

# Building climate resilience through commercial agroforestry tree nurseries

Producer organization: Lake Elementaita Tree Nurseries  
Self Help Group (LETNSHG)



Kenya - Climate Resilience Case Study No. 4

Amos Wekesa, 2020



## Forest and Farm Facility



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## EXECUTIVE SUMMARY

Lake Elementaita Tree Nurseries Self Help Group (LETNSHG) is a nursery tree producer organisation found in Gilgil Subcounty, Nakuru County, Kenya. It was supported by the Farm Forest Facility (FFF), a partnership of FAO, IUCN, IIED and Agricord to commercialise climate resilient tree nursery businesses. LETNSHG was founded in 2004 by six women and to date its members grew to 62 people producing and selling over three million seedlings annually. Forty-Eight group members have established nurseries along the Nairobi – Nakuru Highway.

The business is in a rainfall depressed region. The region is a dryland and so experiences elevated impacts of climate change. The major climate change threats were rising temperature, unpredictable rains, extreme weather events including droughts and flooding, outbreak of pests and diseases, prolonged dry spells, and occasional heavy rainfall.

These threats impacted the group's businesses both positively and negatively. Prolonged rains favoured the business as customers purchased seedlings continuously. On the other hand, prolonged dry spells were associated with inadequate water supply. Water scarcity affected forests and farms by reducing productivity and yields but also depressing demand for seedlings. Inadequate water supply also led to loss of seedlings and delayed transplanting.

The financial resources of the businesses were impacted by these climate change threats. The said hazards led to delayed selling or transplanting of the seedlings. These elevated cost of purchasing water and maintaining labour prior to the eventual sales. Occasionally, seedlings became overgrown or required tubes to be changed or additional manure, thus increasing costs of seedling production and marketing value chains. Conversely, some unseasonably heavy rainfall events damaged nursery structures, buildings and infrastructure consequently introducing new costs and affecting sales. Women and youth members of LETNSHG were the most vulnerable and disproportionately impacted by climate change. This was because women play particularly active roles in providing water during droughts and maintaining labour in the nurseries in addition to other domestic chores such as child and animal care. This made them work for longer hours. They also occasionally incurred new costs associated with hiring labour and buying water. To bridge the financial gap related to climate impacts, they resorted to selling household assets or over borrowing to sustain the business. Such threats affected their livelihoods and income sources.

The support provided by the Forest and Farm Facility (FFF) empowered the group to undertake sustainable production of commercial seedlings through a climate resilient inclusive business model. The six-step model that included agro-ecological, economic, social, partnership, customer and marketing strategy diversifications and integration was adopted. To address impacts of climate change on forest and farm resources, the group implemented diversification of seedlings, water efficiency and sustainable cropping patterns.

Agro-ecological diversification included collecting and selling more tree species, improving water-use efficiency by shading, mulching, periodic watering, using compost manure and forest soil as well as rainwater harvesting and storage. They also promoted to their customers more sustainable agricultural methods such as intercropping, agroforestry, conservation agriculture and organic farming.

Economic diversification complimented the above strategies of the commercial nurseries. Through the FFF support and capacity building, the group introduced local poultry enterprises reared in homesteads to supplement the nursery businesses. The group also started growing beans, sugarcane, fruit trees and banana in an integrated manner on individual farms as additional income sources. These diversifications sustained their businesses.

Social diversification was achieved through capacity building, organisational development, collective marketing (everyone owning a nursery but selling together) and financial services. Group leaders and members were trained on marketing, gender integration and financial services. Trainers of Trainees (ToTs) were engaged in training community members especially women and youth who could not afford private extension services. A total of 3,127 farmers were trained in the area. The group was able to conduct self-assessment geared towards improving its governance structures and in enhancing participation of women and youth in leadership, marketing, and business implementation. Over 62

members were trained on Village Savings and Loaning (VSLA) as a social financial model where 28 members started cycles of savings and loaning.

The final step of climate resilient business development was a revised marketing strategy. The group invested in product development, price stabilisation and promotions. In terms of product development, a marketing strategy included production of a variety of high-quality seedlings. These seedlings were produced throughout the year to maintain market supply. Value addition was improved through grafting, improved seedling grading and varying container sizes to boost sales. To make prices stable and maintain customers' trust, the nursery owners sold seedlings at same prices without much change over time. The seedlings were strategically placed along the busy Highway for ease of access by customers. For a climate resilient business model to be viable and successful, it is important to invest in institutional support, resources (e.g. water, human and financial), information and technical capacities development. Improved and stable income and diversified livelihoods were realised among producers and other community members.

## 1. INTRODUCTION

### 1.1 NAME AND VISION OF FOREST AND FARM PRODUCER ORGANISATION

Lake Elementaita Tree Nurseries Self Help Group (LETNSHG) is a producer organisation of commercial agroforestry tree seedlings for sale. Its vision was to promote sustainable farming practices for conservation of natural resources and income generation at household level – and to supply those households with both seedlings and knowledge of how to grow them. The organization targeted smallholders' farmers and their Small and Medium Enterprises (SMEs) in forests and farms.

### 1.2 LOCATION OF BUSINESS

Lake Elementaita Tree Nurseries Self-Help Group located at S0°26'43.2888", E36°16'17.8212" (Annex I) and operates in Gilgil Sub-County, Nakuru County Kenya (IEBC, 2013). The business serves communities within Gilgil Sub-County and Nairobi-Nakuru Highway users. The Sub-County has an area of 1348.4 km<sup>2</sup> and with a population of 212,736. (KNBS, 2017). The area occurs at an altitude of 2004m above sea level, is dry with an annual rainfall of 654mm. Water scarcity is a major problem. The area is dominated with savannah vegetation (Annex II) and the major economic activities include dryland agriculture, livestock ranching, tourism, and extraction of chalk from diatomite (Nakuru County Integrated Development Plan 2018-2022). Farming is the main source of livelihoods. Land is owned privately with mean landholding size of 0.77 Ha.

### 1.3 FOUNDATION AND MEMBERSHIP

Elementaita region was inhabited by smallholder farmers in 1984 when they purchased land from Gikuyu, Embu, Meru, and Akamba Association (GEMA). The founders of Lake Elementaita Tree Nurseries Self Help Group were six women of Geta Nyakinyua Women Self-Help Group. In 2003, the founder member started a tree nursery along the Highway. To date, the group has 62 members (45 females and 17 males). Forty-eight (48) members established commercial tree nurseries along the Highway between Kariandusi and St Mary's Hospital. The group is a member of Gilgil Sub-County Community Based Organisations (CBO) which joined the larger Nakuru County Tree Nurseries Association (NCTNA). NCTNA is made up of nine CBOs with a total of 800 members in Nakuru County. NCTNA is a member of Community Tree Nurseries Growers Association of Kenya (CTNGAK) that operates nationally.

### 1.4 BUSINESS PROPOSITION

The 48 commercial nurseries generate seedlings of different species of trees, shrubs, flowers, and vegetables. The seedlings comprised 90% indigenous species and about 10 % exotics traditionalized as agroforestry species in Kenya. Each year, the group produced a variety of tree and vegetables seedlings to meet preferences of their customers. The nurseries offer high value seedlings such as grafted avocado, pawpaw, mangoes, and macadamia as well as timber and indigenous tree seedlings. Members bought nursery inputs including certified seeds, polythene tubes, forest soil, compost manure, water and as well as hiring casual labor to produce seedlings. Producers purchased seeds and scions from certified sources such as Kenya Forest Research Institute (KEFRI). Indigenous trees, herbs, bamboos, and flowers were collected locally from domesticated tree around the farms. Trained group members provided advisory services to other farmers and other members of the community who turn up to be their customers. This maintained their existing customers and attracted new ones thus expanding the sale of fruit tree and flower seedlings. Altogether, the group produces 3 million seedlings annually with a turnover of 20 million Kenya Shillings.

## 1.5 MARKET CONTEXT

The main markets of seedlings were individual farmers, travelers, and institutions. Nearby schools, churches, colleges, and government institutions such as Kenya Forest Services (KFS), Water Resource Management Authority (WRMA), and National Environment Management Authority (NEMA) constituted a considerable segment of clients. Kenya Commercial Bank, Safaricom Ltd, Non-Governmental Organizations (NGOs) and hotels were additional customers. These markets sources were crucial for the group to attain its annual turnover. The major competitors included rival local individuals and entrepreneurs who started group nurseries for fruit and high value trees.

## 2. THE CLIMATE CHANGE THREAT

### 2.1 PERCEIVED THREATS

Nakuru County has varied eco-climatic conditions. Gilgil sub-County is cool and dry with an average annual rainfall of 654 mm. Climate change is considered a major threat to forests and farm resources that smallholder farmers and entrepreneurs depend on for livelihoods. Smallholder farmers and business-holders were reported as the most vulnerable to climate change threats in the County (County Government of Nakuru, 2018).

According to the community, the major threats associated with climate change include rising temperature, prolonged dry spells, extreme weather events including droughts, flooding and hailstorms, and climate induced outbreaks of pests and diseases. Rainfall patterns were reported as irregular and varied, with decreasing rains during March, April, May season and increasing during October, November, and December season. Occasionally, the long rains season could be short while the short rains season would extend to the month of February. Over the past decade, it was reported that outbreaks of pests such as Fall Army Worms (FAW), beetles and termites had become regular, increased in numbers and persistence. Even though the perceived climate events occurred in other areas, they had an impact on tree nursery businesses.

### 2.2 IMPACT ON FOREST AND FARM RESOURCES

Climate change affects both forest and farm resources. This can be both negatively and positively (Sohngen *et al*, 2005). Climate change threats were potentially damaging reducing growth and development of forest and farm resources. The group observed that rising temperature and droughts in Gilgil had increased outbreaks of fire that consumed croplands, forests, woodlands, and grasslands. This increased risk of soil erosion, soil infertility and loss of biodiversity. The decline in yield of beans, bananas, oranges, avocado, pawpaw, mangoes, passion, and sugarcane, and productivity of *Grevillea*, *Acacia*, *Casuarina*, *Eucalyptus*, and pepper tree were perceived to occur due to climate change impacts and land degradation.

Droughts brought about reduced water availability for nursery establishment, and farm and forest management activities. Rising temperature and changing rainfall patterns made certain areas unsuitable for growing certain types of trees and crops. For instance, growing tall trees, vegetables and maize under rain fed cropping system was becoming impossible in the area. Increased dry spells provided conducive conditions for invasive species such as *Cactus*, *Euphorbia* and Desert *Acacia* to colonize and shrink the habitats of local species. Pests and diseases affected plants growth, survival, yields and quality of resources.

### 2.3 IMPACT ON BUSINESS AND FINANCE

Climate change impacts were reported to threaten seedling production, business flows and finances of the group. For instance, irregular rainfall patterns affected production of seedlings, their supply to and demand from the markets. Droughts also affected flowering that resulted to high costs of seed collection, transportation, and purchase, especially from certified sources. If droughts or dry spell occurred, the demand for seedlings reduced while the cost of watering, labour and security increased

leading financial and revenue losses. These resulted to seedlings becoming overgrown or members incurring further costs of changing tubes to protect them. Nevertheless, bigger seedlings were sometimes sold at higher prices fetching more income. Conversely, prolonged rains reduced watering and labor costs and promoted timely sales of seedlings.

Heavy rainfall destroys nursery structures, seedlings, drainage, roadways, farms, and forests disrupting supply chains of inputs, labour and marketing of products. Heavy rains affect quality of seedlings so that they fetch lower prices. In several cases, it was observed that if droughts, dry spells, or rainfall seasons shift, the demand for seedlings or any other farm product also changed. For example, if the rainfall season delayed, farmers would not purchase seedlings. The seedlings would overgrow, increasing water, labour and maintenance costs. During dry seasons, the prices of seedlings were much lower than the rains seasons. Additionally, the County Government of Nakuru employed water rationing regulations that affected water availability. This created further costs of finding alternative water sources, adopting new technologies for watering seedlings or incurring losses as seedlings withered. Constant low water supply and frequent droughts drove businesspersons and some community members to invest their income from nurseries and farms into water tanks and irrigation projects and soil moisture conservation practices. Currently, the group is looking for mechanisms to mobilize five million Kenyan shillings to invest in borehole water supply.

## 2.4 IMPACTS ON VULNERABLE GROUPS

Women and youth made up the majority of nursery owners (38 out of 48). In the area they were identified as the most vulnerable persons exposed to the impacts of climate change since they depended on forest and farm resources for their livelihoods. This was supported by a report that women and youth with limited capacity to cope with climate change were impacted the most (IPCC 2014). Women and youth are affected differently and disproportionately due to their roles in growing food, providing labor, care, and water. For instance, at household level, workload during drought periods increased for women, thus limiting their capacity to work on other domestic chores such as providing labor, food, or care. For example, women walk long distances to fetch water during drought periods while those who engage water vendors spend more money leading to high cost of production. Women and youth who have already invested in tree and vegetable seedlings had their seedlings damaged during droughts, heavy rainfall, or by pests and diseases. Their financial resource base became disrupted hooking them into a borrowing cycle. Persistent threats at times force women to sell their household assets to sustain their businesses.

## 3. THE RESPONSE OF THE BUSINESS AND FINANCIAL MODEL TO IMPROVE CLIMATE RESILIENCE

### 3.1 AGRO-ECOLOGICAL DIVERSIFICATION

The Lake Elementaita Tree Nurseries Self Help Group members have adopted a six-step model for climate change resilience: agro-ecological, economic, social, partnership, customer and marketing strategy diversifications and integration. LETNSHG members were empowered on agroforestry, sustainable agriculture, and forest conservation to adapt to and mitigate the effects of climate change. They were trained on nursery management practices including sourcing certified seeds, establishing nurseries and tree growing.

The adoption of agro-ecological diversification (Step 1) was a mechanism to enhance forest and farm ecosystem stability and resilience. This was achieved in three major ways: (i) using more biodiversity (species or varieties, and ecosystem diversification); (ii) water conservation in the nurseries and (iii) promoting sustainable agricultural methods among client farmers.

Since the group vision was to promote agroforestry, members selected seeds from a greater variety of trees, crops, and flowers to establish diverse nurseries. The seeds were sourced from different agro-ecological zones including natural forests, farmlands, rangelands, woodlands, and riparian areas. Group members also adopted grafting and budding as technologies for improving genetic diversity and qualities. The preferred species included *Acacia xanthophloe*, *Grevillea robusta*, *Prunus Africana*, *Persea americana* (Avocado), *Carica papaya* (Pawpaw), *Casuarina*, pepper tree, mangoes, macadamia, and passion fruits. Grafted seedlings were sold at an average of Ksh. 200, far much higher than the other seedlings.

Water resource efficiency was equally important for nursery establishment and farm production. In the nurseries, owners adopted water conservation methods such as shading, mulching, putting seedlings on impermeable surfaces, using compost manure and forest soil. Other ways included growing of species that had low water requirements. Rainwater harvesting and storage as well as use of drip irrigation were adopted.

Sustainable agricultural methods such as intercropping, conservation agriculture and organic farming were adopted by LETNSHG members to diversify resources on farms. Product knowledge and skills acquired promoted their sales. The group trained farmers and its members on agroforestry, crop rotation, reduced tillage, use of crop residues, mulching, composting and cover cropping. Beans, bananas, and sugarcane were intercropped. The business targeted raising seedlings to enhance a mixed system of crops, livestock, and trees. These practices enhanced agrobiodiversity on farms and improved soil fertility and organic matter aspects that increased resilience to impacts of climate change. Agro-ecological diversification increased tree cover for fuelwood, timber, food, forage, fodder, and ecosystem services such as land restoration and carbon sequestration.

### 3.2 ECONOMIC DIVERSIFICATION

Economic diversification in forestry and agriculture sectors (Step 2) enhances resilience capacities to climate change impacts (Briguglio et al, 2008) – and in this case involved two main elements: product diversification and internal finance mobilization through a group savings fund. To adapt to the impacts, the Lake Elementaita Tree Nurseries Self Help Group started other Income Generating Activities (IGAs), adopting seedlings improvement technologies (such as grafting, budding, value addition, tubing etc.) and financial resource mobilization. These approaches enabled them to adapt to fluctuations in income when seedlings were affected by climate shocks.

Group members together with other farmers were trained on a sustainable poultry production enterprise. Farmers were empowered on chicken selection, breeding, housing, feeding and disease control. The group members were able to procure high quality breeds of chicks for rearing. Besides seedling production, members diversified into selling reared chicken and chicken products such as eggs, meat, and manure. The poultry business expanded with over 3,127 farmers participated in rearing, collecting, and selling of up to 20 trays of eggs and 50 chicken daily. Local tourists' hotels and

campsites offered consistent market for poultry products thus enhancing its success. Poultry production was reported as a low-cost enterprise regarding water use and management as compared to tree nurseries under similar climate impacts. Poultry production was considered a complementary source of income. Other livelihood activities that LETNSHG members and their families engaged in included bee keeping, salt mining, basket weaving and chalk industry.

To adapt to seasonality and fluctuations in income, producers were trained on Village Savings and Loaning Association (VSLA). In this model, 28 farmers saved money in the group while others were given loans from the group fund. At the end of a saving and loaning cycle, normally one year, the group shared out its savings and dividends. Members used their savings and dividends as capital to invest back into their nurseries, poultry businesses or farms. Others invested the money in water harvesting, storage, to purchase livestock or as school fees. During prolonged dry spell when seedlings sale was low, farmers were able to borrow from the group to meet their domestic needs. The group also trained community members on financial literacy, planning, budgeting, recording, savings, debts, credits, profit calculations and risk management.

### 3.3 SOCIAL DIVERSIFICATION

Social services provided to women and youth (Step 3) were expanded, included four types of capacity building: (i) sustainable agriculture, (ii) organizational development, (iii) collective marketing and (iv) financial services. Besides economic and agricultural diversification, the 48 members of the group were also trained on gender equality, and youth engagement.

In terms of strengthening social networking in sustainable agriculture, four group members also being leaders became Trainers of Trainees (ToTs) in sustainable agriculture. These TOTs were engaged in the project to enhance knowledge and skills of over 3,127 farmers in sustainable agriculture, agroforestry, and poultry farming. The trainings were conducted by FFSPAK, We Effect, NCTNA and service providers.

Group leaders were trained on organizational development. After self-assessment, the group found that their governance structures had improved following an inclusion of women and youth in business leadership and development process. Women and youth were integral in addressing practical climate resilience needs.

Social networking was enhanced by incorporating the group into the Nakuru County Tree Nurseries Association (NCTNA) where advocacy and other social support services were offered. Within NCTNA, the group representatives advocated for tenure rights and certification of tree nurseries as well as development of policy framework for the venture. Other social services offered to strengthen the group structure included pulling together resources, labour and social capital. The group provided opportunities for its members to participate in ecotourism guiding, hiking and scouting activities within Elementaita ecosystem.

To enhance women and youth access markets, the group was trained on collective marketing. This involved identifying markets, accessing marketing information before production, and producing for known markets. Members started marketing seedlings and poultry products as a group reducing marketing costs and individual losses. The group is in the process of establishing a cooperative for marketing their products. The training in financial services resulted in the establishment of the VSLA group already described above.

### 3.4 PARTNERSHIPS

Partnerships and collaborations (Step 4) enhance climate resilience (UNOSSC, 2015). Lake Elementaita Tree Nurseries Self-Help Group partnered and received support from the United Nations Food and Agricultural Organization (FAO), in partnerships with We Effect, Farm Forest Smallholder Producer Association of Kenya (FFSPAK), Nakuru Tree Nurseries Association of Kenya (NTNAK) and Community Tree Nurseries Growers Association of Kenya (CTNGAK). This partnership provided financial support, capacity building, organization development (OD), and tree nursery technology development and marketing. Through Farm Forest Facility (FFF) funding, FAO, financed the project, diversified business value chains (seedlings, poultry, fruit trees and crops) and supported organizational

development. FFSPAK, NTAKE and We Effect conducted trainings and empowerment of producer organization. Other non-formal linkages included collaboration with Elementaita Ecotourism Organization to support water supply, marketing of fresh organic products and tree seedlings. The group was in discussion with the Green Belt Movement for technical, financial and forestry partnerships for scale-up and innovations.

### 3.5 CUSTOMERS

Broadening their customer base (Step 5) was also a key element of climate resilience. The main initial customers for the nurseries were local farmers in Gilgil Subcounty and some of the travelers along the Mombasa-Nakuru Highway. Government institutions such as KFS and NEMA were additional clients. But the LESGH members diversified their customer base by selling to private institutions such as schools, hotels, Banks, and NGOs - now also served by the group. For example, Cooperative Bank contracted the group and purchased over 100,000 seedlings. Green Belt Movement, KFS, NEMA and several schools purchased seedlings for riparian protection, afforestation, and reforestation projects.

### 3.6 MARKETING STRATEGY

A new marketing strategy was the final step in the LETNSGH climate resilience planning (Step 6). In the recent decade, tree production in Kenya became a major environmental, social, and economic activity. For this group, trees, vegetables, and flowers nursery seedlings were the major products. Production of seedlings was continuous due to water efficiency approach and labor supply. The marketing strategy of the group involved producing many high-quality seedlings at affordable prices. These prices were controlled by production cost, market demand, species, size, and quality.

The group invested in product development, value addition and promotion. Marketing of multiple products reduced costs at individual level. Production was planned, budgeted, managed, and records kept for accountability. Factors that influenced production cost were water availability, procurement of polythene tubes, germplasm (seeds, buds etc.), compost manure, soil, labour and transport. The annual average price of a small seedling was Ksh. 20 while seedlings in large containers were sold at Ksh. 200. Grafted seedlings were sold at an average price of Ksh. 250. This venture was reported as profitable. Value addition, bulk and collective sale stabilized prices of commodities produced. Seedlings were positioned strategically for the markets. They were potted, contained, watered, and placed by the roadside for ease of access. Individual nursery owners established direct customer contacts with minimal or no brokers or retailers. Just like any other business, producers faced stiff competition from large and commercial scale high value seedlings producers, farmers, and entrepreneurs across the country.

The Government policy to increase indigenous trees production for restoration of ecosystems through Climate Smart Agriculture (CSA) boosted customer growth. The group developed brochures and calendars to publicize their business. Through KFS, the group was featured in the local media and KFS also highlights the organization in its periodic magazine published in the month of December.

## 4. CONCLUSIONS

### 4.1 MAIN CONCLUSIONS

This study has described not only how commercial nursery businesses have been underdeveloped and vulnerable to impacts of climate change, but also many of their agricultural clients are also vulnerable to these same changes. For the LETNSHG members to thrive in the context of climate change, financing support through FFF was a key factor identified to support the climate resilience business model. With financial and human resources support, the major step was to help the producer organization contextualize its business under climate change scenarios. The group understood the concept of climate change and its threats to their production units. This was achieved through assessment of organization's weaknesses and strengths and the use of locally available opportunities as a six-step adaptation strategy.

Capacity building on entrepreneurship, sustainable production technologies (in seedlings and poultry) helped develop value chains and marketing. The group was trained in six areas of agroecology, economic, social, partnership, customer, and marketing diversifications. Training on gender inclusion and capacity building of women and youth was also key to the success of the business model. Other factor that promoted business success was empowerment of group members to mobilize finance. This was achieved through introduction of Village Savings and Loaning Association. A simple marketing strategy consisting of a participatory product development and promotion and price stabilization were key strategies to the success of the business.

### 4.2 INVESTMENT CHALLENGES

The major challenges of adopting climate resilient seedling production business model were institutional weaknesses, access to resources, information, and lack of technical capacities. The producer organization required institutional support to create awareness on policy framework on forest and farm resources. In this context, policy framework supporting diversification was weak and producers lacked incentives to diversify for ecosystem services. Diversification in this business model had higher initial costs. The producer members required additional finance to invest into seedlings diversification, starting poultry and other enterprises. Access to water, human and financial resources was a challenge. A climate resilient business model required water availability, staffing and financial capital to enable diversification, for procurement of seedlings and marketing. The producer organization did not own water source, had no structured administrative or technical staff and lacked finance for its operations. Technical capacity of climate resilient model was not acquired by the producers. Hence, significant financial and human resources provided by FFF and partners provided business extension services. The business resilience model also required information on climate change, markets, and other components. Getting such information was either difficult, costly, or not available. Hence, a climate resilient business model requires investment in policy reviews, resource availability, technical support and scoping the information.

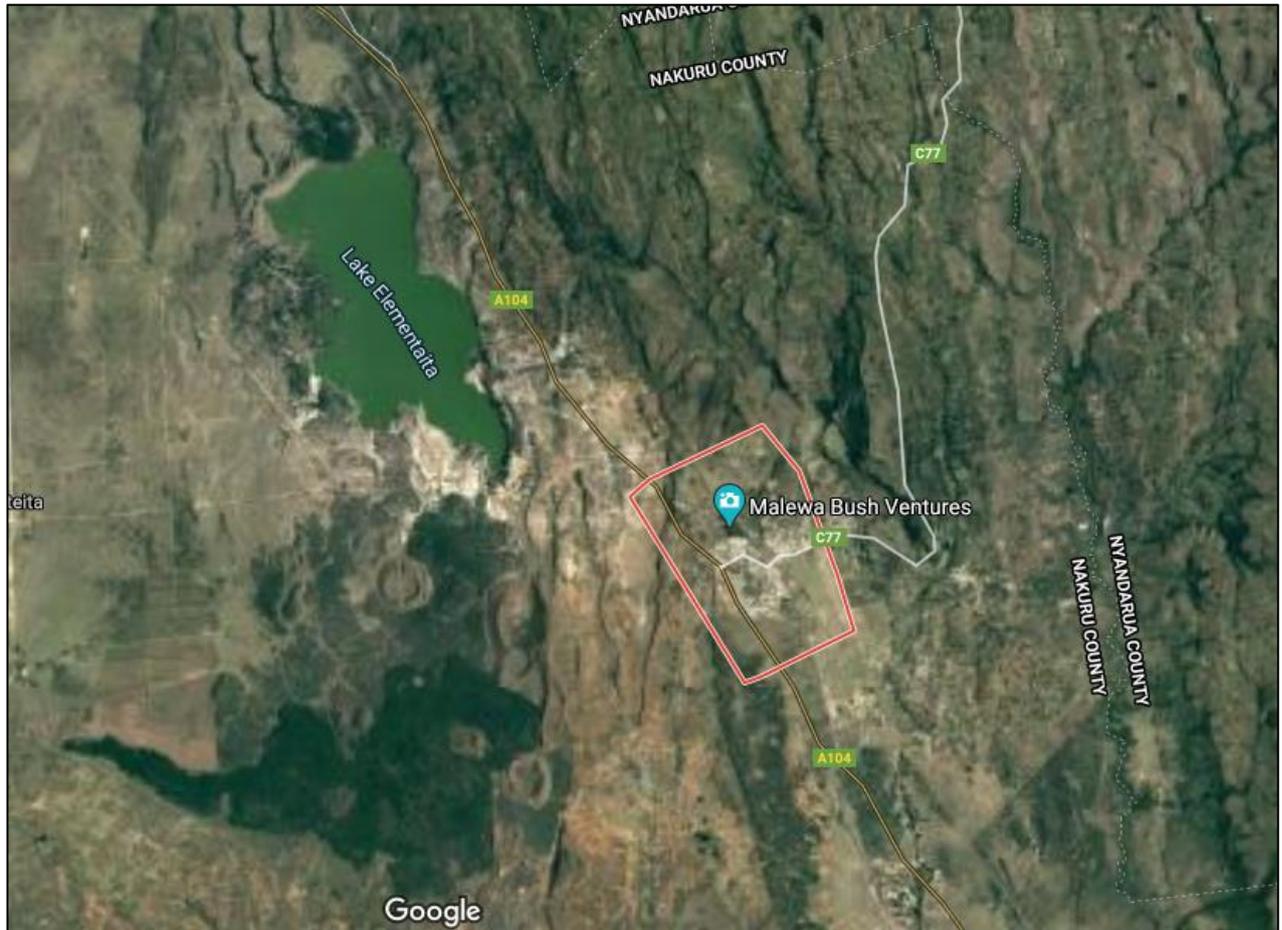
### 4.3 BENEFITS AND THEIR DISTRIBUTION

Following adoption of climate resilient business model, seedlings producers reported improved benefits and equitable sharing of proceeds. For instance, their first benefit was acquisition of entrepreneurship knowledge and skills in sustainable farming and business. The organization was able to assess its capacity and came up with an inclusive organizational development plan. This enabled producers to adopt new technologies such as grafting and value addition thus increasing volume and variety of seedlings produced. The group members initiated other income generating activities alongside seedling production and this created new knowledge, skills, markets, and income. There was job creation among 38 women and youth. Livelihoods of over 3,127 farmers were improved due to adoption of diversified sustainable farming methods that improved productivity and resilience to climate change.

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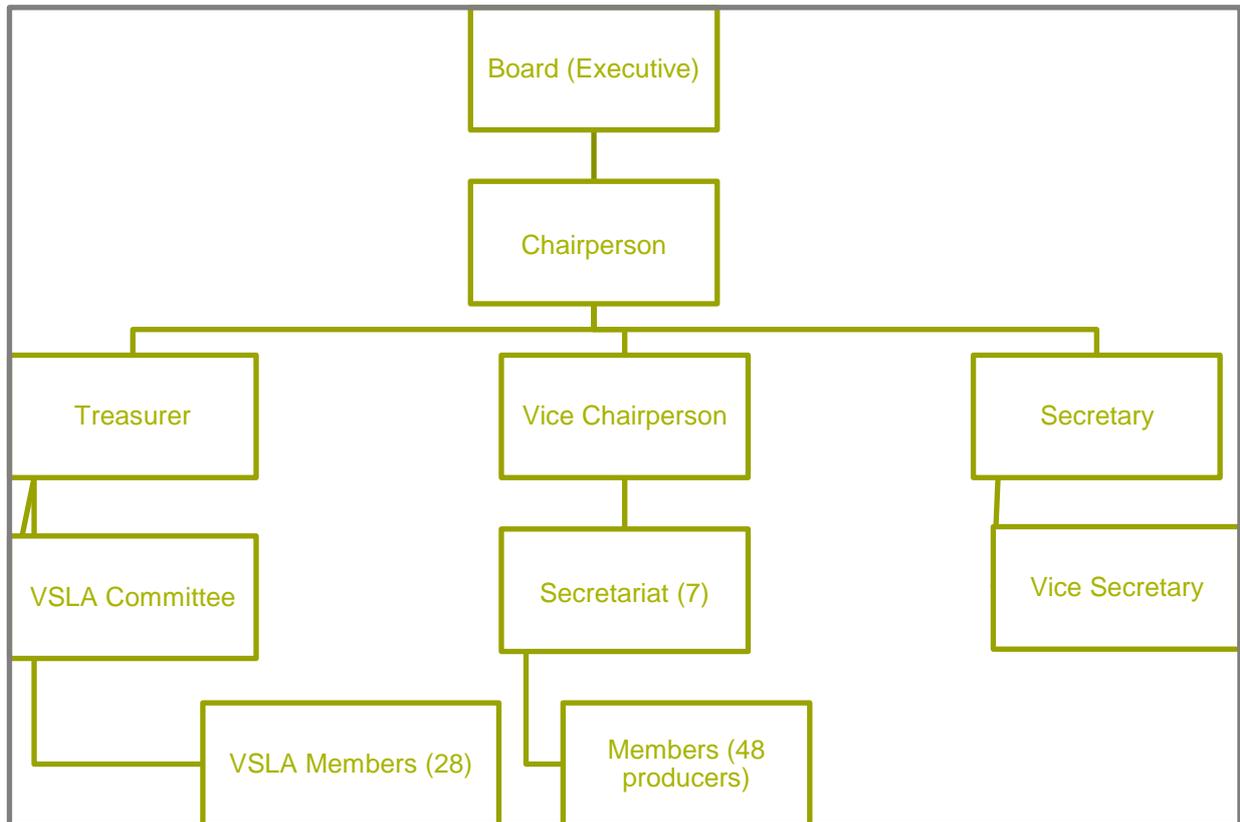
ANNEX I: SATELLITE MAP OF GILGIL SUB-COUNTY (TOWN, LAKE ELEMENTAITA AND HIGHWAY)



The nurseries are located on the Mombasa-Nakuru Highway marked A104 opposite Lake Elementaita  
 Source: Google (<https://maps.app.goo.gl/2YAnRZ8yfGUCstEz7>)

## ANNEX II: LAKE ELEMENTAITA TREE NURSERIES SELF-HELP GROUP ORGANIZATIONAL CHART

The group has a board with five executive members: The Chairperson, Vice Chairperson, Secretary, Vice secretary and the Treasurer. The secretariat committee is made up of executive committee and two co-opted members. The secretariat (Chair, Treasurer, Secretary, Vices and 2 members) carries out financial management, leadership, collective marketing of seedlings, capacity building and monitoring. Below the secretariat are individual nursery producers who are shareholders, producers, and managers of nurseries. There is also VSLA committee to manage savings and loans.



### ANNEX III: SAMPLE PHOTOS DEMONSTRATING ACTIVITIES OF TREE NURSERIES PRODUCERS



Pictures showing location of tree nurseries in Gilgil along, Mombasa-Nairobi-Nakuru Highway.  
Source: Pictures taken on May 7<sup>th</sup>, 2020 at 12:46 pm By Joseph Josephat Gaitho.



Pictures showing tree nursery owner with diversified species and also farming bananas, vegetables and avacado.  
Source: Photo taken on April 7, 2020 by Philip Kisoyan



Pictures showing avocado seedling nursery also growing oranges for additional source of incomes.  
Source: Photo taken on April 7, 2020 by Philip Kisoyan



Picture showing nursery owners being trained on economic diversification raising seedlings as well as local poultry.  
Source: Photo taken on May 7, 2020 by Joseph Gaiho



Picture showing a nursery of different types of seedlings of flowers and trees  
Source: Photo taken on May 7, 2020 by Joseph Gaiho