ANNUAL REPORT 2022

"For children living surrounded by hidden dangers, mine risk education is the best way to prevent casualties while minefields are being cleared.

25 YEARS OF SAVING LIVES

apopo

ABOUT APOPO

IN **2022**, APOPO marks its 25th anniversary as a global leader in scent detection animals. Since its humble beginnings, APOPO has responded to the devastating impact of landmines on people and post-conflict areas by developing a fast, simple, and cost-efficient mine clearance technology that can be sustained within national mine action programs in low-income countries. Through its unique method of using trained African giant pouched rats, APOPO has been highly effective in detecting landmines, which has allowed the organization to expand its efforts into other fields, such as tuberculosis (TB) control, and to develop specially trained Technical Survey Dogs.

As a research organization, APOPO remains committed to staying at the forefront of developing new humanitarian and environmental applications.

> In 2022, APOPO marks its 25th anniversary as a global leader in scent detection animals.

ABOUT APOPO

APOPO's Training and Innovation Center is based out of the Sokoine University of Agriculture in Tanzania. The Mine Action operations are spread across Angola, Cambodia, Mozambique, and Zimbabwe. Additionally, operational partnerships are maintained in South Sudan, Senegal, Azerbaijan and Turkey. APOPO's TB detection research laboratories are in Ethiopia, Mozambique, and Tanzania, where APOPO works with trained rats and confirmatory technology to detect TB.

APOPO is supported by a large international network of diverse partners, donors, and the general public. Foundations in Switzerland, the United States, and the United Kingdom support APOPO's work to save lives and develop sustainable solutions in low-income countries.

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

APOPO commits itself to the common good and shares responsibility toward the protection of the people, communities, and the planet.

CELEBRATING 25 YEARS OF TRANSFORMATIVE IMPACT

Christophe Cox, CEO

For a quarter of a century, APOPO has been at the forefront of innovation, leveraging technology and collaboration to address some of the world's most daunting challenges. As we celebrate our 25th anniversary, we reflect on the remarkable journey that has brought us to where we are today.

DETECTION ANIMALS

Our vision is to create a better world as a global leader in scent detection animals. Guided by this vision, we have tirelessly pursued our mission to **protect people and the planet** through innovative solutions using detection animals.

We embarked on a journey filled with twists and turns, and countless hurdles and challenges along the way. The development of scent detection rats required extensive research, experimentation, patience, and determination. Fueled by our passion to make a lasting impact, we successfully trained **African giant pouched rats** to become skilled landmine and tuberculosis detectors, marking a breakthrough that has saved around 2 million lives.

As of late, we expanded our portfolio to incorporate detection dogs. Through extensive efforts, we have successfully developed and thoroughly documented the training and deployment of **Technical Survey Dogs** in Mine Action.

Rolling out our developed technologies efficiently in the real world was another significant milestone. We work closely with the mine action and medical industries, ensuring that our solutions meet their rigorous standards. The acceptance and recognition we received from these industries have humbled us and solidified our position as leaders in the field.

NEW DEVELOPMENTS AND INNOVATIONS

In recent years, APOPO has shown remarkable growth, both geographically and thematically. APOPO's expansion into new countries, such as Zimbabwe, Azerbaijan, and Senegal, has allowed us to make a meaningful global impact. But we are also thrilled to embrace new developments and innovations. The introduction of **Search & Rescue Rats** and **Wildlife Detection Rats** will allow us to address broader challenges. These advancements enable us to make even greater strides in humanitarian and conservation efforts, strengthening our commitment to positive change.

By working hand-in-hand with local communities and international partners, we have adapted our methodologies to effectively address diverse contexts.

Our dedication to working in line with the **Sustainable Development Goal**s (SDGs) and the **Anti-Personnel Mine Ban Treaty** (APMB) remains unwavering. Through our efforts, we contribute to the goals of peace, justice, and sustainable development. Similarly, our commitment to the **World Health Organization's** (WHO) targets for ending tuberculosis aligns with our mission to safeguard lives through disease detection.

REMARKABLE MILESTONES

In conclusion, we extend our **deepest gratitude to our partners, collaborators, and donors** for their unwavering support throughout our journey. Together, we have achieved remarkable milestones and impacted countless lives. As we look ahead to the future, we remain committed to our vision of a world where innovative solutions continue to save and improve lives. Here's to 25 years of transformative impact, and many more years of driving positive change for a better world.

ENABLED IMPACT

SINCE APOPO BEGAN UNTIL THE END OF 2022

155,744
Landmines and other explosives destroyed

87,374,285 m²
Safe land given back to communities

2,193,278
People freed from the terror of landmines

534,230
Patients screened for TB

27,059
Additional TB cases detected

272,888
Potential infections halted

apopo HEROTREES

Over 30,000 trees successfully growing since 2017

MINE ACTION

apopo MINE ACTION

Landmines and explosives left from past conflicts still threaten people around the world. 60 million people still live with direct threats to their safety and there is new landmine contamination in Ukraine, Yemen, and Myanmar. These weapons remain active and dangerous long after hostilities end, causing accidents, inflicting terror, and impeding development. The Landmine Monitor reports that in 2021, landmines and other explosive remnants of war caused 5,544 casualties. This number will likely be higher in the next years and sadly, it is ordinary civilians who pay the heaviest price, especially children who account for half of these casualties.

Michael Heiman
Head of Programs Mine Action

OUR APPROACH
Integration of animal detection systems

During conflict landmines are hidden in the ground

Restricting areas and terrorizing entire communities

APOPO surveys the suspected areas to release land based on evidence of landmines

The confirmed minefields are now further reduced using technical assets such as Technical Survey Dogs

APOPO returns safe land to the communities

People return to their land, children play safely and farmers cultivate and nourish their families.

Vegetation is removed and the mined area is divided in boxes clearing safe access lanes

Human deminers excavate and destroy the mines

APOPO's Mine Detection Rats systematically search boxes and quickly find landmines

Clearing landmines and other explosive devices is at the heart of what APOPO Mine Action does to protect people and their livelihoods from weapons that have little to do with them. Because this is intense work and can take time, APOPO educates vulnerable communities about the risks of explosives to keep them safe until we can clear the minefields. And, where possible, APOPO continues to provide victims with assistance.

APOPO uses innovative solutions that integrate detection animals into traditional methods that allow us to clear landmines and other explosives more efficiently. In 2022, APOPO continued clearing landmines and other explosives in Cambodia, Angola, and Zimbabwe. We also deploy animals to partners in Azerbaijan, Senegal, South Sudan, and Turkey.

APOPO's animals ignore scrap metal and only detect the scent of explosives. This makes mine detection rats much faster at finding landmines than humans with metal detectors. Using technical survey dogs beforehand, to confirm the presence of landmines or other explosives creates an accurate picture of which areas are contaminated. Results show, that by integrating both these detection animals, the overall efficiency of the landmine clearance process can be doubled on some tasks and even tripled on others, compared to using conventional methods alone.

MINE ACTION

APOPO maintains its commitment to work closely with governments, other mine action organizations, development partners, and the private sector to ensure that no one affected by landmines is forgotten. Our work would not be possible without the support of government donors, private foundations, and the public. Thanks to the dedication and hard work of our teams, and the generous support we receive, around 1.9 million people feel the impact of our work. With increased funding and strategic partnerships, we hope to further expand our efforts in 2023.

> In 2022, APOPO continued clearing landmines and other explosives in Cambodia, Angola, and Zimbabwe. We also deploy animals to partners in Azerbaijan, Senegal, South Sudan, and Turkey.

WHERE WE WORK

SOUTH SUDAN

APOPO operates with Mine Detection and Technical Survey Dog Teams in partnership with G4S. This project started as a 2-year scheme under the United Nations Mine Action Service (UNMAS), which is central in terms of planning, coordination and the funding of mine action in South Sudan.

ANGOLA

APOPO has been a Mine Action operator in Angola since 2012, operating in the provinces of Malanje, Zaire, and Uige with Mine Detection Rats, Manual Deminers and Machines. In 2020, APOPO moved to the Province of Cuanza Sul and was tasked by the Government to complete the clearance of the remaining 135 minefields and declare the province mine free.

SENEGAL

APOPO started operations in Senegal in 2023, in collaboration with Humanity & Inclusion, deploying Technical Survey Dogs to survey the remaining contaminated areas in Casamance region and reduce the size of the remaining hazardous areas.

ZIMBABWE

APOPO began operations in 2021 in the Great Limpopo Transfrontier Park. The park was one of the first formally established peace parks in southern Africa. This 35,000 km² park links the Limpopo National Park (NP) in Mozambique, the Kruger NP in South Africa, and the Gonarezhou NP in Zimbabwe. The Sengwe Corridor is a 37 km long border minefield between Zimbabwe and Mozambique, which has been divided into 17 sectors. APOPO is currently tasked by ZIMAC to clear 14 sectors with a border front of 26 km in length, and up to 200m in depth.

MOZAMBIQUE

APOPO's Mine Action program has been active in Mozambique since 2004 contributed greatly to the landmine-free declaration of Mozambique in 2015. Since then, APOPO has been helping with residual tasks clearing ammunition depots, and is now a partner of the Peace Process Secretariat in the disarmament of RENAMO forces.

TANZANIA

Since 2000, APOPO has developed its operational headquarters and training and innovation center at the Sokoine University of Agriculture where all the Mine Detection Rats are born and trained. It is also home to the largest animal mine detection training area in the world, which was established with the assistance of the Tanzanian Peoples Defence Forces. After being trained and accredited on real landmines, the animals are sent to the different programs

AZERBAIJAN

APOPO began operations in Azerbaijan in 2022, deploying Mine Detection Dogs (MDD) in collaboration with national and international Operators, clearing landmines left from the conflicts of Nagorno Karabakh over the last 30 years. APOPO plans to expand its activities with additional MDD, Mine Detection Rats and mechanical assets in 2023.

TURKEY

APOPO operates with Mine Detection and Technical Survey Dog Teams in partnership with The Development Initiative (TDI). This project started as a 2-year scheme under the United Nations Development Programme (UNDP), aiming to clear all the remaining minefields on the Eastern Border with Georgia, Armenia and Iran.

CAMBODIA

APOPO has been clearing minefields in Cambodia since 2014 in collaboration with the Cambodian Mine Action Center (CMAC). Operating in 4 Provinces, the Program is using Mine Detection Rats, Technical Survey Dogs, Manual Deminers and Machines in collaboration with national and international Operators. Cambodia is also home to APOPO's Dog Training Centre, where animals are trained throughout the year and deployed to other APOPO programs and projects.

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

CAMBODIA

Michael Raine
Program Manager

Cambodia's landmine contamination is the legacy of 30 years of conflict that ended in the 1990s with a high concentration in 21 north-western provinces along the border with Thailand. These provinces account for the bulk of casualties in the country.

2022 saw APOPO expand its operations in Cambodia to 10 teams in four provinces thanks to additional Belgian government funding. Cambodia is APOPO's biggest Mine Action program to date.

APOPO uses innovative working techniques using mine detection animals, ground preparation machines, and manual deminers. New teams have joined the working efforts in **Preah Vihear**, in collaboration with the Cambodian Mine Action Center (CMAC). This is clearing large areas for agriculture as well as removing the minefields around the famous Preah Vihear Temple.

MINE ACTION CAMBODIA
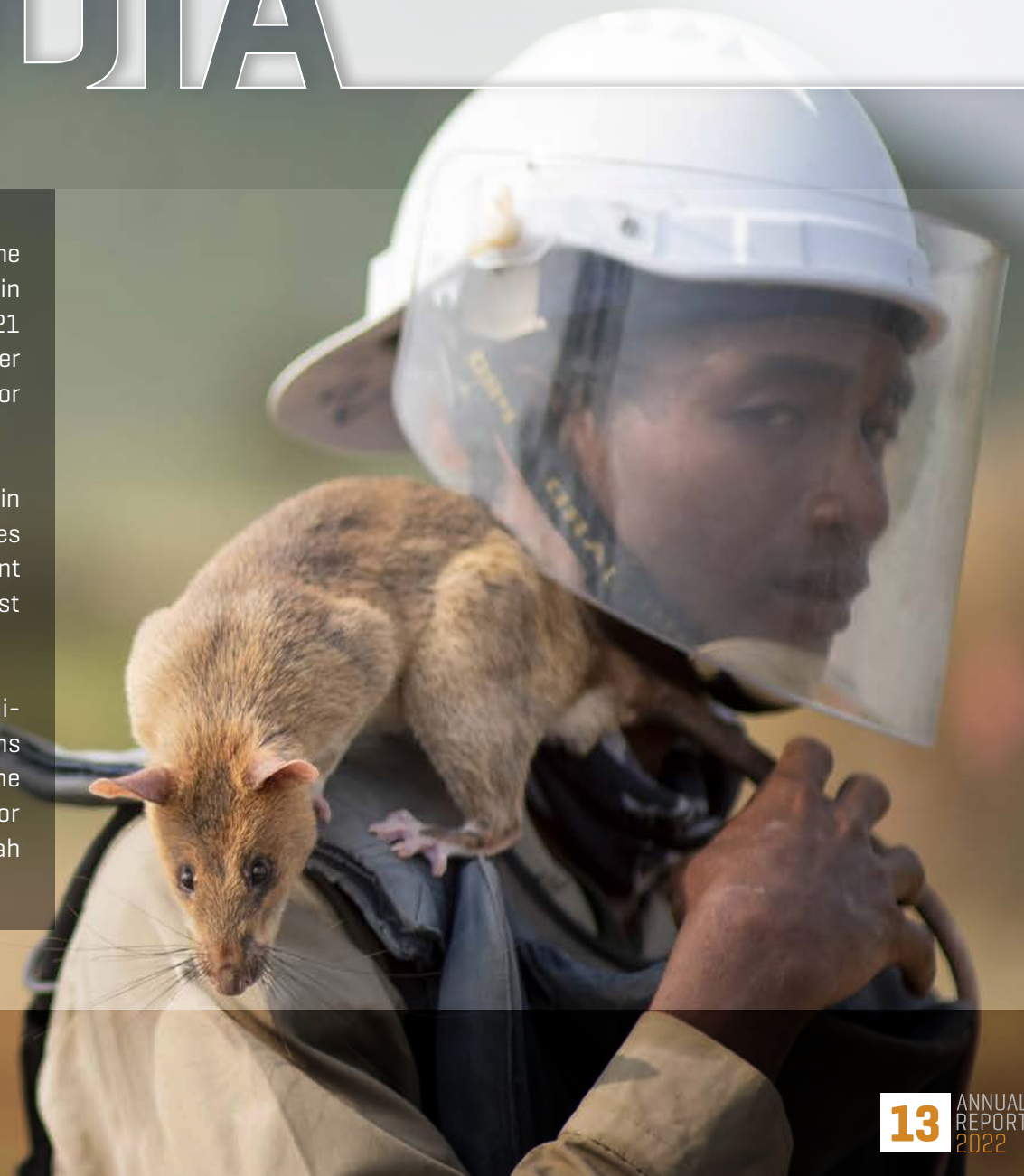
In **2022** APOPO started working in the **Koh Ker temple** perimeter. This important archeological site is one of the main Cultural Heritage sites in the country and is in the process of being added to the UNESCO World Heritage Site List The area is densely forested and contains a total of 169 archaeological remains, including 76 temples where there are plans to establish natural pathways between the various attractions so visitors can walk through the forest safely. In **2023**, this working effort will be reinforced with an additional Technical Survey Dog Team and a Manual Team.

Alongside the expansion in Preah Vihear, APOPO continued working in collaboration with **CMAC** and **Mines Advisory Group** [MAG] in Siem Reap and Battambang Provinces. The Technical Survey Dog [TSD] team continued working with **MAG** in Ratanakiri province, piloting an innovative Cluster Munition Technical Survey [CMTS] method to identify and reduce the areas contaminated by Cluster Munitions from the Vietnam War.

MINE ACTION CAMBODIA

As a result, the Cambodia program surpassed previous outputs with 10,731,960 m² of safe land released back to local communities for development. With 616 landmines, 272 cluster munitions, and 436 other explosive remnants of war (ERW) found and destroyed, APOPO proved to be invaluable, allowing communities to safely cultivate land, raise livestock, educate children, and feed their families.

The Explosive Ordnance Risk Education (EORE) and Victims Assistance (VA) team has almost completed work in Preah Vihear province, with 25,843 people attending mine risk education lessons, and 96 mine victims receiving treatment through our partner HI (Humanity and Inclusion). The team plans to complete its work in Preah Vihear and start working in Siem Reap province in 2023.

IMPACT IN 2022

Landmines and explosives found and destroyed	616
Cluster munitions found and destroyed	272
Safe land given back to communities	10,731,960 m²
People benefitting from our work	13,624
People attended Risk Education	25,843
Mine Victims who received treatment	96

"When I stepped on a landmine, I lost my right leg. I pitied myself and felt discouraged, but I received support and encouragement. Getting a prosthetic changed my world. But after a few years, the prosthetic got old, the knee tired, and it started to hurt. My job selling street food (Doner Kebabs), requires me to stand a lot and I was in pain. APOPO drove me to the clinic and I got a new prosthetic that fits well and works smoothly. The clinic was very far away and I would never have been able to go on my own."

Soeun Vichet, Street Vendor

APOPO DOGS

Ibro Tinjak & Chiara Faini
Head Dog Trainer & Programs Officer

APOPO is a leading service provider of mine detection animals globally. APOPO delivers high-performance animal detection teams to respond to Mine Action challenges and improves the operational cost-efficiency of land release efforts. APOPO also helps National Mine Action Authorities establish national animal detection standards and plays an important advisory role in developing internationally accepted standards for the mine action industry. Currently, APOPO combines the use of rats and dogs in different complementary roles.

Since 2017, APOPO has been training traditional mine detection dogs and is the first organization in the world to successfully train Technical Survey Dogs (TSD).

TSDs became operational in Cambodia in 2019 and have achieved outstanding results since. TSDs find the boundaries of minefields or other contaminated areas as quickly as possible while reducing the overall environmental impact of mine action activities. The TSDs are uniquely selected and highly driven search dogs, equipped with a track & trace system, that can search in 30-meter lanes without prior vegetation cutting. By integrating TSDs, suspected areas that do not contain any evidence of explosives can be returned to local communities and the expensive and intrusive clearance methods are restricted to areas where they are needed. This avoids spending major resources on areas that do not contain any landmines.

APOPO DOGS

Cambodia
APOPO's Dog Training Center is based in Cambodia, where the climate allows training all year round and where it is possible to establish large training areas with buried explosive items. APOPO currently has 50+ operational dogs in Azerbaijan, Cambodia, South Sudan, and Turkey and throughout 2022 was preparing additional dogs for Senegal and potentially Ukraine.

SOUTH SUDAN

Decades of war drastically impacted the population of South Sudan and encouraged a complex humanitarian crisis. According to Mine Action Review, at the end of 2021, approximately **11.1 km²** are affected by landmines and cluster munitions and need to be cleared. **The United Nations Mine Action Service** [UNMAS] requires operators to enhance 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 personnel. The dog teams are deployed in different parts of the country, searching for landmines along roads and cluster munitions around affected villages.

In 2022, UNMAS selected G4S to replace TDI on the project, which caused additional delays beyond the standard seasonal stand-down from July-August. Once the teams returned to work, the collaboration with G4S has been very successful. Overall, in 2022 the dog teams searched **129,917 m²** of contaminated land and found 48 landmines and explosive remnants of war [ERW].

AZERBAIJAN

Mine contamination in Azerbaijan is a consequence of the armed conflict with Armenia from 1988–1994, where landmines were laid by both sides. During 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 **Nagorno-Karabakh**, 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.

In 2022, APOPO started looking into setting up a project in Azerbaijan. Following several interactions with **ANAMA (the National Mine Action Authority)**, and local and international organizations, it was agreed that APOPO would take part in the **United Nations Development Programme** (UNDP) clearance project funded by the EU, in partnership with **MAG** and **IEPF** (a local NGO). APOPO prepared both Technical Survey Dog and Mine Detection Rat teams during 2022 and the project will begin in 2023.

In addition, in June 2022 APOPO was requested to provide Dog teams to one of ANAMA's projects, in partnership with **RPS**, a UK-based company. The dogs were deployed in September 2022 and cleared 187,954 m², found 4 landmines and other explosive remnants of war. Due to the winter conditions in Nagorno Karabakh, the teams stopped operations in mid-December and will resume in late February 2023.

> in June 2022 APOPO was requested to provide Dog teams to one of ANAMA's projects, in partnership with **RPS**, a UK-based company

TURKEY

Landmines were laid alongside Turkey'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 Turkey in 2021, in partnership with **TDI**, as a part of the UNDP **Eastern Border Mine Clearance Project**. The project was initially delayed due to the Covid-19 pandemic restrictions in Turkey. The dog teams started working in March 2022 on minefields on the border with Armenia and Iran, they cleared **487,589 m²** and found **27 landmines** and other explosive remnants of war.

The season ended in November as the first signs of snow began to appear. Together with TDI, APOPO prepared the winter stand-down facilities for the dogs, where they will be trained and maintained until the end of winter, waiting to resume operations in March 2023.

SENEGAL

Senegal has a remaining contamination of approximately 2.5 km², mainly in the Casamance region. In 2022, APOPO developed a proposal together with Humanity & Inclusion (HI) which received a grant from the Dutch Government to expand the mine clearance project in Casamance by adding a Technical Survey Dog team. APOPO prepared the team and will mobilize them to Senegal where the dogs will begin operations in early 2023. The project is being implemented with HI, the main mine clearance operator in the country, in the hopes of accelerating the land release and bringing Senegal to a Mine-Free status by 2025.

ANGOLA

Manuel João Agostinho
Program Manager

APOPO has been working in Angola since 2012 and is currently operational in the west of the country in Cuanza Sul province. The Angolan Government tasked APOPO to support their efforts to clear all remaining minefields so the province can be declared mine-free.

In 2022, APOPO continued operations in Cuanza Sul, the fourth most contaminated province in Angola with 105 minefields, corresponding to around 8.7 million m2 in size. The program applied an operational capacity that integrated ground preparation machines, manual deminers, mine detection rats, and technical survey dogs (until May 2022) to accelerate landmine clearance. APOPO continued to carry out explosive ordnance risk education (EORE) activities. Risk education is the best way to prevent casualties for people living surrounded by hidden dangers.

MINE ACTION ANGOLA

APOPO maintained an operational partnership with Centro Nacional de Desmi-nagem (CND) a national mine action institute and public demining operator. And established new partnerships with two agriculture partners, Samuel Base Cole Association (ASBC) and the Institute for Agriculture Development (IDA). As APOPO returns cleared and safe land, ASBC, and IDA assess the agricultural development opportunities in beneficiary communities and link farmers to higher-value crop and agricultural product development initiatives that help meet Angola's national goals, including food security.

APOPO surpassed its annual targets in 2022, clearing and releasing 2,181,922 m2 back to local communities directly benefiting 13,790 people. The teams found and destroyed 166 landmines, 142 other explosive remnants of war, and 426 small arms and ammunition.

In 2023 APOPO aims to clear more than 1,000,000 m2, directly benefiting over 20,000 people from the local community providing safe access to vital farmland, and bringing back transport routes and trade for the community.

IMPACT IN 2022

Landmines and other ERW destroyed	308
Small arms and ammunition	426
Safe land given back to communities	2,181,922 m²
People benefitting from our work	13,790
People attended EO Risk Education	413

"Before APOPO came, my land was full of landmines, but work is life, and we couldn't survive without farming the land. After a heavy rainy season, I found a landmine exposed on my land. How lucky we are not to have stepped on it! Now that APOPO cleared the land, we are free."

Eduardo Antonio, Farmer

ZIMBABWE

Mikael Bold
Program Manager

APOPO's Zimbabwe program is focused on mine clearance in the Sengwe Wildlife Corridor, along the border with Mozambique. The aim is to support Zimbabwe's goal of becoming mine-free by 2025 and to enable the movement of endangered wildlife between South Africa's Kruger, Mozambique's Limpopo, and Zimbabwe's Gonarezhou National Parks.

MINE ACTION ZIMBABWE

CORDON SANITAIRE(CORSAN) MINEFIELD

In the remote southeast corner of Zimbabwe along the border with Mozambique, in Masvingo Province, APOPO's teams are clearing the dense CORSAN minefield in the Sengwe Wildlife Corridor, which contains both Anti-Personnel and Anti-Vehicle mines. This minefield poses a significant risk to the local community, particularly to children who must pass through it to attend school. The clearance operations began in January 2021 and are expected to be completed in 2025. Last year APOPO released over 1,2 million m2 and destroyed over 3,900 landmines and explosives. The introduction of new metal detectors from the US Department of Defense's Humanitarian Demining R&D Program will improve outputs in 2023.

"Once all the mines are cleared, we will sing new songs. There will be so much joy, peace, and no more fear in Chilotlela. APOPO is giving us so much hope."

Nyengeterai Tsunduka, Beneficiary

WILDLIFE CONSERVATION

The CORSAN minefield also threatens wildlife, preventing elephants and other animals from migrating between parks and causing overpopulation and habitat destruction. By clearing the landmines, APOPO hopes to open the area for development, agriculture, and eco-tourism, bringing benefits to local communities and enabling conservation authorities to reconnect ecological systems and develop wildlife conservation as a land-use option.
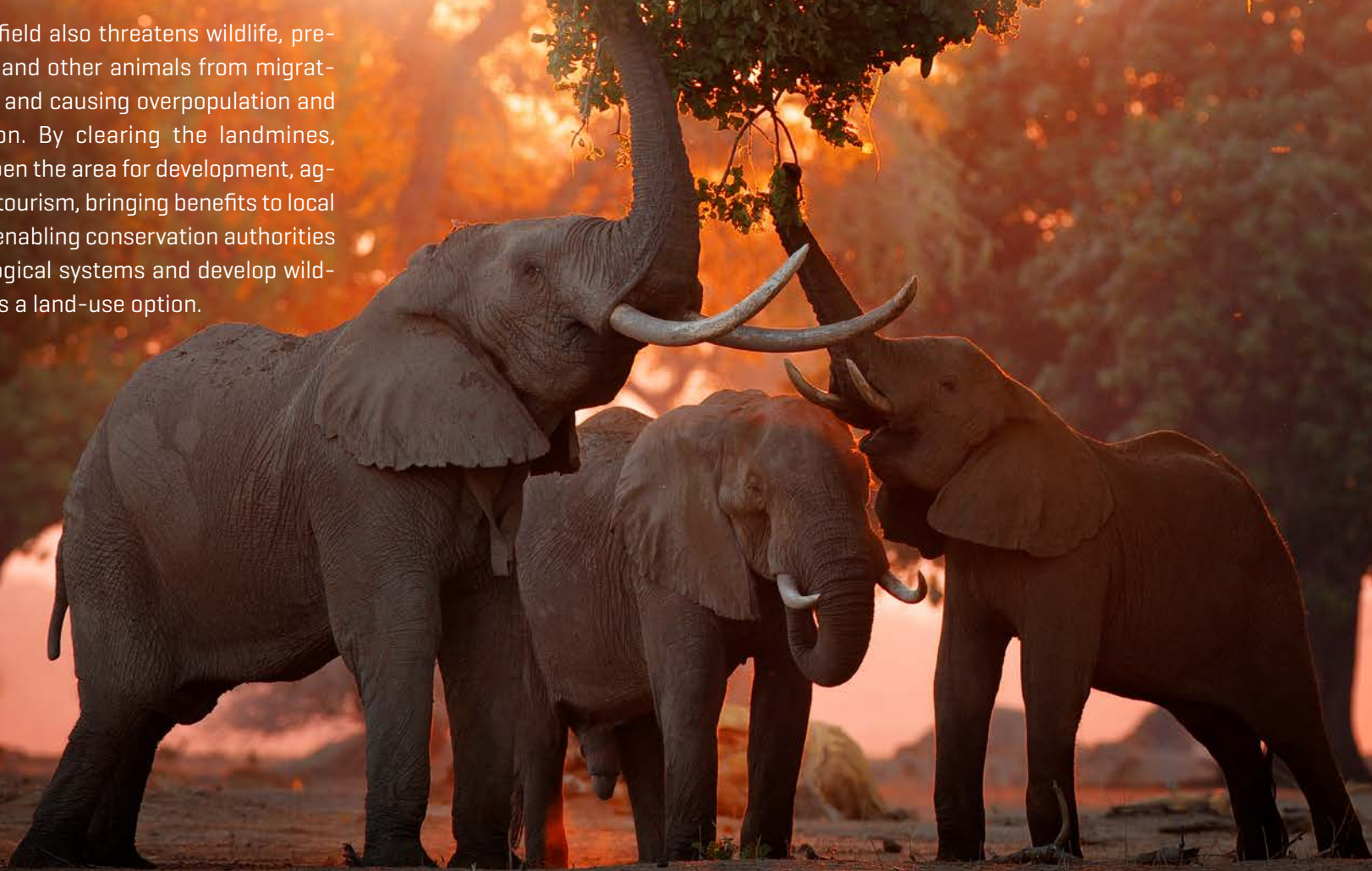
EXPLOSIVE ORDNANCE RISK EDUCATION

Clearing minefields takes time. Risk education is the best way to prevent casualties for families surrounded by hidden dangers. Risk education informs as many people as possible with life-saving information on recognizing, avoiding, and reporting threats. Children are particularly at high-risk, so APOPO's risk education in Zimbabwe focuses on schools to maximize its reach.

Challenging Gender Stereotypes

Some traditional people think it is strange that a woman, far from her home, spends most of her time in minefields. But APOPO makes sure that not only men, but women can be part of the solution. The world has great spaces and opportunities for all of us women if we are willing to show up, work hard and grab the spaces."

Rhoda Hlonganani, APOPO Team Leader

IMPACT IN 2022

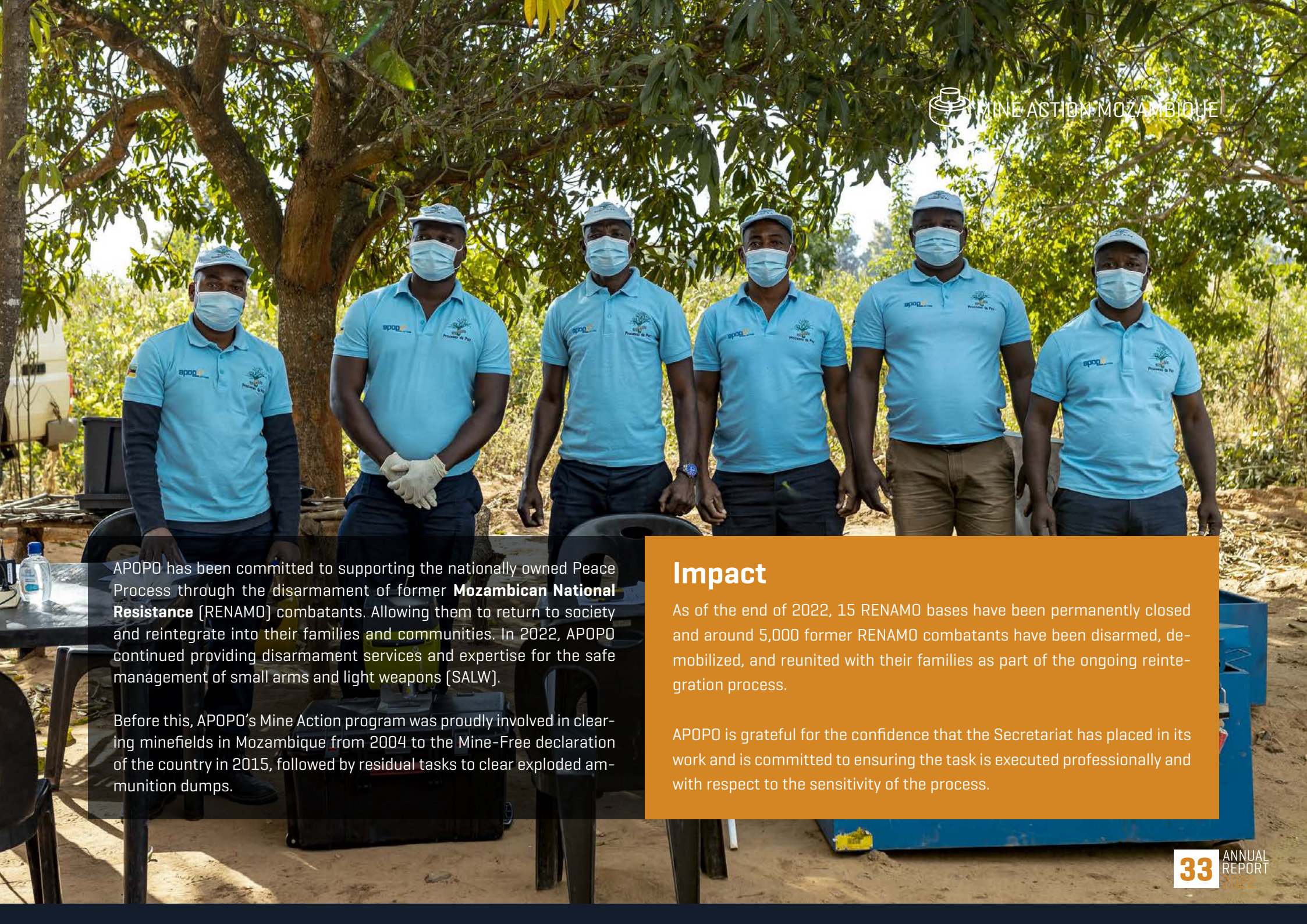|	
Landmines and explosives destroyed	6,920
Safe land given back to communities	1,550,133 m²
People benefitting from our work	1,292
People attended Risk Education	7,841

MOZAMBIQUE

Haider Abdula
Project Manager

The Maputo Accord for Peace and Reconciliation was signed in August 2019 by the President of Mozambique and the country's main opposition leader. The signing of the accord brought an end to decades of violence in the country. A partnership between the **United Nations Office for Project Services** (UNOPS) and the **Peace Process Secretariat** is supporting the implementation of the Maputo Accord for Peace and National Reconciliation.

APOPO has been committed to supporting the nationally owned Peace Process through the disarmament of former **Mozambican National Resistance** (RENAMO) combatants. Allowing them to return to society and reintegrate into their families and communities. In 2022, APOPO continued providing disarmament services and expertise for the safe management 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.

Impact

As of the end of 2022, 15 RENAMO bases have been permanently closed and around 5,000 former RENAMO combatants have been disarmed, demobilized, and reunited with their families as part of the ongoing reintegration process.

APOPO is grateful for the confidence that the Secretariat has placed in its work and is committed to ensuring the task is executed professionally and with respect to the sensitivity of the process.

TUBERCULOSIS DETECTION

apopo
TB DETECTION

WHERE WE WORK

apopo
TB DETECTION

ETHIOPIA

Hosted by the Armauer Hansen Research Institute since 2018, APOPO runs a TB-detection research lab contributing towards the national TB control effort by finding missed cases among patients in Addis Ababa and additional efforts to test samples from elderly patients (65+) and pediatrics (<15).
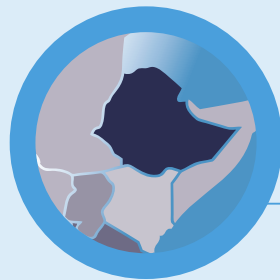
MOZAMBIQUE

Situated at the Veterinary School of Eduardo Mondlane University, APOPO runs a TB detection lab in the capital city of Maputo and since 2012 has contributed to the National TB program with additional case finding. APOPO collaborates with Population Services International (PSI) testing samples from health clinics for human papillomavirus (HPV).

TANZANIA

Since 2000, APOPO has developed its operational headquarters and training center at the Sokoine University of Agriculture. This is where the APOPO tuberculosis (TB) detection research program was launched in 2007 in Morogoro. In 2016 APOPO added a testing facility in Dar es Salaam with a 24-hour result turnaround to get to the heart of TB response.

TB DETECTION SUMMARY

Until the coronavirus (COVID-19) pandemic, TB was the leading cause of death from a single infectious disease, ranking above HIV/AIDS.

Dr. Tefera Azigew
Head of APOPO TB

Tuberculosis (TB) remains a public health problem in sub-Saharan countries, Ethiopia, Tanzania, and Mozambique included. Globally about 10.6 million people fell ill with TB and **1.6 million died** in 2021 according to the World Health Organization (WHO). Globally, over **4 million out of 10 million new TB patients were missed**, either undiagnosed or unreported, and probably did not get the TB care they needed.
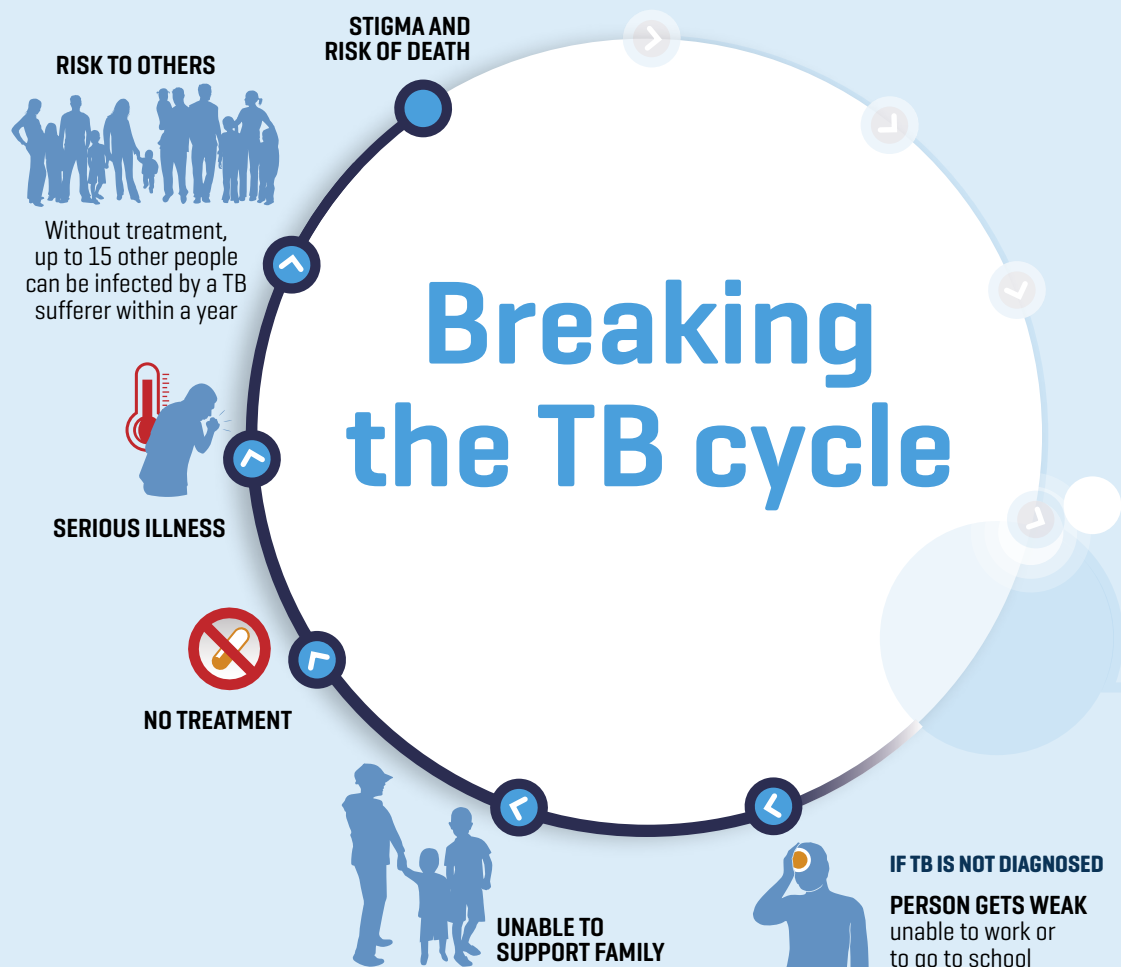
TB FACTS

TB is caused by *Mycobacterium tuberculosis*, which is spread when people who are sick with TB expel the bacteria into the air by coughing or sneezing. The disease typically affects the lungs (pulmonary TB) but can affect other parts of the body too. According to the WHO, about a quarter of the global population is estimated to be infected with TB, but most people will not go on to develop the disease. Ninety percent of the people who develop TB each year are adults, with more cases among men than women.

apopo
TB DETECTION
TUBERCULOSIS DETECTION

Breaking the TB cycle

STIGMA AND RISK OF DEATH

RISK TO OTHERS

Without treatment, up to 15 other people can be infected by a TB sufferer within a year

SERIOUS ILLNESS

NO TREATMENT

UNABLE TO SUPPORT FAMILY

IF TB IS NOT DIAGNOSED

PERSON GETS WEAK
unable to work or to go to school

CLOSING THE GAP

APOPO's programs work within government health systems to support over 160 partner clinics in **Ethiopia, Mozambique**, and **Tanzania** in their fight against TB. According to the WHO, about one in three TB patients in these countries are 'missed'. Some remain untested or unreported because of socio-economic barriers that prevent them from accessing healthcare. Even when they can overcome these barriers, there are limitations to existing diagnostic tools at clinics, resulting in over 4 million people globally remaining undiagnosed and without treatment last year.

OUR IMPACT

Over the years, African giant pouched rats (Cricetomys ansorgei), trained by APOPO to identify TB by smell, have demonstrated their ability to detect TB from sputum. By the end of 2022, APOPO's TB detection program has served to screen **870,777** sputum samples from 517,264 presumptive TB patients and found **26,084** new TB patients in three high TB burden countries (Ethiopia, Mozambique, and Tanzania). In 2022 alone, from **70,031** presumptive TB patients, **91,089** samples were tested and APOPO identified **3,932** additional TB cases.

> Over the years, African giant pouched rats trained by APOPO to identify TB by smell, have demonstrated their ability to detect TB from sputum.
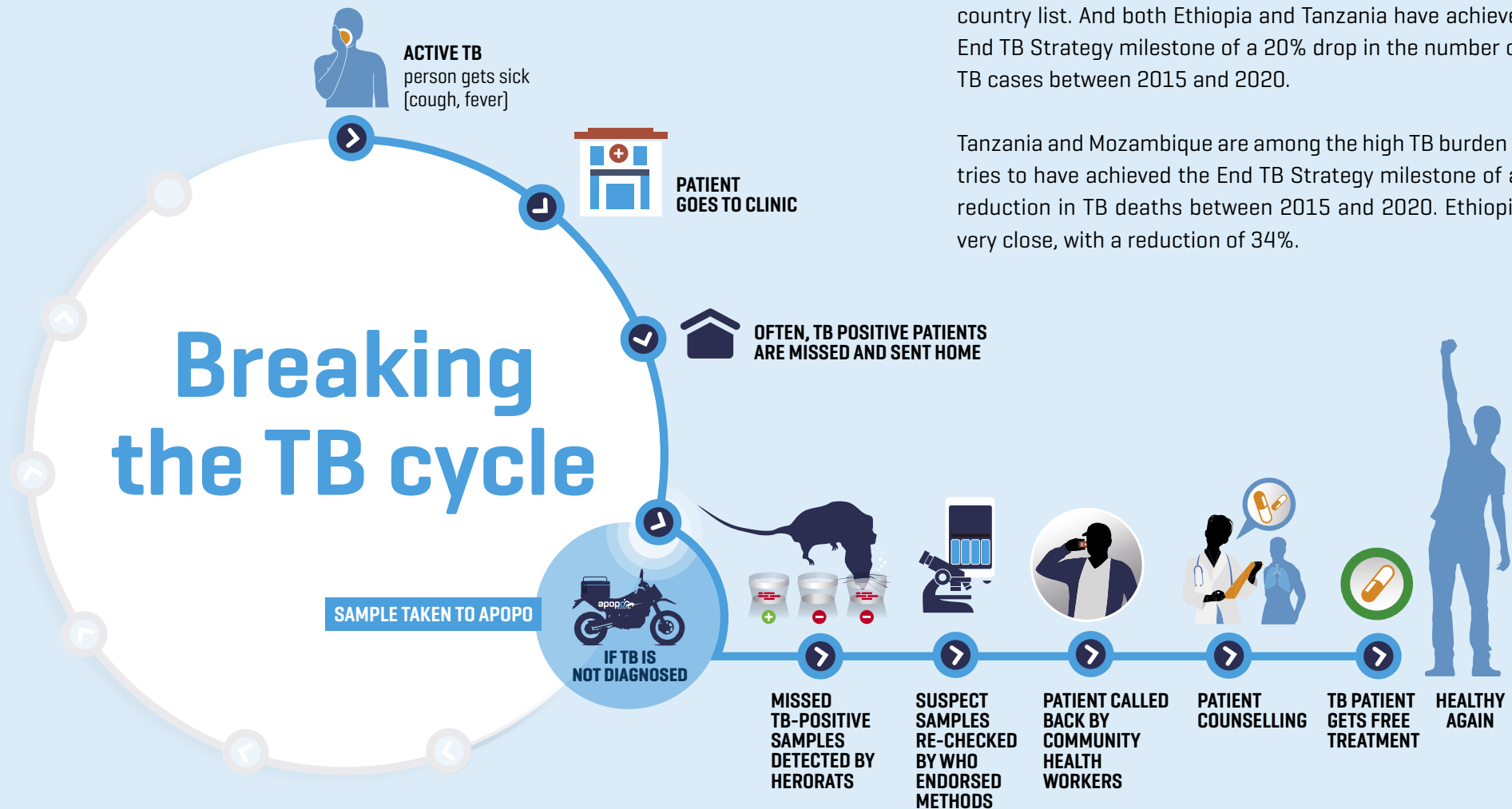
One TB detection rat can check 100 samples for TB in as little as 20 minutes. This would typically take a lab technician up to 4 days using conventional microscopy. APOPO confirms the rat findings using globally endorsed confirmation methods before notifying the clinics. This results in a very low cost of only about €1 per sample tested.

In addition to APOPO's ongoing case detection activities, APOPO is hoping to further refine our innovative TB detection research using trained rats – one of the three pillars of the End TB strategy; and to expand our portfolio to detect TB from a range of new sample materials, such as saliva, urine or breath.

These sample materials are less invasive and more child friendly. This research is currently 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 devices.

> One TB detection rat can check 100 samples for TB in as little as 20 minutes.

APOPO'S APPROACH

![apopo TB DETECTION logo]

Breaking the TB cycle

ACTIVE TB
person gets sick
(cough, fever)

PATIENT GOES TO CLINIC

OFTEN, TB POSITIVE PATIENTS ARE MISSED AND SENT HOME

SAMPLE TAKEN TO APOPO

IF TB IS NOT DIAGNOSED

MISSED TB-POSITIVE SAMPLES DETECTED BY HERORATS

SUSPECT SAMPLES RE-CHECKED BY WHO ENDORSED METHODS

PATIENT CALLED BACK BY COMMUNITY HEALTH WORKERS

PATIENT COUNSELLING

TB PATIENT GETS FREE TREATMENT

HEALTHY AGAIN

MILESTONES TO CELEBRATE

On a very positive note, we are pleased to see that Ethiopia has exited the high multidrug-resistant tuberculosis (MDR-TB) country list. And both Ethiopia and Tanzania have achieved the End TB Strategy milestone of a 20% drop in the number of new TB cases between 2015 and 2020.

Tanzania and Mozambique are among the high TB burden countries to have achieved the End TB Strategy milestone of a 35% reduction in TB deaths between 2015 and 2020. Ethiopia was very close, with a reduction of 34%.

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

TANZANIA
TB DETECTION

Dr. Joseph Soka
Program Manager

APOPO runs two tuberculosis detection laboratories in Tanzania. One is in Morogoro on the premises **of Sokoine University of Agriculture** [SUA] and the second is on the grounds of the Tanzania **Veterinary Laboratory Agency** [TVLA] in Dar es Salaam. Since 2007, the project in partnership with local health clinics has contributed to national efforts to stop TB by finding missed patients in Dar es Salaam, Dodoma, Morogoro, and Coastal regions. The expansion to include two new clinics in Dar es Salaam brings the total number of collaborating health clinics to 80.

In 2022 the project surpassed its main targets by testing, **52,396** [101% of the target] from 41,152 [108.3% of the target] presumptive TB patients, diagnosed 2062 [122.7% of the target] additional patients. **86.9%** of the additional cases were treated, which is the highest achievement the project has made to date.

Recently APOPO chose to place a special focus on the detection of pediatric TB, as TB in children has historically been a neglected area of TB control. The project launched in July 2021 and **1,988 children** with signs and symptoms of TB were screened by APOPO and the HeroRATs. As a result, 111 additional child patients were diagnosed in the first year of the project.

APOPO received an invitation from the **National Tuberculosis & Leprosy Programme** and the **Ministry of Health**, to submit a summary of the APOPO efficiency model of active case finding in preparation for the **Global Fund** write-up. If approved, this will mean APOPO will be considered an implementing partner, which in turn may generate new avenues for support.

As of 2022, APOPO's TB detection rats are included in a draft National TB Operational Research Agenda (2022-2025) with quarterly participation in the National TB Laboratory Technical Working Group.

IMPACT IN 2022

Samples evaluated	52,396
Patients evaluated	41,152
Additional patients diagnosed	2,062
% increase in detection rate	41%

ACCESS TO TREATMENT

Tuberculosis can be particularly difficult to detect in children as it takes a lot less bacteria in their bodies to make them ill. 10 year old **Hamisi**'s clinic was unable to diagnose his TB, but APOPO and the HeroRATs found it. This allowed him to get on life-saving treatment!

MOZAMBIQUE
TB DETECTION

Robert Burny
Program Manager

Mozambique remains among the 30 high TB-burden countries, yet it is among 33 countries that achieved the 2020 milestone of reducing the number of deaths from tuberculosis (TB) by 35% over the past five years.

APOPO opened a laboratory in 2013 in partnership with the **Eduardo Mondlane University (UEM) Veterinary School**, and since then has been diagnosing TB in Mozambique. APOPO contributes to the National TB Control Program by increasing the number of TB patients diagnosed and linked to care. As a response to the 2018 national roll-out of molecular testing for TB and the challenges in obtaining enough samples for rat testing that arose as a result, APOPO aligned its strategy to deliver molecular testing. In 2020, APOPO paused TB detection activities using HeroRATs in Mozambique. APOPO continues to provide molecular TB testing services for partner clinics. In 2022, these increased from 20 to 33, including for the first time two rural districts: Boane and Namaacha in Maputo province.

Molecular testing using Xpert MTB/ RIF®, can detect drug-resistant strains of TB, which is a serious concern in Mozambique.

In 2022 APOPO tested 18,442 samples from symptomatic TB patients and diagnosed 1,553 new TB patients in both Maputo city and province. In Maputo city, along with notifying the clinics, APOPO informs partner organization Centro de Colaboração em Saúde (CCS) so their community health workers could track down patients and support them through their course of treatment.

APOPO 's collaboration with CCS enabled 94% of newly diagnosed TB patients in Maputo to be successfully linked to care, receiving life-saving treatment and support.

TB DETECTION MOZAMBIQUE

In collaboration with **Population Services International** [PSI], APOPO continued testing samples from four health clinics for **Human Papillomavirus** [HPV], a common cause of cervical cancer in women. Making good use of APOPO's existing infrastructure, skilled staff, and laboratory equipment communities in need continued to be served.

Despite a break from April to June, APOPO tested 3,158 women for HPV, of which 877 were positive and referred to family planning services and treatment. This partnership ended in October 2022 but has proven that APOPO's TB detection model can tackle other diseases and further increase our impact.

IMPACT IN 2022

TB samples evaluated	**18,442**
New patients diagnosed with TB	**1,553**
Number of patients linked to care (% of the above)	**1,446 [93%]**
HPV samples and patients evaluated	**3,158**
New patients diagnosed with HPV	**877**

ETHIOPIA
TB DETECTION

Dr. Negussie Beyene
Program Manager

APOPO's Tuberculosis (TB) Research Program in Ethiopia is hosted by **Armauer Hansen Research Institute** (AHRI) a government health research organization. The research is conducted in collaboration with the **Addis Ababa City Administration Health Bureau** and the **National TB Control Program** (NTP). Starting in March 2018 APOPO contributes towards the national TB control efforts by finding missed cases among patients showing signs and symptoms of TB in Addis Ababa.

This year APOPO Ethiopia collected and retested 20,251 samples from 10,437 patients and found 329 additional TB cases contributing to a 68% increase in detection rates of partner clinics. Although Covid restrictions were lifted in the last quarter of 2020, the presumptive TB patient flow in 2022 was 22% less than that of 2019 (pre-Covid year). The 2021 patient flow was also lower by 39% compared to that of 2019. However, the decline doesn't necessarily mean TB cases are declining post-Covid. It could rather be attributed to the effect of Covid on the health-seeking behavior of the population as has been reported elsewhere.

TB DETECTION ETHIOPIA

The Ethiopian team also reported that TB detection rats identified 7 out of the 8 rifampicin resistance cases found by GeneXpert ultra, suggesting that the characteristic chemical signature (volatile organic compounds) of rifampicin resistance and drug-sensitive TB might be similar.

MASS SCREENING

In 2022, a research agreement was signed between APOPO and L'Initiative (Expertise France) for a 4-year project amounting to € 1.263 million. This project aims to screen more than 450,000 people from the urban poor population of Addis Ababa for pulmonary tuberculosis starting in 2023.

IMPACT IN 2022

|	
Samples evaluated	20,251
Patients evaluated	10,437
Additional patients diagnosed	329
% increase in detection rate	68%

Joy Milne

APOPO, in collaboration with **Joy Milne** (retired nurse) and **Manchester University**, is conducting groundbreaking trials to determine if tuberculosis (TB) can be detected from biosamples other than sputum. Joy, renowned for sniffing out Parkinson's Disease, joined **Dr. Drupad Trivedi** from Manchester University in Morogoro in 2022.

Joy is now assisting APOPO by detecting the odor of TB in various sample candidates, including sebum, urine, breath, and saliva. The study's results will guide the TB detection rats' work, potentially enabling training on easier-to-obtain sample types, especially for children or the elderly. Manchester University will analyze the volatile organic compounds (VOCs) associated with the samples' smells, including sebum, with the aim of developing an early TB detection method.
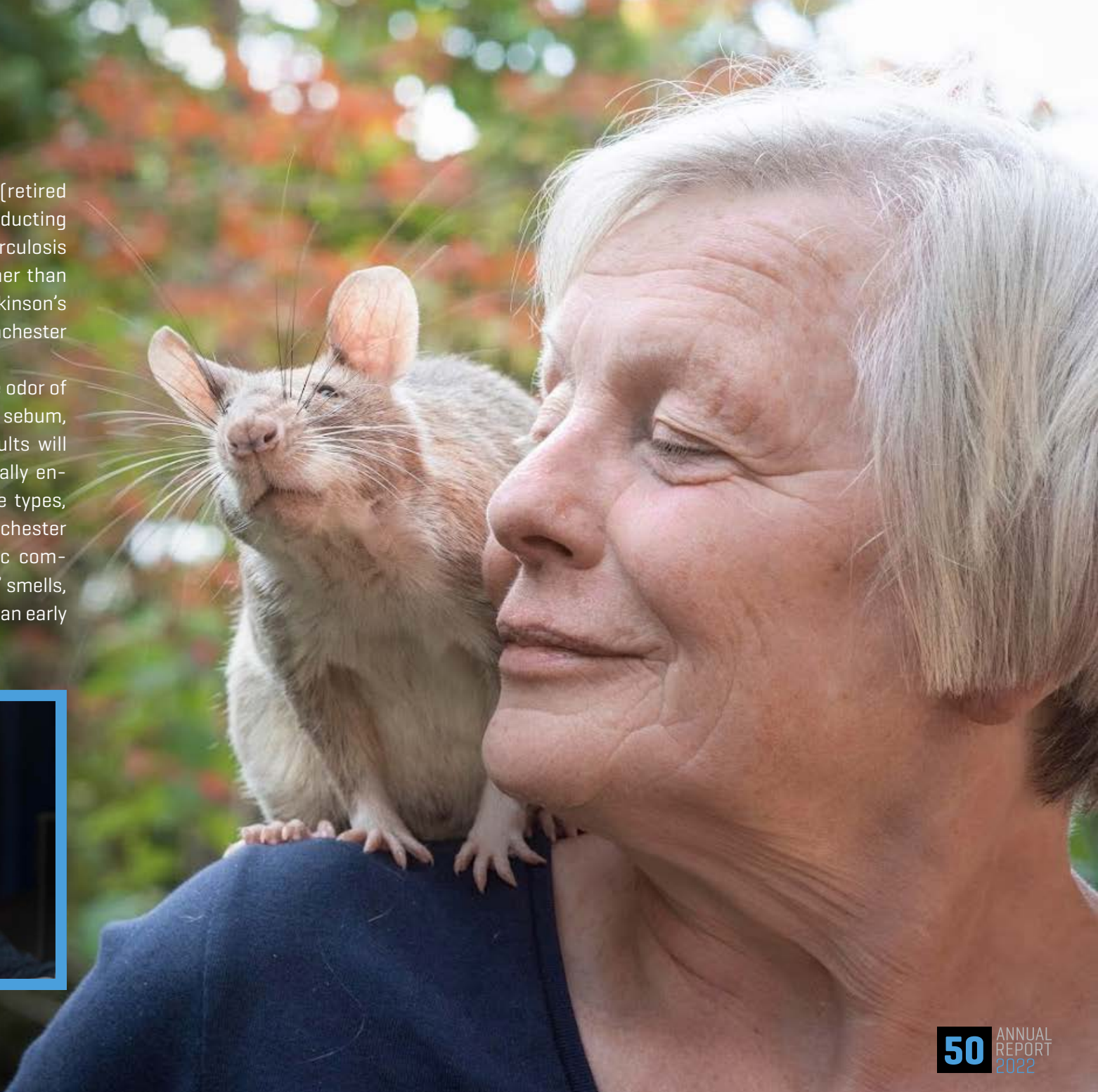
TRAINING CENTER
TANZANIA

Dr. Cindy Fast
Head of Training and Innovation

Who are the HeroRATs?

APOPO's HeroRATs are African giant pouched rats *(Cricetomys ansorgei)*. Like most rodents, they are nocturnal and have an incredibly well-developed sense of smell. They have large cheek pouches (similar to hamsters) for storing and carrying food. However, they're much larger than more common rodents (weighing around a kilo) and live 8 years or more in captivity. While considered a giant among rodents, they're too light to detonate pressure-sensitive mines and they are well adapted to the climates in which APOPO works.

WHERE THE MAGIC HAPPENS

All HeroRATs begin their life-saving careers at our Training Center on the campus of the Sokoine University of Agriculture (SUA) in Morogoro, Tanzania. Rat pups remain undisturbed with their littermates and mother until their eyes open at 4 weeks old. This is when they begin learning bravely to explore the environment and to trust humans through gentle procedures called habituation and socialization. This training sets the foundation for all future stages of training, which formally begin when juvenile rats turn 10 weeks old. This is when they are also weaned from their mother and are housed with littermates. It takes around a year to fully train a rat.

In 2022, our family of HeroRATs expanded with the addition of 38 rat pups, including Baraka, the first HeroRAT in training to participate in our adoption program. Ten other pups were born to internally accredited mine detection rats who were bred before being deployed to operational programs.

IMPACT 2022

With 15 rodent trainers joining our team this year, a total of 82 rats participated in mine detection training. Out of these, 20 were deployed to Cambodia where they earned external accreditation, and another 18 were internally accredited and prepared to join operational programs in 2023.

Introducing a simple mechanism to secure TNT-filled tea eggs early in training led to even stronger indication behaviors and accelerated training timelines with only 5 rats failing out of the program.


In 2022, APOPO's team honored the graduation of 20 MDR that set out to begin their careers on the minefields of Cambodia. All staff at the Training and Innovation Center celebrated this big achievement. Teamwork, discipline, and well-established and defined training procedure enabled the team to reach this success.

Revival of TB detection rat training (following a two-year hiatus) to meet program demands was met with renewed enthusiasm to improve efficiency and bolster overall detection accuracy. With 20 rats slated to begin training early in 2023, all necessary preparations were completed in 2022, including incorporating recent lessons learned from other training and research projects into training plans and conducting rodent trainer in-service sessions. This interactive series of 14 lectures and practical exercises reviewed both theory and procedures related to animal health and welfare, features of animal learning, and a more advanced look into factors influencing scent detection accuracy, as well as specific TB scent detection training methods.

Another six HeroRATs received specialized training to prepare them for careers as HeroRAT Ambassadors performing demonstrations at partner facilities to raise public awareness.
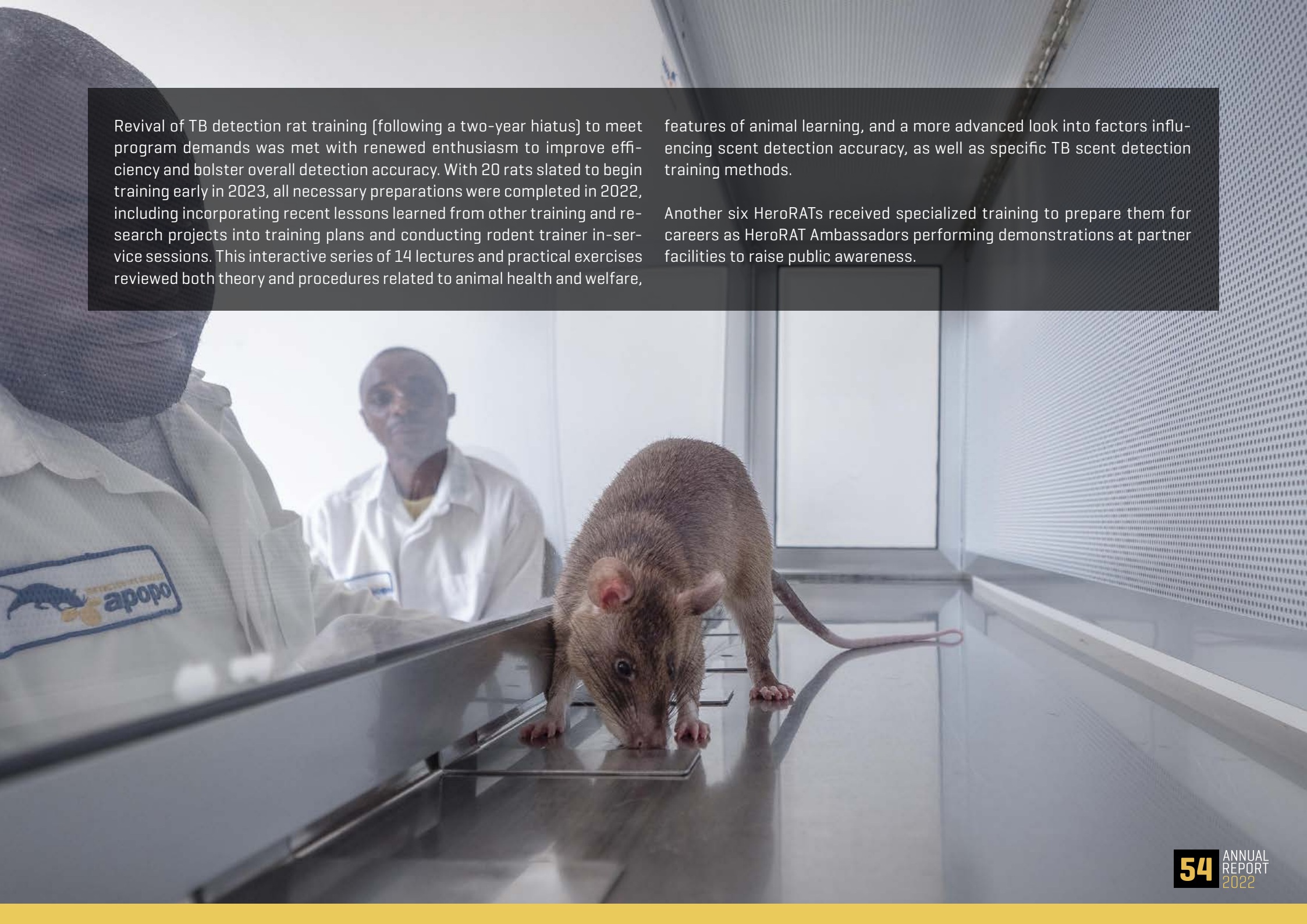
"The future is not about what you have, it is about what you say, what you do, and what you think. I am proud of being in the APOPO team and I am proud of all the hard work they put into this organization and our little heroes."

Abdullah Mchomvu,
Tanzania Training Center Manager

HEALTH & WELFARE

Traditionally, good welfare meant an animal is healthy, comfortable, well-nourished, safe, able to express innate (or natural) behaviors, and not suffering from unpleasant states such as pain, fear, and distress. Good animal welfare, therefore, requires disease prevention and appropriate veterinary treatment, shelter, nutrition, and humane handling. Driven by novel insights gleaned from research, the field of Animal Welfare science continues to develop rapidly and expand to define welfare itself with a greater emphasis on cognitive and emotional aspects as well as practices and methods for measuring welfare across species.

"I had the exciting opportunity of attending the APOPO animal olfaction and welfare workshop as a keynote speaker. It was a great chance to form connections with other researchers, both in my field and in other disciplines, and explore ways to bring animal welfare into scent detection and olfaction research. I loved seeing the care APOPO staff are taking for the welfare of their rats - such as the outdoor enrichment houses with constantly varying environments for the rats to explore."

Heather Browning, PhD
London School of Economics

WHAT'S NEW IN 2022?

APOPO is proud to remain at the forefront of applied welfare practices. Building on our already strong foundation in which rats receive nutritious diets (supported by a generous donation from Specialty Feeds), enriched housing tailored to their needs, and routine veterinary check-ups, we continued our commitment to make the health and welfare of each rat our top priority this year. These efforts were supported by international participation from renowned animal welfare experts in our very first **Scent Detection Animal Welfare Symposium**. This symposium was open to the public and held in conjunction with an in-person scent detection workshop in June. Topics addressed in the symposium included, What is animal welfare and why should we care? What does animal welfare mean for different animals? How does animal welfare impact the performance of working animals? and How do we achieve good animal welfare and how can this be measured?

APOPO's HeroRATs also continued regular exercise sessions in shaded environments; however, the schedule for these sessions was increased so each rat is given even more time to play and explore. The exercise environments were also outfitted with a greater variety and rotation of enrichment items
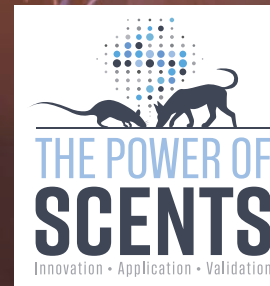
(including custom-built running wheels, sand flooring, sisal ropes, bamboo poles, tree branches, and wooden ramps and platforms, to name a few) to encourage the rats to express their natural climbing, digging, and running behaviors while staying fit for their life-saving duties! A short research project conducted by a student intern revealed the branches, running wheels, and rock arrangements as clear favorites.

A health and welfare seminar series was also established in 2022. Each week, 45-minute session held at the Training & Research Headquarters involves a prepared lecture delivered by a veterinarian focusing on a case study to drive discussions on HeroRAT anatomy, physiology, and pathology. These topics serve as a springboard to dive deeper into possible causes, prevention, and treatment to improve procedures and understanding while also boosting rat health and welfare. This seminar series will continue in 2023 with the aim of further building capacity, knowledge, and understanding within the HeroRAT health and welfare teams.

INNOVATION

Innovation is the core of all we do at APOPO and the Innovation Department is the driving force behind our life-saving activities. Stationed alongside the **Training Department at the Sokoine University of Agriculture** (SUA) in Tanzania, the Innovation Department conducts multi-faceted research to empirically inform training and operational protocols to ensure safety and efficiency while meeting or exceeding scent detection standards. Reflecting the diverse nature of our research, our team is comprised of Tanzanian and international researchers holding a variety of scientific expertise. Embracing a collaborative team approach, the Innovation Department proactively builds internal capacity and program sustainability while closing the gender and diversity gap in Science, Technology, Engineering, and Math (STEM) fields.

Dr. Cindy Fast
Head of Training and Innovation

> The Innovation Department expands APOPO's impact by developing new applications for APOPO's HeroRATs to put their noses to use protecting people and our planet.

INTERNATIONAL SCIENTIFIC VENUES

Promoting awareness of the quality of science coming from the global south, the Innovation team strongly represented APOPO at international scientific venues in 2022. These include invited keynote lectures at the **7th Annual International Conference on Rodent Biology and Management** [ICRBM7] held in Arusha, Tanzania; **the Natural Disasters Expo** in Anaheim, California; and as **the Presidential Scholar at the annual meeting of Applied Behavior Analysis International** [ABAI] in Boston, Massachusetts. In addition to invited lectures to **the International Society for Comparative Psychology** [ISCP], **Animal Concepts**, Bristol University, **Noses for Nature conference for wildlife detection, and a feature on Team Savari** NatGeo/Disney. Additionally, the team collaborated with the **University of Magdeburg** [Germany] to organize APOPO's first-ever international scent detection and animal welfare workshop, entitled **The Power of Scents**: Olfactory Research from Innovation to Application and Validation. Held on the SUA campus, the workshop welcomed senior and junior scientists from around the world to discuss key aspects of scent detection and forge lasting collaborations. Feedback from participants was overwhelmingly positive for the unique and thought-provoking content and format and with an expressed desire to attend similar events in the future.

PROTECTING PEOPLE AND PLANET

Importantly, among its priority objectives, the Innovation Department also expands APOPO's impact by developing **new applications** for APOPO's HeroRATs to put their noses to use protecting people and our planet. Adopting a phased development approach, impressive progress was made to push these projects [described in further detail below] beyond proof-of-concept and feasibility toward operational trials.

FUNDAMENTAL PRINCIPLES: MAINTAINING ACCURACY

In the behavioral sciences, the term extinction is used to describe when an animal stops performing a learned behavior when its expectancy of earning a reward for that behavior decreases. Expectancy of reward is driven by many things, including the contingency between the reward (which is often reduced or altogether eliminated in the operational setting) and the behavior itself or features in the environment, such as smells, sights, sounds, and even how frequently a trained odor target is encountered while searching (known as target prevalence). Extinction can be especially problematic for scent detection animals because it increases the risk of missing targets. For APOPO's landmine detection rats, this would mean the risk of overlooking a mine.

Scientists working with scent detection dogs and laboratory rats discovered a novel method to combat extinction of behavior. They trained animals on a second, non-related target scent which could later be artificially planted in the animals' working environment. Because this second target was planted, trainers could reward the animal for indicating it. Despite not being rewarded for finding the primary scent target in the working environment, both dogs and rats were more likely to find this primary (relevant) scent target if they had been rewarded for finding the irrelevant secondary target while working.

> "Scientists working with scent detection dogs and laboratory rats discovered a novel method to combat extinction of behavior. They trained animals on a second, non-related target scent which could later be artificially planted in the animals' working environment.

NEW APPLICATIONS

WILDLIFE DETECTION

Dr. Isabelle Szott
Lead Researcher

Illegal wildlife trade is of increasing concern and has reached a new dimension with transnational and regional implications for the conservation of the endangered species trafficked and for the economic basis and security of the affected countries. Furthermore, some researchers estimate that the extinction of species, such as elephants, could dramatically compromise natural carbon sequestration and accelerate global warming. Shipping containers are moved in large numbers through busy international seaports, where seizure reports identify containers as popular routes for the illegal smuggling of large volumes of wildlife. However, current methods of screening shipping containers are expensive, time-consuming, and potentially disruptive to other operations.

WILDLIFE DETECTION

Building on conceptual research that began in 2017 in collaboration with the **Endangered Wildlife Trust's Illegal Wildlife in Trade** program, rats that had already been trained to reliably sniff out the scent of commonly trafficked wildlife (such as scales from **pangolins**) were trained to search for these items within more realistic settings in 2022. This was facilitated by the installation of additional training equipment, including actual shipping containers, smaller-scale mock containers, and the custom construction of a rat trolley to enable the rats to access container air vents to sniff the contents.

Conceptually, this holistic approach enables rats to not only assess contents of sealed containers, but also to follow-up suspicion by searching within a fully packed container or evaluating lined-up items while on a long leash. Strategic meetings with key stakeholders forged a strong working relationship with port and government officials, paving the way for operational trials within the Dar es Salaam seaport in 2023. These operational trials will not only inform future rat training and deployment procedures, but also set the stage for rats to play a role in combating illegal wildlife trade.

> APOPO is deeply grateful to the Tanzanian Wildlife Management Authority (TAWA) and the Joint Port Control Unit (JPCU) for their ongoing collaboration and support.

Dr. Danielle Giangrasso
Lead Researcher

SEARCH & RESCUE

Sadly, 2022 brought its share of natural disasters. Although Search and Rescue teams are expertly trained to quickly locate where survivors are trapped following these disasters, their efforts are impeded by the technologies available to support their efforts. These tools are generally incapable of either 1) penetrating the debris, 2) navigating within this environment, or 3) strategically searching for survivors.

Because of their compact size, agility, and exceptional sense of smell, **HeroRATs** could uniquely overcome these challenges, particularly when outfitted with technology to map their location, remotely signal when they've found a survivor, and provide real-time communication with the victim.

> "Because of their compact size, agility, and exceptional sense of smell, HeroRATs could provide real-time communication with the victim.

SEARCH & RESCUE

This project builds on previous APOPO research (2015) demonstrating our rats can be trained to search for humans by utilizing facilities built in 2021 to simulate a collapsed building. This year, while rats learned to navigate this environment to locate and indicate a "trapped" human and return to where they had been released, regardless if the human was familiar to the rat, hidden from view from either above or below debris (by introducing levels to mimic floors of a collapsed structure), or if distracting sounds (such as sirens, jack-hammers, and dog barking) were played from a speaker while the rat was searching.

Coupled with valuable lessons learned by partic-ipating in a search and rescue training exercise on location with our project partner, GEA (a major Turkish Search and Rescue organization) these promising preliminary results provide a firm foundation for continued training with hopes of conducting operational trials with GEA in 2023.

> "This project particularly enjoyed a lot of media attention 2022: CNN, BBC, and even The Daily Show with Trevor Noah.

CONTAMINATED SOIL

Soil contaminated with petroleum hydro-carbons (PHCs) can have harmful effects on ecosystems making efficient identification of contamination levels critical for environmental remediation, particularly where former industrial sites are converted for public use. Existing methods for screening soil for the presence of contamination are labor intensive, costly, and involve significant logistical challenges and delays, including transportation of soil samples to laboratories for analysis. Notably, these laboratory methods are themselves limited in their ability to differentiate between petroleum and non-petroleum sources of hydrocarbons.

In prior years, APOPO proved the concept that **HeroRATs can be trained to reliably delineate PHC levels** across a variety of soils while ignoring other sources of hydrocarbons, such as grass. This year, we validated our training procedures by replicating delineation accuracy with two additional cohorts of young rats. Feasibility tests revealed that trained rats readily delineated PHC contamination levels within soils collected from two active remediation sites. Despite revealing some site-specific calibration may be necessary, the rats readily generalized what they had learned to novel sources of crude oil.

A scientific manuscript detailing training methods and results is being prepared for peer-reviewed publication in 2023 and given the promising results, the project remains on-track for operational field trials, provided financial support continues.

SUPPORTIVE TECHNOLOGIES

Many of the new scent detection applications in development capitalize on the rat's unique combination of size, trainability, and powerful sense of smell; however, these alone do not overcome all gaps in existing technologies. For example, while the rat may be better suited than a dog for navigating the tightly confined areas of a collapsed structure or search more efficiently than a camera because it is guided by scent, the rat alone cannot communicate when and where it has found a trapped survivor to facilitate Search & Rescue efforts. However, outfitting the rat with a technology-enabled backpack could simultaneously overcome limitations of both the rat and the technology operating in isolation.

In collaboration with researchers at **Eindhoven University of Technology** and the **American non-profit organization Oomvelt**, a second, more versatile, rat backpack prototype was developed in 2022. This backpack is capable of live-streaming and locally saving audio-visual information captured by a small camera and contains a device to measure rat movement (which may allow tracking the rat's position).

A microswitch was also designed which rats were trained to trigger by pulling a small pendant attached to their harness. The signal from this microswitch was integrated into the backpack circuit to send a signal to a custom-designed, handheld remote control. Using this remote, the handler can also activate a callback sound to play from the backpack real-time, allowing a sort of 2-way communication between rat and handler. Further research and development in both function and design are planned for 2023.

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

Supported by players of PEOPLE'S POSTCODE LOTTERY — Awarded funds from POSTCODE GLOBAL TRUST

Belgium partner in development

UN DP

SOKOINE UNIVERSITY OF AGRICULTURE · 1984 · ARDHI NI HAZINA

ARAMA KURTARMA GEA EKOLOJI-İNSANİ YARDIM

USAID FROM THE AMERICAN PEOPLE

provincie Limburg

THE ELEVATE PRIZE

german cooperation DEUTSCHE ZUSAMMENARBEIT — Implemented by giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

ENDANGERED WILDLIFE TRUST

WCN Wildlife Conservation Network

Joint Port Control Unit

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TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

TAWA

POINT DEFIANCE ZOO & AQUARIUM

San Diego Zoo

INDIANAPOLIS ZOO

GLOBAL WILDLIFE PROGRAM

gef

VolkswagenStiftung

ARAMA KURTARMA GEA EKOLOJI-İNSANİ YARDIM

OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

MARKETING & VISIBILITY

MARKETING & VISIBILITY

PUBLIC FUNDRAISING

2022 was an impressive year for APOPO's Marketing department. Public fundraising revenue increased by **over 37% compared to 2021**. APOPO raised over €1,419,000 from various channels, platforms, and generous donors despite what could have been considered a difficult year with social and economic factors affecting regular charity giving.

WEB AND MEDIA

In September 2022, APOPO launched a new, modern version of its **website** to improve the user experience and provide better navigation and more security during the checkout process.

2022 was a great year for APOPO in the media, with over **3200 global online and traditional press articles** about APOPO. The RescueRATs took center stage this year making headlines around the world. Media coverage is vital to APOPO as it creates awareness and engagement for our animal teams and the causes we support including landmines, tuberculosis, climate change, and more.

THANKS

To all who have supported us over **the last 25 years**. We cannot thank you enough!

"We had people run, hike, walk, and create bake sales to raise money for our HeroRATs. Others volunteered their skills and time, donated or adopted a hero animal, and contributed proceeds from auctions and sales. We are grateful to supporters past and present who leave a legacy gift in their will. We are truly thankful for every bit of support we received. APOPO has an extraordinary group of followers and donors from all over the globe that continue to engage with, and support, the important life-saving work we do."

Emma Mortiboy,
Public Fundraising Officer

ONLINE COMMUNITY

Facebook followers: 98,375

Twitter followers: 12,865

Instagram followers: 37,810

YouTube subscribers: 2,855

LinkedIn: 2,796

Website sessions: 243,000/year

Newsletter subscribers: 31,036

Global Giving Donors: 5,466

APOPO WOULD LIKE TO GRATEFULLY ACKNOWLEDGE PARTNERS AND DONORS

Institute of Ammunition Clearance	California Community Foundation	Austin Comms	Dude Wolverine Foundation	Facebook	Global Giving
The Boeing Company Corporate	Global Development Group	Google	Gregory Rowling, NZH Management	DonorBox	Captiva Foundation
Jewish Community Foundation	King Baudouin Foundation	Lee and George Foundation	Lee and George Foundation	Maecenata	Marriott Daughters Foundation
Shipyard Hill Giving	GIGA GmbH	Fivetolife	The Woods and Gil Family Foundation		
Seattle Foundation	Schwab Charitable	Vanguard charitable	XKBB Foundation		

Universiteit Antwerpen

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 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 RAT ADOPTIONS

THANK YOU
FOR SUPPORTING APOPO
TO SAVE LIVES BY ADOPTING YOUNG HERORAT IN TRAINING.

Baraka

THIS CLASSIFIED INFORMATION BELONGS TO

apopo

BARAKA

Full Name	Baraka (Baa-raa-kaa)
Gender	Male
Scientific Name	Cricetomys Ansorgei
Date of Birth	4th August 2022
Birthplace	Morogoro, Tanzania
Parents	Nysa (f) + Finest (m)
Siblings	2 sisters, 1 brother
Education	Landmine detection
Personality	Playful and curious

apopo

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!

MEET OUR **HERORATS**

Ronin
is a gentle and social landmine detection rat. 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.

Baraka
Baraka is being trained as a Mine Detection Rat or 'HeroRAT' for short. Future HeroRATs like Baraka use their remarkable sense of smell to safely sniff out explosives faster and more accurately than existing methods.
Baraka means blessing in Swahili.

Carolina
is a boisterous, young 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 her favorite platforms.

APOPO DOG ADOPTIONS

MEET OUR **HERODOGS**

THANK YOU

SENDER
CYKLON
TECHNICAL SURVEY DOG
CAMBODIA

apopo
MINE ACTION

THANK YOU!

s HeroDOGs to detect landmines and save lives by adopting Cyklon.

a highly trained Technical Survey Dog, or 'HeroDOG' for short.
ike Cyklon use their remarkable sense of smell to safely sniff out
explosives across difficult terrain.

ou're part of a remarkable community of people who are supporting APOPO
to save lives. This information pack will introduce you to Cyklon's world
nd show you how to follow his life-saving adventure.

Name
CYKLON

Cyklon (SIGH-CLON)
Male

Breed	Belgian Shepherd
Date of Birth	28 May 2016
Country of Birth	Germany
Job Title	Technical Survey Dog
Location	Cambodia
Colour	Brown
Favourite Pastime	Sunbathing
Personality	Focussed and hardworking

Cyklon is a highly trained Technical Survey Dog, or **HeroDOG.**

apopo
MINE ACTION

Mannes

Mannes is strong-minded and a hard worker. Based in Siem Reap, Cambodia, he's known for his tenacity, high-levels of concentration, and loyalty when he's out in the field.

Cyklon

Cyklon is a Belgian Malinois with a nose for landmines and unexploded remnants of war. He's energetic, fast, and thoroughly enjoys lazing in the sun after a hard day's work.

Gizmo

Gizmo has incredible energy at work. She's always wagging her tail but don't be fooled by her playfulness - she's serious when it comes to detecting landmines.

SUSTAINABLE DEVELOPMENT GOALS

The Sustainable Development Goals or SDGs are a collection of **17 interlinked commitments** designed to achieve a better and more sustainable future for all. The SDGs were set up in 2015 at the **United Nations General Assembly** and are intended to be achieved by 2030. They are a bold plan of action agreed to by 193 world leaders to build a greener, fairer, better world by 2030, and everyone has a role in achieving them.

APOPO takes **positive action** across the fields of Mine Action, Tuberculosis Detection and Innovation. The SDGs provide a measure of how well APOPO is delivering on its mission and offer the opportunity to quantify and demonstrate effectiveness and impact. APOPO's ability to inspire positive social change, although not purely innovative technology, provides another way for APOPO to act in line with the SDG ethos.

APOPO CONTRIBUTES TO 13 OF THE 17 SDG'S

SWISS FOUNDATION

Anna Bouchier
Swiss Director

In 2022, the Swiss Office continued to build on the foundation laid in previous years, fostering, and strengthening its philanthropical relationships. While maintaining its role as grants coordinator, the office explored ways to expand support for both new and existing programs.

The Foundation oversaw the management of the Swiss governmental grant in Zimbabwe, adding a local agricultural component to mine clearance, APOPO recognizes that Mine Action is a humanitarian process that extends beyond resolving the contamination issue. APOPO remains dedicated to seeing the cleared lands used for development and directly impacting the lives of its beneficiaries, not just for their security, but also for their sustenance. Similarly, the Swiss Office worked towards extending substantial support in Cambodia, emphasizing the agricultural potential of cleared lands.

LEADING ROLE
The Swiss team played a leading role in ensuring long-term support for the TB detection programs, particularly through its key role in securing the Belgian DGD grant. The Swiss Office also managed two large private donors' grants, with a focus on peadiatric TB. In parallel, the Foundation renewed support for the research department, specifically for the Search& Rescue Rats project.

THE FUTURE
As grants coordinator, the Swiss Foundation reached out to all long-term APOPO supporters and shed some light on the satisfaction levels of major donors. The survey highlighted an excellent Net Promoter Score of 50 and a high level of satisfaction, which APOPO remains dedicated to building on, in the future.

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

"We were incredibly grateful to witness the level of engagement and willingness of our partners to continue the fight against TB and landmines. The generous renewed support from our long-term partners, as well as of new allies, reinforces the potential for sustainable change for many of our beneficiaries."
Yves Hervieu-Causse
Chairman of the Board

UNITED STATES OFFICE

Charlie Richter
U.S. Director

In 2022, APOPO US achieved record-breaking fundraising results. The Office played a crucial role in securing increased funding for APOPO's demining project in the 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 successfully secured several small and mid-size grants from US-based foundations and supported the finalization of APOPO's 5-year plan for support from the Belgian government. Furthermore, the US Office supported APOPO's Zoo program at San Diego, Point Defiance (Tacoma, Washington), and Indianapolis, which became increasingly active with HeroRAT demonstrations as COVID restrictions were lifted.

DIB

Throughout 2022, the US Office dedicated significant effort towards spearheading the design of the first-ever **Development Impact Bond** (DIB) in the Mine Action sector. The DIB, to be finalized in March 2023, will combine landmine clearance in Preah Vihear province, Cambodia, with organic rice development on beneficiaries' land that aims to increase farmer income by at least 30%. Private investors are funding implementers APOPO Mine Action and Cordaid (organic rice development) with $410,000 of initial upfront capital.

UKRAINE

The UK government is then providing over $1.8M of additional project working capital as well as a modest investor return, as outcomes are realized and verified through March 2025.

The partners have high hopes to scale up the initiative both within Cambodia and to new countries, including Ukraine, where landmines are having a particularly detrimental effect on agricultural activities.

During my time as Vice President of Marketing and Communications at Ashoka, I had the opportunity to work with Bart Weetjens, the founder of APOPO, the organization that uses African giant pouched rats to find and clear landmines. I initiated a rat adoption drive among Ashoka staff to raise funds for APOPO. Nine years later, I am a member of APOPO's US Board, witnessing the organization's impressive innovations. The same rat training for detecting landmines is now identifying tuberculosis bacilli and exploring human detection in collapsed buildings. Now APOPO US is developing a Development Impact Bond that links mine eradication with agricultural outcomes by aiding farmers in growing rice on cleared land. I am proud to be part of the remarkable strides APOPO has made in saving lives and livelihoods worldwide."

**Beverly Schwartz,
Secretary of the Board**

US BOARD

Kristen Davis - Chairwoman
Beverly Schwartz - Secretary of the Board
Piet Van Hove - Board Member
Bart Weetjens - Board Member
Isa Mirza - Board Member

UK PARTNER

Ros Bird
Operations & Fundraising Manager

APOPO is delighted to announce that, despite unprecedented delays caused by the Covid-19 pandemic, APOPO UK has finally been approved for registration as a charity by the Charities Commission in England & Wales on 18 May 2022 (Charity No: 1199007). APOPO UK was previously incorporated and registered as a private company limited by guarantee on 19 August 2019 (Company No: 12164277).

While maintaining autonomy in decision-making, the APOPO UK Board Members, supported by two volunteers and one part-time staff member, will work in close partnership with APOPO vzw to secure resources and support for designated APOPO projects.

The UK team will help raise awareness of animal scent detection innovation, establish and foster vibrant networks, and offer tax-efficient giving for individual supporters. With a collaborative formal Partnership Agreement in place, APOPO UK will seek funding primarily, although not exclusively, from UK-based grant givers.

The Board of Trustees currently comprises four members, led by **Chair Susan Robertson**, with **Justin Bedingfeld** serving as Treasurer, and **Alan Mathers** and **Dr. Cameron Watson.** Following the recent resignation of co-founder member, **Gemma Hampson**, effective from May 2023, two additional mem-bers will join the Board: **Alan Macdonald OBE** and **Dr. Deborah Charnock**.

Each member of the Trustee Board brings a unique skill set, ensuring that the Board is well-informed on governance, communications, business development, biotech, science, health, and mine action aspects.

> " The UK team will help raise awareness of animal scent detection innovation, establish and foster vibrant networks, and offer tax-efficient giving for individual supporters.

UK TRUSTEE BOARD

Susan Robertson - Chairwoman
Justin Bedingfeld - Treasurer
Alan Mathers
Dr. Cameron Watson
Dr. Deborah Charnock
Alan Macdonald OBE

VISITOR CENTER
CAMBODIA

APOPO's Visitor Center in Siem Reap, Cambodia offers guided tours that provide valuable insights into the global landmine problem, Cambodia's tumultuous history, and feature live mock demonstrations of our trained rats detecting landmines.

Sambat Meas
Visitor Center Manager

The Visitor Center serves as an excellent platform to spread awareness about our program while generating additional revenue. In 2022, the VC experienced a resurgence in popularity as travel restrictions eased and borders reopened, attracting an increasing number of tourists and prominent figures who were eager to learn about our work in Cambodia.

Over the course of the year, 8,614 visitors registered to tour the center. We anticipate that 2023 will be an even more successful year, and we are excited to witness the Visitor Center reclaim its position as a noteworthy tourist destination with a noble cause.

> " Over the course of the year, 8,614 visitors registered to tour the center. We anticipate that 2023 will be an even more successful year

Sister Srey Café

Nestled among the trees on the Siem Reap River in Cambodia, Sister Srey is a charming little cafe with a big heart. Not only does it offer delicious food and coffee, but it also supports our Cambodian demining program and empowers local Khmer students. With the reopening of borders and tourism picking up again, Sister Srey eagerly welcomed new visitors opening its doors after a temporary shutdown in 2021. Although Cambodia's tourism industry may take several years to fully recover, the first signs of progress are already visible in popular destinations such as Siem Reap. 2023 is expected to make a strong recovery.

An Enduring Partnership

The collaboration between **Sokoine University of Agriculture** (SUA) and APOPO has been a long-term partnership that spans over two decades. It began in the late 1990s when APOPO wanted to establish its headquarters in Tanzania and needed a local partner. SUA, one of the leading agricultural institutions in Tanzania, was the natural choice for a partner due to its expertise in rodents, veterinary care, and research and strong link with the University of Antwerp.

Over the years, the collaboration has **grown and evolved**, with SUA as APOPO's primary training and research center for all rat programs. The university provides crucial infrastructure, including land for the training minefield, laboratory facilities, housing for the rats, research personnel and veterinary staff, which APOPO utilizes to support its global programs, fine-tune detection techniques and develop new applications for the rats.

The collaboration has yielded **remarkable results**, including taking landmine detection out of Africa and developing unique tuberculosis (TB) detection method that has been successfully piloted in Tanzania, Mozambique, and Ethiopia and may soon be adopted into the National TB Strategy. Magawa, PDSA Gold Medal and Guinness World Record winner has been a delightful ambassador for rats, APOPO, SUA, and Tanzania as a whole.

In addition to scientific advancements, the partnership has also created **opportunities for university students** to gain practical experience in the fields of animal behavior, disease detection, and breeding. This has contributed to the development of a new generation of researchers and professionals who are passionate about using innovative solutions to solve complex problems.

Between December 2000 and September 2003, I had the golden opportunity to attend the HeroRATs as **veterinary patients**. I vividly remember Norpheus, a giant brown-grey male; Gyseek, Jedidia, Harare, Kitindi and Zaina. While we primarily handled domestic and wild animals with various ailments, the first generation of domestically raised HeroRATs presented cases of confinement trauma, abscesses, arthritis, and even bone fractures.

Providing feedback to APOPO allowed for continuous improvements in the care, welfare, and use of these **noble animals**. One of the most impressive aspects of their training sessions was the strict adherence to natural nocturnal habits, with sessions limited to early morning and late evening hours.

I commend APOPO for their humane treatment of the rats and respect for their natural needs in line with their great service to humankind. The **SUA Animal Referral Hospital** is committed to supporting APOPO, collaborating on rat handling, preventing diseases, and expanding our knowledge of their health and well-being.
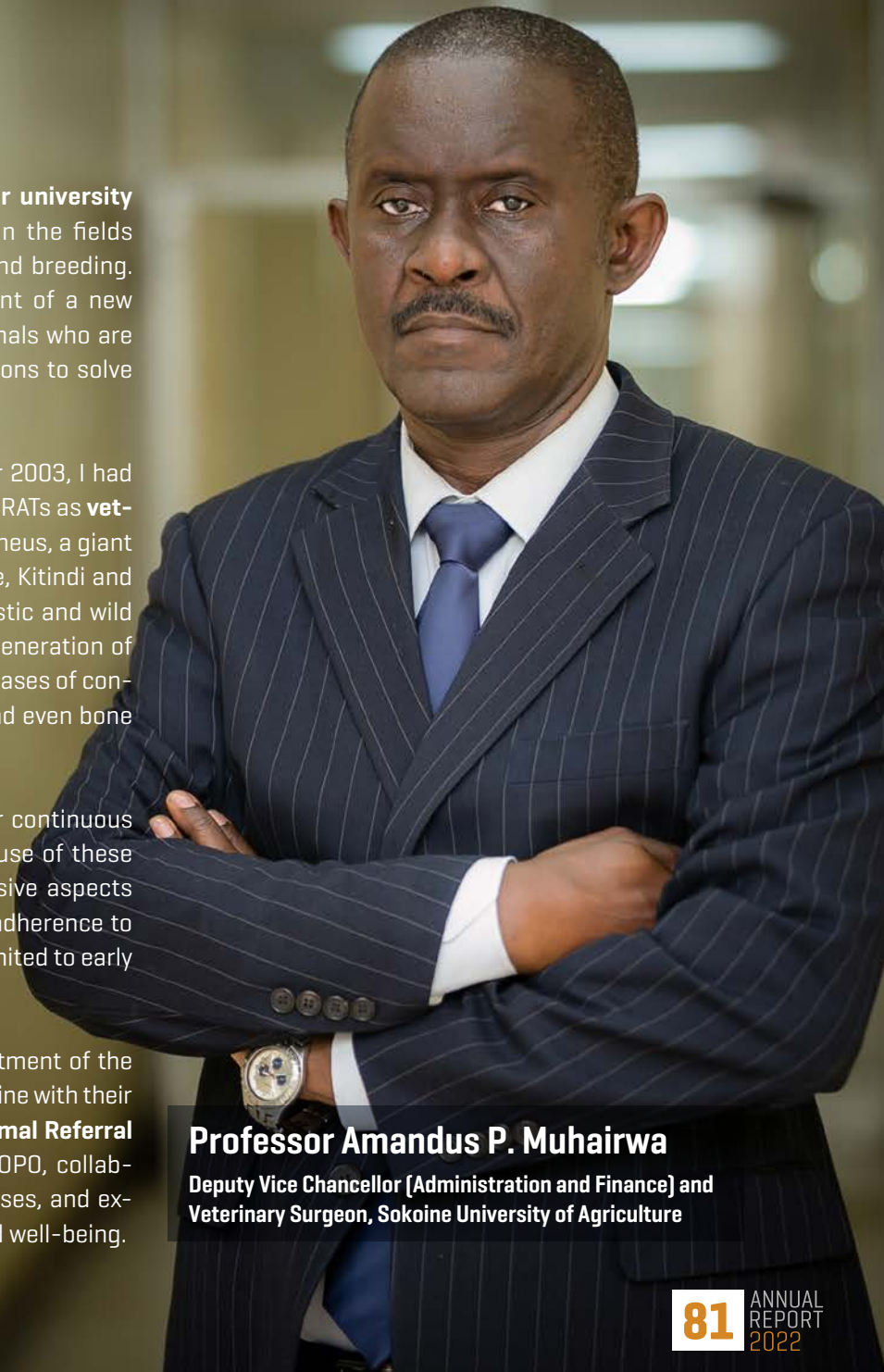
Professor Amandus P. Muhairwa
Deputy Vice Chancellor (Administration and Finance) and Veterinary Surgeon, Sokoine University of Agriculture

HEROTREES

PROTECTING THE PLANET

APOPO is working in partnership with Sustainable Agriculture Tanzania (SAT) to promote climate-smart farming practices through its HeroTREEs project. By promoting techniques like planting trees alongside crops and using natural fertilizers, farmers are able to increase crop yields, improve soil quality, and mitigate the negative environmental impacts of unsustainable farming practices like slash-and-burn agriculture. The fact that the project is also contributing to food security, poverty reduction, and socio-economic development in the participating communities in the Uluguru Mountains is a testament to the multiple benefits that can be achieved through sustainable land management practices.

Sustainable Agriculture Tanzania

Since the start of the project, APOPO has planted over **43,000 trees** of **64 species**, of which 29,091 were found growing during the end of 2022 audit. As part of the project, SAT trained 160 farmers who are responsible for growing the seedlings and the trees. APOPO will continue and expand this effort, contributing to the conservation of the unique biodiversity found in the Uluguru Mountain range in Tanzania.

A newly emerging component of the HeroTREEs project is **Syntropic Farming**, a form of agroforestry that involves planting a mix of crops and trees in a way that mimics natural forest ecosystems.

Syntropic farming or the development of food forests is a **sustainable and innovative** approach to agriculture that has numerous environmental benefits. By planting a mix of crops and trees, farmers can create a diverse ecosystem that supports soil health, biodiversity, and water conservation.

HeroTREEs farmers in Tanzania

Food forests cool the soil and atmosphere through maximizing photosynthesis and stratification, and dense intercropping of various layers of crops. Food forests improve soil and plant quality through intensive mulching and stimulation of soil fungi, they reduce the need for irrigation water and increase biodiversity. Syntropic farming does not apply chemicals of any kind and rather focuses on plant health to prevent disease.

APOPO launched Syntropic Farms at its facilities in Tanzania and plans to promote this technology to support post mine clearance agricultural communities. A key component of APOPO's core vision is to protect the planet, and this includes taking measures to address its carbon footprint and contribute to climate change mitigation and biodiversity conservation. APOPO plans to offset its carbon footprint while benefiting the HeroTREEs farmers in Tanzania, and the rural communities affected by landmines and promoting innovative ecological agroforestry approaches.

> "
> A key component of APOPO's core vision is to protect the planet, and this includes taking measures to address its carbon footprint and contribute to climate change mitigation and biodiversity conservation

Before (12/2021)

After (05/2023)

Trees are life!

"I am 97 years old and I have four small farms up in this area. I am a proud HeroTREEs farmer and have planted over 400 trees with my family so far. Trees are life! My grandchildren and their children will benefit from our trees, and this makes me happy."

Babu Athuman, HeroTREEs Farmer, Tanzania

FINANCIAL STATEMENT BALANCE SHEET IN EURO*

ASSETS	2022	2021
Current assets	2,307,307	2,634,646
Current receivables	909,709	513,020
Other assets	148,821	172,929
Cash and equivalents	1,248,777	1,948,697
TOTAL ASSETS	**2,307,307**	**2,634,646**
Liabilities		
Net capital	1,675,677	1,305,827
Funds of the organization	380,046	328,046
Retained Earnings	1,295,631	977,781
Long term liabilities	623,930	1,298,413
Deferred Income (Grants)	287,463	998,498
Loan	336,467	299,915
Curent liabilities	7,700	30,405
TOTAL LIABILITIES	**2,307,307**	**2,634,646**

PROFIT&LOSS STATEMENT (EURO)

	2022	2021
Total Income	8,125,885	6,275,244
Total Operational Expenses	3,145,476	2,612,856
Total Personnel Expenses	4,622,751	3,487,661
Depreciation	12,207	12,207
Other costs	52,000	–
Operating Result	**293,452**	**162,521**
Financial Result	25,382	-12,863
Extraordinary Result	-985	–
Net Income	**317,849**	**149,658**

* Annual accounts audited by BDO

DONATIONS & SUBSIDIES 2022

IN EURO

TOTAL 8,133,911
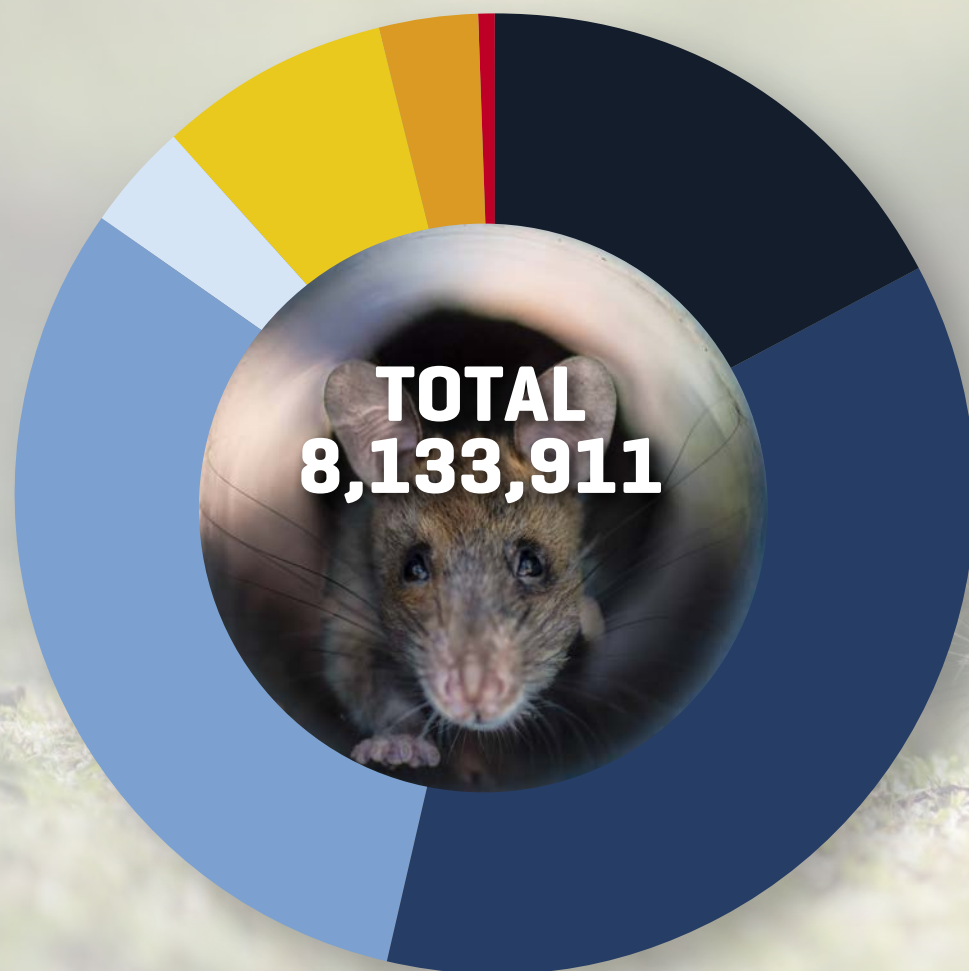
●	Public fundraising	1,420,475
●	Government grants	2,945,653
●	Foundation grants	2,528,856
●	International institution grants	291,471
●	Earned income	649,496
●	Research grants	270,122
●	Miscellaneous operating income	27,838

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.
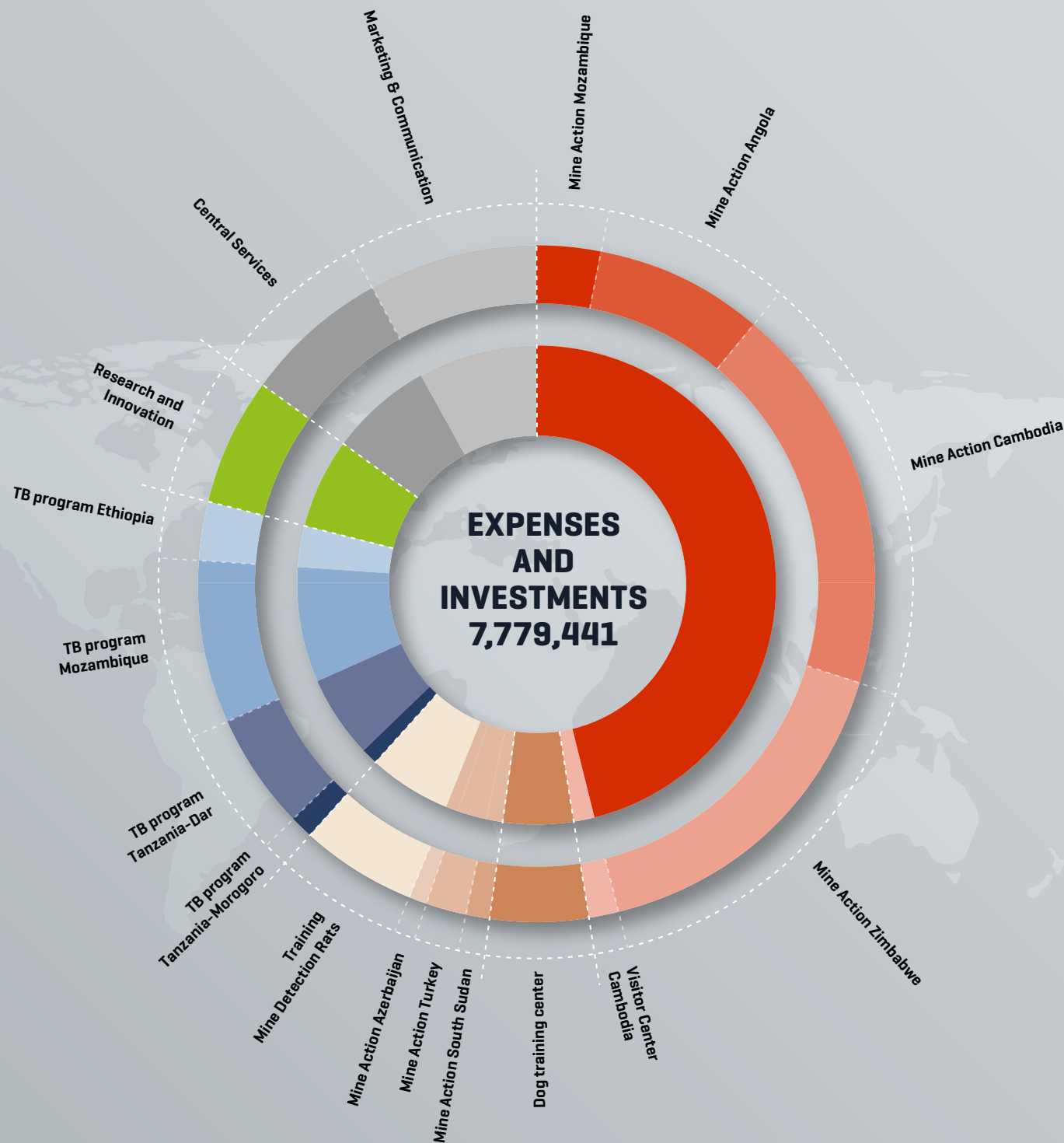
EXPENSES AND INVESTMENTS 2022
PER ACTIVITY IN EURO

Mine Action Mozambique	243,738
Mine Action Angola	636,071
Mine Action Cambodia	1,442,744
Mine Action Zimbabwe	1,280,773
Visitor Center Cambodia	108,989
Dog Training Center	365,416
Mine Action South Sudan	73,629
Mine Action Turkey	160,083
Mine Action Azerbaijan	73,935
Training Mine Detection Rats	421,151
TB program Tanzania-Morogoro	97,158
TB program Tanzania-Dar	414,216
TB program Mozambique	607,045
TB program Ethiopia	213,905
Research and Innovation	487,473
Central Services	535,458
Marketing and Communication	617,657
Total	**7,779,441**

APOPO VZW

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Apart from:
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Peace Process Secretariat

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

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Rucaplein 572, 2610 wilrijk, Belgium
Swift code: GEBABEBB
IBAN: BE24 0013 8706 5038

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SAVES LIVES