminated with landmines and other explosive hazards. The EU support includes funding for TSD team deployment, development of National Standards for their use, and MEAL to assess the effectiveness of the method. Through this project, the EU contributes to humanitarian demining, supports national authorities in mine action management, and integrates innovative solutions into this process.

Brief description of the project

Through this project, MAG, in partnership with APOPO, will deploy TSDs to identify and confirm land contaminated by explosive ordnance. The project aims to efficiently survey and where required clear land for safe use, supporting Ukraine's agricultural recovery. Key activities include surveying land, evaluating TSD effectiveness, and building the capacity of the National Mine Action Authority (NMAA) to manage and regulate animal detection systems. The project aligns with EU's goals to improve mine action, enhance local capacities, and support Ukraine's recovery.

The deployment of TSDs in Ukraine introduces an innovative, efficient, and cost-effective method for addressing land contamination caused by EO. As TSDs have not been previously used in Ukraine, this project seeks to demonstrate their efficiency and effectiveness, with plans for

future scaling up in alignment with Ukraine's National Mine Action Strategy. The project is initially focused on supporting MAG's operations in Kharkiv and Mykolaiv but also collaborating with other mine action actors to maximize the deployment of TSDs across the country. MAG coordinates and manages the project, ensuring information management and reporting is coordinated. APOPO contributes its expertise by training two TSD teams supervised by a TFM, to operate in Ukraine. Post technical survey utilising TSD, MAG's manual teams will conduct follow-up clearance activities where required.

Project Duration

The total project duration is from **1 May 2024 to 30 October 2025**. The evaluation will cover a **one-year period** of project implementation [De facto included outputs of operational months May and June 2025].

Project Funding

The project has a **budget of €2,000,000**, covering an 18-month period. MAG is the lead implementing partner, while APOPO serves as the technical partner responsible for TSD implementation, which is being introduced in Ukraine for the first time.

Project Objectives, Outcomes, and Impact

Project Objectives:

- Accelerate the Land Release Process – Deploying Technical Survey Dogs (TSD) to expedite the identification of mine-contaminated areas, enabling the swift return of land for humanitarian and economic use.
- Enhance the Efficiency of Humanitarian Mine Action – Utilising TSD in combination with other methodologies to precisely locate explosive ordnance contamination.
- Develop National Capacity – Supporting Ukrainian authorities (NMAA, NMAC) in establishing standards and procedures for TSD deployment, training personnel, and integrating this methodology into the national mine action system.
- Ensure Safety and Facilitate Post-Conflict

Recovery – Releasing land for agriculture, infrastructure, and the safe return of affected communities.

- Monitoring and Evaluation of TSD Effectiveness – Establishing a comprehensive MEAL framework to assess the impact of TSD activities and provide data-driven recommendations for future implementation.

The **overall impact** which MAG, in partnership with APOPO, seeks to contribute towards is an improved socio-economic situation in the regions of Kharkiv and Mykolaiv through clearance operations and land release to increase safe access to key infrastructure and agricultural areas. In order to do so, land must be made available for MAG and other operators to be able to undertake clearance operations. This will be done through the achievement of **three key outcomes**, which are:

- Sustainable nationally owned mine action through improved governance and with increased local implementation
- Safe and productive land allows freedom of movement to improved livelihoods, basic services, and natural resources
- Risk of harm reduced through safer behaviour and clearance

Scope of Evaluation

Evaluation Objectives and Stages of Project Development

The evaluation will assess the impact, effectiveness, and cross-cutting outcomes of TSD activities in mine action in Ukraine, with a focus on the following stages of project development:

- Establishment and initiation of the TSD project: Examining the initial setup and initiation phase of the TSD project in Ukraine.
- Project development and key challenges: Analysing the development process, identifying challenges faced, and the strategies employed to address them.
- Actual results at the time of report preparation: Evaluating the tangible outcomes achieved up until the report's preparation.

- Effectiveness of the applied TSD methodology: Assessing how well the TSD methodology has been applied and its effectiveness in the context of Ukrainian mine action.
- Progress towards achieving project objectives: Reviewing the progress made toward meeting the established project goals and objectives.
- Project sustainability and long-term viability: Exploring the sustainability of the project and its long-term viability in terms of continued success and impact.
- number and type of methods to use
- Suggesting short-, medium-, and long-term strategies for TSD deployment in Ukraine
- Identifying instances where TSDs should be used as alternative forms of TS, particularly in high mental contamination areas (e.g. pylons)
- Testing the effectiveness of TSDs in critical infrastructure environments, such as roadsides, where relevant

This comprehensive approach will provide a thorough evaluation of the project's outcomes and future directions.

In addition, the evaluation will provide insights on:

- Establishing criteria for when TSDs should be deployed compared to other methodologies
- Evaluating coordination efforts with other stakeholders
- Analysing the cost-effectiveness of the intervention
- Providing recommendations for scaling up the activities, including the optimum

Research Questions and Evaluation Criteria

Following the evaluation criteria of the OECD Development Cooperation Directorate, the current assessment aims to cover five out of six evaluation criteria, as well as the criterion of collaboration and coordination.

The evaluation is designed to address the research questions below:

Criteria	Evaluation questions
Relevance	To what extent does the project align with and respond to national demining priorities and the current context in Ukraine?
	To what extent has the project been adapted in response to the conditions in which it is being delivered?
Coherence	How does the TSD project integrate with other technical survey methods?
	How well is coordination ensured with local and international entities?
Effectiveness	To what extent did the programme achieve (or not achieve) intended outcomes and outputs – in line with the proposed approach and MAG's HMA Theory of Change?
	What factors have facilitated or hindered the achievement of objectives?
	How effective is the use of TSD compared to other demining methods?
Efficiency	To what extent were projects delivered in a timely and successful manner given the resources available?
Sustainability	To what extent does the project contribute to the development of national capacity in humanitarian demining?

Methodology

In preparing this mid-term evaluation report, a data triangulation of qualitative and quantitative methods is proposed, which involves cross-referencing data from different sources.

Data Collection

This report will utilise data obtained from the following sources:

- **Desk Analysis** (proposal and signed contract, reports for the evaluation period from MAG and APOPO)
- **Structured Interviews** 30-min length with MAG and APOPO management, as well as group interviews with handlers and deminer teams.
- **Operational Data** provided by the

Information Management team and TOM team for analyzing actual results and the effectiveness of TSD methods.

Data Analysis

Since the project is ongoing and in the implementation phase, the following analytical methods are proposed for the mid-term report:

- Document/Desk Analysis
- **Thematic Analysis** of Interviews (identifying key themes and patterns in respondents' answers to gain deeper insights and recognize recurring motifs).
- **Comparative Analysis** (applied to real-time quantitative indicators to assess the effectiveness of TSD technology).

Timeline	w/c 24 March	w/c 31 March	w/c 7 April	w/c 14 April	w/c 21 April	w/c 28 April	w/c 5 May	w/c 12 May	w/c 19 May	w/c 26 May	5 June
ToR development and finalisation											
Preparation of report template and drafting of background context section											
MEAL Officer field visit to Mykolaiv											
Group interviews with handler team and deminer teams											
Interviews with APOPO staff											
Interviews with MAG staff											
Desk assessment of existing operational data											
Analysis of primary and secondary data											
First draft of evaluation report											
Review and feedback by MAG and APOPO											
Revision of evaluation report addressing feedback											
Hard deadline to submit the final evaluation report to the donor											

Proposed Report Structure

The mid-term evaluation report will be presented as the outcome of this assessment. The report is expected to be between 15 and 20 pages (including photos, tables, and references) and will generally follow this structure:

Table of Contents

Acronyms

Report Objective

Summary

1. Background and Context:
 - 1.1. Situation in Ukraine
 - 1.2. MAG and APOPO Collaboration (Brief description of cooperation in other countries and how responsibilities are divided in Ukraine – who is responsible for what)
 - 1.3. Project Overview (Start date, signed documents, activities, work plan etc briefly)

2. Methodology
3. Findings
4. Lessons Learnt and Recommendations
5. Conclusion

Intended Use of the Evaluation

MAG, APOPO, and the EU will use the evaluation results to inform and guide future planning and implementation of similar projects/programmes both in Ukraine and in other countries.

Report Authors

The report will be prepared by the MAG MEAL Officer, in coordination with the MAG Operational Department and APOPO, with input from the Programming Department and with technical advice and support provided by MAG's global Programmes Performance & Learning Unit.

Annex 2: Evaluation Methodology

The project evaluation framework has been developed in accordance with the MAG-internal Terms of Reference (ToR)⁹⁵ prepared for this evaluation, which reflect the guidance Applying Evaluation Criteria Thoughtfully established by the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD).⁹⁶ Within this approach, the following five of six main criteria are suggested, excluding impact.⁹⁷

- **Relevance** – To what extent does the project align with and respond to national demining priorities and the current context in Ukraine? To what extent has the project been adapted in response to the conditions in which it is being delivered?
- **Coherence** – How does the TSD project integrate with other technical survey methods? How well is coordination ensured with local and international entities?
- **Effectiveness** – To what extent did the programme achieve (or not achieve) intended outcomes and outputs – in line with the proposed approach and MAG’s HMA Theory of Change? What factors have facilitated or hindered the achievement of objectives? How effective is the use of TSD compared to other demining methods?
- **Efficiency** – To what extent were projects delivered in a timely and successful manner given the resources available?
- **Sustainability** – To what extent does the project contribute to the development of national capacity in humanitarian demining?

The selection of these criteria is justified by the evaluation’s objectives and the availability of the necessary data.

The evaluation was conducted using a theory-based approach, specifically MAG’s organisational **Theory of Change**,^{98,99} based on the sector-wide Theory of Change for mine action.¹⁰⁰ The Theory of Change for

this project is centred on the overarching goals of increased peace, human safety and security, and socio-economic development in countries affected by explosive ordnance, contributing to the attainment of the Sustainable Development Goals. Accordingly, the evaluation methodology adopts the Theory of Change as an assessment framework to examine the causal pathways between project activities, expected outcomes, and long-term impact.

Data Sources and Collection Methods

To ensure an objective evaluation, the methodology used in the preparation of this report included **methodological data triangulation** (the use of different data collection methods, such as qualitative and quantitative).

The evaluation of the implementation and achievements of the project is based on the following **data sources**:

Quantitative operational data collected from the field, where technical survey dogs are deployed, will be used to assess performance metrics. These data include the number of surveyed areas, identified hazardous areas, clearance efficiency, and other measurable indicators reflecting the effectiveness of TSD operations. Comparative data from manual BAC and mechanical TS activities were used for early comparative analyse.

MAG and APOPO documentation, like SOPs, internal MAG–APOPO meeting minutes, deployment records, training materials, accreditation submissions, coordination documents with SESU and NMAC, budget summaries, TSD productivity data, risk registers, and previous TSD learning reports from Cambodia and Azerbaijan (Final report (1 September-31 August 2024)), enable the assessment of formal performance indicators, as they include descriptions of completed activities, beneficiaries reach, information on land clearance, and other relevant data.

Semi-structured interviews¹⁰¹ were used to explore the “top-down perspective” and highlight the strategic vision of the deployment, implementation and overcoming challenges in similar projects. Interviews were conducted with key informants from both MAG and APOPO. Interviewees were selected based on their level of involvement in TSD deployment or coordination. Interviews lasted 30–55 minutes and were recorded with consent.

responsible for project implementation in the field. On the APOPO side, interviews are conducted with the Program Manager Ukraine, the Operational Coordinator, the TFM and with two Team Leaders from two TSD teams.

In total, **ten semi-structured interviews** were conducted with ten individuals (two women, eight men) from MAG and APOPO.

To ensure the confidentiality of individuals whose quotes and insights are included in this report, respondent data were anonymised and coded using the format **KII 1–10** (Key Informant Interview 1 etc.). This approach is particularly crucial in qualitative

research involving small sample sizes, where the risk of deductive disclosure – a situation in which a respondent’s identity can be inferred indirectly through contextual clues such as job title, organisation, or geographic location. In such contexts, even minimal contextual information can inadvertently lead to the identification of participants.¹⁰² Therefore, to protect participant identities, responses were not categorised by organisational affiliation (e.g., MAG or APOPO).

Three FGDs were conducted as part of the evaluation: One FGD was held with the MAG demining team responsible for CASEVAC support, target marking, and manual clearance within the framework of this program. This discussion included MAG deminers — in total, nine people (six women and three men).¹⁰³ Participants from this group are coded as **KII_FGD_M**. Two FGDs were conducted with groups of APOPO dog handlers, involving a total of seven participants — five women and two men. Key informants from the APOPO handler groups are coded as **KII_FGD_A**. FGDs provide a “bottom-up perspective” to explore challenges and achievements in field conditions, ensuring insights from those directly involved in implementation.

During the focus groups with handler teams and the group interview with the demining team, the discussion followed a structure based on the evaluation criteria, adapted to the field-specific context. Participants sequentially addressed topics such as collaboration, marking systems, CASEVAC coordination, and perceptions of efficiency. Issues related to relevance (understanding of the mission), coherence (interaction and openness), sustainability (vision for the project’s future and potential scaling), and effectiveness at the field level were also raised.

Information was collected from **open sources**, including official websites of Ukrainian government bodies and other relevant organisations, as well as reports from humanitarian and non-governmental organisations. Media publications were also

reviewed and assessed for their relevance to the mine action sector in Ukraine.

In addition, a significant portion of the contextual and methodological framework was informed by international standards—such as the IMAS, globally recognised evaluation criteria for humanitarian action including the OECD DAC framework, as well as standards for the collection and assessment of qualitative data and their contextual relevance. When appropriate, additional resources were consulted to incorporate various types of methodological and operational standards. These sources helped ensure the standardisation of approaches and alignment with best practices in monitoring, evaluation, and accountability.

As part of the preparation of this report, a series of **field-based evaluative observations** were conducted through multiple site visits in Mykolaiv Oblast. These visits included participation from representatives of both implementing organisations. From MAG, the field visits were conducted by the MEAL Officer, the Programmes Quality Director (PQT), and the Technical Operations Manager (TOM). From APOPO, the Program Manager for Ukraine and the Operational Coordinator visited the field.

These site visits were carried out in Stepova Dolyna, where the evaluation team observed TSD deployments, handler–deminer interaction, marking and safety practices, daily team briefings, and the sequencing of clearance activities. A structured observation checklist, aligned with MAG’s deployment criteria and SOPs, was used to guide and document these observations. The purpose of the visits was to gain first-hand insight into the implementation process and validate reported activities against field realities.

Data cross-checking in the report is presented through references, where the author, asserting a fact or event, provides evidence from alternative sources mentioned in these references.

Data Analysis Process

A mixed-method approach¹⁰⁴ was used in the preparation of this report, combining quantitative (operational data) and qualitative (interviews, document analysis, open sources) research methods. This approach was chosen as it allows for the integration of both types of data at the analysis stage: quantitative indicators complement and explain qualitative observations, providing a deeper understanding of the results.¹⁰⁵

Semantic analysis constituted the principal approach to the interpretation of qualitative data throughout this report. Although employed selectively, it facilitated the identification of thematic regularities across participant responses. In particular, for the indicator related to factors influencing project effectiveness, semantic analysis was applied in a vote-counting capacity to quantify the occurrence of relevant keywords and phrases.

Sentiment analysis was likewise applied to this indicator, enabling the detection of emotional coding within respondents' narratives.

In addition, cognitive analysis was applied across the full set of qualitative data to explore divergences in the conceptualisation of key issues among different respondent groups. Findings from the cognitive analysis were reflected in two indicators presented in the report, illustrating contrasts in interpretation between management and field personnel.

Although no formal coding software or matrix was used, the structure of the interviews was thematically aligned with the OECD-DAC evaluation criteria and their associated indicators. As a result, the moderation process itself functioned as a form of preliminary coding, shaping the flow of discussion and thematic clustering.

To ensure the robustness of the findings, data triangulation and integration were carried out by cross-verifying the various sources of data described above. This analytical convergence enabled the identification of patterns,

inconsistencies, and areas of alignment, thereby enhancing the validity and credibility of the results.

The interpretation of evidence was guided through the ToC framework, which served as a conceptual lens to assess how and why desired outcomes were or were not achieved. The ToC helped trace the logical links between activities, outputs, and expected outcomes, allowing for a more structured analysis of causality and the assumptions underlying the intervention.

Building on this, the analysis was aligned with the selected OECD DAC evaluation criteria—relevance, coherence, effectiveness, efficiency, and sustainability. Each data point was mapped to one or more of these criteria, enabling a multi-dimensional assessment that captured not only the outcomes but also their quality and alignment with broader strategic objectives.

The logical flow of analysis—from the ToC framework to the OECD DAC evaluation criteria—allowed for the development of nuanced findings that go beyond surface-level performance metrics. The ToC provided a foundation for understanding causal pathways and testing underlying assumptions, while the DAC criteria enabled a structured evaluation of the intervention's relevance, coherence, effectiveness, efficiency, and sustainability.

These findings served as the basis for generating evidence-based recommendations and identifying lessons learned. Together, they offer forward-looking insights aimed at improving the design and implementation of future activities.

Annex 3: Factors affecting MDD/TSD effectiveness – open-source perspective

Environmental and weather conditions

directly affect MDD performance. High temperatures can cause overheating, especially in dark-coated dogs, while humidity alters the dispersion of explosive odours, potentially making detection either easier or more difficult. Strong winds disperse scents, complicating detection. Soil composition also plays a role: soils with high metal or moisture content can mask odours, whereas dry and loose soils facilitate detection. Dense vegetation limits dog movement and odour dispersion, often requiring preliminary mechanical clearance.¹⁰⁶

Type and composition of explosives are also crucial. Dogs are effective at detecting standard explosives such as TNT or ANFO, but improvised explosive devices (IEDs) with non-standard components (e.g., faeces, glass) alter odour profiles, posing challenges. Deeply buried mines (over 1 metre) are harder to detect due to lower surface odour concentration. Plastic mines with low metal content can be easier for dogs to detect than for metal detectors, provided appropriate training.¹⁰⁷

Quality of dog training is critical. Dogs must be trained in accordance with IMAS to ensure reliability. Adaptation to local climate and conditions is necessary to prevent stress or discomfort. Individual traits such as intelligence and breed endurance (e.g., Belgian Malinois) also influence performance.¹⁰⁸

Interaction with the handler significantly impacts effectiveness. Experienced handlers accurately interpret canine indications, and a strong emotional bond improves coordination and the dog's motivation. Inexperienced handlers or frequent handler changes can reduce detection accuracy.¹⁰⁹

Organisational and logistical factors

include the quality of handler equipment, such as comfortable clothing that affects mobility. Lack of veterinary support, food, or

transportation limits operations. Inconsistent SOPs or weak communication between teams (e.g., handlers and deminers) lead to inefficiencies.¹¹⁰

The physical and psychological condition of the dogs

also matters. Fatigue, illness, or stress diminish performance. Lack of motivation (e.g., due to absence of rewards) or the presence of other dogs can negatively affect results.¹¹¹

Type of operation and integration with other methods

influence effectiveness. Dogs are most effective during Technical Survey and Quality Control phases, as they can quickly cover large areas, but are less effective in areas with high mine density. Combined use with manual demining or mechanical systems, such as vegetation clearance, optimizes outcomes.¹¹²

Staff motivation and team dynamics are widely recognised as factors influencing the effectiveness of any team effort. High motivation, driven by a sense of mission, increases engagement and productivity. Positive team relationships based on trust and support improve coordination and morale, which is especially critical in high-stress environments.¹¹³ Cohesive, highly motivated teams perform better in complex tasks requiring collaboration.¹¹⁴

Annex 4: Qualitative Analysis – Detailed findings

Several qualitative types of analyses were used in this report: semantic, sentiment, and cognitive analysis.

➤ **Semantic analysis** is a general approach to working with text, which involves examining not only the content but also the structure, meaning, and key themes mentioned in respondents' answers. This method helps us understand what exactly people are talking about and which topics dominate in their statements.

➤ **Sentiment analysis** (or emotional tone analysis) is considered a subcomponent of semantic analysis. It is used to assess the emotional tone of statements — whether they are positive, neutral, or negative. In

this report, sentiment analysis was used for emotional coding, to identify how participants emotionally perceived factors influencing performance.

➤ **Cognitive analysis** was applied to compare the responses of management and field staff, with the goal of understanding how perceptions, interpretations, and priorities differ across levels. This type of analysis helps reveal potential disconnects between strategic intentions and field-level realities.

Together, these methods complement one another: semantic analysis answers, “what is being said,” sentiment analysis looks at “in what emotional tone,” and cognitive analysis addresses “who interprets it and how.”

Factors influencing the effectiveness of the demining process in Ukraine, according to respondents¹¹⁵

			Negative	Neutral-Negative	Neutral	Mixed ¹¹⁶
						Neutral-Positive
						Positive
						Strongly Positive
emotional coding						
Weather	Weather, as a force majeure factor beyond control or influence, becomes a balance between a factor in itself and a challenge.	<i>“So we adapt — start earlier in mornings during hot months, stretch operations into December, be flexible and reactive to conditions. It’s not only weather variability, it’s extremity that creates the real challenge in Ukraine.”</i> <i>“It’s a factor we have to rely on, and the challenge is to plan the deployment of people and dogs wisely when weather doesn’t permit.”</i> <i>“One of the key challenges in Ukraine is the extremity of the climate — with prolonged sub-zero temperatures in winter and extremely high temperatures during the summer months. These conditions significantly narrow the operational windows for dog teams.”</i>				
	<i>Is Weather a Factor or a Challenge?</i>					
	90% of respondents perceive weather as a balancing concept:					
	Factor → Uncontrollable (e.g. extreme heat, snow, wind) Challenge → Requires flexibility					

Operational risks	Nearby Explosions (Demolitions) ➤ Wind spreads explosive particles → dogs alert everywhere ➤ Operations must be suspended immediately ➤ Scent contamination prevents further work GPS Jamming & Air-Raid Alerts ➤ Tracking systems disabled ➤ Immediate pause required ➤ Hinders monitoring & documentation Proximity to Frontlines ➤ Minefields often overlap with battle area contamination ➤ Dogs alert on shell fragments → harder to confirm actual threats ➤ Operational instability Contaminated Environment (BAC + Mines) ➤ Explosive residues in soil trigger frequent false alerts ➤ Every indication requires manual verification ➤ Slows down detection process significantly	<i>“They (SESU) are stopping us in the middle of the working day to do a demolition. Very close to our task. So now all the wind, all the molecules from the explosion will be carried into our field. And the dogs might start reacting everywhere. So if that’s the case, then we need to stop operations because we cannot work there.”</i> <i>“What about the air alarm? [...] And that’s another challenge. Because, you know, we work with GPS. Every time there’s an air alarm, the GPS stops working.”</i>
Bureaucracy	Institutional & Bureaucratic Constraints High Administrative Burden on National Authorities Complex Documentation & Approvals ➤ Accreditation ➤ Site validation ➤ Reporting requirements ➤ Inter-agency coordination Impact on Project Timeline ➤ Procedural delays postponed field deployment ➤ Operational start: March 2025 Key Insight: Administrative realities—not technical limitations—became the primary constraint during the rollout phase.	<i>“I would say bureaucracy. I would say in Ukraine ADS is fairly new and sometimes the NMAC didn’t necessarily know how to deal with this kind of project.”</i> <i>“I would like to see a dashboard for documentation, a digital platform where all tasking and coordination would be tracked... The current paperwork and email system is very slow.”</i>
Resource Availability	Resource Needs: From Field to Management Effective mine action requires resources at all levels Field-Level Needs ➤ Comfortable clothing & uniforms ➤ Spare sets for rotation	<i>“We would really like to have more T-shirts.”</i> <i>“The roof in the kennel is leaking.”</i>

	➤ Reliable communication tools Management-Level Needs ➤ Additional personnel & staffing ➤ Technical equipment & IT support ➤ Kennel maintenance (infrastructure repairs, facility upgrades) ➤ Budget flexibility — ability to reallocate funds between budget lines as operational priorities shift Key Insight: Sustainable operations depend on addressing both daily operational needs and strategic infrastructure and planning requirements.	<i>“She analyzes all this data completely on her own, and she definitely needs an assistant or a second staff member.”</i>
Logistics – Infrastructure Constraints	Logistics: A Recurring Operational Challenge Monthly dog transfers between regions ➤ Training base: Kyiv Oblast ➤ Operational site: Mykolaiv Region Why the transfers? ➤ Required for internal accreditation tests ➤ Mandated monthly to maintain operational readiness Impact: ➤ Exhausts staff and dogs ➤ Drains time and resources Wider Challenge Across Operators ➤ Infrastructure for dog operations is hard to establish Requires additional funding and long-term planning Key Insight: ➤ Building decentralised infrastructure is essential to reduce stress, cost, and delays across all canine operations in Ukraine.	<i>“It was like with us - there was a situation when one of my dogs got sick and needed an IV drip, but there was simply nowhere to do it. If those people hadn’t let us into their facility — and we’re very grateful they did — we would have had nowhere to go. And how is it possible that there are no 24/7 veterinary clinics in Mykolaiv? Yes, there’s a contract, but they don’t work around the clock.”</i> <i>“Transporting the dogs is exhausting. People get tired. We finish work — and the next day we’re back on the road. It’s hard for both, us and the dogs.”</i> <i>“Yes, the road is exhausting. I agree with my colleague.”</i> <i>“We were looking to rent a place where we could set up kennels. But everything was outside the city, and it was very difficult to reach. Plus, veterinary clinics need to be nearby. There are many important details to consider.”</i>

Quality of dogs training	Training Quality Matters Only the best dogs are deployed ➤ Rigorous internal training & selection ➤ ~80% pass rate ensures top-tier performance Impact of High-Quality Training ➤ Improved detection accuracy ➤ Fewer false alerts ➤ Faster and more efficient operations ➤ Enhanced safety for teams ➤ Greater trust in TSD results Key Insight: ➤ Reliable performance in the field begins with rigorous, consistent training at the base.	<i>“... for ourselves, we do a monthly test which is like a small accreditation we do ourselves and annual accreditation. So, in Krasnoyarsk, we have a training area and an accreditation area.”</i> <i>“We need to keep the dogs continually working, which we need to do for both organisations in order to fill our contractual outputs.”</i>
Interaction with the handler	Handler–Dog Interaction: The Heart of Detection Why It Matters: The strength of the bond between the handler and the dog directly impacts: ➤ Detection accuracy ➤ Reduction of false alerts ➤ Operational performance Field Insight: ➤ Handlers can read subtle signals from their dogs ➤ They detect signs of fatigue or stress ➤ They adjust pace, breaks, and focus accordingly Key to Success: Trust + Communication = High Performance Especially critical in extreme weather or high-pressure environments Key Insight: A skilled handler who understands their dog is as essential as the dog itself.	<i>“When you are working with dogs, you need some level of physical activity. Some of these dogs are very big, so you need to be active and responsive.”</i> <i>“I have two girls (dogs), and they’re like my daughters. We’re together every day, and I notice every change in their behaviour — how they wake up, how they feel, whether they’re tired. They’re not machines — they’re partners. And they feel us too. If we’re nervous, they feel it as well.”</i>
Physical and psychological condition of the dogs	Wellbeing of Dogs: A Core Operational Factor Dogs are not machines — their condition matters. Performance depends on both training and wellbeing. Key Influencing Factors: ➤ Emotional stress – distraction, refusal to work	<i>“One of the dogs had an injured paw and couldn’t work — she was given time to rest until it healed.”</i> <i>“The dog didn’t want to work. We see this now. Before, we didn’t understand — the dog just</i>

	➤ Fatigue – signs include lying down, disengagement ➤ Physical health – illness or discomfort reduces accuracy What It Means for Operations: ➤ Requires attentive handlers and flexible planning ➤ Humane, responsive management improves outcomes ➤ Well-supported dogs = better detection + faster clearance Key Insight: Understanding and respecting canine signals is essential for both efficiency and ethical treatment.	<i>comes and works. But it turns out, sometimes she (dog) just plays, sits with the handler, doesn't want to work today."</i> <i>"There was a situation where the dog just lay down and wouldn't get up — the handler said, 'She (dog) just doesn't want to work today. That's her mood.'"</i> <i>"She (dog) doesn't want to, she can't. Sometimes she's tired, sometimes a little sick — just like humans. You have to understand it's an animal, not a robot."</i>
Insufficient number of deminers on MAG's side	Operational Imbalance: four TSD Teams, one Manual Team Four TSD teams = Fast detection One manual team = Not enough capacity for follow-up Consequences: <i>Delays in verification</i> ➤ TSD indications remain unconfirmed ➤ Land cannot be formally handed over <i>Sites remain "uncleared"</i> ➤ No release = no use by local communities ➤ Delays affect livelihoods & recovery <i>Regulatory pressure</i> ➤ NMAC requires weekly reports ➤ Lack of progress = risk of investigation ➤ Could lead to loss of accreditation for MAG/APOPO Key Insight: ➤ Detection without verification stalls the entire clearance process. ➤ Balanced deployment is critical for impact and compliance.	<i>"We potentially have seven tasks completed by the dogs. There's not enough manual follow-up to do it. [...] We run the potential of not being able to open new task sites because the NMAC won't give new task sites while we have seven tasks still open."</i> <i>"First issue is lack of personnel. [...] We have four teams and we have a very extensive area. [...] Because we (APOPO) only have support from one team, we need to squish together and do as best as we can with what we have."</i>
Team cohesion	Team Climate: The Hidden Driver of TSD Effectiveness It's not just about dogs or tools — it's about people. Key Factors of a Productive Team Environment: ➤ Clear communication — across teams, roles & cultures	<i>"To have happy staff and good dynamics in any given team will always make a more effective and efficient team. [...] If you foster good relationship within the team... then, of course, it's going to make for a more effective delivery."</i>

	➤ Trust in leadership — confidence in guidance & decisions ➤ Positive peer dynamics — mutual respect & support Why It Matters: ➤ Higher productivity ➤ Smoother coordination ➤ Lower emotional burnout ➤ Sustained long-term performance Key Insight: A cohesive, trusted, and motivated team clears land faster — and safer.	<i>"We are satisfied, we're ready to work — we come in, we arrive, we're all prepared. [...] We simply do our job, and we even celebrate our dogs."</i>
Field Staff – Management Relations	Leadership & Communication: What Field Teams Say Leadership style directly impacts morale and performance What Works Well: ➤ Supportive team leaders ➤ Trust-based relationships ➤ Accessible and approachable supervisors Challenges Identified: ➤ Unclear planning & scheduling ➤ Weak communication channels ➤ Decisions made far from the field reality ➤ Uncertainty about who to approach for guidance Why It Matters: ➤ Strong leadership = cohesive, motivated teams ➤ Poor communication = delays, inefficiencies, burnout Key Insight: Effective leadership isn't top-down — it's field-informed, consistent, and present.	<i>"Our team leader is a treasure. We're very lucky. He's always positive, and that helps us stay calm even in stressful situations."</i> <i>"We don't have a clear understanding of how long we work or when we finish. A lot depends on the management — HR, managers — who are supposed to organise this."</i>
Personal motivation	Personal Motivation: The Engine Behind the Mission Handlers, deminers, coordinators, managers — all point to one shared value: <i>"We're not just doing a job — we're helping rebuild the country."</i> Motivation goes beyond salary: ➤ Desire to be useful	<i>"I work here because I have experience and I want to contribute — to our land, to our people. After we clear a site and hand it over, people can live and work without fear. That's my main motivation. Even if they paid less — I would still do this job."</i>

- Commitment to community safety
- Sense of national recovery
- Belief in a greater mission

Why It Matters:

Keeps the project going despite:

- Limited resources
- Bureaucratic delays
- Operational risks

Strengthens resilience, loyalty, and team unity

Key Insight:

Purpose sustains people. And people sustain the project.

“This is my choice — to help those living in the occupied territories. I’ve been there, I’ve seen it with my own eyes. People can’t live, work, raise livestock... This is my way of being useful right now.”

“What’s our goal, really? Clearing the land, returning it to everyday civilian use. And why? So that people can come back here and live.”

Annex 5: List of Sources

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Internal documents:

- 1 APOPO EU Monthly Narrative Report APRIL 2025
- 2 APOPO EU Monthly Report March 2025
- 3 APOPO EU Monthly Report FEBRUARY 2025
- 4 APOPO EU Monthly Report JANUARY 2025
- 5 MAG EU Monthly Report – March 2025
- 6 MAG Proposal to EU-FPI, June 2024
- 7 Ukraine NMAC. SOP 3.1 – Use of Technical Survey Dogs (Version 7, February 2024)
- 8 Ukraine. Order No. 785 of 29 March 2025 – On the Organization of the Humanitarian Demining Process by the Mine Action Operator (TO, ORVBD, MRS)
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Annex 6: Semi-structured Interview Guide

Introductory Questions

- Please tell us your name, position, and organisation.
- How long have you been involved in humanitarian demining activities in Ukraine?
- What is your role in the TSD (Technical Survey Dog) project?

1. Relevance

- To what extent does the TSD project align with Ukraine's national demining priorities?
- How well do you think the project responds to the evolving context in Ukraine (e.g., conflict dynamics, access, needs)?
- In your experience, has the project been adapted effectively in response to field conditions?
- Additional question: Do you understand the mission of your work here? What do you see as your purpose in Ukraine?

2. Coherence

- How does the TSD project integrate with other technical survey methods used in Ukraine?
- Are there coordination mechanisms in place with national authorities, other INGOs, or local actors?
- How would you rate the coherence of the project in relation to other ongoing demining activities?
- Additional questions:
 - » Do you trust the new methodology introduced by the project?
 - » What would you like to improve in the partnership between the two organisations involved?

3. Effectiveness

- To what extent has the TSD project achieved its intended outputs and outcomes?
- What were the key facilitating factors or challenges that impacted implementation?
- How does the use of TSD compare in effectiveness to other demining approaches or methods you've observed?

➤ Additional questions:

- » Do you consider each factor mentioned a facilitator or a challenge?
- » In field operations – do you trust the dogs?
- » What operational challenges have you faced during implementation?

4. Efficiency

- Were the activities implemented in a timely manner?
- In your view, were the financial, human, and logistical resources used efficiently?
- Were there areas where improvements in resource allocation or planning could have helped?

5. Sustainability

- In what ways does the project contribute to building local or national capacity for humanitarian mine action?
- Are there processes in place to ensure continued use of TSD or technical survey methodology after external support ends?
- Additional question: What does “sustainability” mean to you in the context of this project? How would you define or measure it?

Closing Questions

- Is there anything else you would like to share about the project's implementation or results?
- Do you have any recommendations for improving the project in future phases?

Annex 7: Quotes from key informant interviews

As additional evidence quotes from KIIs. The below quotes were not presented in the text body above.

Context

“Children are getting blown up, people are getting blown up. We can’t sow [seeds on our] agricultural land. Our country’s economy is built on agricultural activity” a quote from an interview with one of the key informants.

Relevance

“For me, the use of, or the deployment of technical survey dogs in Ukraine within the current context is paramount or invaluable if the mine action programme within the country is to move forward with the rapid release of large swathes of land back into productive agricultural or other use”

— KII_2

(This project) “First and foremost, it’s about helping my country—the one where I was born, where I have lived, and where I continue to live. This is my land and my people. We’re doing everything we can to bring peace back as quickly as possible so that people can sow their fields again. And why? For our economy, for ourselves. This is our food, our money, our taxes. This is our life and our future. So that people can return to their homes and start over.”

— KII_G_A

“We do this because it’s about families getting their land back, their homes. It’s about life returning — not just clearing mines.”

— KII_G_M

“I think it’s about showing what could work — not proving everything at once. That’s the spirit of it.”

— Representative, MAG Headquarters

“It’s the same reason why I joined this work. I want to make the change I would like to see in the world. My country has been also affected by war, and I know how it is to live in a country with contamination, where people cannot use their land. So, my mission here

is to do all I can to support your country to overcome this problem”

— KII_3

“From what I’ve seen during my time on the project, the way MAG and APOPO have adapted and responded to challenges together has been truly collaborative. We’re able to identify problems and address them constructively. This kind of continuous learning cycle can’t just be a one-time step — it has to be an ongoing part of how we work together to ensure the project remains safe and effective moving forward.”

— KII_10

“From my perspective, I haven’t seen any issues on the ground. However, the NMAC is under capacity for the number of mine action operators in the country, which affects their responsiveness in delivering tasking orders and approving clearance plans. This results in delays in implementation. The issue isn’t with the NMAC itself, but with being overwhelmed by too many operators, many of whom do not bring added value to the programme and only dilute available resources. It’s a hard one. For me, I would be advocating the NMAC to say stop. No more operators.”

— KII_2

“When I first started looking into this procedure, it seemed to me that everything was overly bureaucratic. However, as I got deeper into the work, I realised that not only is this the way it has to be, but sometimes, in my opinion, more documentation should be required. There are a large number of operators on the market, and new operators are also in the queue for accreditation... I would just like for the processes to perhaps be a bit more digitised. It would make things easier for us.”

— KII_9

“... “It’s about making sure the donor has all the relevant information — so they can advocate on our behalf to the government and the national Mine Action Centres. “

— KII_5

Coherence

“NMAC wanted to ensure that after mechanical demining, either dogs or humans conducted a final inspection. This is a requirement, as a mine may remain lodged after the machine’s work.”

– KII_9

“They (MAG) would take much longer to do the work without us, while we (APOPO) wouldn’t be able to do any of it without them. We don’t do the work they do. Our role is focused exclusively on working with dogs for detection; they carry out everything that follows.”

– KII_G_A

“We’re working in partnership with MAG. Essentially, we’re just an asset of MAG — we’re subcontracted to them. MAG handles everything — it’s their task site. They manage all the liaison with local stakeholders and the community through their CL [Community Liaison] teams, as well as coordination with local authorities at the NMAC level and so on”

– KII_2

“We (APOPO) need collaboration or we need to have our own deminers. But we do need support from deminers because the handler must be attentive of their dogs all the time. So if we need to do a CASEVAC, we cannot leave the dogs unattended.... At the moment we are facing some issues. First issue is lack of personnel. You know, we have four teams and we have a very extensive area. So, in this case, sometimes I cannot deploy or I cannot follow my plan, because, for example, this field is almost one kilometre long. For me, the best option is to leave one team every 250 metres. So, we have [adequate safety] distances and everybody is on their own, and we don’t have too many people gathered in one place. But because we only have support from one [MTT] team [for verifications and clearance], we need to squish together and do as best as we can with what we have.”

– KII_3

“I think there’s a lot that could be improved. Obviously, we’re building on an existing partnership that we’ve held in several other countries. Here, it’s obviously a new

partnership and the scale of the partnership is sort of bigger than we have anywhere else. So, it’s still very new... I think there could be better communications between the organisations.”

– KII_2

CASEVAC planning: “There was one day when we were already deployed, but the distances for a CASEVAC were too long. So MAG told us, like, we cannot support you all the way there, so you need to withdraw some of your guys. That’s slowing our process, that’s slowing our productivity. It’s wasting time for us to go and place someone in one place and then tell them, no, you have to go back.”

– KII_3

Use of marking systems: “Yeah, it’s just that we’re still getting used to working together — lots of small details to figure out, and I think things will change with time. For example, I’d also raise the issue of field markings. We’re not used to them yet. With MAG’s own marking system, it’s clear to us. But with their (APOPO) stakes — we’ve noticed that the small stake with the black cap, which marks a detection — we often miss it; it’s hard to see.”

– KII_G_M

Integration of TSD schedules with manual clearance workflows: “I’m speaking specifically about our [MAG] team. We changed our work schedule to start earlier. We load the marking stakes at a different office, but it’s not convenient — sometimes others are already there, and half the people arrive later than us. It’s hard for us to get close enough to pick up the stakes. I used to work in another team where we had a very clear daily schedule. Sometimes, even in the evening, we’d get a message saying, ‘Tomorrow you’ll be doing visual inspection all day,’ or ‘working only with the detector,’ or ‘digging.’ That doesn’t happen here. I’m not sure if it’s a matter of different work style or just a temporary issue.”

– KII_G_M

“We had to compress our deployment because we didn’t have MAG

deminers available in time to follow up on dog indications.”

— **APOPO’s TFM (outside formal KII)**

“We used to get our daily plan the evening before. Now it’s unclear what we’ll be doing until we’re on-site.”

— **KII_G_M (deminer)**

“Without them, our work would take forever. Without us, they can’t proceed.”

— **KII_G_M (deminer)**

“Yes, we’re scared — not for our own feet, but for others’. Fear keeps us cautious.”

— **KII_G_A (handler)**

“It’s scary, and no, we can’t afford to relax.”

— **KII_G_M (deminer)**

“I can definitely say that everyone is interested in mechanised demining. Because everyone knows it’s effective, fast — in fact, everyone, including the regional administration, is looking at mechanised demining as the way to clear Ukraine. That’s what really interests everyone.”

— **KII_9**

“32 dogs [for starting TSD projects in general] — that’s a very good number because it reflects the speed at which we can survey land.”

— **KII_9**

“Communication with NMAC can sometimes be a challenge, mainly because of turnover. They have different people coming and different people going and it’s not always clear who in NMAC you need to speak to about certain issues.”

— **KII_1**

Effectiveness

Used in text.

Efficiency

“I think sometimes it’s not just about the money, it’s about how we’re allowed to spend the money”

— **KII_10**

“Donors that fund projects over multiple years

and allow us to move money between budget lines fairly easily, without having to realign the budget always, makes the work more efficient and more effective. So, a donor like the (donor’s name) who’s relatively flexible in how we use the money means that in order to achieve the outputs and the outcomes we sometimes can adapt the project without having to ask permission from the donor. Whereas other donors who are a lot stricter means that when we face an unpredictable challenge there’s nothing we can do about it without realigning the project. So, it’s not just about how much money, it’s about flexibility of how we’re allowed to use the money that there is.”

— **KII_10**

“We have not got any dedicated teams inside MAG for the EU project to be able to support the technical survey dogs.”

— **KII_5**

“I think it’s been a very good lesson learned that dedicated teams need to be included for technical survey dog teams.”

— **KII_5**

“There was a situation where one of my dogs got sick and needed an IV drip, but there was simply nowhere to go. Fortunately, some kind people allowed us into their facility - otherwise, I don’t know what we would have done. There, the dog could rest away from the others, and I stayed with her to administer injections. But in Mykolaiv, there’s no 24-hour vet support. It’s a real problem. If something happens in the evening or at night, there’s nowhere to take the dog. You just have to help them yourself...”

— **KII_G_A**

“We really need more T-shirts—when it’s hot, you sweat, and you need to wash them... A T-shirt becomes a disposable item. In summer, it can fade in a week or two under the sun. And the boots too—we walk all day through mud, wetlands... They fall apart and stop keeping your feet dry. When it snows, it’s all slush. Ideally, we’d have two pairs—summer and winter. But right now, we only have one.”

— **KII_G_A**

“I think it’s about making sure that we’re using feedback and that’s going back into the field, back into management for when we do project planning, but making the donor funding more flexible so that we can make changes as and when we have them. I’ll give you another example. Females often require changing trousers more often than men...”

– KII_10

“Working with the EU as a donor is a real pleasure. Unlike many traditional donors, they are remarkably open to innovation, supportive of piloting new methodologies, and exceptionally flexible in how funds are used. That flexibility has made project implementation in Ukraine much easier, even under the unpredictable conditions we’ve faced.”

– MAG HQ representative

“The EU-FPI presence inside of Ukraine allows for effective communication with individuals, who are knowledgeable and understand the constraints of working inside of Ukraine. They provide great support and flexibility”

– MAG Ukraine representative

Sustainability

“I think MAG is a very moral organisation and I think, honestly, when we talk about developing national capacities and partnerships, we don’t just say that as a thing to make our donors happy. I think we say it because we really believe it. [...] I can see that Ukraine is the type of context in a shorter time rather than a longer time where MAG can work with partners and the government to leave a strong national capacity here and continue to provide technical support. [...] Ukraine is one of those contexts where a sustainable national capacity does look like it could be enforced in the country.”

– KII_10

“I very much see the future of Ukraine... they will probably see this dog technology, see the value of it and start developing their own national capacities with it.”

– KII_5

“The use of dogs in mine action is developing in Ukraine — just two years ago, this didn’t exist at all. It’s a completely new field, and I believe we shouldn’t rely solely on donor funding. We need to create our own Ukrainian mine detection dog institute. This method is effective and fast. Right now, we purchase dogs from abroad, but I am convinced that we must start breeding and training them here in Ukraine.”

– KII_9

Notes

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- 3 Mine Action Review. Ukraine: Clearing the Mines 2022.
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- 7 “Rights of Victims.” State Agency of Ukraine for Recovery and Development of Peace, 2025, <https://demine.gov.ua/postrazhdalym/prava-postrazhdalymkh>. Accessed 12 June 2025.
- 8 ACAPS. Humanitarian Implications of Mine Contamination in Ukraine: Thematic Report. 24 Jan. 2024, https://www.acaps.org/fileadmin/Data_Product/Main_media/20240124_ACAPS_thematic_report_Ukraine_Analysis_Hub_Humanitarian_implications_of_mine_contamination_.pdf.
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- 10 World Bank, Government of Ukraine, European Union, and United Nations. Ukraine: Fourth Rapid Damage and Needs Assessment (RDNA4): February 2022 – December 2024. Feb. 2025, <https://documents1.worldbank.org/curated/en/099022025114040022/pdf/P180174-ca39eccd-ea67-4bd8-b537-ff73a675a0a8.pdf>.
- 11 Oblast is synonymous with Region. Both terms are used throughout.
- 12 In the Ministry of Economy, It Was Announced How Much Land Will Be Returned to Use in 10 Years.” *Agroportal.ua*, 2023, <https://agroportal.ua/ru/news/ukraina/u-minekonomiki-ozvuchili-silki-vdastsya-povernuti-u-vikoristannya-zemelnih-ugid-za-10-rokiv>
- 13 International Campaign to Ban Landmines. Landmine Monitor 2024. ICBL-CMC, Nov. 2024, backend.icblcmc.org/assets/reports/Landmine-Monitors/LMM2024/Downloads/Landmine-Monitor-2024-Final-Web.pdf
- 14 World Bank, Government of Ukraine, European Commission, and United Nations. Ukraine Fourth Rapid Damage and Needs Assessment (RDNA4), February 2022–December 2024. World Bank, 2025.
- 15 On the Approval of the National Mine Action Strategy for the Period Until 2033 and the Operational Plan for Its Implementation in 2024–2026.” Verkhovna Rada of Ukraine, 2024, <https://zakon.rada.gov.ua/laws/show/616-2024-%D1%80#Text>
- 16 National Mine Action Portal. Demining.gov.ua, <https://demine.gov.ua/>
- 17 IMAS are the International Mine Action Standards, which inform the National MA Standard. <https://www.mineactionstandards.org>.
- 18 Further details can be found in International Mine Action Standard (IMAS) 09.40, Animal Detection Systems – principles, requirements and guidelines.
- 19 If nothing is found, the search area is increased to 3x3 metres.
- 20 <https://www.garmin.com/en-US/p/618510>. Four dogs only need two GPS, with four trackers. A GPS can track up to 20 dogs at once, but APOPO decided to use two GPS units, one in each working effort.
- 21 Thanks to the dogs, explosives can be removed first, then manual clearance can work faster in BAC mode to make the area 100% metal free.
- 22 The marker is placed 1 metre behind the place where the dog is sitting. Using normal procedure for manual clearance, a deminer will then approach the location of the MDD indication from the closest side and will check an area of 2 x 2 square metres around the indication.
- 23 Before deployments, type, density etc of the vegetation has to be assessed. ‘Obstructed’ terrain may include conditions where it is not possible to deploy dogs - but slopes, standing water, vegetation - where the is the possibility of injuries to the dog.
- 24 Target refers to a hidden explosive device, dogs need to catch the scent and report correctly.
- 25 Accreditation in Ukraine is referred to as certification. This report uses the term accreditation in line with IMAS. It comprises the accreditation of the organisation per se, for specific technical activities, and the individual staff/ animal.
- 26 See: UA National Mine Action Center. Plans, organises and coordinates mine action activities, UA National Mine Action Center, 2025, <https://ua-nmac.org/en/>.
- 27 By 30 April 2025, APOPO brought 34 dogs in, in several batches. They came from various locations, including other working programmes. All were fully trained, had to get acclimatised and pass operational

testing on Ukrainian ground.

28 The MTE period of analysis is end of April 2025 but for a more updated picture, quantitative figures on additional metres surveyed and cleared and the number of indications made by dogs are provided.

29 Mixed methods research involves the collection and analysis of both quantitative and qualitative data, as well as their integration within a single study or research program. See: Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and Conducting Mixed Methods Research* (3rd ed.). Thousand Oaks, CA: SAGE Publications

30 The sixths is *Impact*. OECD. (2021). *Applying Evaluation Criteria Thoughtfully*. Paris, OECD Publishing. <https://doi.org/10.1787/543e84ed-en>

31 Document is provided from MAG: HMA Theory of Change. Can be shared upon request.

32 In this study, the focus-group method was applied in an adapted form. Participants were not entirely homogeneous in terms of their social and professional characteristics—a practice that aligns with contemporary approaches to employing focus groups in narrowly scoped professional contexts. See: Morgan, D. L. (1998). *Planning Focus Groups*; Krueger, R. A., & Casey, M. A. (2015). *Focus Groups: A Practical Guide for Applied Research*.

33 The Theory of Change (ToC) has become a methodological mainstream in strategic planning, monitoring, and evaluation across philanthropy, international development, social entrepreneurship, and other fields aimed at driving social change. See: Belcher, B. M., Bonaiuti, E., & Thiele, G. (2024). *Applying Theory of Change in research program planning: Lessons from CGIAR*. *Environmental Science & Policy*, 160. <https://doi.org/10.1016/j.envsci.2024.103850>

34 Sector-wide Theory of Change for Mine Action. <https://www.itad.com/knowledge-product/mine-action-sector-wide-theory-of-change/>

35 Bernard, H. Russell, Gery W. Ryan, and Amber Y. Wutich. *Analyzing Qualitative Data: Systematic Approaches*. 2nd ed., SAGE Publications, 15 July 2016.

36 See for example, *Sentiment Analysis - an overview* | ScienceDirect Topics, URL: <https://www.sciencedirect.com/topics/social-sciences/sentiment-analysis> accessed 9 June 2025.

37 Cabinet of Ministers of Ukraine. Order No. 616-p: On the Approval of the National Mine Action Strategy Until 2033 and the Operational Action Plan for 2024–2026. 14 June 2024, <https://zakon.rada.gov.ua/laws/show/616-2024-%D1%80#n19>

38 See sources no. 5, 13, 20, 32, and 44 in the list of sources.

39 Sumy National Agrarian University (SNAU) is located in the city of Sumy and occupies a large area that includes academic buildings, laboratories, dormitories, sports facilities, and other infrastructure. In addition, the university operates a teaching and research farm with a land area of 2,600 hectares, including 2,300 hectares

of agricultural land. (Sumy National Agrarian University. Sumy National Agrarian University, <https://snaeu.edu.ua/>)

40 APOPO internal document: Cooperation Agreement for the establishment of facilities for mine detection and technical survey dogs in order to expedite the clearance of land contaminated with anti-personnel mines and explosive objects in Ukraine. Dated: 17/01/2024.

41 Law of Ukraine “On Handling of Industrial Explosives” (No. 2288-IV of December 23, 2004) adopted to regulate the production, acquisition, storage, transportation, use, and disposal of industrial explosives in Ukraine.

42 Hird, Karolina, et al. “Russian Offensive Campaign Assessment, March 4, 2025.” Institute for the Study of War, 4 Mar. 2025, <https://www.understandingwar.org/background/russian-offensive-campaign-assessment-march-4-2025>, and Evans, Angelica, et al. “Russian Offensive Campaign Assessment, March 28, 2024.” Institute for the Study of War, 28 Mar. 2024, <https://www.understandingwar.org/background/russian-offensive-campaign-assessment-march-28-2024>

43 Krasylivka is a village in Brovary Raion, Kyiv Oblast.

44 APOPO internal document: Cooperation Agreement. The establishment of technical survey dogs training areas to expedite the clearance of land contaminated with anti-personnel mines and explosive objects in Ukraine. Dated: 30/04/24.

45 Demining Solutions. Demining Solutions, <https://demining.solutions/>

46 Ukraine NMAC SOP 3.1 Use of Technical Survey Dogs
47 A known challenge across Ukraine, see: Kormotech (2023), <https://savepetsofukraine.kormotech.com/en/post/research-how-war-affected-animal-shelters-in-ukraine>. Nova Ukraine. “Animal Welfare Annual Report 2023.” Nova Ukraine, 2023, <https://novaukraine.org/animal-welfare-annual-report-2023/>

48 Cabinet of Ministers of Ukraine. “On the Approval of the National Mine Action Strategy for the Period up to 2033 and the Operational Plan for Its Implementation in 2024–2026.” *Zakonodavstvo Ukrainy*, 28 June 2024, <https://zakon.rada.gov.ua/laws/show/616-2024-%D1%80#Text>

49 APOPO internal document: Documented by a letter of receipt of APOPO’s Accreditation/Certification Documentation from NMAC Chernihiv ref 14/24 dated 01/04/24.

50 “IMSMA Web Application.” Information Management System for Mine Action (IMSMA), <https://ua.imsma.org/portal/apps/webappviewer/index.html?id=f56cac5195da46118c0534c1554663c6>. Accessed 5 June 2025.

51 National Mine Action Centre (NMAC). *Instructions for Mine Action Operators on Planning*. NMAC, 2021, <https://ua-nmac.org/downloads/planning/1-0-instructions-for-mine-action-operators-on-planning.pdf>.

52 MAG internal document: Task order 21.11.2024

53 Often terms not well differentiated, one may view Cooperation as having independent goals with agreements not to interfere with each other and Collaboration as the process of shared creation; collectively creating something new that could not have been created by the individual users [convergenclabs.com].

54 ISO. ISO 18091:2015 - Guidelines for Local Governments on Implementing the International Standard for Quality Management. International Organisation for Standardisation, 2015, www.iso.org/standard/72808.html

55 The Mines Advisory Group Branch in Ukraine. Opendatabot, <https://opendatabot.ua/c/26635641>

56 “List of Mine Action Operators Certified in Ukraine.” Ukraine Mine Action Portal, <https://ua.imsma.org/portal/apps/webappviewer/index.html?id=f56cac5195da46118c0534c1554663c6>

57 Charitable Foundation APOPO. Opendatabot, <https://opendatabot.ua/c/45312268>

58 A more detailed description of the area and the nature of its contamination will be provided in the chapter on Effectiveness. Note that MAG reports all of its outputs weekly to NMAC.

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60 Cabinet of Ministers of Ukraine. Regulation on the Approval of the Action Plan for Implementing the National Mine Action Strategy until 2033. 30 May 2024, No. 616-p, <https://zakon.rada.gov.ua/laws/show/616-2024-%D1%80#Text>

61 Mine Action Review. Clearing the Mines 2020: Ukraine. 2020, https://www.mineactionreview.org/assets/downloads/907_NPA_Clearing_the_Mines_2020_Ukraine.pdf.

62 Department for Humanitarian Demining. Ministry of Economy of Ukraine, <https://me.gov.ua/Documents/Detail?lang=uk-UA&id=ce8b1cee-1227-438e-8f88-469e6745b9a8&title=UpravlinniaZPitanGumanitarno goRozminuvannia>

63 Partnerships for International Development: Rhetoric or Results? Lynne Rienner Publishers, 2002. — This work provides a detailed account of the lifecycle of partnerships and emphasises that the phase of organisational tension — the conflict or misalignment phase — is not an exception but a predictable part of partnership development.

64 Tuckman, Bruce W. “Developmental Sequence in Small Groups.” *Psychological Bulletin*, vol. 63, no. 6, 1965, pp. 384–399. doi:10.1037/h0022100.

65 Bryson ea. 2006, pp. 44–55. doi:10.1111/j.1540-6210.2006.00665.x.

66 Not coded as KII as this is used for anonymisation,

in this case, title of the informant has been deliberately mentioned.

67 As suggested by emerging organisational theory, working with animals as active partners (rather than passive tools) can influence the broader structure and culture of an organisation, reinforcing trust-based leadership and adaptive team cohesion. Hodgetts (2024), pp. 337–357. doi:10.1177/13505084231217079.

Available at: <https://journals.sagepub.com/doi/10.1177/13505084231217079>

68 The partial semantic analysis conducted, including emotional coding of participant responses, revealed the main categories of factors influencing the interrelation between handler and dog. This approach is based on the principles of critical qualitative analysis, where the emotional tone of statements not only helps classify the factors but also uncovers the level of subjective burden, stress, or intrinsic motivation associated with them. See: Miles ea. (2014). See also: <https://www.geeksforgeeks.org/nlp/understanding-semantic-analysis-nlp/>.

69 Clusters refer to areas with areas where dogs altered on items that no longer existed. The intention here is that visual search helps to reduced this phenomenon. MAG and APOPO will study to see how much the residual scent reduces over time.

70 This quote is attributed to a named individual to highlight the importance of decision-making authority and the level of managerial involvement in the project.

71 “Mine Detection Dogs (MDDs) may be used for quality control (QC) by conducting verification of cleared areas to confirm that clearance standards have been met. This may include re-surveying areas previously cleared by manual or mechanical means.” IMAS 09.40: Guide for the use of Mine Detection Dogs, Section 4.2: Applications of MDDs, IMAS 09.40 PDF.

Note: While MDDs are highly effective for quality control after manual or mechanical clearance, applying MDD-based QC to land that was already cleared using dogs does not provide meaningful added assurance. This is because the verification would be performed using the same detection method, offering no independent confirmation of the clearance result. For true QC, a different and independent method (e.g., manual sampling or mechanical verification) is recommended following MDD-based clearance.

72 The tasks are not yet fully cleared but the TSD tasks were completed.

73 MAT composition can vary slightly. Currently at eight deminers but could increase to 10, depending on funding and operational planning.

74 ‘False positives’ refers to dogs picking up indications as positive, containing explosives, that turn out to be ‘false’, as explained in the text elsewhere.

75 Inter-Agency Standing Committee (IASC). Multi-Year and Flexible Funding – Definitions Guidance. IASC, Jan. 2020, <https://interagencystandingcommittee.org/grand-bargain-official-website/multi-year-and->

flexible-funding-definitions-guidance

76 Stoddard ea. (2017), https://humanitarianoutcomes.org/sites/default/files/publications/humanitarian_financing_efficiency_.pdf.

77 ALNAP. Summary Brief: Review of the OECD DAC Criteria for Evaluating Humanitarian Action. ALNAP, 16 June 2023, <https://reliefweb.int/report/world/review-oecd-dac-criteria-evaluating-humanitarian-action-summary-brief-enar>.

78 Development Initiatives. Falling Short? Humanitarian Funding and Reform. Development Initiatives, 2024. https://devinit.org/media/documents/Falling_short_Humanitarian_funding_and_reform.pdf.

79 ALNAP. The State of the Humanitarian System 2022: Chapter 10 – Does the System Use Resources Efficiently? ALNAP, 2022, <https://alnapp.org/help-library/resources/2022-the-state-of-the-humanitarian-system-sohs--full-report/sohs-2022-chapter-10-does-the-system-use-resources-efficiently>.

80 Project concept note: MAG internal document

81 This does not impact the project in anyway as APOPO dogs are not housed in the permanent kennels. They are housed in their own temporary kennels, within the police kennel grounds. APOPO is paying for some refurbishment of parts of the kennels with other unrestricted costs as part of their rental agreement with the police.

82 “IMAS 10.30: Personal Protective Equipment (PPE).” International Mine Action Standards, United Nations Mine Action Service, 1 Jan. 2009, <https://www.mineactionstandards.org/standards/10-30/>.

83 “PPE Clothing Norms: A Quick Guide to Safety Compliance.” TenCate Protective Fabrics, <https://eu.tencatefabrics.com/blog/ppe-clothing-norms-quick-guide-safety-compliance>.

84 “How Often Should an Employer Replace Their Team’s Safety Boots?” Shoes For Crews, 24 Oct. 2024, <https://shoesforcrews.pro/blog/replacing-workers-safety-boots/>.

85 Harutyunyan, Armen. “Staff Turnover in the Humanitarian Aid and Development Assistance Sector.” LinkedIn, 17 Jan. 2023, <https://www.linkedin.com/pulse/staff-turnover-humanitarian-aid-development-sector-armen-harutyunyan/>. Accessed 5 May 2025.

86 OECD Development Assistance Committee (DAC). Better Criteria for Better Evaluation: Revised Evaluation Criteria Definitions and Principles for Use. OECD, Dec. 2019, [https://one.oecd.org/document/DCD/DAC\(2019\)58/FINAL/en/pdf](https://one.oecd.org/document/DCD/DAC(2019)58/FINAL/en/pdf).

87 “Over USD 700 Million Committed by International Partners for Humanitarian Demining Projects in Ukraine for 2022–2027.” Cabinet of Ministers of Ukraine, 2025, <https://www.kmu.gov.ua/en/news/ponad-700-milioniv-vydilyly-mizhnarodni-partnery-na-proekty-v-humanitarnomu-rozminuvanni-ukrainy-na-2022-2027-roky>. Accessed 12 June 2025.

88 Ministry of Defence of Ukraine. “Mine Action,

Demining, and Logistics: How the SIRKO-S1 Ground Robotic System Supports Ukrainian Military.” Ministry of Defence of Ukraine, 8 Mar. 2024, <https://mod.gov.ua/en/news/mine-action-demining-and-logistics-how-the-sirko-s1-ground-robotic-system-supports-ukrainian-military>.

89 Cabinet of Ministers of Ukraine. “National Mine Action Strategy for the Period up to 2033.” Ministry of Economy of Ukraine, 28 June 2024, <https://demine.gov.ua/static-objects/demine/uploads/public/676/004/a22/676004a224dd4084346105.pdf>

90 National Mine Action Authority of Ukraine.

“Certification.” UANMAC, <https://ua-nmac.org/en/about/activities/certification/>

91 Center for International Stabilization and Recovery. “Ukrainian Deminers Complete EOD Training in Kosovo.” James Madison University, 24 Oct. 2024, <https://www.jmu.edu/news/cisr/2024/10/24-training.shtml>.

92 Ministry of Economy of Ukraine. “Svyrydenko: The Best International Practices Will Be the Basis for Ukraine’s Humanitarian Demining Strategy.” Ministry of Economy of Ukraine, 9 Mar. 2023, <https://me.gov.ua/News/Print/29fbd020-7017-4e95-888e-dc2e0cea3e86?lang=en-GB>.

93 The scent of explosives wafts into the operations area and confuses the dogs.

94 The presence of formal procedures does not eliminate the need for flexible, adaptive task-level planning. The project confirmed the value of iterative field adjustments through close collaboration between MAG and APOPO field teams and management. However, the field teams’ perspectives and problem-solving proposals often remain underrepresented at management level. This highlights the need to establish a robust feedback mechanism between operational teams and senior management.

95 See Annex 1.

96 OECD. (2021). Applying Evaluation Criteria Thoughtfully. Paris, OECD Publishing. URL: <https://doi.org/10.1787/543e84ed-en>.

97 The sixth OECD-DAC criterion - impact - was not included in this assessment, as the scope of this work is preparation mid-term evaluation report.

98 The Theory of Change (ToC) has become a methodological mainstream in strategic planning, monitoring, and evaluation across philanthropy, international development, social entrepreneurship, and other fields aimed at driving social change. See: Belcher, B. M., Bonaiuti, E., & Thiele, G. (2024). Applying Theory of Change in research program planning: Lessons from CGIAR. Environmental Science & Policy, 160. URL: <https://doi.org/10.1016/j.envsci.2024.103850>.

99 Document is provided from MAG: Theory of Change.

100 Sector-wide Theory of Change for Mine Action. <https://www.itad.com/knowledge-product/mine-action-sector-wide-theory-of-change/>

101 The interview structure is presented in Annex 6.

102 This practice aligns with established ethical guidelines in qualitative research, which emphasize the importance of maintaining participant confidentiality to protect their privacy and ensure the integrity of the research process. UK Statistics Authority. Ethical Considerations Associated with Qualitative Research Methods. UK Statistics Authority, 2015, <https://uksa.statisticsauthority.gov.uk/publication/ethical-considerations-associated-with-qualitative-research-methods/pages/6/>.

103 At the time of the interview, one deminer was on medical leave.

104 For a more detailed discussion on mixed-methods analysis, refer to Creswell & Plano Clark (2018).

105 Mixed-method analysis combines quantitative and qualitative approaches, integrating them at the analysis stage for a deeper understanding of the phenomenon under study, whereas methodological triangulation is used to verify the reliability of data by comparing results obtained through different methods. See: Bryman, Alan. Integrating Quantitative and Qualitative Research: How Is It Done? Qualitative Research, vol. 6, no. 1, 2006, pp. 97–113; Greene, Jennifer C. Mixed Methods in Social Inquiry. Wiley-Blackwell, 2007.

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107 Marshall Legacy Institute (2023). “Mine Detection Dog Programs.” <https://www.marshall-legacy.org/mine-detection-dogs>

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115 These are individual statements, opinions. Some may not be true or have not necessarily been checked; all concerns, where possible, have been addressed. In the sentiment analysis table, individual informants are not numbered, as the focus of the study is not on who exactly expressed a particular view, but rather on the emotional tone and sentiment content of the responses. This approach aligns with the principles of thematic and emotional coding, where the aim is to identify recurring patterns and sentiments rather than attribute statements to specific individuals. See: Saldaña (2016).

116 The “Mixed” emotional coding category was used to capture statements expressing simultaneous or interwoven positive and negative sentiments—such as motivation despite fatigue, pride tempered by frustration, or affection alongside operational concern.

