



Thank you, APOPO, for bringing security and opportunity to our community.”

Kol, 65, Farmer in Siem Reap Cambodia

A N N U A L R E P O R T

2023




apopo
SAVES LIVES

ABOUT APOPO



Founded on a commitment to humanitarian and environmental well-being, APOPO addresses the critical issue of **landmines left behind in post-conflict regions**. To clear landmines and allow local communities to flourish, APOPO has harnessed the acute olfactory capabilities of **African giant pouched rats (*Cricetomys ansorgei*)** to develop an innovative, cost-effective method for landmine clearance. Our approach using both trained rats and **technical survey dogs (TSDs)** speeds up the clearance process and is also cost-efficient, making it well-suited for integration into national mine action programs around the globe.

Recognizing the urgent need for improved health interventions in vulnerable communities, particularly in sub-Saharan Africa, APOPO has also extended its expertise to a major public health challenge: **tuberculosis (TB)**. TB requires prompt and accurate detection to prevent its spread. APOPO trains HeroRATs to quickly and effectively detect TB, significantly reducing the time between detection and treatment.



In parallel, APOPO runs TB detection labs in **Ethiopia, Mozambique, and Tanzania**, where our trained rats complement advanced diagnostic technologies.

APOPO manages Mine Action operations in **Angola, Azerbaijan, Cambodia, Ukraine, and Zimbabwe**. APOPO extends its reach through mine action partnerships in **South Sudan, Senegal, and Türkiye** where we deploy dog teams.

The support that drives APOPO's mission comes from an extensive network of international partners and donors, including foundations based in Switzerland, the United States, and the United Kingdom. This global backing enables APOPO to continue its life-saving work, striving to create safer, healthier, and more prosperous communities in regions most affected by the legacies of conflict and disease.

VISION AND

MISSION

MISSION

Our MISSION is to protect people and the planet with innovative solutions using trained rats and other scent detection animals.

VISION

Our VISION is to create a better world as a global leader in scent detection animals.



APOPO adopts the UN Sustainable Development Goals (SDGs) that are aligned with our work and values and commits to supporting global efforts to achieve these universal goals.

CORE VALUES



QUALITY

Demonstrating and promoting high standards in research, design, training, and implementation of scent detection animals technology.

INNOVATION

Pioneering creative research and innovative solutions within a participatory learning culture.

SOCIAL TRANSFORMATION

Developing skills, creating jobs, improving socio-economic and environmental conditions, releasing land for development, and combating public health issues.

DIVERSITY

Embracing diversity in all facets of the organization with respect to age, gender, religion, sexual orientation, physical abilities, nationality, or ethnicity.

SOLIDARITY

Committing to the common good and shared responsibility toward the protection of the people, communities, and the planet.

ANIMAL WELFARE

Demonstrating and promoting high standards in humane training and welfare for our animal partners.

INTRODUCTION

IMPACT AND INNOVATION IN THE FACE OF ADVERSITY



“With the help of our detection animals, dog teams, and our broad conservation and sustainability initiatives, we’re ready to face any challenge.”

Christophe Cox,
CEO APOPO

In 2023, the world faced ongoing challenges. Against this backdrop, APOPO’s achievements stand out as a source of **optimism and progress**. With both pride and appreciation, I’d like to highlight our team’s exceptional accomplishments across various fronts.

By the end of 2023, after more than 20 years working in humanitarian mine action, APOPO achieved a milestone of releasing a total of **100 million square meters of land**. Additionally, in **Türkiye** and **Mozambique**, we successfully **completed critical demining** and disarmament projects, saving lives and allowing communities to rebuild in safety. These efforts mark significant advancements in our mission to combat the effects of conflict and violence across the world.

Our demining work is currently focused on **Angola, Cambodia, Azerbaijan, South Sudan, and Senegal**, where we’ve **cleared thousands of mines and unexploded ordnance**, allowing communities to reclaim and safely rebuild their lands. Our preparation for a new project in **Ukraine** also demonstrates our dedication to addressing emerging mine action challenges head-on, even in the most volatile and complex scenarios.

In our **battle against tuberculosis (TB)** in **Tanzania, Ethiopia, and Mozambique** we continue to see very positive results. Through innovative TB detection methods using the remarkable sense of smell of our HeroRATs, we’ve identified TB cases more efficiently and are bringing hope to communities affected by this epidemic, saving lives and improving health outcomes.

Innovation drives our approach to overcoming obstacles. Our trials with African giant pouched rats in **wildlife detection** and preparations for **search and rescue missions** are examples of our commitment to using cutting-edge technology for conservation and disaster response. Our work also extends to training and supporting other organizations, reflecting our collaborative ethos.

Addressing **climate change** and promoting **sustainable livelihoods** have also been a priority. Our **HeroTREES** project and other climate initiatives show our commitment to **environmental conservation**. In **Cambodia**, we’ve launched a significant project in **organic rice farming** for mine clearance beneficiaries, enhancing both environmental preservation and community livelihoods.

Looking ahead, we remain united in **resilience and determination**. With the help of our detection rats, dog teams, and our broad conservation and sustainability initiatives, we’re ready to face any challenge. Our collective dedication ensures we continue making a **significant impact**.

I extend my **deepest gratitude** to the APOPO family - our staff, partners, and supporters. Your dedication and passion make our successes possible, driving us toward a better, more hopeful future.

Sincerely,

Christophe

SINCE APOPO BEGAN UNTIL THE END OF 2023



162,138

Landmines and other explosives destroyed



105,875,553 m²

Safe land given back to communities



2,281,575

People freed from the terror of landmines



589,438

Patients screened for TB



30,163

Additional TB cases detected



304,928

Potential infections halted



Over **44,000** trees successfully growing since 2017



MINE ACTION



“Despite ongoing efforts to eliminate these dangers, approximately 60 million people across the globe still live under the threat of landmine contamination.”

Michael Heiman
Head of Programs Mine Action



The persistence of landmines and unexploded ordnance from past conflicts continues to pose significant challenges to global safety. Despite ongoing efforts to eliminate these dangers, approximately 60 million people across the globe still live under the threat of landmine contamination. These remnants of conflict remain a cause of accidents and are barriers to development long after hostilities have ceased. The Landmine Monitor reported that, in 2022, there were at least **4,710 casualties** due to landmines and other explosive remnants of war - **1,661 killed** and **3,015 injured**. Civilians, particularly children who represent half of the casualties, are the most affected by these threats.





APOPO Mine Action’s primary mission is the **detection and clearance of landmines and explosive devices** to improve safety and support the recovery of communities affected by these dangers. Alongside clearance activities, APOPO focuses on **education** on the risks associated with explosives to local communities. Additionally, we aim to provide assistance to victims of landmines and explosive remnants of war. In 2023, APOPO continued its landmine clearance operations in **Cambodia, Angola, and Zimbabwe**. We also continued to deploy animals to partners in **Azerbaijan, Senegal, South Sudan, and Türkiye** and made preparations to start a program in **Ukraine**.



APOPO Mine Action’s primary mission is the **detection and clearance of landmines and explosive devices** to improve safety and support the recovery of communities.”

To increase the efficiency of mine clearance, APOPO makes use of **animal detection systems** alongside traditional clearance techniques. This approach, which includes the use of **mine detection rats (MDR)** and **technical survey dogs (TSD)**, has proven to be effective. The animals are trained to detect the scent of explosives, bypassing the issue of false positives from scrap metal that can slow down human deminers with metal detectors. This method has been shown to potentially double or triple the efficiency of clearance operations compared to traditional methods alone.





MINE ACTION

APOPO continues to work in close collaboration with governments, mine action organizations, development partners, and the private sector. The organization's efforts are supported by government donors, private foundations, and public contributions. Thanks to this support, APOPO's work impacted approximately **1.9 million people to date**. With plans to increase funding and strengthen partnerships, APOPO aims to extend its impact further in the coming year.

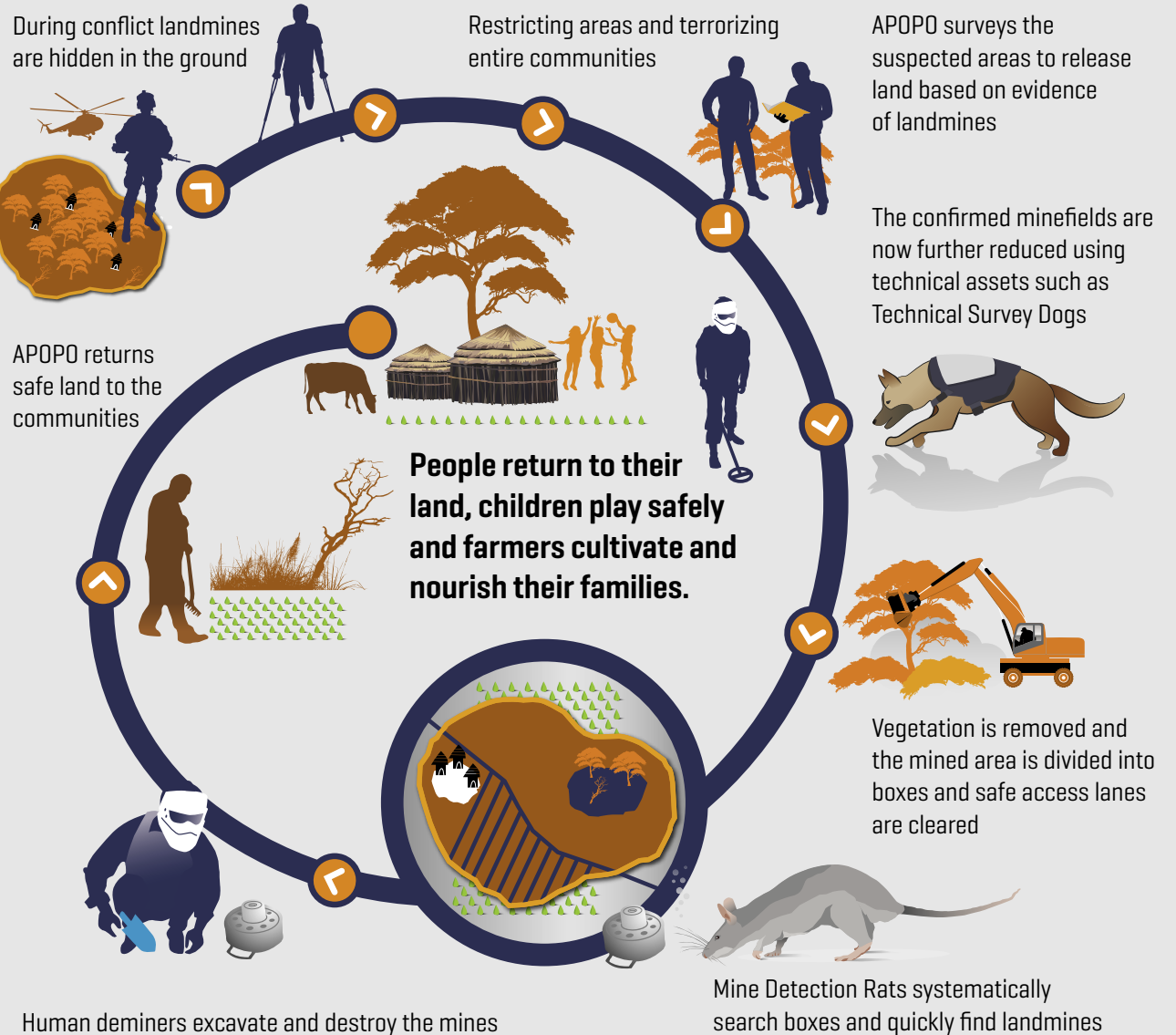


Integrating these animal detection methods has proven to enhance the efficiency of mine clearance efforts, doubling or even tripling the speed of operations."

APOPO employs specially trained animals that detect explosives without being distracted by scrap metal, which often slows down human deminers using metal detectors. This capability allows mine detection rats to locate landmines more quickly. We also use technical survey dogs to inspect areas for explosives, helping to pinpoint where the dangers lie more accurately. Integrating these animal detection methods has proven to enhance the efficiency of mine clearance efforts, doubling or even tripling the speed of operations in some instances compared to traditional methods.

Our Approach

Integration of animal detection systems





MINE ACTION

In 2023, APOPO saw **growth**, expanding its operations in existing locations and launching new initiatives with various partners. This expansion was supported by the dedication of APOPO staff worldwide. The increased demand for **APOPO's animal detection teams** and the development of **new partnerships** with major international and national operators are a testament to APOPO's effective work and the effort of its team.

APOPO remains dedicated to collaborating with **governments, mine action groups, development partners**, and the private sector to ensure comprehensive support for those affected by landmines. The organization's efforts are made possible by contributions from **government donors, private foundations, and the public**. Looking forward to 2024, the organization aims to expand its impact further with increased funding and strategic partnerships.

Where we work



SOUTH SUDAN



SENEGAL



ANGOLA



ZIMBABWE



MOZAMBIQUE



TANZANIA



UKRAINE



AZERBAIJAN



TÜRKIYE



CAMBODIA



THE APOPO MINE ACTION PROGRAMS ARE MADE POSSIBLE BY OUR PARTNERS AND DONORS



CAMBODIA



“There is an urgent need to remove landmines to ensure that living and farming in Cambodia is as safe as possible.”

Michael Raine
Program Manager



Decades after the end of war and conflict in Cambodia, the country is still dealing with the danger of millions of landmines and other explosive remnants of war (ERWs) buried under its soil. These explosives pose a serious risk to the safety of its people and hinder the country's development. As land for farming becomes scarcer due to population growth, many people are moving into previously uncultivated areas where there's a higher chance of encountering landmines. There is therefore an urgent need to remove these landmines to ensure that living and farming in these areas is as safe as possible.





MINE ACTION CAMBODIA

APOPO's Cambodia Mine Action Program has played an essential role in addressing the country's landmine problem throughout 2023. The program focuses on finding and safely clearing landmines and other ERWs, which allows the land to be returned to the community for agricultural use and homes.

The work APOPO does in Cambodia includes careful mine clearance operations using **human deminers**, **technical survey dogs** and **mine detection rats**, educating people in the community about the dangers of ERWs, and offering support to those who have

been affected by landmine incidents. These efforts are intended to reduce risks related to landmines and help the areas impacted by them to recover and grow sustainably.

HISTORICAL SITES

Cambodia is APOPO's biggest Mine Action program. APOPO works in collaboration with **Cambodian Mine Action Center** [CMAC] in Siem Reap and Preah Vihear, and **Mines Advisory Group** [MAG] in Battambang, and Ratanakiri provinces.

In 2023, APOPO intensified its efforts by deploying an additional **Technical Survey Dog (TSD) team** to speed up clearance efforts in and around the Koh Ker temple perimeter. This historic site, which includes a densely forested area with 169 archaeological remains, including 76 temples, is a culturally significant site for Cambodia. The recognition of the **Koh Ker Temple** as the fourth Cambodia World Heritage Site by **UNESCO** in September 2023 emphasized the importance of protecting these historical sites from the threat of landmines and other explosives.





APOPO LAUNCHES FIRST MINE ACTION DEVELOPMENT IMPACT BOND

In April, APOPO launched the groundbreaking “Minefields to Rice-Fields” project in **Preah Vihear province**, marking the first-ever **Development Impact Bond (DIB)** in mine action. Collaborating with agricultural partner **Cordaid**, the project aims to clear contaminated land of mines/ERW while simultaneously providing training to farmers on organic rice cultivation. By empowering vulnerable communities and increasing farmers’ income through premium organic rice production, the project demonstrates AP-OPO’s holistic approach to addressing the socio-economic challenges brought on by mine contamination.



The Technical Survey Dog team's partnership with **MAG** in Ratanakiri province showcased innovation through the success of the **Cluster Munition Technical Survey (CMTS)** method. This pioneering approach identifies and reduces areas contaminated by Cluster Munitions left over from the Vietnam War, thereby mitigating the risk posed to local communities and leaving a safer environment for future generations.

Despite the complexities and challenges faced by the program, APOPO's commitment and strategic partnerships have made significant strides toward Cambodia's goal of becoming mine-free by 2025.





The Cambodia program surpassed all previous outputs with over 18.5 million sqm of safe land released back to local communities for development. With 532 landmines, 60 cluster munitions, and 392 other explosive remnants of war (ERW) found and destroyed, APOPO proved to be invaluable, allowing communities to live freely and get their livelihoods back on track. **The Explosive Ordnance Risk Education (EORE)** and **Victim Assistance (VA)** team was able to successfully reach 26,193 people attending mine risk education sessions, and 274 mine victims receiving treatment through our partner **HI (Humanity and Inclusion)**.

IMPACT IN 2023

Landmines and explosives found and destroyed	984
Cluster munitions found and destroyed	60
Safe land given back to communities	13,435,170 m ²
People benefitting from our work	52,713
People attending Risk Education Sessions	26,193
Mine Victims who received treatment	274





MINE ACTION CAMBODIA



Hope for a Better Future

“ Despite the challenges of farming and supporting a large family, I hold onto hope for a better future. My grandchildren, attending school without fear of landmines, represent the promise of a safer, brighter tomorrow. Thank you, APOPO, for bringing security and opportunity to our community.”

Kol, 65, farmer in Siem Reap, Cambodia

APOPO DOGS



Ibro Tinjak
Head Dog Trainer

Chiara Faini,
Head of Support



Alongside training and operating with animals in its own programs, APOPO is a **leading provider of mine detection animals globally**. APOPO delivers high-performance animal detection teams to partner organizations to respond to Mine Action challenges and improve the operational cost-efficiency of land release efforts. Although APOPO only started training dogs for specific survey roles in 2017, today it has the largest number of dogs in the Mine Action sector. APOPO also assists **National Mine Action Authorities** in setting national animal detection standards and plays an important advisory role in developing internationally accepted standards for the mine action industry.





Equipped with a track & trace system the dogs can search in 30-meter lanes without prior vegetation cutting.

TSDs became operational in **Cambodia** in 2019 and have achieved outstanding results since then. TSDs find the boundaries of minefields or other contaminated areas as quickly as possible while reducing the environmental impact of mine action activities and allowing rapid release of land back to the people. **The TSDs are uniquely selected and highly driven search dogs.** Equipped with a track & trace system the dogs can search in 30-meter lanes without prior vegetation cutting. By integrating TSDs, suspected areas found to have no evidence of explosives can be returned to local communities. This allows for expensive and intrusive clearance methods to be restricted to areas where they are needed.





MINE ACTION CAMBODIA



Alongside training and operating with animals in its own programs, APOPO is a leading provider of mine detection animals globally



APOPO currently has **70+ operational dogs** and its Dog Training Center is based in Cambodia, where we have large training areas with buried explosives and the climate allows training all year round.

In 2023, the HeroDOGs Program continued to train dogs, handlers and team leaders and to support the APOPO programs in **Cambodia** and **Azerbaijan**, and manage independent projects in **Türkiye**, **South Sudan** and **Senegal**.

TÜRKIYE



Landmines were laid alongside Türkiye's borders with Syria, Iraq, Iran, and Armenia, since the 1950s, and according to Mine Action Review, 140.6 km² of contaminated land remains.

APOPO started operating in Türkiye in 2021, in partnership with **The Development Initiative (TDI)**, as a part of the **UNDP Eastern Border Mine Clearance Project**. The dog team began working in May 2023 on minefields on the border with Armenia and Iran, clearing **238,842 m²** and detecting **44 landmines**.



In 2023, APOPO's first Turkish **female handlers**, **Ayşe** and **Merve** started working with their dogs in the country and brought media attention to women working in demining.

The project was completed in October and the team was mobilized to **Azerbaijan**. APOPO maintains its readiness to return to Türkiye for the second part of the project along the borders with Syria and Iraq.



“APOPO's HeroDOGs Find 40 Mines in a Single Day in Turkey”.



SOUTH SUDAN



Decades of war drastically impacted the population of South Sudan leading to a complex humanitarian crisis. According to Mine Action Review, at the end of 2021, approximately 11.1 km² need to be cleared of landmines and cluster munitions. **The United Nations Mine Action Service (UNMAS)** requires operators to boost their landmine clearance capacity with mine detection dogs to speed up the clearance of essential roads across the country.





APOPO started working in South Sudan in 2017, in collaboration with **The Development Initiative (TDI)**, providing trained dogs and staff. The dog teams are deployed in different parts of the country, searching for landmines along roads and for cluster munitions around affected villages.

In 2023, the APOPO team continued operating with **G4S**, surveying and clearing roads across the country, as a part of the **UNMAS Road Clearance Capacity**. Overall, in 2023 the dog teams searched **898,533 m²** of contaminated land along various roads, facilitating the safe movement of people and supplies across the country.

SENEGAL



Senegal has a remaining contamination of approximately 2.5 km², mainly in the Casamance region.

In 2023 APOPO partnered with **Humanity & Inclusion (HI)**, the main mine clearance operator in the country, aiming to accelerate the survey, clearance, and release of the remaining areas in Casamance, and bringing Senegal closer to a Mine-Free status by the end of 2025.

APOPO's team was mobilized and was trained and prepared for accreditation. Due to political unrest in Casamance, accreditation and deployment plans were delayed several times, and the team finally received all permissions to work in December 2023. The team found a landmine on its second day of operations. HI and APOPO agreed to continue the partnership for another year, until March 2025.

ANGOLA



“APOPO Angola achieved significant milestones in its mine action activities in Cuanza Sul province.”

Manuel João Agostinho
Program Manager



In 2023, APOPO Angola achieved significant milestones in its mine action activities in Cuanza Sul province. This is the fourth most contaminated province in the country with approximately 7.3 million sqm across 95 known minefields. APOPO has been operational in Angola since 2012, working to accelerate demining efforts and achieve a mine-free status for the country.





MINE ACTION ANGOLA

APOPO maintained an integrated operational capacity, using heavy ground preparation machines, manual deminers, mine detection rats, and teams focused on **Explosive Ordnance Risk Education (EORE)**, **Non-Technical Survey (NTS)**, and **Explosive Ordnance Disposal (EOD)**.

Agricultural partners, including the **Samuel Base Cole Association** and the **Agriculture Development Institute (IDA)**, continued to collaborate with APOPO on innovative post-clearance efforts to support agriculture tasks in areas where landmines were cleared. This initiative contributes to Angola's national development goals, including food security and poverty reduction. In 2024 APOPO plans to facilitate training sessions with Agroforestry consultant **Roland van Reenen** to empower beneficiaries, partners, and APOPO staff to implement a pilot **Syntropic Farming Project** in the Caiombo locality, where APOPO has previously cleared minefields.



Agricultural partners continued to collaborate with APOPO on innovative post-clearance efforts to support agriculture tasks in areas where landmines were cleared.





Throughout 2023, APOPO’s teams made significant progress releasing **921,421 sqm of land through Technical Survey (TS)** and clearance, reaching around 87% of the annual target. It also canceled **56,000 sqm of land through Non-Technical Survey (NTS)** and demined and released **six Cluster Hazard Areas (CHA)**, directly benefiting over **13,900 people**. APOPO Angola also removed and destroyed **811 landmines and other explosives**, significantly reducing threats to the local community. Because clearing minefields takes time, APOPO conducted 62 mine risk education sessions, reaching a total of **16,284 individuals** and raising awareness about the dangers of explosive remnants.

Despite the challenges, APOPO’s operations maintained an average clearance cost per square meter of €0.65, which is well below the national standard of €2.5, demonstrating cost-effectiveness in its approach.

IMPACT IN 2023

Landmines and other ERW destroyed	198
Small arms and ammunition	608
Safe land given back to communities	921,421 m ²
People benefitting from our work	13,916
People attended EO Risk Education	16,284





MINE ACTION ANGOLA



Peace of Mind

“ Before, I avoided certain paths due to landmines. Life was challenging. APOPO’s work changed everything. We’re grateful for the safety they’ve brought. Now, I start my day at 7 am, going to my land. With peace of mind, we can work and move freely. APOPO’s efforts have made a real difference in our lives”

Marcolino, Farmer in Cuanza Sul, Angola

ZIMBABWE



“The aim of the program is to improve community safety, facilitate agricultural activities, and promote wildlife conservation.”

Mikael Bold
Program Manager



In 2023, APOPO's Zimbabwe Mine Action Program continued to clear land contaminated with landmines. The aim of the program is to improve community safety, facilitate agricultural activities, and promote wildlife conservation. Zimbabwe's border with Mozambique, heavily mined during the liberation war, presents significant challenges to both human and wildlife populations, impacting economic and environmental well-being.

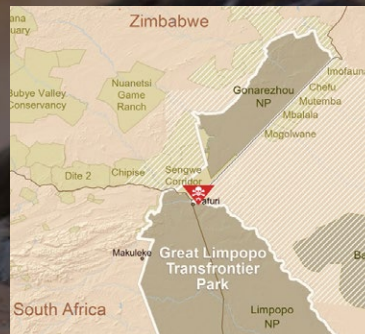




CORDON SANITAIRE (CORSAN) MINEFIELD

Landmine removal focused on the CORSAN minefield within the **Sengwe Wildlife Corridor**, a critical link between **Gonarezhou National Park** in Zimbabwe and **Kruger National Park** in South Africa. The minefield, extending 37 kilometers and containing thousands of R2M2 anti-personnel mines, is an obstacle to the free movement of wildlife and endangers local communities. In 2023, APOPO's clearance efforts in this area led to the neutralization of **4,608 landmines** and booster charges, facilitating safer access to land for both humans and animals. The clearance process involves a combination of manual and technological methods.

The **U.S.** and **Swiss Governments** have amiably supported the mine clearance operations of the CORSAN minefield. The additional support from the **US Department of Defense's Humanitarian Demining R&D Program**, which started in October 2023 and includes detection technology and information system development, will improve outputs in 2024.





EXPLOSIVE ORDNANCE RISK EDUCATION

APOPO also continued to conduct **Explosive Ordnance Risk Education (EORE)** sessions in 2023, reaching 208 people, including 215 children. These sessions aim to inform local populations about the dangers of landmines and safe practices to minimize accidents. Education and awareness are critical components of APOPO’s strategy to reduce the risk of landmine injuries and deaths within communities, even before mine-affected areas can be cleared.

IMPACT IN 2023

Landmines and explosives destroyed	4,608
Safe land given back to communities	1,939,151m ²
People benefitting from our work	2,611
People attended Risk Education	398



AZERBAIJAN



“More than 1,600 km² of contaminated areas remain to be cleared in Azerbaijan.”

Itamar Levy
Program Manager



Mine contamination in Azerbaijan is a result of the armed conflict with Armenia from 1988-1994, during which both sides laid landmines. In the most recent conflict in 2020, there were reports of retreating Armenian forces planting landmines in civilian infrastructure: lamp posts, canals, road junctions, rural and urban paths, courtyard entrances, cemeteries, and riverbanks. The most heavily contaminated areas are in the **Karabakh region**, along the previous borders and confrontation lines between Armenia and Azerbaijan. According to the Mine Action Review, more than 1,600 km² of contaminated areas remain to be cleared.





MINE ACTION AZERBAIJAN



AGHDAM AREA

In 2023, APOPO continued its collaboration with **RPS and Safepoint LLC** deploying its **Mine Detection Dog team** for survey and clearance tasks in the **Aghdam area**. The team expanded in July, to include 10 operational dogs. The program cleared **674,716 m²** of land and found and destroyed **35 landmines** and other explosive remnants of war.

KARABAKH

In May 2023 APOPO mobilized its **HeroRAT and HeroDOG teams** to take part in the EU-funded project for survey and clearance in **Karabakh**, alongside long-standing partner **Mines Advisory Group (MAG)**. This effort involved an additional capacity of 20 animals and 20 staff and enabled establishing an APOPO office in the country and appointing Itamar Levy as the new Program Manager for Azerbaijan, together with several Azerbaijani program support staff.

BASH GARVAND

By the end of July, all animals and staff were accredited and began working on their first task in **Bash Garvand**. APOPO's teams, including female demining teams, worked alongside **MAG** and the **International Eurasia Press Fund (IEPF)**, surveying and clearing **605,281 m²** of land by the end of 2023, just before winter arrived.

REPUBLIC OF ARTSAKH

In September 2023, due to the Azerbaijani Military Operation in the self-proclaimed Republic of Artsakh, the teams had to evacuate but resumed operations in October.



MINE ACTION AZERBAIJAN

EXPLOSIVE ORDNANCE RISK EDUCATION

APOPO's presence in Azerbaijan and the work of its animal detection teams drew positive attention from various stakeholders in the country. This resulted in an additional partnership with **Qaya Safety Solutions LLC**, a mine clearance operator working with the **Azerbaijan National Agency for Mine Action (ANAMA)** in the southern Jibrayil area. In November, APOPO mobilized its 8-dog team from Türkiye to Azerbaijan and passed ANAMA accreditation.

The Azerbaijan program now has **28 detection animals** and 30 staff. Challenges from the winter in Karabakh led APOPO to adapt its methodology to enable working with **HeroRATs** in colder environments while ensuring the animals' health and safety. To keep the rats in shape during the winter, indoor training areas with heating systems were established, allowing training to continue throughout December.

IMPACT IN 2023

Landmines and explosives destroyed 78

Safe land given back to communities 1,133,392 m²



UKRAINE



“ Over 154,000 square kilometers of land are contaminated [...] making it the ‘largest minefield in the world.’ ”

Nick Guest
Program Manager



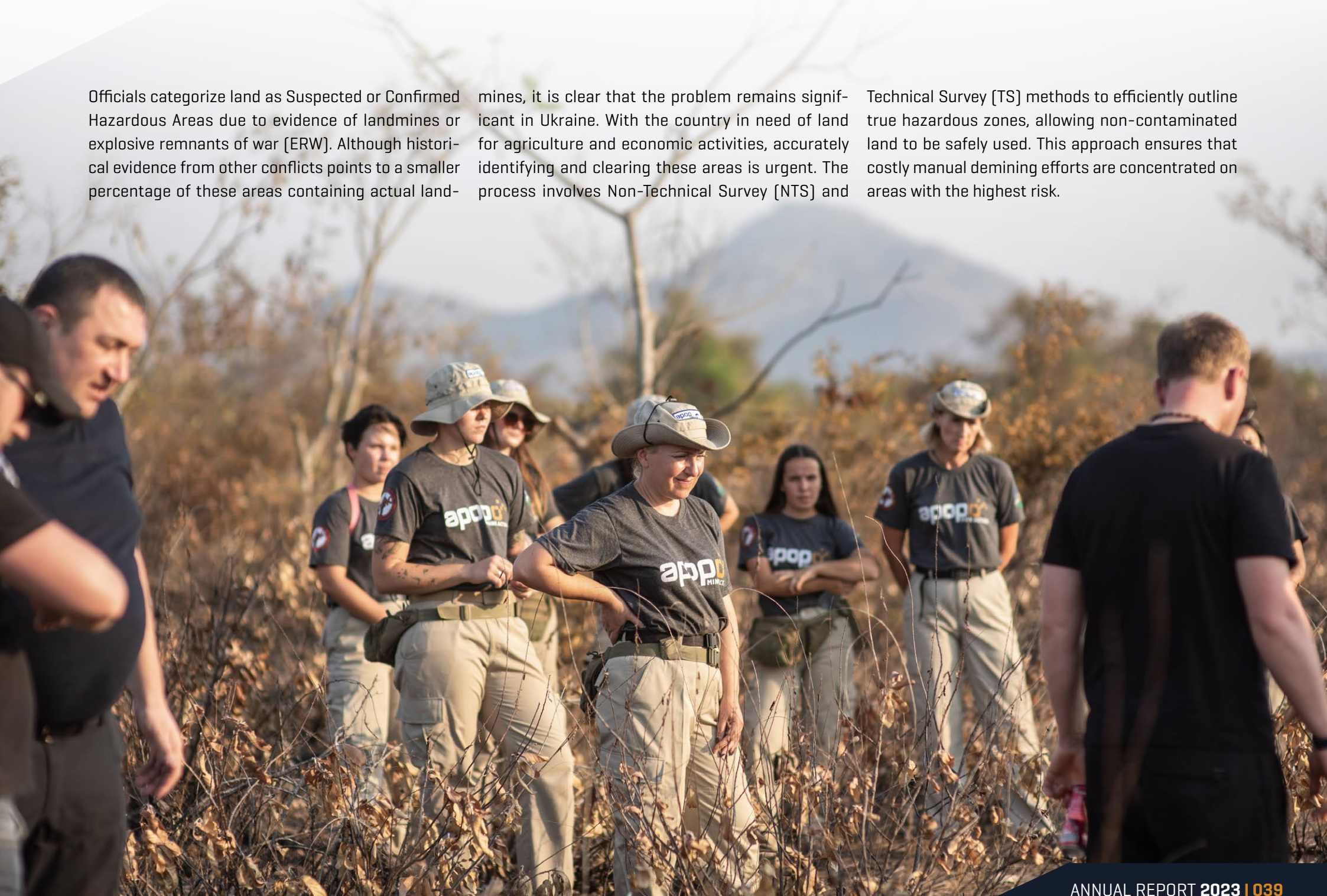
Estimates regarding contaminated land in Ukraine are staggering. As of February 2024, over 154,000 square kilometers are contaminated due to Russia’s invasion in February 2022 and ongoing conflict. This makes it the ‘largest minefield in the world’, covering about 30% of Ukraine’s total land area. The severity of the issue prompted the United Nations Development Program to call for over \$1.5 billion over five years to address this problem.



Officials categorize land as Suspected or Confirmed Hazardous Areas due to evidence of landmines or explosive remnants of war [ERW]. Although historical evidence from other conflicts points to a smaller percentage of these areas containing actual land-

mines, it is clear that the problem remains significant in Ukraine. With the country in need of land for agriculture and economic activities, accurately identifying and clearing these areas is urgent. The process involves Non-Technical Survey (NTS) and

Technical Survey (TS) methods to efficiently outline true hazardous zones, allowing non-contaminated land to be safely used. This approach ensures that costly manual demining efforts are concentrated on areas with the highest risk.



UKRAINIAN TEAM TRAINING

APOPO Mine Action personnel visited Ukraine in 2023 to discuss how their Technical Survey Dog (TSD) approach could help. A partnership was formed with **Sumy National Agrarian University (SNAU)** to establish APOPO's dog maintenance training center. APOPO plans to finalize this setup at SNAU by April 2024. Initial use of TSD in hazardous agriculture areas is planned, with remote-controlled vegetation-cutting machines considered for forested areas with tripwire risks.

APOPO registered as a non-profit in Ukraine in September 2023 and began recruiting staff. **Twelve Ukrainian women from Sumy Oblast** are undergoing training in Cambodia to become TSD Handlers. Nick Guest joined as the Manager of the Program in Ukraine, tasked with program management, certification, habitat building, team mobilization, and operational deployment.

DEPLOYMENT TO UKRAINE

In 2024, APOPO aims to deploy two TSD teams to Ukraine and maintain additional capacity for reinforcements, totaling 14 staff and 20 dogs. Partnership with **Mines Advisory Group (MAG)** is likely in Kharkiv and Mykolaiv Oblasts, based on state prioritization.



MOZAMBIQUE



“APOPO is grateful for the confidence placed in its work by the Peace Process Secretariat.”

Haider Abdula
Project Manager



In August 2019, a landmark agreement, the **Maputo Accord for Peace and Reconciliation**, was signed by Mozambique’s President and the **RENAMO** opposition leader. This pivotal accord ended the long-standing conflict and was implemented with support from the **United Nations Office for Project Services (UNOPS)** and the **Peace Process Secretariat**.



“Opposition leader **Ossufo Momade**, hands over the last Renamo weapon to Mozambican President, **Filipe Nyusi**, marking the end of the disarmament phase.”



MINE ACTION MOZAMBIQUE

Following its successful mine clearance operations from 2004 until Mozambique was declared Mine-Free in 2015, APOPO's efforts have been vital in the disarmament and demobilization phases of the peace process. **As of the end of 2023, all 16 RENAMO bases have been permanently shut down**, and over 5,000 former combatants have been successfully disarmed, demobilized, and reintegrated into their communities. This marks a significant step forward, with the closure of the last RENAMO military base being a milestone in ensuring lasting peace.

APOPO has supported this peace initiative by facilitating the disarmament of former RENAMO combatants, thereby helping them reintegrate into civilian life. Throughout 2022, for example, APOPO provided its expertise in managing the safe disposal of **small arms and light weapons (SALW)**

Before this, APOPO's Mine Action program was proudly involved in clearing minefields in Mozambique from 2004 to the Mine-Free declaration of the country in 2015, followed by residual tasks to clear exploded ammunition dumps.

APOPO is grateful for the confidence placed in its work by the **Peace Process Secretariat** and is immensely proud of the role it played in peace and reconciliation efforts in Mozambique.



PARTNERSHIPS

FOR GOOD

The Mines Advisory Group (MAG) is a UK-based charity that detects and destroys landmines, cluster munitions, and unexploded bombs in places affected by conflict, as well as reducing the threat of armed violence and the impact of weapons on communities. MAG currently operates in 31 countries, and since 1989, has helped over 20 million people.



MAG traditionally uses various detection methods in its programs, such as manual deminers, machines, and animals, constantly seeking innovative tools and methods to accelerate the land release process and improve its cost efficiency. In 2020 MAG trialed the first team of APOPO Mine Detection Rats in its Cambodia program and partnered with APOPO for the first time. A year later, APOPO provided a Technical Survey Dog team to be trialed by MAG in the Cluster Munition Survey and Clearance Project alongside the border with Vietnam. In 2022, MAG included APOPO as a part of its program in Azerbaijan, with both rat and dog teams. And finally, in 2023, both organizations are pre-

paring dog teams to begin work in Ukraine and exploring additional locations for potential future cooperation.

The collaborative projects undertaken with MAG have had a significant impact on APOPO's internal training and operational procedures, facilitating valuable learning from a large-scale international operator and continuously improving its methods to meet high standards. APOPO and MAG initiated discussions about further cooperation on topics such as advocacy, communications, and identifying new projects for mutual benefit through synergistic efforts.

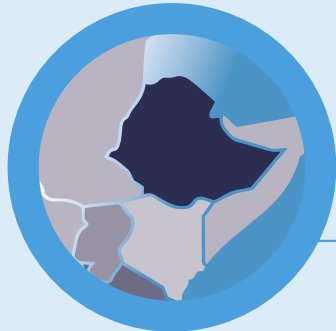


TUBERCULOSIS

WHERE WE WORK



ETHIOPIA



MOZAMBIQUE



TANZANIA

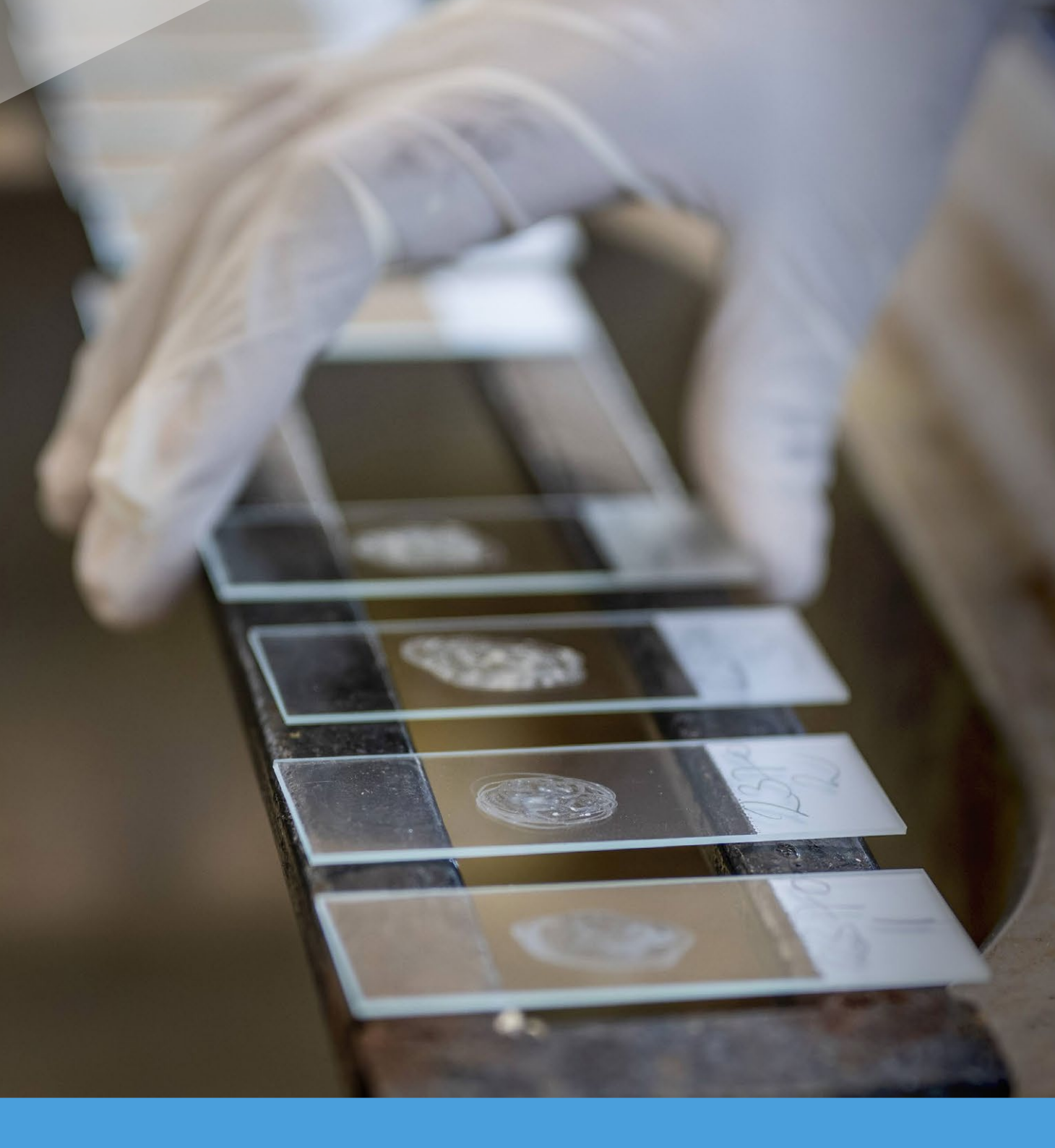


SUMMARY

Globally, tuberculosis (TB) remains a public health concern, with countries like Ethiopia, Tanzania, and Mozambique at the forefront of the struggle. Figures released in 2023 indicate a recovery in TB diagnosis and treatment after the negative impacts of COVID-19, and 7.5 million people were diagnosed with TB, the highest diagnosis rate since monitoring began in 1995. However, the WHO estimates that 10.6 million people contracted TB globally in 2022, indicating that **around 3.1 million people remained undiagnosed** and continued to spread the disease in their communities.

“ Though there was a major global recovery in the number of people diagnosed with TB and treated, TB caused nearly twice as many deaths as HIV/AIDS in 2022 and was the second most common infectious agent worldwide, after coronavirus disease (COVID-19)”

World Health Organization (WHO) 2023



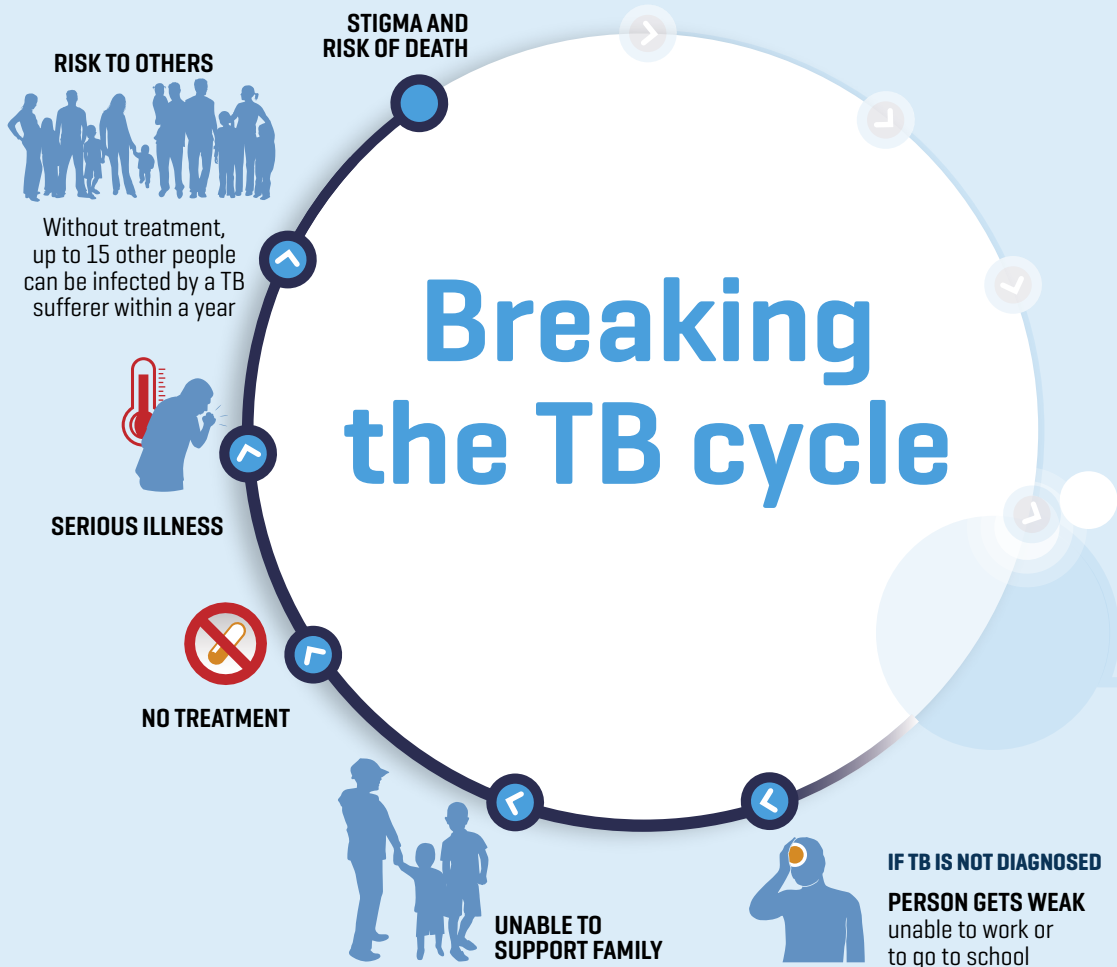
ABOUT TB

Tuberculosis (TB), caused by *Mycobacterium tuberculosis*, is primarily transmitted through the air when people with the active disease cough or sneeze. Common symptoms include a persistent cough, fever, night sweats, and weight loss, underscoring the need for awareness and timely diagnosis. It mostly targets the lungs but can affect other parts of the body. Approximately 25% of the global population is estimated to carry TB bacteria; however, only a small percentage develop the disease. TB predominantly affects adults, making up 90% of cases annually, with a higher incidence in men. Children under 14 accounted for 12% of reported TB cases in 2022.

“ TB remained the world’s second leading cause of death from a single infectious agent in 2022, after COVID-19, and caused almost twice as many deaths as HIV/AIDS.”

WHO Global Tuberculosis Report 2023

TUBERCULOSIS DETECTION



OVERCOMING TB'S HURDLES

In Ethiopia and Tanzania, a decline in TB of just 5% yearly is a significant challenge in achieving the END TB targets. APOPO's collaboration with local health systems and over 160 partner clinics across Ethiopia, Mozambique, and Tanzania intends to tackle the issue of the 'missed' patients identified by the WHO, who account for around a quarter of infected people. Economic and social barriers, along with limited diagnostic capabilities at clinics, are limiting factors for individuals who remain untested or their cases unreported, resulting in 3.1 million people globally remaining undiagnosed and untreated for TB in 2022.

OUR IMPACT

Trained African giant pouched rats [*Cricetomys ansorgei*], have been effectively used by APOPO to detect the odor of TB in human sputum samples. By the end of 2023, APOPO's TB detection initiative had screened a total of 954,469 sputum samples from 585,293 individuals suspected of having TB in Ethiopia, Mozambique, and Tanzania. This effort led to the discovery of 29,946 new TB cases, potentially preventing a further 359,352 TB infections. In 2023 alone, **APOPO tested 359,352 samples from 59,877 individuals, identifying 3,300 new TB cases.**



NEW SAMPLE MATERIALS

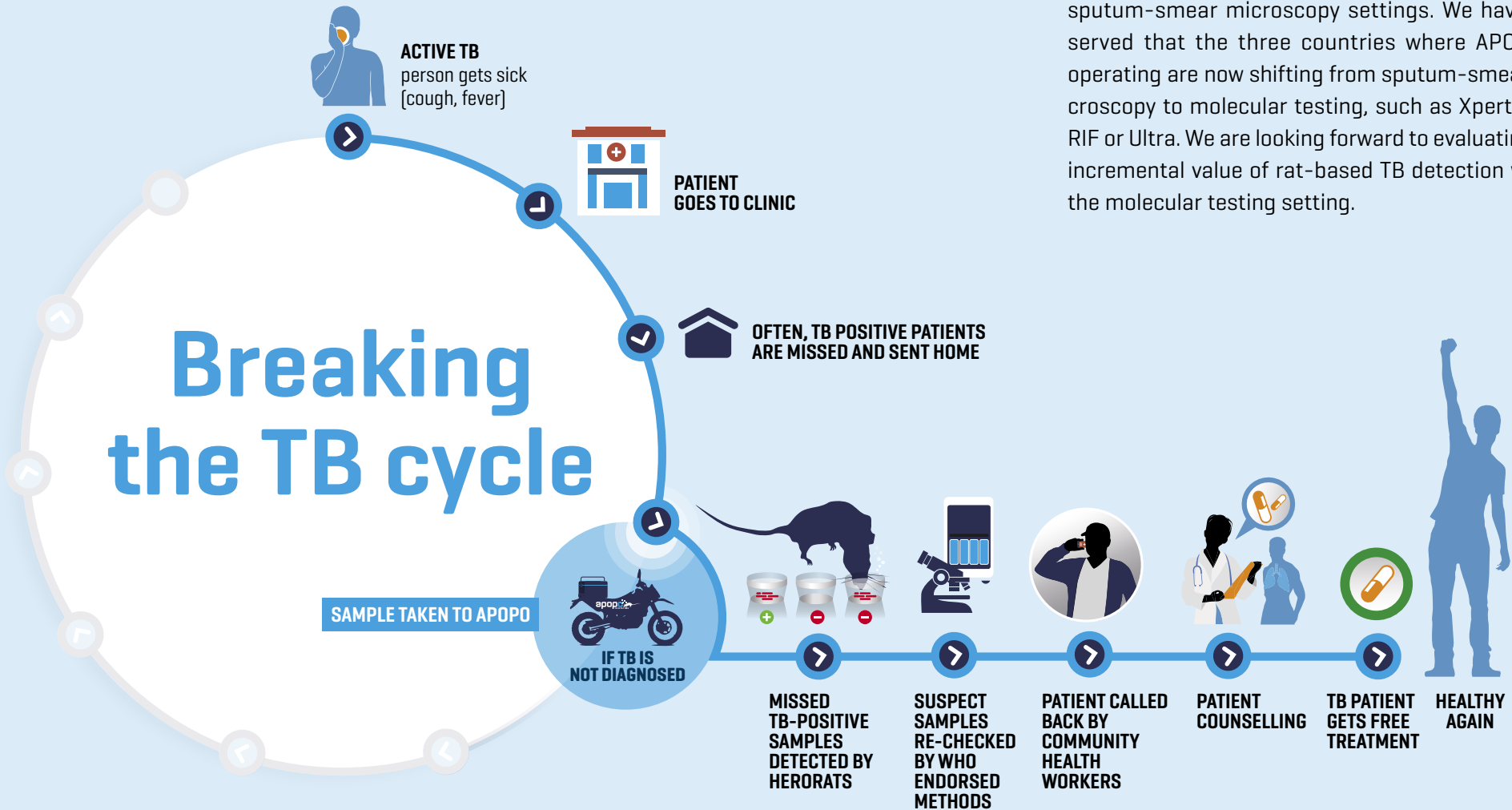
Beyond our ongoing case detection activities, APOPO continues to further refine the use of our innovative TB detection research using trained rats – one of the three pillars of the End TB strategy. This research includes expanding our methodologies to detect TB from a range of new sample materials, such as sebum, sweat, saliva, urine, or breath. Collection of these sample materials is less invasive than collecting sputum, and will potentially make it much easier for children to provide samples. This research is underway in partnership with the **University of Manchester** and a “*human biosensor*”, **Mrs. Joy Milne**. The research may also lead to discoveries that inform the development of synthetic disease detection devices.

FUTURE ASPIRATIONS

Going forward APOPO hopes to use its innovation in other countries in the world, particularly those among the 30 high TB-burden countries. APOPO-trained **rats can sniff 100 samples in just 20 minutes** and indicate whether the samples are positive for TB or not. Therefore, APOPO’s efficient and cost-effective TB detection technology has the potential to contribute to TB elimination goals and global END TB strategies. We aspire to expand our technologies in regions such as Arusha, Mwanza, and Kilimanjaro, where TB rates are above the national average in Tanzania.



APOPO’s recent contribution highlighted that the rats are particularly effective in identifying TB in children, a group traditionally challenging to diagnose, even with low bacterial loads of the disease.”



Currently, the added value of APOPO’s rat-based technology is well demonstrated in the context of sputum-smear microscopy settings. We have observed that the three countries where APOPO is operating are now shifting from sputum-smear microscopy to molecular testing, such as Xpert MTB/RIF or Ultra. We are looking forward to evaluating the incremental value of rat-based TB detection within the molecular testing setting.

THE APOPO TB RESEARCH PROGRAMS ARE MADE POSSIBLE BY OUR PARTNERS AND DONORS.



TB DETECTION

TANZANIA



Dr. Joseph Soka
Program Manager



APOPO operates two TB detection facilities in Tanzania. One is in Morogoro at the **Sokoine University of Agriculture [SUA]** since 2007, and the other is in the **Tanzania Veterinary Laboratory Agency [TVLA]** premises in Dar es Salaam since 2016. This initiative, in collaboration with **80 local health clinics**, has played a significant role in the national campaign to combat TB by identifying undiagnosed patients in Dar es Salaam, Pwani, Morogoro and Dodoma regions.

In 2023, the project tested a total of **46,674 samples** from 37,655 presumptive TB patients and diagnosed **2,363 additional patients**, the greatest number the project has ever achieved. This represents a **47%** increase in case detection, and **85%** of the additional cases were successfully treated and completed treatment.





TB DETECTION TANZANIA

In 2023, APOPO, in partnership with the **University of Manchester** and 'human biosensor' **Joy Milne**, conducted successful research on the rats' ability to detect TB in various bodily fluids like saliva, urine, breath, sebum, and sweat. This breakthrough promises to significantly improve the efficacy of TB detection, particularly in children and people living with HIV, where traditional sputum samples may be of poor quality and more difficult to collect.

The project's success has been greatly bolstered by increased acceptance and support from the government of Tanzania. Notably, on World TB Day 2023, the **Prime Minister of the United Republic of Tanzania, Hon. Kassim Majaliwa**, visited the APOPO booth and emphasized the crucial role of APOPO in TB case finding in Tanzania. He also advocated for expanding the project nationwide.

IMPACT IN 2023

Samples evaluated	46,674
Patients evaluated	37,655
Additional patients diagnosed	2,363
% increase in detection rate	47%



I work in Dar es Salaam at an APOPO partner clinic. The city has close to 8 million people and high TB rates. We see around 100 patients daily, prioritizing "first come, first served." APOPO's rat screening helps us diagnose more patients quickly, reducing suffering, saving lives, and reducing TB's impact

Dr. Leah Ndoveni, Medical Doctor



TB DETECTION

MOZAMBIQUE



Robert Burny
Program Manager



Mozambique remains on the global list of **30 high TB-burden countries**, despite being one of the 33 countries that reduced the number of deaths from tuberculosis (TB) by 35% between 2015 and 2021. Although Mozambique has made progress in the detection of TB cases and TB/HIV coinfection, only 43% of presumptive TB patients had access to the national standard molecular testing.



TB DETECTION MOZAMBIQUE

APOPO started its program at the **Eduardo Mondlane University (UEM) Veterinary School** to support the diagnosis of TB in Mozambique in 2013, contributing to national TB control efforts by increasing the number of TB patients diagnosed and linked to care. In 2018, the **Ministry of Health** decided to roll out molecular testing, which progressively decreased the flow of samples to APOPO's laboratory. This led to the interruption of rat-based TB-detection activities in Mozambique in mid-2020. Since then, APOPO has continued to provide **Xpert MTB/RIF testing services** for partner clinics. In 2023, the number of partner clinics decreased to 30, and with fewer needs expressed by provincial health authorities, APOPO refocused support on Maputo City. In November 2023 APOPO started testing stool samples - a national initiative to increase TB detection in children.

In 2023, APOPO tested **8,722 samples** and diagnosed 833 new TB patients in Mozambique. In Maputo City, along with notifying the clinics, APOPO notified partner organization **Centro de Colaboração em Saúde (CCS)** to mobilize community health workers who track down patients and support them throughout their course of treatment. APOPO's collaboration with CCS enabled 90% of newly diagnosed TB patients in Maputo to be successfully linked to lifesaving care and treatment.





TB DETECTION MOZAMBIQUE

APOPO continued testing samples for **Human Papillomavirus (HPV)**, a common cause of cervical cancer in women, in collaboration with **RICE University**, continuing the partnership with **Population Services International (PSI)**. APOPO tested **625** additional samples for HPV as control tests, showing that APOPO has the potential to tackle other diseases and further increase our impact.

In the current context, APOPO has assessed needs and prepared new projects, including with a new promising partner organization, **UNIDOS**, working on harm reduction activities for drug users. This is a growing problem in large cities like Maputo, and we identified testing and treatment for both TB and other frequent lung diseases as a serious gap in the delivery of health services in this group of patients.

IMPACT IN 2023

TB samples evaluated	8,722
New patients diagnosed with TB	833
Number of patients linked to care [% of the above]	751 [90%]
HPV samples and patients evaluated	625



TB DETECTION

ETHIOPIA



Dr. Negussie Beyene
Program Manager



APOPO, in partnership with the Armauer Hansen Research Institute (AHRI) and the Addis Ababa City Administration Health Bureau, has been actively engaged in finding missed TB cases in 60 public health centers in Addis Ababa, Ethiopia since March 2018.

In 2023, more than **30,000 sputum samples** collected from **15,257 patients** were screened, and 215 TB patients who were declared negative by their respective health centers were subsequently identified as positive by APOPO's TB-detection rats and confirmed in the laboratory. These cases were found in addition to the 518 smear-positive cases detected by the health facilities themselves.



TB DETECTION ETHIOPIA

The **RUPAA project (Reaching the Unreached Urban Poor Population of Addis Ababa)** was implemented in two areas of Addis Ababa, covering **21 health centers**, and reaching **23,218 people**. These include high-risk groups such as weavers, shoemakers, underprivileged people using a feeding center, an orphanage, a police detention center, beggars on a churchyard street, and more.

320 health professionals [75% of whom were female] were trained in TB screening and deployed in the community to provide TB health education and identify presumptive cases. Accordingly, high risk populations or people from high risk populations as well as **2,271** presumptive community cases, were tested for TB using Xpert MTB/RIF Ultra diagnostic tests. APOPO found 33 bacteriologically confirmed pulmonary TB cases, out of which three were rifampicin resistant. All the identified TB patients started treatment.

IMPACT IN 2023

Samples evaluated	30,053
Patients evaluated	15,257
Additional patients diagnosed	215
% increase in detection rate	42%





TB DETECTION ETHIOPIA



My name is Mohammed. I'm 45 and a day laborer. I had a cough, night sweats and fatigue. I was diagnosed with TB at the clinic. I started treatment but stopped. APOPO and the health center team found me, I got tested again and resumed treatment. Despite another relapse, they tracked me down, and urged me to continue. Thanks to the team, I finished treatment and I'm healthy again. I regret my lapses and advise others to heed health advice to complete treatment for a full recovery."

Mohammed Abdella, Former TB patient



TRAINING, BREEDING,

AND WELFARE



Dr. Cindy Fast
Head of Training

The Making of a HeroRAT

Every HeroRAT starts its journey to become a lifesaver at our Training Center, located at the Sokoine University of Agriculture [SUA] in Morogoro, Tanzania. Rat pups stay with their littermates and mother, undisturbed until they are about 4 weeks old. This marks the beginning of their introduction to the world around them, learning to explore and build trust with humans. This early phase involves gentle practices known as habituation and socialization, crucial for further training. Official training starts when the rats are 10 weeks old, when they are also weaned and start living with their siblings. Completing the full training cycle for a rat takes approximately a year, laying the groundwork for their future roles in saving lives.

MINE DETECTION RATS

In 2023, APOPO continued to expand its mine detection rat (MDR) training program, with 77 young rats participating in the training program. Innovations in training procedures, such as the continued use of a “tea egg holder” developed in 2022 and a new training stage with permanently buried tea eggs in our training minefield, improved training efficiency. This reduced the duration of training while maintaining a low drop-out rate of 6.5% of rats unsuitable for mine detection.

Notably, **37 mine detection rats achieved internal accreditation in 2023**, with 22 being deployed to operational programs in Angola and Azerbaijan. APOPO’s rigorous testing protocols between training stages led to **151 blind tests, with a 90% pass rate**. In field training, the rats collectively searched **486,458 square meters**, detecting **19,914 explosives** and earning 13,024 banana rewards.



A close-up photograph of a small, light-colored rat with pinkish ears and nose, being held gently in a person's hand. The rat is looking towards the left. The background is a dark, textured fabric, likely a uniform. The lighting is soft, highlighting the rat's fur and the texture of the fabric.

TB DETECTION RATS

APOPO's TB detection rat training also progressed, with 24 rats starting training in 2023, three of which achieved internal accreditation within the year. Research into alternative training methods showed promising results, particularly a technique involving initial training on an irrelevant scent which shows potential to decrease overall training time.

BREEDING PROGRAM

The breeding program saw the birth of 32 rat pups, alongside the successful rearing of 6 orphaned pups rescued from the wild. Public support allowed for significant renovations to breeding facilities and retired rat kennels, improving living conditions and providing further enrichment for the rats. Additionally, 11 tablets were acquired for staff to monitor rat health and collect data more efficiently.

ANIMAL WELFARE

To further improve the **health and welfare** of the **HeroRATs** and provide educational opportunities for rat caretakers, **weekly seminars** led by a vet and behavior research scientist were developed and TB-detection rat trainers in Tanzania underwent refresh training to renew their internal accreditation.

CAPACITY BUILDING

APOPO was one of the 10 recipients of the **2023 Elevate Prize**. In addition to financial support of rat training and research programs, the prize provided supervisors and staff with leadership skills training. APOPO's contributions to scientific research and capacity building were highlighted through invited lectures, presentations at international symposiums, and publications on scent detection and animal behavior.

Collaborations with students and researchers focused on developing new methods of training rats for scent detection of various scent targets as well as genetic influences of scent detection. The organization also gained support from Tanzanian officials following World TB Day demonstrations and delivered **Ambassador HeroRATs** to the **San Diego Zoo**, showcasing their impact and innovative approaches in mine detection and TB screening.



THE ELEVATE PRIZE

“ Our partnership with APOPO has been a transformative journey, illustrating the boundless potential of collaboration. As new supporters in the Rat Training section, we’ve witnessed first-hand the remarkable dedication APOPO shows towards capacity building, animal health, and innovative solutions for global challenges like landmine and TB detection. We’re honored to be part of APOPO’s mission, leveraging the unique capabilities of their trained rats to forge a safer, healthier world. Their work not only exemplifies innovation but also embodies hope, transforming lives one sniff at a time.”

**Alex Rosales, The Elevate Prize,
Senior Program Manager**





“ Working with APOPO is literally a dream come true for me. When trying to explain to my family why I was relocating to Tanzania for the year, I described APOPO as “the NASA of rats” and “the coolest place a rodent olfactory researcher could possibly be.” The rats do not disappoint – I continue to be blown away by their cleverness, their unique personalities, and the sheer amount of food they can fit in their cheeks. The opportunity to work with APOPO as a visiting student researcher has meant so much to me, and I will forever be thankful for all I have learned from the amazing APOPO team.”

Madeleine Mason, Doctoral Student, University of North Carolina Wilmington



INNOVATION

In 2023, innovation remained at the heart of APOPO's work, spearheaded by our dedicated **Innovation Department**. Located at the **Sokoine University of Agriculture in Tanzania**, this department works closely with the **Training Department** to conduct comprehensive research on new areas of application for our scent detection rats.

Our team includes experts from both Tanzania and abroad, spanning various scientific disciplines. The Innovation Department focuses on fostering teamwork, enhancing our internal capabilities, and contributing to sustainability. Additionally, it focuses on addressing the diversity in **Science, Technology, Engineering, and Math (STEM)** fields.

In 2023, APOPO's Innovation Department continued to expand its groundbreaking work, hosting significant events and making notable advancements in research and field applications. In November, our team welcomed members from our **Turkish partner GEA** at our Training and Innovation headquarters, marking an important step in the **Rescu-eRATs project**. This initiative focuses on training APOPO's African giant pouched rats for integration into **Search and Rescue** operations, enhancing their role in critical emergency responses.



“Further showcasing our innovative projects, APOPO participated in the Dutch Design Week in Eindhoven, The Netherlands.”

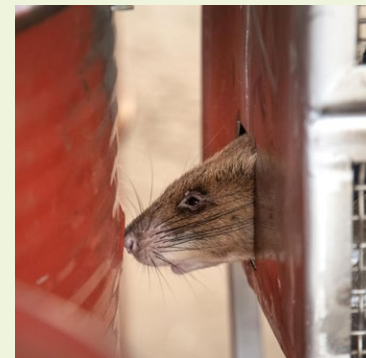


DRIVERS OF CHANGE

Further showcasing our innovative projects, APOPO participated in the **Dutch Design Week** from October 21st to 29th in Eindhoven, The Netherlands. Featured in the TU/e exhibition ‘**Drivers of Change,**’ we highlighted our Search and Rescue rat project. The event peaked on November 26th when **Her Majesty, Queen Máxima of the Netherlands** visited our booth, showing great interest in our efforts and the capabilities of our HeroRATS.



WILDLIFE DETECTION



Additionally, in 2023, APOPO conducted a **field trial** at the Dar es Salaam seaport in Tanzania, where our HeroRATS were tested on their ability to **detect wildlife contraband**. Their exceptional sense of smell and agility proved effective in this non-intrusive and cost-efficient screening method. The positive outcomes from this trial suggest a promising new tool in **combating illegal wildlife trafficking**, potentially revolutionizing current screening processes and aiding in the global fight against the illegal wildlife trade.

BRUCELLOSIS

This year also highlighted APOPO’s scientific contributions with the publication of research on a **new potential application** for our rats—**detecting the Brucella bacteria**, responsible for Brucellosis. This disease, transmittable from animals to humans, represents a significant health and economic threat globally. Our rats’ ability to identify this bacteria could lead to innovative approaches to disease control and prevention.

SEARCH & RESCUE



**Dr. Danielle
Giangrosso**
Behavioral Research
Scientist

APOPO's RescueRAT project is focused on training African giant pouched rats to find survivors in post-disaster Search and Rescue scenarios. In 2023, the RescueRAT project made several strides toward its goal of deploying a team in real-world Search and Rescue responses.

SEARCH & RESCUE

The rats completed advanced training, learning to locate and identify mock human **'survivors'** in more complex search scenarios. This included (i) discriminating between the smell of humans and the smell of human-associated items (i.e., clothes, shoes), (ii) identifying survivors who are fully concealed by debris, and (iii) ignoring distracting items during their searches, such as food and other household items. Building on this success, the rats' training then advanced into more complex search scenarios, within an expanded search area packed with dense debris.

Other milestones in 2023 include on-site visits with **APOPO's partner GEA**, a volunteer search and rescue organization based in **Türkiye**. In June, the RescueRATs' lead researcher visited GEA in Türkiye, touring their headquarters and different debris training sites as well as attending their search and rescue training camp.

INNOVATION

In November, two GEA members visited APOPO's training headquarters in Morogoro, Tanzania. They advised on the setup of the mock debris site, observed rat training, and educated the team on search and rescue practices. In addition, we also had several strategic meetings to plan how to conduct operational research on-site in Antalya, Türkiye in 2024.

All of this work was made possible by the generous support from our donors. **The Alpha-Omega Association** supported our advanced training efforts as well as GEA's on-site visit. In addition, the project received generous support from the **Karakin Foundation**.

Together, the progress and promise of our **RescueRATs team**, combined with the ongoing support from our donors and partners, brings us closer to our goal of deploying RescueRAT teams in real-life international Search and Rescue efforts.



WILDLIFE DETECTION

INNOVATION



Dr. Isabelle Szott
Senior Behavioral Re-
search Scientist

In 2023 the Wildlife Detection project completed its first-ever operational trials at the seaport of Dar es Salaam, Tanzania. Following four weeks of training in the port, the rats completed one week of testing, where our partner, the **Tanzanian Wildlife Management Authority (TAWA)** placed both wildlife targets and non-target items within the search environment. The rats demonstrated remarkable abilities by detecting an incredible 83% of wildlife targets, despite the trainers and researchers not knowing which items contained wildlife and which did not. This success highlighted their potential in combating wildlife trafficking within operational environments.



INNOVATION

Following the trials, a new generation of wildlife detection rats underwent training to fill the paw-steps of the now-retired cohort. Applying lessons learned from the port trials, the new rats completed the initial training stages in just 9 months, learning to detect wildlife targets within shipping containers as well as when searching on a long leash in a simulated warehouse.

The success of these trials and the ongoing efforts of the project are made possible through collaboration with key partners and donors. Organizations such as **TAWA**, the **Joint Port Control Unit**, **Endangered Wildlife Trust (EWT)**, and project funding from the **German government (GIZ)**, **Karakin**, and **UNDP-GEF-USAID** under the World Bank-led Global Wildlife Program, provided crucial support and resources for the project's operations.

Looking ahead, the project aims to conduct additional operational trials at the Dar es Salaam seaport in 2024, with plans to expand to the airport as well. These trials will further inform APOPO's training protocols and pave the way for transforming this from a research project into a fully operational project in the near future.



A LONG SUCCESSFUL COLLABORATION

The over 20-year collaboration between **Sokoine University of Agriculture (SUA)** and APOPO arose from a collaborative **Rodent Research Project** between the **University of Antwerp (UA)**, Belgium and SUA, Tanzania in the late 1980s. The initial collaboration agreement was signed between SUA and UA in 1986. In 2000 the collaboration between SUA and UA was extended to include APOPO and the three sides agreed to work together in research, training, and product development.

The collaboration between SUA and UA has continued to focus on research and training of Postgraduate students while that between SUA and APOPO has prioritized research, development and deployment of biosensor technology using African giant pouched rats, [*Cricetomys ansorgei*] also known as HeroRATs.

APOPO's groundbreaking innovations include the use of the HeroRATs, bred and trained at SUA, Morogoro, Tanzania for landmine detection in Mozambique, Angola, Cambodia, Zimbabwe, and Azerbaijan with potential for further expansion of demining activities in several other countries in the world. Additionally, APOPO uses its HeroRATs for rapid detection of *Mycobacterium tuberculosis* [TB] in human sputum samples from presumptive TB patients in Tanzania,

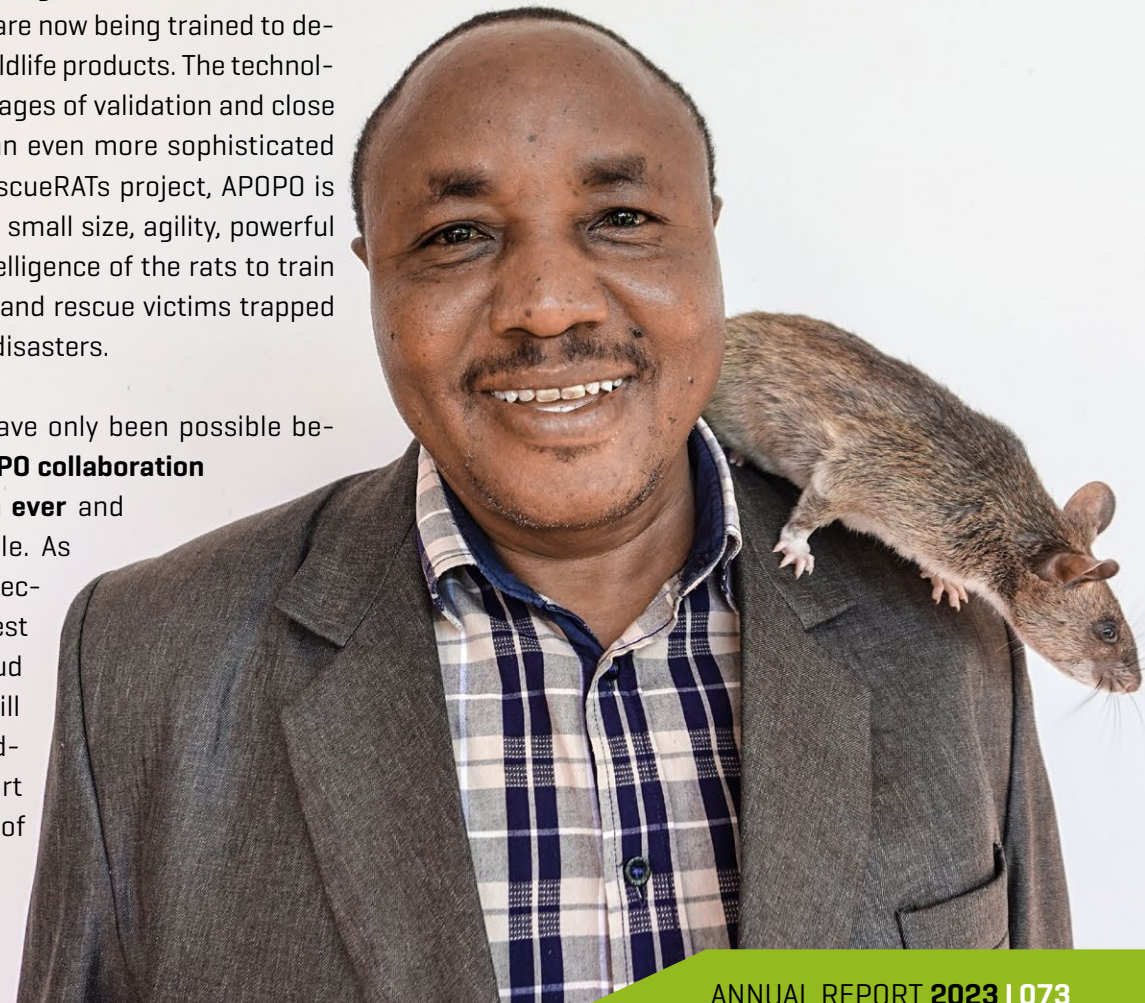
Mozambique and Ethiopia with the potential to be adopted in other countries in Africa.

APOPO's detection technologies are expanding rapidly; HeroRATs, initially recognized for their landmine and TB detection skills, are now being trained to detect a variety of illegal wildlife products. The technology is in its advanced stages of validation and close to being rolled out. In an even more sophisticated venture, through its RescueRATs project, APOPO is taking advantage of the small size, agility, powerful scent detection and intelligence of the rats to train them to search, locate, and rescue victims trapped under debris in natural disasters.

All these innovations have only been possible because **the SUA-UA-APOPO collaboration remains stronger than ever** and each party plays its role. As the newly appointed Director of the Institute of Pest Management, I am proud to join this team and will strive to continue providing the required support to further the success of this venture.

Prof. Allen Malisa

Director Pest Management,
Sokoine University of Agriculture



APOPO TRAINING & INNOVATION IS MADE POSSIBLE BY OUR PARTNERS AND DONORS



A close-up photograph of a person wearing a dark uniform and a white hard hat, gently holding a small brown mouse. The mouse is resting on the person's arm, which is covered in a light-colored sleeve. The background is a soft-focus green field. The image is overlaid with orange graphic elements containing text.

MARKETING &

COMMUNICATIONS

MARKETING & COMMUNICATIONS

2023 was a year of growth for APOPO's Marketing team. Public fundraising revenue increased by 14.2% compared to 2022, with €1.6 million raised from a dedicated global supporter base. This marks the second consecutive year of significant growth despite challenging global economic conditions.

APOPO maintained a robust online presence, with over 1,500 mentions in online and traditional media, including notable outlets like CNN, National Geographic, Forbes Magazine, and The Guardian. APOPO's animals enjoyed worldwide attention, while our Marketing Team also concentrated on grassroots campaigns. Our online community thrived, with over 230,000 supporters, and our social media performance outpaced many similar organizations.

The team also grew, to include a copywriter, SEO specialist, and social media content creator to develop our TikTok account, enhancing our outreach efforts.

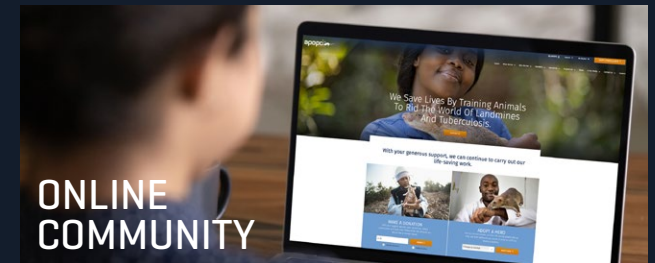
We launched a new internal communication channel to improve the flow of information from our programs to the Comms Department. This channel has already increased the visibility of our initiatives, al-

lowing us to share more stories from the field and ensure timely reporting of events.

APOPO officially launched the new EU Store, offering APOPO merchandise to our customers in Europe and the UK. The new store operates on a print-on-demand basis, and allows us to provide eco-friendly and locally made options.

APOPO participated in a growing number of prestigious industry events, such as the Union TB Conference, Meetings of the States Parties to the Anti-Personnel Mine Ban Convention (APMBC), and the Gregynog Associative Learning Symposium. These events provide a great platform to further build our reputation, engage with potential funders, and strengthen ongoing partnerships.

As part of the Elevate Prize support, the Marketing team received comprehensive support from the Elevate Prize Foundation, including detailed audits of our social media channels and overall brand. These audits highlighted our strong, engaged audience and impressive content performance.



ONLINE COMMUNITY



Facebook followers: 117,000



Twitter followers: 15,000



Instagram followers: 56,500



TikTok followers: 15,300



YouTube subscribers: 3,200



LinkedIn: 3,400



Newsletter subscribers: 32,000



Global Giving Donors: 5,900

APOPO WOULD LIKE TO GRATEFULLY ACKNOWLEDGE PARTNERS AND DONORS

Association Basmati	FJC	Communities Foundation of Texas	Jewish Communal Fund
Martin Foundation, Inc.	Global Development Group	Google	Gregory Rowling, NZH Management
Jewish Community Foundation	King Baudouin Foundation	Shipyards Hill Giving	Seattle Foundation
Maecenata	DonorBox	Facebook	Global Giving
Captiva Foundation	APOPO is extremely grateful for the continued Pro Bono support of the Belgian Law firm Liedekerke Wolters Waelbroeck Kirkpatrick and the US law firm Foley Hoag LLP. Your work has proven incredibly valuable to our innovative life-saving efforts!		



APOPO thanks the University of Antwerp

for always having been a most trusted partner, hosting APOPO's Head Office, Board Meetings and providing valued scientific and networking support.

APOPO RAT ADOPTIONS

MEET OUR HERORATS



APOPO's animal adoptions give you the chance to join one of three HeroRATs or HeroDOGS on a life-saving adventure. Every adoption comes complete with a 10-page welcome pack, adoption certificate, and regular impact updates with the latest news, pictures, and statistics from the field. For as little as US\$9 a month (HeroRAT) or US\$19 (HeroDOG), you can adopt or gift an animal and help save lives. Visit our website to find out more!



Baraka

Baraka was trained as a Mine Detection Rat or 'HeroRAT' for short. After his initial training period in Tanzania, In 2023 Baraka was deployed to Angola where he now works with the demining team in Cuanza Sul province. Baraka uses his remarkable sense of smell to safely sniff out explosives faster and more accurately than existing methods. Baraka means blessing in Swahili.



Ronin

Ronin is a gentle and social landmine detection rat who is also one of APOPO's most successful HeroRATs. On the minefield, he is focused and hardworking. Based in Cambodia where a legacy of the 30-year internal conflict still hurts people today, Ronin sniffs out deadly explosives much faster than conventional solutions.



Carolina

Carolina is a boisterous and hardworking HeroRAT based in Dar es Salaam, a mega-city in Tanzania. Carolina can search 100 sputum samples for tuberculosis in under 20 minutes. She enjoys play time in the mornings where she can expend all her excess energy climbing on her favorite platforms.



SWISS FOUNDATION



Anna Bouchier
Director of Partnerships,
Europe

In 2023, the APOPO Swiss Foundation expanded beyond its local ecosystem, to start acting as APOPO’s partnerships coordinator for the European region. Building on previous years, the Foundation strengthened its existing relationships and expanded its portfolio to support the organization’s growth, while representing APOPO at global events.

VICTIM ASSISTANCE

The Swiss team also contributed to the support of the Cambodia programme’s Victim Assistance Unit, by creating a dedicated database to map landmine victims encountered in the areas of operation. APOPO has been working with **Humanity & Inclusion (HI)** to transport victims to the nearest rehabilitation centers, thanks to the financial contribution of multiple European donors. This additional support also allowed for an increased number of **Explosive Ordnance Risk Education (EORE)** sessions, aimed at reducing casualties by educating affected communities and raising general landmine awareness.

LEADING ROLE

The Foundation has been instrumental in supporting APOPO’s expansion into **Ukraine** and **Azerbaijan**, providing financial support for the operations. This support continues to contribute to the growth and sustainability of Mine Action programs, as the demand for APOPO’s solutions increases. Additionally, the Swiss foundation has played a leading role in securing funding for the **TB detection programs**, including securing large grants for the pediatric TB project in Tanzania and assisting the team with global funding proposals to advance research on TB detection using rat technology.

GLOBAL EVENTS

Finally, the team represented APOPO at large global events including the **Skoll Forum** and the **Mine State Party Convention** hosted by the United Nations in Geneva. APOPO spoke alongside the **HaloTrust**, **Cambodian Mine Action Center (CMAC)**, and **Cambodian Mine Action and Victim Assistance Authority. (CMAA)** in the context of Cambodia’s upcoming presidency of the Anti-Personnel Landmines Convention, with a focus on the potential of the private sector engagement to support Mine Action.

SWISS BOARD

- Yves Hervieu-Causse** - Chair
- Thierry de Meulder** - Vice-Chair
- Jennifer Saurina** - Board Member
- Ulrich Lehner** - Board Member
- Mario Tonini** - Board Member



“ I was immediately fascinated by APOPO’s commitment not only to combating landmines but also to using the incredible sniffing abilities of “HeroRATs” to detect TB and other substances. As a board member of APOPO in Switzerland, I am eager to leverage my relationships and network to secure additional supportive partners for APOPO’s vital work.”
Mario Tonini, former AVIA International CEO



UNITED STATES OFFICE



Charlie Richter
U.S. Director

In 2023, APOPO US once again achieved record-breaking fundraising results. The Office played a critical role in helping secure increased funding for APOPO’s demining project in **Zimbabwe’s Sengwe Wildlife Corridor** from the **Office of Weapons Removal** and Abatement in the **U.S. State Department’s Bureau of Political-Military Affairs (PM/WRA)**. APOPO US also helped secure private foundation support for the launch of APOPO’s **Ukraine program**, as well as to support APOPO’s two most advanced research applications, **Search and Rescue** and **Wildlife Detection rats**.

Finally, APOPO’s US Director was instrumental in the launch of the **UK government-funded Development Impact Bond (DIB)** project “**Minefields to Rice Fields**”. This is an innovative funding mechanism for the Mine Action sector and the first DIB focused on

Mine Action. As of March 2024, the project achieved all of its targeted outcomes.

NEW BOARD MEMBERS

APOPO US actively sought new board members in 2023 and is very happy to announce that **Whitney Hersher** and **Jerome Tagger** will join the APOPO US Board in March 2024. Whitney’s background and connections are uniquely aligned with APOPO’s current needs. A professor at *Berkeley’s Hass School of Business* and a native of the Bay Area, Whitney has been engaging with and advising APOPO since 2021.

In addition to business and strategic planning expertise, Whitney also has expertise in building canine detection business plans and technology education and development in Cambodia, where she directs a major USAID project.

Jerome Tagger, who is based in New York City, has decades of experience in the Social Entrepreneurship and Finance sector, including at think tanks and consulting firms. Jerome recently began working with **FAI**, an organization specializing in helping food brands engage consumers with socially responsible initiatives. This knowledge set could be very valuable for APOPO as it looks to improve global market linkages to the farmers it serves under its mine action program.



Hawk Rock Foundation has been supporting APOPO for over a decade. In that time, we have provided traditional grants, but also impact investment capital including for the **Minefields to Rice Fields (M2R) Development Impact Bond project**. The Foundation has been impressed with APOPO’s innovation and growth in both its novel animal detection solutions as well as its openness and ability to embrace innovative financing schemes. Going forward, we are particularly excited to see how APOPO’s Technical Survey Dogs will speed up the return of agricultural land to landmine-impacted farmers in Ukraine, as well as how M2R will develop in Cambodia and beyond.”

Hawk Rock Foundation

US BOARD

- Kristen Davis** - Chair
- Beverly Schwartz** - Secretary
- Piet Van Hove** - Board Member
- Bart Weetjens** - Board Member
- Isa Mirza** - Board Member
- Whitney Hersher** - Board Member
- Jerome Tagger** - Board Member



UK PARTNER



Ros Bird
Operations & Fundraising
Manager

In 2023, APOPO UK continued to develop a strong strategic focus, build networks, deepen our collaborative partnership with APOPO vzw, and steward UK supporters.

Trusts and Foundation applications sit at the heart of our fundraising strategy, and we are grateful to receive donations from several UK-based Trusts this year. These include **The David Family Foundation**, **The Willow Trust**, the **Golden Bottle Trust** and the **Charities Trust**. Funds have also come to us from generous individual donors, challenge event participants, and corporate supporters. APOPO UK can offer UK-based APOPO vzw supporters a tax-efficient way to support APOPO's projects when donating via the UK entity adding 25% to a donation at no further cost to the donor via the Gift Aid tax relief scheme.

We were delighted to pass across a grant to APOPO vzw in November 2023 and see a positive outlook for fundraising growth in 2024.

THE FUTURE

APOPO UK is looking forward to the future, as we begin to position ourselves and make progress on our goals. Plans are in place for our trustee **Alan Macdonald** to visit demining projects in Cambodia in early 2024. This will help inform some of our key fundraising activities, including a potential engagement-raising event with partners in the UK parliament. At the same time, we are scoping areas of potential innovation and partnership opportunities for our shared mission.

We look forward to welcoming two additional trustees, Yasmine Colijn and Philip Mark Unsworth, who will be formally appointed in early 2024.

UK TRUSTEE BOARD

- Susan Robertson** - Chair
- Justin Bedingfeld** - Treasurer
- Alan Mathers** - Trustee
- Cameron Watson** - Trustee
- Alan Macdonald OBE** - Trustee



“APOPO UK has big ambitions to help catalyze game-changing solutions for a better world through the innovative deployment of scent detection animals. 2023 was a very positive year for us, we established ourselves as a new charity, and now look forward with excitement to what we can achieve in the coming year.”

Susan Robertson,
Chair APOPO UK Board

VISITOR CENTER

CAMBODIA

In 2023, the APOPO Visitor Center (VC) in Siem Reap continued its mission to educate visitors about the global landmine issue and the innovative role of trained HeroRATS in landmine detection. The center offers guided tours that delve into Cambodia's history and APOPO's contributions to mine clearance, alongside live demonstrations of our rats at work.



Sambat Meas
Visitor Center
Manager

The center saw a significant increase in visitor numbers in 2023, welcoming over **33,000 guests** compared to 8,614 in 2022. This surge can be attributed to post COVID-19 travel norms recovering, increased online marketing efforts and the center's recent renovations, which enhanced its appeal and professionalism. The VC currently has a satisfaction rating of 4.9 stars on Google Reviews and is considered the fourth most popular activity in Siem Reap.

Financially, 2023 was a milestone year, with the Visitor Center generating a record \$489,000 in revenue, demonstrating its growing popularity and the effectiveness of our enhanced visitor experience.



VISITOR CENTER



VISITOR CENTER



VISITOR CENTER GIFT SHOP

The APOPO Visitor Center includes a gift shop that sells merchandise like t-shirts, hats, educational toys, books, and local handicrafts. Proceeds from the shop support APOPO's operations, directly supporting our work in Cambodia.





Sister Srey Café



Along with the Visitor Center, **Sister Srey Café** remains a beloved spot among tourists and locals alike. Nestled by the Siem Reap River, this charming café offers food and coffee and plays a crucial role in supporting APOPO's demining efforts in Cambodia by raising funds. Additionally, the café provides valuable employment and training opportunities to local students, furthering community development and engagement.

HEROTREES



GREENING APOPO, PROTECTING THE PLANET



“In 2023, APOPO’s HeroTREES program expanded into a multifaceted tree planting initiative with the goal of making APOPO climate-positive while also supporting livelihoods and restoring biodiversity.”

Currently, APOPO has over 44,000 trees growing and is protecting many more.

CARBON OFFSETTING

In 2023, APOPO calculated its first detailed carbon emissions for its global programs in 2022, using [compareyourfootprint.com](#) software. The results showed global emissions of just under 2,400 tonnes of CO₂ primarily from the use of liquid fuels and flights, electricity consumption, and the purchase of equipment and consumables. While APOPO is committed to seeking interventions to reduce its footprint, there are some challenges, particularly in the Global South, where low-carbon alternatives may be unavailable.

Rather than outsourcing or purchasing carbon credits, APOPO chose to invest in **carbon offsetting by planting trees** under its own management and in partnership with local organizations in the areas where we operate. This approach both offsets our carbon footprint and brings other benefits, such as supporting livelihoods for the communities we work with and over time restoring biodiversity to the areas.



HEROTREES

PLANTING TREES

Since 2017, APOPO has worked with its organic farming partner, **Sustainable Agriculture Tanzania (SAT)**, to plant trees as part of its **HeroTREES** initiative in the **Uluguru Mountains** in **Morogoro**. Together, we have planted a total of **60,920 trees** of 71 different species, with 36,945 currently thriving. With SAT providing training and support to **160 farmers involved** in the project. This initiative aims to improve watershed management, reduce slash-and-burn agriculture, and increase soil and water quality. It also provides economic support to the participating communities through spice trade, encouraging sustainability and resilience in local livelihoods.

PLANTING FOOD FORESTS

Syntropic agroforestry is a regenerative agricultural practice that mimics natural forest systems and integrates vegetable crops, fruit trees, timber, and indigenous trees within the same ecosystem. This method supports livelihoods and promotes soil health, biodiversity, and sequesters carbon in the soil and biomass.

It offers numerous benefits, including:

- Increased biodiversity
- Improved soil fertility
- Higher yields
- Carbon sequestration

It is also a more **sustainable alternative** to conventional agriculture, which relies on monoculture, heavy chemical use, and high-energy inputs, leading to soil degradation, loss of biodiversity, and climate change.

Since 2021, APOPO has been collaborating with forest farmer **Roland van Reenen** to implement this approach, planting 10 demonstration food forests across three countries. Over **2,000 fruit and timber trees** have been planted, and more than **200 staff, farmers, and community experts** trained in syntropic agroforestry techniques.

APOPO also plans to expand the implementation of syntropic agroforestry to more beneficiaries as part of its **post-land-mine-clearance capacity building for rural communities**.

Before



After



PRESERVING EXISTING FORESTS

APOPO has made substantial efforts to **preserve and restore natural habitats** in the heart of Morogoro, Tanzania. Between 2000 and 2005, we fenced off over **8.4 hectares of land** and allowed it to regenerate into a thriving dry woodforest. Enriched in 2023 with **216 larger indigenous tree species**, this area has become a haven for local flora and fauna.

We will continue to protect and monitor this precious ecosystem, ensuring its sustainability for future generations. Through our ongoing efforts, we aim to contribute to the preservation of biodiversity and the protection of critical habitats in Tanzania and beyond.

PLANT NEW FORESTS

In partnership with the **College of Forestry at Sokoine University of Agriculture (SUA)**, APOPO has acquired **stewardship of over 40 acres of land** dedicated to reforestation efforts. Our focus is on four key objectives: carbon capture and storage, the inclusion of indigenous and diminishing species, increasing biodiversity, and integrating food trees for the benefit of local communities and farmers responsible for the land.

Additionally, we have planted a one-acre forest boasting **1,435 trees indigenous to the region** and extending existing woodland behind our TB lab in Morogoro.





HEROTREES



STAFF TREE PLANTING PROGRAM

2023 saw APOPO launch a **staff tree planting program**, providing training and distributing fruit and timber trees or staff to plant on their own land. This program is beneficial to our staff, their families, and the organization by making use of land that is accessible to them. We aim to instill a sense of pride in our collective efforts to address climate change. So far, 17 staff members have planted a total of **4,050 trees**, contributing significantly to our greening initiatives and demonstrating our commitment to sustainability.

FINANCIAL STATEMENT BALANCE SHEET IN EURO*

ASSETS	2023	2022
Current assets	3,745,631	2,307,307
Current receivables	869,032	909,709
Other assets	322,471	148,821
Cash and equivalents	2,554,128	1,248,777
TOTAL ASSETS	3,745,631	2,307,307
Liabilities		
Net capital	1,582,123	1,675,677
Funds of the organization	328,046	380,046
Retained Earnings	1,254,077	1,295,631
Long term liabilities	2,156,579	623,930
Deferred Income (Grants)	1,527,719	287,463
Loan	628,860	336,467
Curent liabilities	6,929	7,700
TOTAL LIABILITIES	3,745,631	2,307,307

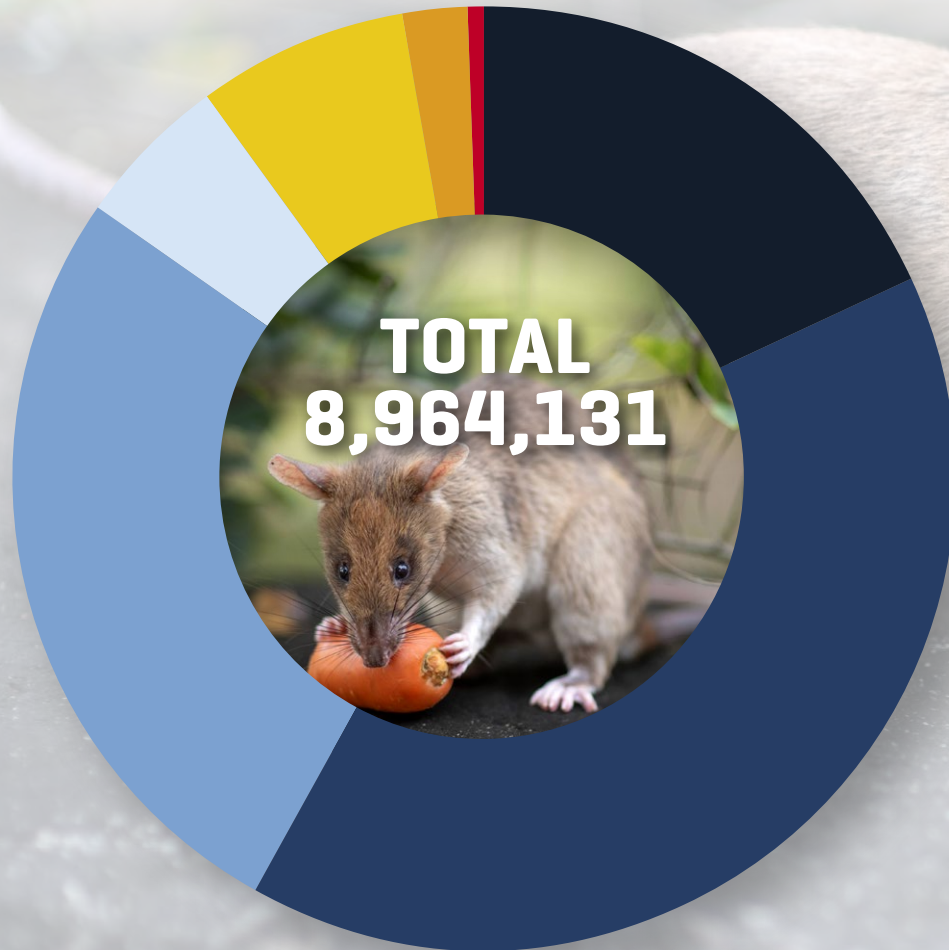
PROFIT&LOSS STATEMENT (EURO)

	2023	2022
Total Income	8,964,133	8,125,885
Total Operational Expenses	3,671,255	3,145,476
Total Personnel Expenses	5,262,837	4,622,751
Depreciation	12,207	12,207
Other costs	-70,643	52,000
Operating Result	88,477	293,452
Financial Result	-111,386	25,382
Extraordinary Result	-	-985
Net Income	-22,910	317,849

* Annual accounts audited by BDO

DONATIONS & SUBSIDIES 2023

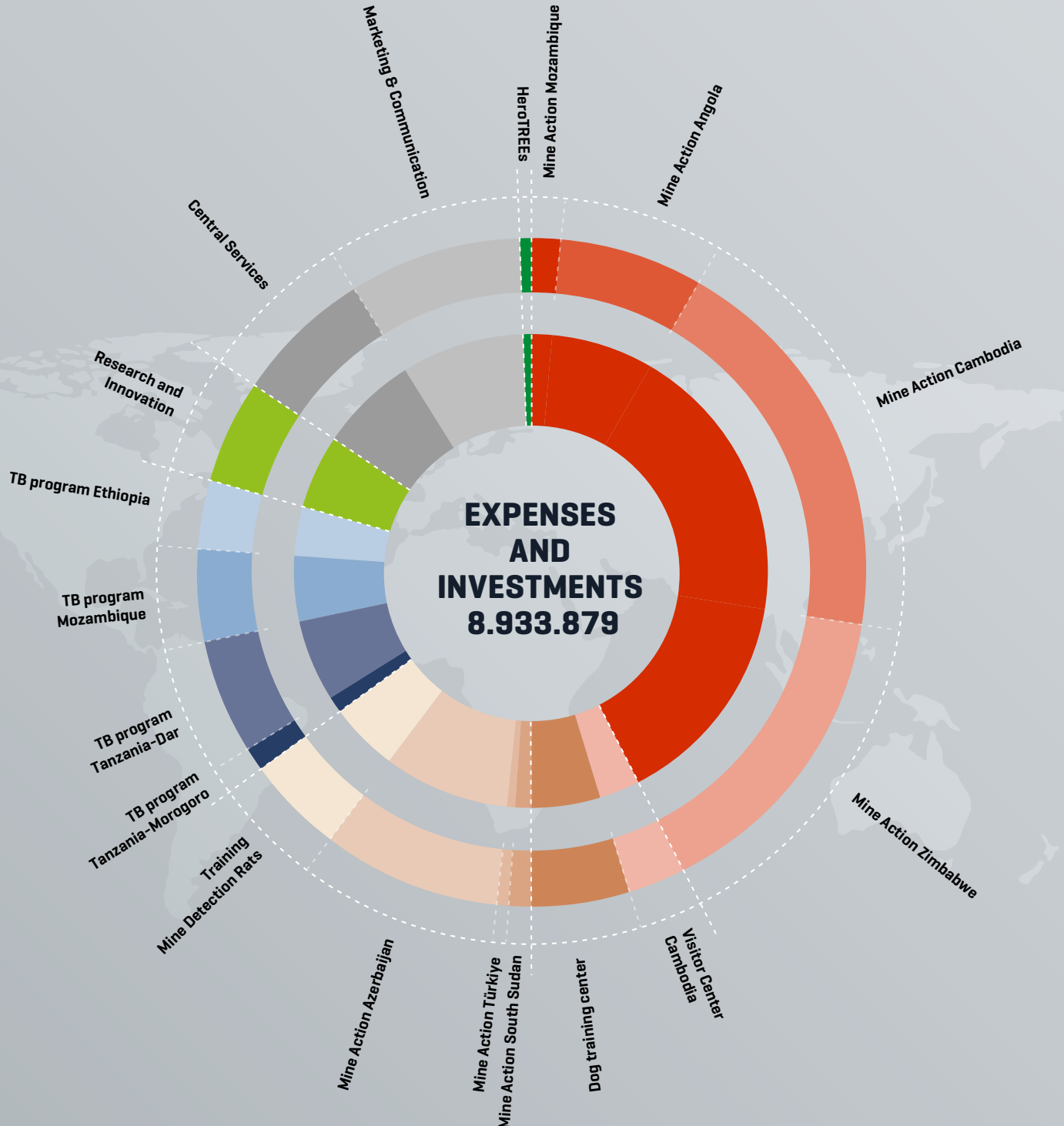
IN EURO



● Public fundraising	1,622,556
● Government grants	3,589,715
● Foundation grants	2,395,962
● International institution grants	461,811
● Earned income	648,245
● Research grants	211,798
● Miscellaneous operating income	34,044

Accountability and efficiency are important to us and for every €1 you donate, 92c goes directly to supporting our work on the ground. Only 8c contributes to fundraising costs, meaning that your support really impacts the communities that we serve.

EXPENSES AND INVESTMENTS 2023 PER ACTIVITY IN EURO



Mine Action Mozambique.....	144,336
Mine Action Angola.....	590,627
Mine Action Cambodia.....	1,673,253
Mine Action Zimbabwe.....	1,302,492
Visitor Center Cambodia.....	243,262
Dog Training Center.....	416,105
Mine Action South Sudan.....	91,440
Mine Action Türkiye.....	66,602
Mine Action Azerbaijan.....	750,375
Training Mine Detection Rats.....	403,996
TB program Tanzania-Morogoro.....	99,922
TB program Tanzania-Dar.....	474,968
TB program Mozambique.....	396,512
TB program Ethiopia.....	291,681
Research and Innovation.....	446,727
Central Services.....	573,271
Marketing and Communication.....	728,045
HeroTREES.....	33,130
Total.....	8,933,879

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SUPPORT OUR WORK

HeroRAT Adoption Program

From 9€ per month you can contribute to APOPO's life saving mission and receive updates of your own HeroRAT

www.apopo.org/adopt

You can also make a donation at:

www.apopo.org/support-us

Bank Details

A/C No 001-3870650-38
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Warandeborg 3, 1000 Brussels, Belgium
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