STRATEGY 2021-2025
APOPO was founded in response to growing awareness that landmines kill and maim people and hamper development in post-conflict areas. Methods to rid affected countries of landmines were slow so a small team in Antwerp, Belgium created APOPO to develop a fast, simple and cost-efficient mine clearance technology that could be sustained within national mine action programs in low-income countries. APOPO developed and implemented landmine detection technology using trained sniffer rats, and now, over 20 years later, APOPO is a leading organization in the development and deployment of scent detection animals.

APOPO grew into a global non-profit organization, with its main hub, rat training and research center anchored at the Sokoine University of Agriculture in Morogoro, Tanzania. As a research organization, APOPO is always at the forefront in developing new humanitarian and environmental scent detection applications. Core operational activities are in the fields of Mine Action and Tuberculosis (TB) control. Despite being a relatively small player, APOPO is uniquely positioned to bring innovation to the sector through integration of its trained detection animals.

APOPO has Mine Action operations in Mozambique, Angola, Zimbabwe and Cambodia with leased dogs active in South Sudan. APOPO runs four TB-research laboratories in Tanzania, Mozambique, and Ethiopia where trained rats work in conjunction with confirmatory technology to test, track, and get more TB patients on treatment.

The organization is supported by a large international network of diverse partners and donors as well as the general public, has foundations in Switzerland, the U.S.A., and is in the process of setting up a U.K. foundation.
VISION & MISSION

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

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

STRATEGIC OBJECTIVES: APOPO saves lives through the deployment of scent detection animals.

Specific objectives:
- Deploy efficient mine action activities in affected countries.
- Accelerate tuberculosis control in high burden countries.
- Research and develop innovative applications for scent detection animals.

APOPO adopts UN Sustainable Development Goals (SDGs) that are aligned with our work and values, and commit 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 animal technologies.

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

INNOVATION
Pioneering creative research and innovative solutions within a participatory learning culture to maximize social impact.

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

SOLIDARITY
Committing itself to the common good and sharing responsibility toward the protection of people, communities and the planet.
At the United Nations Sustainable Development Summit on September 25, 2015, more than 190 world leaders adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030.

The SDGs, are a universal and standardised metric that offer APOPO the opportunity to quantify and demonstrate effectiveness and impact in new ways. The ability to measure how well the organisation is delivering on its mission is critical to improving our outcomes and reporting to beneficiaries, donor partners and other interested stakeholders. The SDGs are applicable to APOPO across the fields of Mine Action, Tuberculosis Detection and Innovation because they provide a comprehensive, relevant framework. APOPO’s ability to inspire positive social change, not purely innovative technology, is another aspect of the organisation that is in line with the SDG ethos. APOPO directly contributes to 13 of the 17 SDGs:

1. **No Poverty**
   - End poverty in all its forms everywhere

2. **Zero Hunger**
   - End hunger, achieve food security and improved nutrition and promote sustainable agriculture

3. **Good Health and Well-Being**
   - Ensure healthy lives and promote well-being for all at all ages

4. **Quality Education**
   - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

5. **Gender Equality**
   - Achieve gender equality and empower all women and girls

6. **Clean Water and Sanitation**
   - Ensure availability and sustainable management of water and sanitation for all

7. **Affordable and Clean Energy**
   - Ensure access to affordable, reliable, sustainable and modern energy for all

8. **Decent Work and Economic Growth**
   - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

9. **Industry, Innovation and Infrastructure**
   - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

10. **Reduced Inequalities**
    - Reduce inequality within and among countries

11. **Sustainable Cities and Communities**
    - Make cities and human settlements inclusive, safe, resilient and sustainable

12. **Peace, Justice and Strong Institutions**
    - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

13. **Partnerships for the Goals**
    - Strengthen the means of implementation and revitalize the global partnership for sustainable development
**WHERE WE WORK**

**TANZANIA**
Since 2000, APOPO has developed its operational headquarters and training center at the Sokoine University of Agriculture where all the Mine Detection Rats are born and trained. This is also home to APOPO’s Innovation department that researches and develops the innovative applications and advanced techniques used in existing operations.

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

**ANGOLA**
APOPO has been a Mine Action operator in Angola since 2012, where it has been operating in the provinces of Malanje, Zaire, and Uíge. APOPO is the only mine action operator with scent detection animals in the country and is now mandated to clear Cuanza Sul province.

**ZIMBABWE**
APOPO began clearance in Zimbabwe in 2020 along the border with Mozambique in the Sengwe Wildlife Corridor. The project aims to free the movement of endangered wildlife between South Africa’s Kruger, Mozambique’s Limpopo and Zimbabwe’s Gonarezhou National Parks.

**CAMBODIA**
APOPO has been clearing minefields in Cambodia since 2014 in partnership with the Cambodian Mine Action Center. APOPO works on several sites in the provinces of Siem Reap, Battambang and Preah Vihear, including clearing around a UNESCO world heritage temple site. In addition to its Mine Detection Rats, APOPO trains and deploys Technical Survey Dogs in Cambodia.

**SOUTH SUDAN**
APOPO supplies Mine Detection Dogs, handlers and team leaders to the Development Initiative (TDI). This project started as a 3-year scheme under a UNMAS tender, which is central in terms of planning, coordination and funding of mine action in South Sudan, and currently is being extended to include Technical Survey Dogs under a new tender.

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THE GLOBAL CONTEXT

Mine Action clears paths and creates safe ground on which homes can be built and land can be cultivated. It gives new horizons and hope to people living at risk in vulnerable communities. Everyone has the right to basic security in their lives, and not fear their next step. By removing landmines and other explosive remnants of war (ERW), APOPO lays the foundation for recovery and sustainable development: reopened roads and bridges, safe routes to schools and restored livelihoods.

An estimated 60 million people around the world are still living in fear of mines and cluster munitions today. The gravity of the problem prompted ninety-two States Parties to the AP Mine Ban Convention to adopt 50 action points at the Oslo Review Conference in 2019 that ensure mine clearance and other treaty obligations are met by 2025. This declaration reinforced the Maputo Declaration of 2014 which also obliged to the world to be free of mines by 2025. Sadly, this goal is realistically too ambitious. Fulfilling it would require a significant increase in the amount of funding available or cost efficiency of demining operations. The Anti-personnel Mine Ban Convention is the cornerstone of the international effort to end the suffering and casualties caused by anti-personnel mines.

Fifty-nine states and other areas are contaminated by antipersonnel mines. Donors and affected states contribute nearly US$700 million annually in combined international and national support for mine action. Despite considerable efforts and funds to survey and clear landmines, there is a mismatch between available funds and the global scope of the problem. This emphasizes the need for increased operational cost-efficiency to accelerate the land release process with scarce funds. As a sector-wide objective, the goal of a mine-free world by 2025 has a huge impact on how APOPO should strategically position itself within the sector over the next five years.

The mine action industry is rapidly evolving from confined landmine related activities, to actions associated with the Convention on Cluster Munitions (CCM) and the unique situation in the Middle East, where there is a high demand for building clearance, removal of Improvised Explosive Devices (IED) and clearing booby trapped devices. The global focus has grown and APOPO’s main emphasis on landmines is evolving. There is a large demand for efficient survey and clearance methods that can address challenges in the extended sector. That said, activities related to landmines will remain a core area of competence for APOPO.

APOPO joined the global Landmine Free 2025 coalition making it part of the global response to rally support for landmine clearance and ensure people affected by landmines are not forgotten.
The Sector
The operational mine action sector is largely composed of around ten international mine action organizations, mostly non-governmental (NGO), an equal number of commercial companies (often funded by the United Nations) and national mine action organizations (typically one in each affected country). Mine Action is managed differently from country to country, but each country has a National Mine Action Authority (NMAA) that will usually receive support from one or several NGOs or the United Nations (UN). In unique cases the UN will act as the NMAA in countries where an NMAA has not been set up.

Mine Action is more than just survey and clearance, it has five interrelated pillars:
- Survey and Clearance
- Advocacy
- Victim Assistance
- Stockpile Destruction
- Mine Risk Education
APOPO’S ROLE

APOPO has a uniquely focused approach, to develop quality solutions for survey and clearance. The organization offers innovative and efficient solutions that surpass traditional mine action methods and speeds up the wider survey and clearance process. APOPO has the unique capability of training and working with rats and dogs in mine action and has strengthened its role as the leading service provider of detection animals accompanied with a good reputation for quality and constructive partnerships.

APOPO will strengthen its capacity around the training and use of animals in the following ways:

- Maintain and further develop quality training of rats in Tanzania and dogs in Cambodia.
- Ensure enough rats and dogs are trained to be able to mobilize capacities as required by potential partners.
- Ensure that animal welfare is thoroughly embedded into any activity around our animals, at our training bases and in the field.
- Ensure the quality of the handlers, team leaders, and other key staff working with the animals through recruitment, training and coaching.
- Ensure that all animal detection capacities deployed in the field, by APOPO or partners, are carefully monitored.
- Prioritize high level work (International Mine Action Standards [IMAS], international networking, reports and publications) with the aim to better define the role of animals in survey and clearance.
Land Release

Land release is the operational framework for any survey and clearance undertaken by APOPO. The process combines different survey and clearance methods for more efficient release of land. These methods are broadly described as non-technical survey (NTS), technical survey (TS) and clearance. APOPO has developed an efficient land release methodology and tailored it to the needs of each programme and partner. The land release methodology complies with international and national standards and offers a structured evidence-based approach where the aim is to release land progressively, first by applying a tight NTS and second, by applying a well-designed and efficient TS methodology. NTS and TS are both part of the wider survey process and when applied correctly, expensive clearance can be restricted to areas that are truly mined, typically much less area than the original mine suspected area.

All these generic activities have been undertaken in support of the removal of mines and ERW. Mine action is however expanding, and APOPO is currently exploring the use of both dogs and rats in fringe applications. APOPO is developing a pilot where technical survey dogs will be re-trained for survey and clearance of Cluster Munition Remnants (CMR). It is expected that the dogs can find CMR consistently while ignoring the million fragments that are typically located in between and will have the potential to significantly improve the operational efficiency of CMR survey and clearance.

A second expansion area is building clearance and searching for Improvised Explosive Devices (IED). In 2021, APOPO will explore opportunities for training of dogs to search buildings and IED.
Non-Technical Survey (NTS)

NTS is the first step in the land release process. Well trained NTS teams combine a desktop study with field inspections and interviews with local populations and authorities. Individuals are interviewed separately to capture all relevant information. Additional evidence is gathered on the ground including local mine marking, signs of detonations, terrain fluctuations, vegetation, soil properties and local use of land in the area. The NTS team further gathers relevant information about potential socioeconomic impact from clearing mines in the area. An NTS survey report is prepared to form the basis for planning further technical survey and clearance.

Technical Survey (TS)

Technical survey is a vital component of the land release process. The universally accepted aim is to release more land by inexpensive survey, thus leaving less land for expensive clearance. Smart technical survey solutions typically enable release of between 30 to 90% of land that would otherwise require clearance. Technical survey dogs (TSD) will search between 1500 and 2,000 m² of land per day and land release rates will be 4 to 10 times higher. The only other alternative technology, manual mine clearance, will require approximately 50 deminers to achieve the same. It is thus imperative to fully develop and deploy this new and innovative way of utilizing dogs more effectively.

APOPO is the only provider of Technical Survey Dogs and the system provides many advantages:

- More rapid survey of large overgrown areas with no need for prior vegetation cutting. This cuts costs by around 70%.
- All other TS methods will require extensive vegetation cutting, which is expensive and a major breach of the goal of a more environmentally-friendly land release process.
- TSD are more versatile and mobile than any other survey methodology and there are few obstacles that could potentially prevent deployment of the dogs.
International Mine Action Standards (IMAS) require a minimum of two successive animal searches over land during clearance while a single search is sufficient during technical survey. This has implications on how APOPO deploys mine detection rats (MDR). The principle rule is to first apply single search over the wider Confirmed Hazardous Area. The parts where mines are found will require clearance and a second search with MDR will be applied to comply with IMAS. The parts where mines were not found may be released by technical survey following careful assessment of all evidence that has been gathered during the wider survey process.

- MDR are excellent clearance tools, likely better than dogs in areas with a high density of mines.
- There is scope to increase overall efficiency using MDR by applying a sound land release methodology which permits single search in a technical survey role to determine much smaller areas for full clearance, where double search will be required.

Clearance

Clearance should be limited to areas that are truly mined. Mine Detection Rats (MDR) have proven to be excellent tools for speeding up clearance. MDR are integrated with manual deminers and brush cutters to typically increase efficiency by almost 300% compared to manual clearance alone.
After the war, they continue to maim or kill innocent people.

Restricting areas and terrorizing entire communities.

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

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.

Human deminers excavate and destroy the mines.

APOPO’s HeroRATs systematically search boxes and quickly find landmines.

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

APOPO returns now safe land to the communities.

The challenging part is to increase global relevance. APOPO has two choices:

- Grow APOPO’s own mine action capacity
- Expand APOPO’s innovative technology into larger mine action organizations

APOPO is deploying its rats and dogs successfully in multiple countries, always within a tailored and efficient land release concept. APOPO can deliver complete mine action solutions that will highly likely increase overall efficiency when it comes to survey and clearance.

Partnership Strategy

Major global increase of land release rates will be required for achieving the 2025 deadline for compliance with the treaties, to which most affected countries and practically all donors have signed up.

The only other alternative is a significant increase of global funding, which is not likely to happen. Global Mine Action is thus being confronted with the highest demand ever for increased overall land release efficiency. This demand has informed APOPO’s strategy. APOPO’s technology and operational know-how has the potential to increase operational efficiency almost everywhere in the world. APOPO is committed to accept a much greater responsibility in the process of achieving the 2025 completion goals.
The way forward for APOPO, and perhaps for the sector, is to focus more on establishing quality partnerships with one or several of the larger NGOs. APOPO can provide state-of-the-art operational capacity for survey and clearance while the partner may be more advanced and skilled in terms of addressing other mine action challenges. Rats and dogs are only truly effective when deployed correctly with other assets and within the framework of a quality land release methodology.

Deploying APOPO’s rats and dogs within capacities of partners has the potential for a much higher impact on the global arena, increasing the relevance of APOPO. A priority is given to strengthening partnership with other organizations for increased use of animals trained by APOPO.

APOPO is invested in continuing to further develop an efficient methodology of the highest standard that will significantly increase land release rates.

PARTNERSHIPS

APOPO has established trustworthy partnerships through active dialogue and strategic implementation of pilot projects. The aim is full collaboration to deploy reliable complementary operational animal detection solutions that can boost overall efficiency.

APOPO aims to strengthen partnership as follows:

- The development of globally accepted methodology through strategic partnerships with expert and research partners and provide quality documentation on efficacy and cost efficiency. With such methodology, a role of APOPO in partnership with larger mine action service providers should stand out as the obvious choice.
- Strategic partnership with international NGOs that share many of the same values as APOPO, to create synergies and mutually enhanced output.
- Strategic partnership with national mine action organizations for improved national capacity building.
- Direct partnership with commercial operators that are funded through tendering for humanitarian survey and clearance.

Mine action will likely be more efficient if stakeholders aim for complimentary rather than replicating roles. Some of the larger NGOs have made good progress in developing strategic partnerships for a more coordinated approach towards certain donors. The risk is that an already small mine action sector is monopolized by a handful or larger NGOs - potential niche services by organizations like APOPO are at risk of being neglected, thus missing out on opportunities for increased overall cost efficiency. There is little tradition for operational partnership arrangements in mine action and opportunities for such partnerships are often neglected.

Bilateral donors bear some responsibility for partnership development within the sector. Both strategic and operational partnerships are in principle good but careful consideration should be given to scrutinizing the true value of the partnership. APOPO will work towards the following:

- Donors are encouraged to support projects where partners team up operationally for increased operational efficiency.
- Donor awareness and, if needed, rejection of partnerships where the aim is exclusion through monopolization.
- Donor awareness of the main purpose of partnership being to improve operational efficiency.
# THEORY OF CHANGE

## STRATEGIC OBJECTIVE: Deploy efficient mine action activities in affected countries.

### DIRECT OUTPUTS

- A large segment of the global mine action industry use mine detection rats and dogs provided by APOPO
- Land release methodology developed and promoted by APOPO is widely accepted and the overall cost efficiency in the sector has increased significantly as a result
- Global cost per sqm of released land is significantly reduced as a result of more widespread use of APOPO’s animals
- The APOPO animal detection technology has been adapted to addressing other explosive hazard challenges (CMR, IED, building clearance)

### OUTCOMES

- Survey and clearance is undertaken much more efficiently, which is reflected in much higher sector-wide land release rates
- Fewer accidents occur in mine/ERW affected countries and communities
- Larger previously mine suspected areas are released and put into productive use, which has enabled development and economic growth in rural areas and in countries as a whole

### END GOAL

- ALL MEMBER STATES COMPLY FULLY WITH THE APMBC AND CCM* TREATIES
- SDG 1, 3, 6 Productive use of previously contaminated land provides livelihood opportunities, unlocking beneficiaries from poverty
- SDG 2 Released agricultural land enables communities to grow crops, improving food security and nutrition
- SDG 7 Released land has permitted development of power infrastructure, making energy services accessible to previously affected communities
- SDG 8, 9 Released land has enabled safe access to natural resources, promoting economic growth/resilience and sustainable tourism
- SDG 16 Children, women and men live dignified lives without the fear of mines/ERW

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*S - ANTI-PERSONNEL MINE BAN CONVENTION (APMBC), CONVENTION ON CLUSTER MUNITIONS (CCM)*
## OUTPUTS, RESULTS AND DELIVERABLES

- Effective implementation of Non-Technical Survey (NTS), Technical Survey (TS), Clearance and Battle Area Clearance (BAC) capacities and Cluster Munition Remnant Survey (CMRS) in the field.
- Successful implementation of the Peace process; Disarmament, Demobilization and Reintegration (DDR).
- An efficient overall land release process that will return large areas of previously suspected land to local communities.
- Adequate capacity building and program management mechanisms in place to facilitate safe and efficient use of mine action resources.
- Expanding operational partnerships with Mine Action partners resulting in more joint field efforts.

## INDICATORS

- Contribute to the National Strategy of Cambodia by surveying, clearing and releasing at least 20 million m² of contaminated polygons in high priority communities.
- Contribute to the clearing of Angola by clearing the entire province of Cuanza Sul and Cuanza Norte, representing 135 Confirmed Hazardous Areas (CHA) or 12% of Angola’s remaining mine problem.
- Clear the entire Sengwe mine belt corridor including the access road in Gonarezhou national park in Zimbabwe.
- Clear Malhazine Beira and Nacala depots in Mozambique.
- Successfully complete the Disarmament, Demobilization and Reintegration of Renamo Forces programme.
- Contribute to the national strategies of at least 3 more affected mine countries.
- Accelerate the survey and area reduction process using SMART Technical Survey dogs, reducing the operational cost by 70% comparing to manual deminers and other traditional methods.
- Implement full clearance with MDR which will reduce the cost compared to manual demining with 50% and to mine detection dogs with 30%.
- Develop and implement CMRS with trained survey dogs, thereby reducing the price compared to manual demining methods with 25%.
- Deminers are well trained according to APOPO’s SOP and know how to utilize demining equipment efficiently and safely.
- No accidents [APOPO staff and beneficiaries] and no missed targets found during internal and external QC in any of APOPO’s operations.
- APOPO conducts standard training courses and refreshers for the training of dog and rat trainers and handlers.
- APOPO conducts standard training courses and refreshers for all its demining capacities – manual demining, battle area clearance, first aid, explosive ordnance disposal, quality management etc.
- APOPO will grow predominantly as a service provider in partnership with other mine action organizations.
- APOPO will be represented on the International Mine Action Networks and Meetings.
- APOPO will closely collaborate with Mine Action Authorities.
- APOPO will have partnerships with at least four external demining organizations.
- All clients return to APOPO for its services.
Since 2000, APOPO has developed its operational headquarters and training center at the Sokoine University of Agriculture. This is home to APOPO’s Innovation department that researches and develops the innovative applications and advanced techniques used in existing operations. APOPO runs two TB-detection labs, one in Morogoro and one in Dar es Salaam.

Hosted by the Eduardo Mondlane University, APOPO runs a TB detection lab in the capital city of Maputo and since 2013 has contributed to the National TB program with additional case finding. APOPO initiated a collaboration with Population Services International (PSI) for Human Papillomavirus detection.

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 finding TB and HIV in high-risk prison populations.

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THE GLOBAL CONTEXT

Tuberculosis (TB) is an old disease, probably as old as humanity itself, caused by bacteria (Mycobacteria tuberculosis complex) that are spread from person to person through the air. TB usually affects the lungs and causes persisting cough and chest pain. General symptoms include feelings of sickness or weakness, weight loss, fever, and night sweats. TB can also affect other parts of the body.

TB is not a disease of the past – it remains the top infectious killer worldwide. About 10 million people fell ill with TB and 1.4 million died in 2019 according to the World Health Organization (WHO). Globally, about 3 out of 10 million TB patients were missed, either undiagnosed or unreported, and probably did not get the TB care they needed. In African high TB-burden countries, this gap as high as 50% and caused by barriers in accessing healthcare and limitations of locally available diagnostic tests, mainly sputum smear microscopy with limited sensitivity. Left undiagnosed and untreated, TB patients will pass the pathogen to up to 15 other people within a year. Up to two thirds of untreated TB patients will eventually die. When diagnosed timely and treated properly TB is curable.

The global aspiration is to eliminate TB, which is reflected in the UN Sustainable Development Goals and the WHO End TB strategy by 2035, and in the strategies of the National TB Programs. There is consensus that better TB tests, which are sensitive, rapid, simple, cheap, have high throughput and are ideally child-friendly are urgently needed. Respective target product profiles (TPP) have been defined by the WHO. Also, integrated health services to find and treat all TB patients are well defined.

TB control is largely a sovereign task coordinated by National TB Programs (NTPs) affiliated with Ministries of Health. Further actors include UN agencies namely WHO and Stop TB partnerships with strategic, regulatory and coordinating tasks; and international, national and local non-governmental organizations; academia; and the corporate sector. Diagnostic R&D is commonly led by private companies, academia, or private-public partnerships.
TB services are meant to be free for patients. Costs are covered by governments, private health services such as corporate occupational health programs, or health insurances. In low-income countries, international donor funding exceeds domestic funding. The total national TB budgets for 2019 were US$ 94 million, US$ 62 million, and US$ 28 million in Ethiopia, Tanzania and Mozambique, respectively. Only 4-11% hereof were covered by domestic funding, the remainder was covered by international sources or remained unfunded. Thus, international funding mechanisms like the Global Fund are important. Their criteria often determine, which tools and services can be budgeted for and included in strategic plans. Typically, these tools and services have to be endorsed by the WHO or other international body.

Delayed diagnosis and sub-standard TB care result in poor health outcomes, catastrophic costs, and ongoing TB transmission in communities. Well functioning TB services contribute to a population’s health and prosperity.

APOPO is a unique non-profit actor in TB control. APOPO stands out as a diagnostic innovator, conducting research into using rats as a TB diagnostic tool, as well as a service innovator designing models of integrated TB diagnostics and care. APOPO’s primary goal is to find TB patients and contribute to ending TB.
APOPO is currently present at four program sites across three African countries, namely Tanzania (since 2007), Mozambique (since 2013), and Ethiopia (since 2018), which are all classified as high TB and high TB/HIV burden countries by the WHO. Beneficiaries of APOPO’s TB Detection are the general populations in resource-limited, high-TB burden settings with limited access to health care. APOPO further places special attention to key-affected groups by TB, including people living with HIV, children, and prison populations. All services are for free for patients and partners.

APOPO’s TB Detection takes a truly collaborative approach in its research and services. APOPO works within government health systems, aligned with national and international standards and strategies, to maximize the health impact and avoid any duplication of efforts.

Special niches/competitive advantages of APOPO include:

- The use of an entirely new diagnostic approach, using scents (from volatile organic compounds, VOC) as a biomarker, and living biosensors, the TB detection rats
- A rapid and high-throughput approach to testing, which is suitable for growing African cities and large populations that need to be screened for TB
- Africa-based product and service model development under real-world conditions, taking the realities on the ground into consideration from the beginning
- A synergistic combination of product development, research, and service delivery, which mutually stimulate each other
- Smooth logistics and slim administration through intelligent integrated models

Since its beginnings in 2007, APOPO’s TB Detection program has served 379,409 patients with signs and symptoms of TB by (re)evaluating their samples and has newly diagnosed 18,388 patients with TB across sites. Research supports that the increase in TB detection is markedly higher (≥68%) in young children and people living with HIV. Both groups commonly suffer from underdiagnosis and may particularly benefit from APOPO’s TB detection. On average, APOPO increased the partner TB centers’ case detection by 40%. Thanks to APOPO’s TB detection and linkage to care services about 155,003 infections to others may have been prevented.
APOPO is the only organization that trains and deploys TB detection rats. TB detection rats are a scent detection technology which is based on the recognition of volatile organic compound (VOC) profiles as a biomarker. TB detection rats are unique in their very high speed, throughput, high sensitivity (compared to the widely used sputum smear microscopy), and low modelled cost of just US$ 1.13 per sample tested. The main cost driver is staff, which comes along with the creation of local employment opportunities.

The TB detection rat journey began in Tanzania in 2002, after first successes in training rats to find explosives, and following historic evidence that olfaction can inform diagnostics in medical practices, e.g. to detect metabolic issues. The collaborative TB detection research since then has gone through the eras of (1) proof-of-principle that rats can be trained to detect TB using a) bacterial culture, and b) human sputum samples, (2) discovery of TB specific-volatile organic compound patterns; (3) applicability of the rats in the field as a second-line test to enhance case finding among smear-negative patients with presumptive TB, namely those who tested negative by the partnering TB centers, and (4) evaluation of performance characteristics of TB detection rats during field use in line with internationally defined target product profiles.

The way forward is to refine TB detection rats, and to expand their portfolio to detect TB from a range of new sample materials, including saliva, urine and breath. These sample materials are less invasive and more child friendly. This research will be conducted jointly with another “living biosensor”, Mrs. Joy Milne, the woman who can smell Parkinson’s disease. The research may also lead to discoveries that inform the development of synthetic devices.
Breaking the TB cycle

ACTIVE TB person gets sick (cough, fever)

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

STIGMA AND RISK OF DEATH

PERSON GETS WEAK
unable to work or to go to school

SERIOUS ILLNESS

NO TREATMENT

UNABLE TO SUPPORT FAMILY

IF TB IS NOT DIAGNOSED

PATIENT GOES TO CLINIC

OFTEN, TB POSITIVE PATIENTS ARE MISSED AND SENT HOME

SAMPLE TAKEN TO APOPO

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
APOPO is designing innovative models to enhance TB case detection and linkage to care. These are driven by the aspiration to deploy TB detection rats, a diagnostic tool for research use, in an impactful way, and guided by a commitment to patient-centered care beyond the rat element.

APOPO’s main TB model works as follows: APOPO builds partnership with local TB health care facilities and clinics that offer TB services under the umbrella of national TB programs and the DOTS strategy, and supports them by enhancing their TB detection and treatment initiation (= enhanced passive case finding). Medical care remains the full responsibility of the TB centers. In APOPO’s model, only samples, not patients, are transferred. No costs are incurred to either patients or partnering centers. For APOPO’s work, human sputum samples are collected from partner TB centers that have already tested the samples using locally available methods, mostly sputum smear microscopy. To maximize speed, APOPO has built its own motorbike sample referral networks.

All TB-positive and negative samples are transported to one of APOPO’s centralized facilities, where they are made safe through heat-inactivation, sorted, and placed in an evaluation cage allowing sequential rat inspection. When a rat suspects TB, it ‘indicates’ this to handlers by holding its nose over the sample for 3 seconds. Samples are then re-checked using WHO endorsed confirmation tests, such as ZN or LED fluorescence microscopy on concentrated sputum or molecular tests. Confirmed TB-positive results are conveyed to clinics largely within 24 hours, contributing to a higher level of patient treatment initiation.
LINKAGE TO CARE

Collaboration with community health workers from patient organizations ensures that more newly diagnosed TB patients are linked to standard TB care at the clinics. APOPO combines diagnostic service with research, and scientifically evaluates the data, which are collected every working day in the custom-made electronic laboratory information and management system TB-LIMS.

APOPO’s TB model has been successfully implemented in Tanzania, Mozambique, and Ethiopia with some local modifications. For instance, in Tanzania, it has been successfully shown, that a digital health solution can be added to monitor treatment adherence and support patients at their homes over the course of their 6-month+ therapy. In Mozambique, APOPO has set-up large molecular testing capacity and offers first-line TB testing for TB centers without diagnostic capacity in collaboration with health authorities. The local health directorate provides test cartridges free of cost to APOPOs center in Mozambique.
TB SCREENING

For certain key affected groups by TB, screening (active case finding) is internationally recommended as a complement to efforts to improve the patient-initiated pathway to TB diagnosis, that is, diagnosing TB among people who actively seek care with TB symptoms or passive case-finding.

APOPO has demonstrated capacity and experience in conducting TB screening at each program site. APOPO’s largest TB screening endeavor is a combined TB and HIV screening study among prison inmates and staff in Ethiopia, where symptom assessment, molecular testing using pooled Xpert MTB/Rif ultra and TB detection rats are used. At a smaller scale, APOPO has contributed to screening campaigns organized by health authorities in Mozambique. With TB screening, APOPO strives for creating direct health impact through TB case finding and linkage to care, for capacity building among partners, and for creating scientific evidence on the diagnostic yield, health benefits and costs of respective diagnostic algorithms.

OTHER HEALTH SERVICES

APOPO’s TB detection infrastructure and experience have a high transfer potential to other health areas, namely its TB detection rats, which can be trained to detect other diseases. APOPO’s laboratory infrastructure can also be utilized for other health services.

An example of integrated testing for two pathogens is the TB and HIV screening in Ethiopian prisons. In Mozambique, APOPO’s success in rapid, integrated TB testing positioned it to embark on Human Papilloma Virus (HPV) testing for women on behalf of Population Services International (PSI) using the established sample collection and laboratory infrastructure. APOPO may also expand its services to Covid-19 detection and supporting the government in the pandemic response. APOPO continues seeking such synergistic, collaborative disease detection opportunities. They create new pillars of income-generation through contract work, and most importantly, help to maximize health benefits using the existing infrastructure and workforce. Strategically, APOPO’s TB detection department has the potential to grow into a disease detection department.
APOPOs TB detection department has a truly collaborative approach in its services and research, and a strong network of partners that allows us to execute all facets of our work. Long-term research partners and hosting sites of APOPO’s laboratories are the Sokoine University of Agriculture (SUA) and the Tanzanian Veterinary Laboratory Agency (TVLA) in Tanzania, the Eduardo Mondlane University (EMU) in Mozambique, and the Armauer Hansen Research Institute (AHRI).

For the TB detection model, APOPO has agreements and strong working relationships with health authorities, mainly National TB Programs, at the national and subnational level and the local TB centers for the purpose of streamlined services that are aligned with the national strategy and for policy integration. The collaboration with community-based organizations like MKUTA and PASADA in Tanzania, and Associação Kengelekezé and Collaborating Centre for Health (CCS) in Mozambique is key in executing linkage to care and patient support services.

For experimental and field research, the countries’ medical research institutions are trusted long-term partners. International research collaboration has mainly been for the analytical chemistry study of VOC using high-end equipment. Key partners have been the Max-Planck Institute for Infection Biology and the Technical University in Braunschweig in Germany, a new partner is the Manchester Institute of Biotechnology in the UK.
### THEOREY OF CHANGE

**STRATEGIC OBJECTIVE:** Accelerate tuberculosis control in high burden countries.

#### DIRECT OUTPUTS

- TB detection rats contribute to increase TB case detection and show documented progress towards meeting WHO targets.
- APOPO has an active line of collaborative research on volatile organic compounds as biomarkers (VOC) that cause the scent of TB.
- The deployed ‘TB model’ has high coverage, and significantly increases the diagnostic yield and linkage-to-care at attractive cost per sample tested and per new patient diagnosed.
- The ‘TB model’ raises partner and donor interest, reflected by requests to extend services to new clinics, new diseases [e.g., HIV, HPV, Covid-19] or include new elements [e.g., eHealth].
- Wide public outreach is achieved for reporting of own results and for raising awareness on TB.

#### OUTCOMES

- A foundation for approval and broader use of TB scent detection is laid by compelling scientific evidence.
- The ‘TB model’ serves more people in a more patient-centered, effective and efficient manner.
- Communities thrive by being better protected from TB transmission, stigma and catastrophic costs related to TB.
- Policy integration of the TB detection model.

#### END GOAL

**ALL TB PATIENTS ARE FOUND & TREATED, LEADING TO A WORLD FREE OF TB**

- **SDG 1**
  Better TB tests & services prevent catastrophic costs for TB-affected families and reduce poverty.
- **SDG 3**
  Better TB tests & services improve health and well-being and directly contribute to ending TB (SDG 3.3).
- **SDG 5, 8, 10**
  Provision of local, inclusive jobs and capacity building empowers people, reduces inequalities, and stimulates economic growth.
- **SDG 11**
  Our TB model is particularly well-suited big cities, making them a safer place to live.
- **SDG 17**
  The truly collaborative, multi-faceted approach in innovating TB tests & services provides an example for vital global partnerships for sustainable development.
<table>
<thead>
<tr>
<th>OUTPUTS, RESULTS AND DELIVERABLES</th>
<th>INDICATORS</th>
</tr>
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<tbody>
<tr>
<td>Effective implementation of APOPO’s TB model and operational research.</td>
<td>Contribute to End TB and the Tanzanian TB strategy by facilitating TB detection of at least 7,500 additional TB cases</td>
</tr>
<tr>
<td></td>
<td>Contribute to End TB and the Mozambican TB strategy in by facilitating TB detection of at least 2,500 additional TB cases</td>
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<td></td>
<td>Contribute to End TB and the Ethiopian TB strategy by facilitating TB detection of at least 2,000 additional TB cases</td>
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<tr>
<td></td>
<td>Increase the TB detection of partnering TB centres by an average of at least 40%</td>
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<td></td>
<td>Ensure that at least 85% of the patients identified by APOPO are linked to care</td>
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<td></td>
<td>Support Countries Health system by using APOPO’s integrated model of rapid case detection, sample transport, and linkage to care in other areas of healthcare provision and other diseases</td>
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<tr>
<td></td>
<td>Expand TB detection services to new regions and districts in countries where we work</td>
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<tr>
<td>Efficient implementation of APOPO’s TB model.</td>
<td>Ensure that both the cost per sample evaluated for TB is below the average of costs in the partner countries.</td>
</tr>
<tr>
<td></td>
<td>Ensure the cost per additional TB patient diagnosed for TB is below the average cost in the partner countries.</td>
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<tr>
<td>Adequate capacity building and program management in place to facilitate safe and appropriate use of resources.</td>
<td>All APOPO labs meet international QA standards and internal QA procedures scores</td>
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<tr>
<td></td>
<td>APOPO’s lab teams pass international QA tests for TB diagnostics</td>
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<tr>
<td></td>
<td>All APOPO staff are adequately trained for their functions</td>
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<tr>
<td></td>
<td>APOPO QA procedures are up to standards to conduct research studies</td>
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<td></td>
<td>APOPO will support the capacity building of the local community-based organizations for patient tracking</td>
</tr>
<tr>
<td>Expanding operational and research partnerships with the National and International TB authorities and organizations/partners resulting in more joint field efforts.</td>
<td>APOPO will be represented on the international TB fora</td>
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<tr>
<td></td>
<td>APOPO will closely collaborate with National TB programs and Medical Research institutes in our program countries</td>
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<tr>
<td></td>
<td>APOPO will have partnerships with international biomedical research institutes</td>
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<tr>
<td></td>
<td>APOPO will partner with at least one local community-based organization, and with local and international Health NGOs</td>
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<tr>
<td></td>
<td>APOPO will build and maintain close collaboration with service clients and technical donors</td>
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<tr>
<td></td>
<td>APOPO will produce joint proposals and publications, and carry out joint events with its partners</td>
</tr>
<tr>
<td>Research broadens the scope of the TB-detection program towards new sample materials.</td>
<td>APOPO will complete a proof-of-concept study on detecting TB from non-invasive sample materials</td>
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</table>
The detection and correct identification of various substances are a necessary condition, but often the main bottleneck, for allowing corrective interventions which improve our lives. For example, detecting buried landmines in soil poses unique challenges that slow the process of clearing affected land and eliminating the threat of injury. Likewise, the detection of *Tuberculosis Mycobacteria* in sputum samples ensures accurate medical diagnosis for efficient life-saving treatment. Numerous users worldwide face detection challenges, including governments, law enforcement agencies, medical service providers, customs operations, diagnostic developers, and rescue organizations. Many detection challenges lack reliable or affordable solutions supporting sufficient throughput. Scent detection animals can overcome many of the unique obstacles posed by these detection challenges; however, they require rigorous research and procedures to develop robust and replicable solutions.

Scent detection is a broad, interdisciplinary area of science and application. Generally speaking, scent detection capitalizes on the evolutionarily old sense of smell to identify the presence of target substances based on the odors they emit. Scent detection offers an innovative, impactful approach in medical diagnostics by identifying unique odor-profiles produced, or generated by, specific diseases, such as certain types of cancer; security, including locating explosives or screening for their presence; locating people, including in search and rescue operations; or finding contraband items, including illegally trafficked wildlife. In other words, applied scent detection improves livelihoods and saves lives.
Often scent detection draws on trained animals, but also human “super smellers”, or synthetic devices called eNoses. A variety of animals have been trained as biosensors, including dogs, rats, pigs, mice, honeybees, dolphins, sea lions, chickens, and elephants for a variety of scent detection tasks. While training approaches may vary depending on the species used and detection target, they are typically accomplished using reward conditioning. A common challenge to all scent detection approaches is that the molecules underlying a particular odor [or scent target] are not always known. This makes it more difficult to scientifically prove or triangulate the approach and assess its accuracy and particularly poses a barrier in development of synthetic devices. Nonetheless, advancements in olfactory research including chemistry, neurobiology, and behavioral sciences have driven rapid development of chemical sensing and genetic identification technologies in recent years, including more widespread deployment of scent detection animals. Dogs remain a leading worldwide technology for airline security and customs searches and promising research suggests they may accurately detect a wide variety of diseases and medical conditions, including cancers, changes in blood glucose levels predicting diabetic shock, and even metabolic precursors signaling the onset of epileptic seizures.
APOPO is the global leader in using trained rats for applied scent detection tasks. Since 2000, APOPO has researched and developed reliable scent detection methods resulting in roughly 50 peer-reviewed publications. APOPO’s early research resulted in safe and reliable techniques for training and deploying African giant pouched rats to directly search land for explosive remnants of war. In 2003, APOPO’s research expanded to include detection of the world’s deadliest infectious disease, tuberculosis (TB). As with mine detection, TB detection research has developed and evaluated detection accuracy of the rats while also exploring how the rats are able to sniff out the disease through chemical analysis of the volatile organic compounds emitted by the disease-causing bacteria. This fundamental research has contributed to broader scientific knowledge of scent detection of diseases while also validating the rat scent detection performance. To date, APOPO is the only organization with scent detection animals operationally deployed for routine disease detection, where the ongoing research in this context has proven to increase case detection.

All landmine and TB-detection rats are bred, socialized, trained, and routinely evaluated at our training and research headquarters in Morogoro, Tanzania, where ongoing multi-faceted research combines ethology, psychology, neuroscience, and chemistry to inform animal scent detection work, including optimizing existing applications and developing new scent detection tasks. Despite our relatively remote location, we remain actively connected to the international network of scientists and scent detection work via our partnerships, research collaborations, participation in scientific meetings, publications, and regular consultation with our R&D Scientific Advisory Committee comprised of world-renowned scholars in related fields including animal behavior, psychology, organic chemistry, neuroscience of olfaction, and applied animal scent detection.
APOPO STRATEGY 2021-2025

APOPO’s research activities for the next five years broadly fit into one of four themes involving support for:

- existing scent detection applications
- developing new applications
- researching universal principles of scent detection
- capacity building

Synergies across these themes will be addressed through carefully designed initiatives that bolster program efficiency and ensure prompt translational application of results.

Optimizing existing applications

Research to optimize the training and deployment of scent detection rats will hold the highest priority over the next five years. This research will apply cross-cutting themes related to animal behavior, olfaction, and chemistry to empirically refine procedures and enhance monitoring and evaluation techniques. Specifically, tools will be developed that allow closer inspection of factors and variables that influence scent detection performance; new training hardware and technologies will be trialed that support operational deployment of scent detection animals; and lessons learned from other research initiatives will be applied to maximize both the accuracy and efficiency of scent detection animals.

For example, keeping animals motivated to work is a common challenge for all scent detection animals; however, recent research suggests this can be overcome by increasing the opportunity for reward within the operational environment. Promising preliminary results suggest this procedure also minimizes down-time needed for maintenance training, thereby boosting overall program efficiency.
Developing new applications

All new applications are carefully evaluated based on well-defined criteria that includes prospective impact, alignment with APOPO’s mission and values, technical consideration of animal suitability to address existing gaps in technology, capacity requirements, and market and partnership potentials. APOPO will collaborate with sector-specific users to explore at least four new scent detection applications over the next five years. Specific projects include: the detection of illegally trafficked and endangered wildlife, search and rescue following natural disasters, detection and delineation of contaminated soil to expedite environmental clean-up efforts, and the detection of other pathogens and diseases, including the zoonotic disease brucellosis. This research will apply a phased approach involving initial proof-of-principle within the controlled research setting followed by feasibility testing within the field environment before operational roll-out. Training procedures and lessons learned during these projects will be submitted for publication in peer-reviewed outlets to openly share with the broader scientific scent detection community.

Researching scent detection

Fundamental research about African giant pouched rat ethology and learning and memory mechanisms contribute to scientific knowledge of scent physics and comparative cognition and supports the quality of APOPO’s products. This research pillar aims to investigate variables related to scent characteristics, as well as the rat’s perception of these, as the foundation to scent detection success. These projects will explore risk factors for and the effects of scent contamination and sensory adaptation on scent detection accuracy; the olfactory learning and memory capabilities of African giant pouched rats, including the number of target scents an individual animal can be trained to reliably detect; how, and to what extent, rats generalize across varying combinations and concentrations of scents; and methods for pre-screening individual animals for scent detection suitability.
Capacity Building

APOPO’s training and research teams provide critical capacity building both within and beyond the organization. The department coordinates and monitors all rat training activities (including breeding) and independently evaluates the internal accreditation tests of each rat before it is operationally deployed. New handlers undergo carefully devised training programs to introduce them to APOPO’s mission, vision, and values; core responsibilities; and the animals they will be working with, including proper care and handling procedures, common training techniques, and advanced troubleshooting. Routine SOP revision is conducted in conjunction with annual refresh training of existing staff to ensure comprehension, adherence, and introduce key sector and field-specific terminology. These refresh training seminars include written and practical assessments that also provide a means for internal QA and staff accreditation. Additionally, we aim to build public speaking, critical thinking, practical problem-solving, and scientific interpretation abilities through internal workshops and promotions. APOPO aims to engage at least three local and international student scholars in its research projects in the next five years. Finally, the team will continue actively promoting involvement of underrepresented groups in STEM fields, including participation in international mentoring programs.

Partners in Research

APOPO’s training and research headquarters are located on the campus of the Sokoine University of Agriculture (SUA), with whom a longstanding and fruitful partnership exists, particularly with the university’s Pest Management Centre and College of Veterinary Medicine and Biomedical Sciences. APOPO supports the dissertation research of Ph.D. and M.Sc. candidates from SUA while engaging recent B.Sc. graduates in research activities.

Many research initiatives are also supported by researchers and students from various universities worldwide, e.g. APOPO has long standing collaborations with University of Antwerp in Belgium and Western Michigan University in the USA. APOPO is also developing new partnerships, such as the ongoing collaboration with the Eindhoven University of Technology, which recently resulted in a functional prototype of a technology-enabled rat backpack that could prove critical for search and rescue operations. Collaborations are also planned with senior researchers at the University of Bristol to explore how animal welfare practices influence scent detection performance. Additionally, the development of each new scent detection application involves sector-specific partnerships, such as the Illegal Wildlife in Trade program at the non-profit Endangered Wildlife Trust of South Africa for training rats to detect illegally smuggled flora and fauna; and the Turkish non-profit volunteer search and rescue group GEA, for developing rats capable of searching for survivors trapped in collapsed buildings.
# Theory of Change

**Strategic Objective:** Research and develop innovative applications for scent detection animals.

## Direct Outputs
- APOPO’s detection animals are reliable and constantly improving where possible
- Innovative technology supports the animal training and detection systems
- Scientific publications in peer-reviewed journals
- Efficient and reliable detection systems for new applications
- Sufficient research capacities in related sciences to sustain APOPO’s research activities
- Research projects and collaborative agreements with local and international institutions

## Outcomes
- Various detection tasks are undertaken more effectively and efficiently.
- APOPO remains at the forefront and is a market leader in developing new animal detection systems.
- The use of animal detection systems will have an increasing positive humanitarian impact, saving lives and preventing suffering on a global scale.

## End Goal
- A local technology provides sustainable solutions for global humanitarian challenges.
  - SDG 1: Detection systems facilitate humanitarian interventions which greatly reduce poverty and suffering.
  - SDG 3: Animal detection systems facilitate healthy living and promote well being.
  - SDG 4, 5: Promote inclusive and quality education and inclusion of women in research.
  - SDG 8, 10: Local technology development promotes inclusive and sustainable growth and reduces inequality within and among countries.
## Outputs, Results and Deliverables

<table>
<thead>
<tr>
<th>Output</th>
<th>Indicators</th>
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| Effective implementation of APOPO’s scent detection animals for existing and new applications | APOPO will provide well-trained scent detection animals to supply and expand its operations.  
APOPO will develop, trial, and successfully implement 2 major new applications from the current development pipeline (wildlife product detection, RescueRATs, detection of contaminated soil, detection of *Brucella*) or other new initiatives.  
APOPO will conduct research to support scent detection animals’ technologies and expand scientific knowledge in fields such as psychology, analytical chemistry, olfaction, and ethology.                                                                                                                                                                                                                   |
| Efficient implementation of APOPO’s scent detection animals | The implementation of APOPO’s scents detection animals will have a proven advantage in terms of cost, speed, throughput or functionality to justify its choice over other technologies.  
APOPO’s scent detection animals will be used efficiently in combination with, or complimentary to, confirmation technologies to realize the most cost-efficient solution.  
APOPO’s training program will minimize overall costs of scent detection animals by maintaining less than 10% attrition with no more than 1 year of initial training required per animal.                                                                                                                                                                                                                         |
| Adequate capacity building and program management in place to facilitate safe and appropriate use of resources | All APOPO scent detection animals meet national or international standards, if applicable, for operational use.  
APOPO will have standardized training packages for its staff and partners and clients alike to train animal trainers and handlers.  
APOPO will maintain clearly defined SOPs and M&E practices supporting program management.  
APOPO will engage researchers at all levels to develop the needed capacities for innovation.                                                                                                                                                                                                                                                                              |
| Expanding operational and research partnerships | APOPO will closely collaborate with partners, both in hosting countries of operations as well as global scientific networks.  
APOPO will closely collaborate with operational partners with expertise in the various areas of the relevant applications, including relevant end-user groups of new applications.  
APOPO will be represented on the major global stages of behavioural and olfactory research.  
APOPO will be represented at major fora of the application industries it works in. |
APOPO has a highly dynamic and diverse team of around 300 staff spread over more than 12 countries, with 95% of its staff working in the affected areas of operation. The management, which is operating as a network of highly motivated professionals, and the local teams, working in remote minefields or in APOPO’s TB labs, are all united by common vision, mission and identity of the organization.

With such diversity, APOPO does not have a one size fits all HR policy, but adapts its processes to cultural, regional and sectoral differences.

APOPO’s HR philosophy and strategy is guided by the core values of the organization:

- APOPO aims to attract and retain the best professionals in the sector to be able to provide the quality services it intends to. As many skills are not available on the market, APOPO is committed to providing the training packages and capacity building on all levels within the organization, enabling all staff to represent APOPO as ambassadors of the organization.

- APOPO aims to effect social transformation by transferring expertise and building skills, in an environment which fosters collaboration, high performance and mutual respect. APOPO’s strategy will focus on empowerment through up front communication and a feedback rich culture to ensure that both the needs of APOPO and of the staff member are being met. APOPO wants to enable its staff to help others.

- As an organization fostering innovation, APOPO encourages ideas and rewards new initiatives across the board. APOPO has a strong pipeline of new technologies including, but not limited to, trained rats and dogs, which will require new skills for staff and research students and the capacity and confidence to implement these innovations.

- APOPO will promote diversity by implementing its gender and diversity action plan, by encouraging internal promotion and by building local leaders in all countries of operations, which in turn, will take on senior positions in APOPO programs elsewhere, fostering South–South collaboration. Hereby APOPO creates a rich exchange between our staff of different gender, religion, nationality and abilities.

- APOPO teams work in solidarity with its beneficiaries, stakeholders and partners, working towards the same vision, mission and targets. APOPO will encourage the building of global networks and provide capacities to partners and clients alike. APOPO strives for its staff to be part of the interconnected global village geared at creating a better world.
APOPO has gained high visibility both in traditional as well as online media around the globe. Thanks to its unique products and professional marketing approach, APOPO manages to reach a very wide audience within different sectors with a small marketing team using limited resources. This puts APOPO in a strong position, not only to share its innovative work, but also to raise the profile of and generate resources for Mine Action and Tuberculosis.

APOPO’s public fundraising, marketing and communications strategy are intertwined. We have found that our best efforts result in a tight feedback loop between the press the communications team is able to succeed in getting, combined with an attractive donor funnel and path. This lets the organization grow in a substantial way from a public fundraising revenue perspective with each new press hit.

In the coming years, APOPO will **further develop and expand its brand** in line with its new vision and mission statement, as well as the expansion of services. Coming from a strong humanitarian and HeroRAT-centered communication angle, APOPO will add focus to the work of its dogs as well as its work to protect the environment.

APOPO will continue to **engage effectively and strengthen relationships** with stakeholders and supporters both public and institutional. APOPO’s success is only possible with effective collaboration and support from partners which APOPO will reflect by actively promoting their work.

APOPO will **demonstrate its work and bring its causes** to the attention of a global audience. APOPO will share the stories of the victims and impact of Landmines, Tuberculosis, Wildlife Trafficking and Earthquakes, and how APOPO can contribute to the solution. APOPO will equally advocate for animal welfare as part of its work.
APOPO will continue enhancing its strategy for the acquisition of new supporters mostly online. These vital recurring donations provide an increasingly strong foundation to support APOPO’s causes. APOPO will expand its public fundraising products in line with its activities and expand from the successful HeroRAT adoption program to also include HeroDOGS thereby engaging a wider global animal-lover audience in the fight against landmines. APOPO also hopes to expand the audience for the HeroRATs by displaying the new capabilities of the RescueRATs and offering new rats for adoption.

APOPO also plans to join the global effort to protect our planet and to grow the HeroTREE program into its own dedicated branch of APOPO. There may be an opportunity to do this through innovative positioning of the program through carbon offsetting as a service for large companies.

APOPO has a dynamic fundraising profile to reach its objectives. In 2019, almost 55% of its income was granted by charitable foundations, half of which was unrestricted. Governments contributed about 20% in restricted grants, and the public supporters of APOPO collectively donated 20% of APOPO’s annual budget. The remaining funding came through earned income and specific research grants.

APOPO’s funding strategy is multi-faceted, and in the coming 5-year period, APOPO will aim to grow its impact and program funding through the following strategies:

- **Strengthening regional approach:** APOPO has currently two foundations, in Washington DC and Geneva, which develop the regional networks and partnerships, and engage with the regional donors. APOPO will expand its regional strategy through the foundations in other countries such as the UK, and regional hubs such as APOPO’s Visitor Centre in Cambodia to develop the Asian and Australian networks.

- **Increasing support from Governments and International Institutions:** APOPO has expanded its products and services and is gaining more recognition of its technology. With a good track record of delivering results as well as high visibility, APOPO will be able to attract more substantial government funding, both directly, but also indirectly through subcontracting its services to major partners.

- **Maintain the strong support of charitable foundations:** through creating social impact in and providing visibility to the foundation’s stakeholders and funder’s base. APOPO has a diverse project portfolio and operates in various sectors such as security, health, development and conservation.

- **Earned income through service delivery:** APOPO is developing full-service packages of trained scent detection animals and handlers and started leasing out dogs in 2018. APOPO will expand this partnership approach, which will not only increase APOPOs impact through its core activity, but also provide a more sustainable and entrepreneurial income model to complement grants and donations.

- **Growing our public supporter base:** APOPO has a high visibility in traditional and online media, with a large supporter base. Public support provides a predictable, mostly recurring and unrestricted source of income, which is a good basis to leverage grant funding. APOPO will grow its public revenue through leveraging online visibility, product diversification and engaging its audience.
As a non-profit organization, APOPO is committed to allocate the highest possible ratio of its income to create positive impact for its beneficiaries. Therefore, APOPO aims to reach the break-even point for each project which will on average result in a break-even situation at the end of each year, with no loss but neither loss nor profit.

In addition, APOPO implements value-for-money-principles in order to ensure that the best impact is reached in the most efficient manner.

Nevertheless, APOPO is committed to sustainability of its activities and security of its staff, which requires an allocation of a few percentage of its yearly income to its reserve. These reserves will be social reserves, operating and investment reserves, which will protect the organization against the impact of possible financial crises.

APOPO’s administrative overheads are closely monitored and currently around 10% with a maximum ratio which will not exceed 15%.

As an innovator, APOPO will commit 5% of its annual income to R&D in order to allow constant improvement of our products and development of new solutions.

APOPO is committed to transparent and reliable management of the resources granted to the organization and is proactive in using state of the art IT systems, as well as organizational and project audits.

APOPO focuses on building all the financial HR capacity within the organization to ensure a strong internal control in order to reduce to the maximum the risk of
In the next five years, APOPO will step up its efforts to protect our planet and improve our environment. Our efforts will follow three main strategies:

- Observe and implement the highest environmental standards applied to Mine Action and TB Laboratories and other sectors APOPO works in.
- Develop applications for scent detection animals and implement programs with the primary aim to protect wildlife species and facilitate environmental cleanup and restoration.
- Expand the HeroTREE program and contribute to carbon sequestration, clean water and air, increased biodiversity and food security.
Acknowledgement

This APOPO 2021-2025 Strategy document was developed by APOPO vzw in close collaboration with partners, stakeholders and APOPO staff.

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