



Farm Africa-Kenya

Embu District in Kenya

2023



Introduction

This report represents a summary of the project details. It has been created in close collaboration between Farm Africa and Acorn. A more detailed Acorn Design Document (ADD) for the project will be made available on the Acorn platform and can be requested by validation and verification bodies and certifiers for third-party oversight or quality checks. The number of participants described in this document reflects only those in the project's first year. Please see the Acorn website for the real-time number of participants at scale.

This Plan Vivo certified project run by Farm Africa in Kenya has helped more than 4,000 smallholder farmers transition away from traditional subsistence practices to diverse agroforestry systems by planting a range of tree species that provide marketable products, such as fruits and nuts and improve the soil's health and fertility. The outcome of the project intervention will enhance farmer and community livelihood by diversifying, stabilizing, and increasing farmer income while building resilience to climate change. Farm Africa aims to bring the benefits of agroforestry to more farmers in Kenya, in both Embu and Tharaka Nithi districts. It will do so in a scaling scenario by supporting a potential 50,000 farmers to adopt new agroforestry.



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Project Summary

Local partner

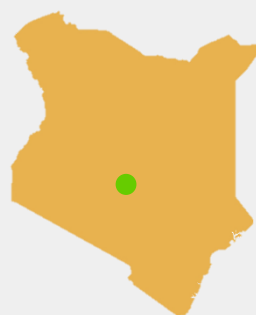


Project location

Embu District, Kenya

Ecoregion

The Northern Acacia-Commiphora Bushlands and Thickets, and the East African Montane Forests



Main crops

Maize, sorghum, legumes, and beans



Minimum number of existing participants



4,096+

Potential number of additional participants



50,000+

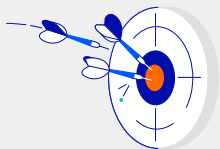
Estimated total size of project area currently



2,997 ha

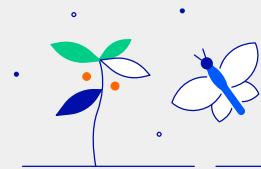
Project's aims and objectives

Through this project, Farm Africa aims to contribute to the development of a food and farming system within a sustainable framework by employing regenerative, context-specific innovation and models that appreciate local diversity and attain climate resilience and food security for smallholder farmers in Kenya.



Impact to the farmer livelihood and environment

- Adopt regenerative farming methods
- Increased food security
- Resilience to climate change
- Diversified and increased income
- Increased and stable productivity



Additionality

This agroforestry project led by Farm Africa was established in 2020 with farmers planting 20 trees per year over 3 years on a community-level. At this time, farmers raised concerns about being able to continue planting or maintain trees over the long-term due to a lack of seedlings, knowledge on agroforestry, and an additional financial incentive for planting trees. Based on this feedback and that was supported by the findings of a needs assessment conducted by Farm Africa, carbon finance was requested from Acorn. As part of the Acorn project, Farm Africa will provide up to 50,000 farmers with seedlings and training on agroforestry practices over the life of the project, to ensure they can plant fruit/nut-bearing, medicinal, and nitrogen-fixing trees to transition to agroforestry, and combat the effects of climate change, land degradation, and declining soil fertility.

Farmer Level

Smallholder farmers in the Embu County of Kenya experience high poverty levels as they dedicate their practices to subsistence agriculture, a value chain associated with low-income generation. In addition, the land in the project area is being severely affected by the adverse effects of climate change, leading to a continuous decline in soil fertility, and ultimately, in productivity and income levels. The lack of financial capital, inhibiting farmers from purchasing planting materials, and the lack of knowledge on the appropriate species to use in an agroforestry design, makes a successful transition to agroforestry on the farmer-level impossible without external support.

Before project intervention, farmers would travel long distances to acquire seedlings and obtain low-quality materials that are not true to type. Farmers also struggled with low purchasing power for fertilizers and organic manure in the drylands where livestock keeping isn't a dominant livelihood activity.

As a result of project intervention, the Embu smallholder farmers will receive carbon finance, providing them with a financial buffer and an additional source of income that can improve their livelihoods and prevent logging in times of severe financial hardship. To overcome the economic and cultural barriers that farmers face in the project area, and further guarantee the successful transition to a long-lived agroforestry system, Farm Africa will use their 10% of CRUs to contribute to the following activities:

- I. Mobilization and sensitization on the benefits of agroforestry carried out by the VBAs (Village Based Advisors), Farm Africa's project officers and government extension officers.
- II. Learning exchange visits at agroforestry farms to cascade knowledge down to other farmers. Carbon finance is expected to increase the amount of demonstration farms and visits made.
- III. Linkage meetings between VBAs and input-output markets to bridge the extension services and access to agricultural inputs and markets gap by rural farmers.
- IV. Support the establishment of 30 certified tree nurseries at the village level by subsidizing the nursery materials (seeds, manure, fertilizers and chemicals) and training VBAs on nursery management.
- V. Induction training of VBAs on agroforestry design and systems to train farmers through the training of trainers (ToT) model.

Project Level

Farm Africa's network of participants is constantly expanding, with a potential for 50,000 farmers. The first trees planted in 2020 by 4,096 farmers, described as Phase I, are few compared with what will be planted over the following years by existing and new farmers. Currently, the project focuses on Phase I and the farmers it encompasses, as well as improving its agroforestry design, such as tree management and care. Phase II targets 50,000 additional potential farmers in Embu and Tharaka Nithi counties at scale and includes fruit, nut-bearing, and medicinal trees as part of its future agroforestry design.

The Acorn project in the region will act as an eye-opener to many farmers on how they can access the carbon market and carbon credits and understand the importance of tree ecosystem services. Suppose farmers who transitioned to this long-term agroforestry system are not rewarded with income from the carbon credits as agreed, they may be discouraged from maintaining and scaling up their agroforestry systems. Providing carbon finance to compensate Kenyan farmers is the only practical way to achieve scale and proof of concept.

Project Baseline

Land use

The land use in the project area, before the start of the project intervention, includes cultivation of food crops and cash crops or livestock rearing. Farmers in the project area currently cultivate both cash crops to be sold at markets and food crops to be consumed by the farmers and their families. These species include fruits like avocado, mangoes, citrus, bananas, macadamia, khat, coffee, tea, maize, beans, grams and peas. Cash crops cover approx. 11% of the arable land compared to food crops. Most farmers use chemical pesticides, rather than manual control, to prevent and combat pest infestation on their farms. Most farmers also use fertilizers, most commonly organic.

Without project intervention, the tendency would be to use more of the land on perennial mono-cropping of cash and food crops, and incentives to log existing trees for timber and firewood would increase.

Habitat species

Embu is diverse in ecological zones and habitats, including lowland and mountain forests, semi-arid scrublands and inland aquatic ecosystems. Species observed in these counties, before the start of the project intervention, include oaks, teaks, eucalyptus and acacias. Fruit trees include mango, lemons and tamarinds. Animal species found in the project area include monkeys, birds, rabbits, gazelle, antelope, elephants, mongoose, hornbill, weaver birds and squirrels.

Without project intervention, biodiversity would be expected to decrease, leaving cultivated areas to expand and continuously fragmenting natural spaces, replacing natural vegetation with crops, thus reducing the diversity of ecosystems, fauna and flora. Without the proposed agroforestry trees, in this case flowering trees that attract pollinators, the prevalence of pollinator species would decline and would lead to a cascading effect in the reduction of biodiversity.

Socio-Economic Benefits

Area	Indicator	Result
Local livelihood	Nutritional variety	The average farmer consumes 3 out of 12 food groups daily
	Farmer income	The average farmer has an annual income of – 1,486.60 after deducting their expenses
	Agricultural land use and productivity	The average farmer produces about 2,316 kg/ha/year of cash crops from their farms.
Environmental improvement	Agricultural biodiversity	52% acceptable (under the Gini-Simpson Index).

Nutritional variety

During the farmer survey, it was identified that nearly half of participants cannot afford to feed themselves and their families every day for all meals. For participants who were able to, their household only consumed the same small variety of food every day, with an average of 3 out of 12 food groups. Their diets mainly consist of cereals, vegetables and dairy products.

The average farmer's diet is mainly sourced from markets and their farms. Some grow various vegetables in their farms, home gardens and kitchen gardens for home consumption. Others buy other food crops from traders or when the ones they plant are out of season. Without the project intervention, households in the project area would continue to face an increasing lack of food security and poor nutrition and health outcomes. The agroforestry design foresees the plantation of fruit-bearing trees, such as macadamia nuts, citrus, mangoes and avocado fruits, which are a reliable source of vitamins at the household level, especially advantageous as the majority of farmers do not consume fruits daily, representing a lack of fruit nutrition from the project's participants. Therefore, the proposed agroforestry design intends to contribute to the improvement of nutrition both for domestic use and surplus for markets, generating additional income that can be used to purchase more nutritious food.

Farmer income

The farmers in the project area are low-income earners as they dedicate their practices to subsistence agriculture, a value chain associated with low-income generation. Roughly half of the participant farmers have a low or insufficient access to resources and financial state. In addition, approx. 20% of Embu County's residents have no formal education, and participants cannot afford the entire amount necessary for education for themselves or their families. Without the support of this project, farmers wouldn't have all of the resources needed to improve and maintain their farms and support their families. This project intervention will reduce the input costs for farmers (i.e., by establishing tree nurseries and selling seedlings at subsidized rates) and create diversified income sources (i.e., sale of produce from the agroforestry systems, sale of honey and other bee products promoted in this project, and carbon revenue).

Agricultural land use and productivity

Farmers describe their farm's productivity as average, with an average total farm yield of 2,841 kg/year from cash crops. The main factors preventing productivity from being high

include frequent droughts, high input and planting costs, and frequent events of diseases. Without the project intervention, it is likely productivity would remain average or decrease due to the impacts of climate change. Through the project intervention, Farm Africa will assist farmers in establishing long-lasting agroforestry systems by establishing agroforestry tree nurseries, thus providing farmers with quality seedlings and manure, and training in various topics, which will influence an increased yield of crops. In addition, the trees planted will contribute to the overall farm productivity after the trees are fully productive by acting as windbreaks, attracting pollinators, and by its nitrogen-fixating properties.

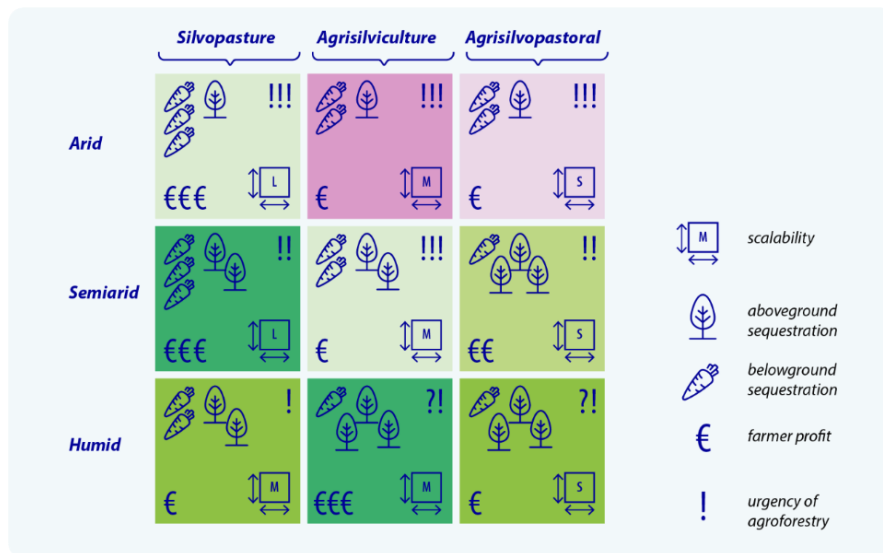
Agricultural biodiversity

The score of biodiversity, under the Gini-Simpson Index, is acceptable at roughly 52%, which reflects farmers growing more than one crop species (between 1 and 5), as they grow both food and cash crops, such as coffee, tea, bananas, maize, bean, sorghum, green grams, millet, and some vegetables, and livestock, including cattle, goats, sheep, and poultry. Nevertheless, the risk of biodiversity loss in the project area is attributed to the expansion of cultivated land, leading to continuous land degradation and habitat fragmentation. With the project intervention, the implementation of agroforestry trees and beehives (in the case of some farmers) will promote a productivity increase on their existing land, mitigating the need for land expansion, attract more pollinators, leading to an increase in biodiversity, and provide shade and refuge for other animals.



Project Activities

The agroforestry system is classified as existing agrisilvicultural agroforestry in a semi-arid environment where maize, sorghum, beans and legumes are the main cash crop. The planting of fruit and leguminous trees is prioritized in this system.



There are eight native or naturalized tree species promoted under the agroforestry design that offer livelihood benefits such as shade, fruit, medicine, and fodder, and ecosystem benefits such as soil carbon storage and nitrogen-fixing. These species were chosen to increase food security for smallholder farmers by offering soil nutrition and consumable and marketable tree products.

- *Mangifera indica*
- *Persea americana*
- *Citrus spp*
- *Macadamia integriflora*
- *Moringa stenopetala*
- *Calliandra calothyrsus*
- *Gliricidia sepium*
- *Grevillea robusta*

Currently, the project focuses on Phase I and the 4,096 farmers it encompasses, as well as improving its agroforestry design, such as tree management and care. The planting was intended to begin in 2022 but was postponed to 2023 due to a drought in the project area. Each farmer will be expected to plant at least 180 trees within three years. The proposed approach in Phase II is to have 16,000 farmers plant trees in 2023 and 30,000 in 2024. The aim is to have farmers plant more diverse trees in larger populations based on their discretion and the suitability for the existing agroecological zones.

The proposed agroforestry system intends to positively impact the land by providing more shade to crops and increasing the soil organic matter and available nutrients through the decomposition of dead leaves (green manure), thus increasing productivity. Incorporating fast-growing leguminous and nitrogen-fixing trees will further provide nutrients to food crops. Higher productivity and more shade, combined with the flowering trees planted, will attract more insects and pollinators, thus increasing the overall biodiversity of the area. Finally, tree cover will ensure carbon sequestration and prevent soil erosion through roots binding the soil to sloping ground.

To ensure that the trees already existing in the project area, before the Acorn project intervention, do not perish due to competition with the trees planted during this project, farmers will be sensitized on the importance of maintaining the existing trees, and the targeted number of trees planted won't exceed the maximum tree density per unit area.

Organizational Capacity

Farm Africa is a non-governmental organization (NGO) that supports smallholder farmers, farm workers and agropastoralists across eastern Africa to increase their productivity, household incomes and resilience to shocks caused by climate change, extreme adverse natural events, such as droughts and floods) and market-related events (fuel, food, input and output price fluctuations, volatilities and price hikes). Through community empowerment programs, Farm Africa helps rural communities increase the quality and quantity of what they produce and build their links to markets while protecting the environment for years to come. In Kenya, Farm Africa has over 37 years of experience in supporting small-scale farmers, women and youth to find new ways to make a living and lift themselves out of poverty in a context where much of the country is classified as arid or semi-arid with increased frequency of drought and competition over scarce resources.

In line with their mission, Farm Africa implemented the Regenerative Agriculture project before connecting with Acorn, with its first Phase running from July 2020 to October 2021 in Embu County. The project increased production and income, and boosted the resilience of 10,000 farmers in Embu through regenerative agricultural practices that improved soil health and food security in the face of climate change. Not all the farmers from their previous project were interested in being onboarded to Acorn in the first year of this project. However, Farm Africa hopes to use success of the Acorn project and the receipt of carbon finance as an additional incentive for more farmers to join at scale.

Furthermore, Farm Africa implements its gender and social inclusion policy in all the projects, with a set gender ratio of 1:3 to ensure that either gender has at least 30% representation. This is implemented in the Acorn project, as the Project Council members' election process requires 30% gender inclusion (e.g. if the chairperson is a male, the vice chairperson is female).

Farmer Payment and Benefit Sharing

To ensure the CRU payments received by Farm Africa are transparent, Farm Africa will disburse farmer payments digitally through the mobile money platform M-pesa, as all farmers engaged in the project have a registered mobile number which they own and have control over. This payment method allows farmers to choose what they spend their carbon income on and ensures traceability, while ensuring that Farm Africa does not draw more than 10% of sales for ongoing coordination, administration and monitoring costs. From the 80% of carbon revenue for farmers, 60% will be paid entirely through mobile money transfer, and the remaining 40% will be in-kind to cater for seedling costs. In addition, Farm Africa and the project beneficiaries will explore savings schemes in which the participants can save part of the money in a Village Savings Loans Association (VSLA) for later lending to members to unlock access to finance hindrances faced by many farmers in Kenya.



Technical Specifications

Leakage

The land in the project area is classified as cropland. On this land, there is no expected loss in productivity due to project intervention and no displacement of farmers' activities. Planting diverse tree species on the existing farmland will create more revenue for farmers through marketable tree products (e.g., fruits and nuts). Farm Africa expects productivity levels to increase from about 5 years after farmers plant trees and reach up to 30% over the project's life. Therefore, there is no activity shifting leakage identified for this project. Farm Africa will annually monitor any changes in productivity over the project's lifetime and conduct periodic output measurements through monitoring surveys to determine farmer crop yield improvements. To prevent and mitigate any potential leakage from activity shifting in the future, Farm Africa will ensure farmers are well-trained and maintain a minimum of 200 fruit-bearing and medicinal trees on 0.8 hectares in their farms for the life of the project.

[Interested?](#)

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