

HeroTREEs 2021

Meeting SAT – APOPO 28/09/2021

Attended by:

Alex Wostry (SAT), Esther Haalboom, Ronald Simon, Lily Shallom and Christophe Cox (APOPO)

Meeting conclusions:

- **APOPO** would like to expand the HeroTREEs program, through more active communications, marketing and fundraising, including:
 - Developing a logo
 - Start with social media posts >1 per 2 weeks
 - Continue Global Giving Fundraising
 - Add Facebook Fundraising building up to planting season February 2022
 - Develop 2-3 webpages on HeroTREEs
 - Develop HeroTREEs as a herogift product, also develop other giving opportunities
 - Build up grant opportunities.
 - APOPO will increase its base budget from 5,000 € to >10,000 € per annum, committing to 10,000€ but hopefully/likely be able to expand beyond that.
- **SAT** will continue its implementation and potentially in the future also expand services and offerings:
 - In 2021, plant trees to reach the 25,000 trees planted and/or 20,000 growing
 - Prepare around 10,000 seedlings for February 2022 planting season
 - SAT has raised the price to 5€/€ to enable development and in line with global carbon prices
 - Start using new software to monitor the trees
 - Current concepts: Food forests
 - Possible future concepts: Spicy Carbon and Fuel wood lots
 - Planning to employ a dedicated officer to this project

Main Messaging:

Core messaging

- The Uluguru mountain range in Tanzania supports a rich forest and rare species, including critically endangered flora and fauna;
- Since 2017, we have planted 23,497 HeroTREEs of 35 species of which 4575 were lost and 18,922 are successfully growing;
- HeroTREEs is not just another tree planting project, but instead part of an agro-ecological project turning farming into a climate-smart solution;
- HeroTREEs are community driven: small holder farmers plant their trees of choice and peer-monitor the maintenance of the trees.
- Each tree costs 5€, of which 60% goes to the farmer, half in cash, half in training, and 40% goes to monitoring, program management and development;

- The farmers receive payment over a 5-year period for each tree that is successfully maintained and growing;
- The farmers own the trees from the moment they are planted;
- HeroTREES enhance the farmers food supply, income and health;
- The 35 tree species include trees used for (1) Soil fertility and stabilization (2) Fuel (3) Timber (4) Fodder (5) Fruits (6) Spices (7) Medicinal use (8) Biodiversity and conservation (9) windbreaks (10) hedges (11) beehives (12) cash crops;
- Planting indigenous trees encourages biodiversity;
- Planting spice trees provides economic support through organic spice trade;
- Planting fertility trees for agroforestry improves soil quality;
- Planting trees for fuel and timber help forest conservation by reducing the demand on existing forests;
- Planting fruit trees enhances food security;
- Planting fodder trees is an ecological solution for small scale animal husbandry;
- Tree planting as part of agro-ecology system eliminates slash and burn farming;
- HeroTREES prevent soil erosion on hill slopes through reforestation;
- HeroTREES help conserve the Uluguru mountain forest with its unique biodiversity;
- HeroTREES increase the quality and quantity of water for the farmers and Morogoro town;
- HeroTREES increase carbon content in the soil.
- It takes about 1,000 trees to offset the average American's carbon emissions, with as little as 50 dollars per month for 10 years, HeroTREES can do just that; and support community farmers to live in harmony with the forests as one sustainable ecosystem.

Executive summary

APOPO is an international non-profit that trains African giant pouched rats (HeroRATs) to save lives by detecting landmines and disease using their extraordinary sense of smell. APOPO's technology is a sustainable *African based innovation* developed at its training and research center in Tanzania.

APOPO does a lot to clear the environment of landmines and tuberculosis in an environmentally responsible way. Nevertheless, APOPO recognizes that all local and international travel, the use of heavy transport equipment in demining, and the regular use of power and consumables, all contribute to the emission of greenhouse gases.

As a humanitarian non-profit embracing social transformation and innovation, APOPO will play a proactive role in safeguarding our climate and planet by offsetting its carbon footprint through the investment and participation in a sustainable conservation project nearby its operational headquarters on the slopes of the Uluguru Mountains. Despite its relatively small size, the Uluguru Mountain forest has long been known for its unique biodiversity and is considered to be one of the top priorities for the conservation of biodiversity in Africa.

This project, which is managed by Sustainable Agriculture Tanzania in collaboration with the village communities, introduced sustainable organic farming program, which reduces greenhouse gases through (1) reforestation of eroded hill slopes, (2) conservation of the existing tropical forest (3) increasing water quality and quantity (4) elimination of slash and burn agriculture and (5) increasing the carbon content in the soil. In addition, this project contributes to food security, poverty reduction and socio-economic development of the participating farmers' communities and beyond.

The project area is of vital importance for Morogoro's water supply. Morogoro is a fast-growing city with around 400,000 residents and suffers from severe water shortages during the dry season. It is expected to reach a population of 1 million by 2035.

Carbon offsetting outcomes

Elimination of slash and burn agriculture

Slash and burn agriculture has been practiced for several centuries in Africa to increase agricultural productivity as a labor intensive approach. Population growth does not allow leaving the agricultural areas long enough anymore for this way of farming. Unsustainable farming practices like these result in the deterioration of water quality and decreases soil fertility. According to the even more compulsive fact that climate change is threatening food security and biodiversity, farming approaches that release large amounts of carbon to the atmosphere, like slash and burn practices, have to be abandoned. Organic agriculture is an appropriate approach to maintain soil fertility and good harvests year after year, breaking the cycle of slash-and-burn and giving food security on one piece of land.

Reforestation of eroded hill slopes

On average a farmer in the Uluguru Mountains has up to 3 plots with a total of 3 acres of land available for cultivation. SAT's organic farming approach aims to convince farmers to use one of these plots to cultivate vegetables (cash crops) by using methods like terracing, composting and biological pest control. The other plots, which were formerly used to rotate the production with slash and burn practices, can be utilized for planting food forests. From an environmental point of view this reduces soil erosion and increases water quantity. Moreover, the growing vegetation sequesters carbon from the atmosphere. In the watershed of Morogoro River 400 households can benefit from these activities economically. Fruits and timber can be sold in town, and other trees can be used to feed livestock or for medicinal purposes. Fuel wood from a managed sustainable source also reduces dependency on other resources (the project promotes energy saving stoves). A food forest can sequester up to 7 tons of carbon a year. In total one acre plantation forest can store up to 100 tons of carbon (One ton of C = 3.67 tons of 'carbon dioxide equivalent').

Conservation and management of existing tropical forest

The forest nature reserve of the Uluguru Mountains is a 400 km² moist forest, which is still under threat of illegal deforestation. On the main Uluguru range, 50 villages touch the forest boundary and over 151,000 people are found within the mountain area, often at increasing densities at higher altitudes up to the forest boundary. The Ulugurus are home to rare animal and plant species that are endemic to Tanzania and the Eastern Arc Mountain range, including the critically endangered Uluguru Bush-shrike (*Malaconotus alius*).

Through collaboration with the government, the project aims to empower farmers to use the forest as a common pool resource. Managed in this way and acknowledged by the government, sustainable activities like beekeeping or collecting herbs are lucrative income opportunities. The community manages the forest and enforces its members to stick to the rules. Through this approach further deforestation of the protected forest reserve can be avoided.

Increasing water quantity and quality

The forests of the mountains provide the water catchment areas for the streams and rivers. This water flows mainly from the forest-capped peaks of the Ulugurus joining to form the Ruvu River, which also provides the water supply to the city of Dar es Salaam. Most of the neighbouring population, around 3 million people, and the major industries in Tanzania rely on this water supply for their continued survival.

For tackling its water demand innovative solutions are needed to protect the catchment area in the mountains to increase water quality and quantity. This is possible since organic agriculture depends on less water due to increased water holding capacity of the soil and chemical pollution and erosion are reduced through agro-ecological practices. Due to the great importance for Morogoro and Dar es Salaam cities, other stakeholders such as the local water authorities, the Ministry of Water, Sokoine University and the Municipality, also support the project; as their services will directly benefit from the outcomes.

Increase carbon content in the soil

Conventional agriculture reduces organic matter in the soil and hence sets carbon free to the atmosphere. An increase of a single percent of organic matter in the soil leads to a sequestration of 8 tons carbon per acre. Therefore organic farming, which builds up organic matter, may be one of the most powerful tools in the fight against global warming. Soil under organic agriculture management can accumulate about 450kg of carbon per acre-foot of soil each year. This accumulation is equal to about 1,650kg of carbon dioxide per acre taken from the air and sequestered into soil organic matter.

To ensure that the new trees that are planted are not cut down, the small-scale farmers are taught new sustainable methods to revitalize their land — planting trees alongside their crops and smart organic agriculture skills that produce natural fertilizers. This leads to higher crop yields, increased income and food security building resilience to a changing climate and sharing their experiences with their wider communities.

Other outcomes

Food security

Many case studies have shown that organic agriculture has a positive correlation with improved food security and enhanced incomes for small-scale farmers (IAASTAD 2008, and goes hand in hand with the Sustainable Development Goals. The mechanisms whereby organic farming improves food security are through (1) organic soil management increasing fertility and avoiding erosion (2) appropriate water management reducing risk of loss during drought (3) increasing farm biodiversity balances a healthy diet reduces nutrition deficiencies, and reduces the risk of losing the total harvest during weather extremes and pest attacks.

Poverty reduction

Organic farmers are no longer dependent on buying fertilizer and pesticides inputs from agro shops. They produce compost and manure tea for fertilizing the soil and use botanical extracts to fight pests and diseases. Since labor is cheap in Tanzania it is a monetary benefit for farmers to produce their inputs themselves, without depending on a price premium for their products. Their products have proven to be well appreciated in the local market, since they are free of pesticide residues. Farmers who shift to organic methods increase their yield, especially if they were facing depleted soil (mainly caused through inappropriate farming methods) before conversion. Disseminating knowledge about agro-ecological farming methods has been acknowledged as the most effective way in sub-Saharan Africa to reduce poverty.

Monitoring and evaluation

SAT has its own M&E department and uses a comprehensive monitoring strategy, which is the systematic and continuous collection, analysis and use of information for management control and decision-making. The Logical Framework, the implementation schedule, activity schedules, and project budget provide the basis for this monitoring. Data will be collected using individual questionnaires, running focus group discussions, conducting key informant interviews, PRA and other forms of monitoring and evaluation. SAT is using mobile survey apps (ZOHO Survey and Kobotoolbox) for collecting information from the field. SAT facilitators and management prepare themselves every Monday with reviewing the project progress, planning according to the monthly field plan and report constraints and achievements of project implementation to the project management. SAT uses Yammer platform to share on a daily basis field visit reports which are supported with pictures and other useful information. This enables easier steering of the project activities by the management team. The M&E plan will be developed for measuring all indicators that will be addressed by this project (trees planted, tree survival rate and social-economic indicators of the tree planters) in a timely manner. If required there will be a terminal evaluation (internally) in the last year. For collecting tree information SAT uses a social peer-pressure system where farmers, organised in groups of max. 6 people, practice individually self-assessments. They report the number of

trees planted, their growth (diameter) and their survival rate within their groups where data is summarized and sent to SAT. Farmers from those groups will be randomly visited by SAT inspectors who will proof if the reported figures hold. In case they don't none of the farmers will qualify for payment. All farms are measured via GPS technology. Drone technology is used to show environmental impact through comparing baseline pictures versus follow up. SAT contracts on an annual basis an external audit firm for project and institutional audit. All data is stored in a data storage which can provide relevant information about farmers, tree species and training provided.

SAT

Sustainable Agriculture Tanzania's goal is to contribute to improved food security and poverty reduction through offering a complete package of technology, guidance and partnership for farmers to transit to sustainable organic agriculture to increase their yields in an environmentally friendly way. Since it began, SAT has provided training to thousands of farmers, including extension work in many villages, and is responsible for the implementation of organic practices by hundreds of families. It runs the first farmer training center in Tanzania which a) focuses solely on sustainable solutions and b) is managed in a financially self-sufficient way. SAT uses a holistic approach where it disseminates knowledge through demonstrations and encourages peer-to-peer learning. SAT accompanies farmers through the whole value chain, from production, to food processing and marketing. SAT collaborates with small-scale farmer groups who are pioneers in the organic sector for domestic food production.

The small-scale farming population in Tanzania faces many challenges such as lack of knowledge on production, lack of capital, inappropriate farm management, harsh weather conditions and limited access to markets. Several of these challenges combined with rapid population growth can lead to environmental degradation and makes farmers and their communities vulnerable to climate change.

The dissemination and growth of agro-ecological knowledge makes SAT a vibrant innovation platform and creates impact from small-scale farmers till policy level without losing the grip on the fertile soil (bottom up). In order achieve financial self-sufficiency SAT practices, markets and delivers quality trainings.

Logo's

