TerraFund for AFR100

TerraFund for AFRI100 Project Half-Year Report

January – June 2024

1.0: General Progress

1.1. General Summary and Overall Goals

The overall goal is to plant 700,000 trees and 1 million Aloes, ultimately restoring a total land area of 500 hectares. To achieve our goals, we have enlisted over 500 farmers. Of these, 100 have adopted Farmer Managed Natural Regeneration (FMNR) practices, while the remaining farmers are engaged in direct seedling planting on farms. In the recently concluded first phase, 350 farmers have begun planting seedlings provided by the NGARA-KEFRI, while 100 farmers have initiated assisted natural regeneration under the team's guidance. Moving forward, restoration efforts, whether through assisted natural regeneration or seedling planting, are planned to continue over the next three planting seasons in both project sites. During these phases, the initiatives are expected to be increasingly enhanced and refined to ensure greater success and sustainability. To ensure consistent supply of seedlings to target farmers NGARA-KEFRI team have established aloe and tree seedling nursery at KEFRI Baringo Forestry Research Sub-centre. The nursery raised more than 120,000 assorted tree seedlings and over 31,100 aloe seedlings during the reporting period.

1.2 Progress So Far, including the Current Reporting Period

Since inception of the project, we have planted a total of 169,115 trees and 30,500 Aloes in the first planting season of this year, thereby restoring 169 hectares, 100 hectares in Tenges Ward (highland) and 69 hectares in Marigat Ward (lowland). The seedlings distributed to the target farmers were obtained from our central nursery at Marigat and a private tree nursery in Uasin Gishu County. To support the TerraFund AFR100 Project, the existing KEFRI nursery in Marigat has been significantly expanded. This expansion has increased the nursery's capacity to raise over 400,000 seedlings annually, ensuring an ample supply of seedlings to meet the project's requirements. Additionally, it is important to note that at the time of writing this report, seedlings from the Farmer Managed Natural Regeneration (FMNR) plots had just begun to emerge. As a result, the areas restored through this natural regeneration process have not yet been incorporated in the overall restoration figures.

During this reporting period, we purchased additional tree and Aloe seeds and sowed them in the nursery to be ready for planting during the second season this year (October/November). We are also making good progress in assessing seedling survival and working with farmers to weed and protect the planted seedlings.

Currently, we are in the process of selecting participating farmers for various training and resource distribution programs. Farmers with substantial aloe populations on their land will be identified and trained in aloe processing techniques. Those who have significant numbers of gum-yielding trees, such as *Senegalia senegal*, or trees producing commercial fruits like *Tamarindus indica*, mangoes, papayas, and oranges, will receive training on value addition for their products. Additionally, farmers will be chosen to receive beehives to integrate beekeeping into their afforestation practices.

1.3 Plans for the next 6 months

Over the next 6 months, we plan to raise 300,000 assorted tree seedlings and 500,000 Aloes species, carefully selected based on farmers preferences. These will be planted during the second planting season, with the aim of restoring an additional 300 hectares of land. By the end of the next 6 months, we also plan to initiate the sowing of the seed for assorted trees and Aloes to be planted in the third season. Additionally, the mature seedlings will be distributed to the target farmers, ensuring they have access to high-quality planting materials. To support this distribution, we will provide comprehensive training sessions on proper seedling handling and care techniques. These trainings will equip farmers with the necessary knowledge and skills to maximize seedling survival rates and promote healthy growth on their farms. Equally, additional farmers will be recruited to practice assisted natural regeneration.

2.0 Progress made toward the project's socio-economic development and social equity goals

2.1 Overall Socio-Economic and Social Equity Goals

Besides the standard multipurpose benefits derived from trees that include wood products (firewood, sawn timber, construction poles, etc) and provisioning services (shade, control of soil erosion, bee forage, carbon stocks, etc), the project deliberately introduced a large proportion of trees that produce commercial/industrial non timber products, namely Gum arabic (from *Senegalia senegal* tree), Aloes for production of gel and bitter gum (from sap) for production of herbal soap, shampoos (at local cottage industries) and pharmaceutical uses. Other trees with fruits that can be processed for juice production are *Tamarindus indica*, Mango and Orange among others. Appropriate training of farmers to process the various products has been considered from the second year of the project where over 4,000 people to be engaged and 22,000 envisaged to benefit either directly or indirectly.

To date, 263 individuals have directly benefited from the project's activities. This includes 234 people involved in nursery establishment and management, 14 enumerators who assisted in collecting baseline data during the identification of potential target farmers, 3 volunteers and 12 local administrators who served as contact persons between the project farmers and the implementation teams.

The 234 individuals engaged in nursery establishment and management participated in a variety of tasks, including but not limited to site preparation, soil mixing, potting, pricking out, watering, and overall seedling care. Of these participants, 65% were women, 20% were youth, and 15% were from marginalized communities within Marigat ward.

2.2 Plans for the next 6 months

In the next 6 months during which time we envisage to intensify the seedlings production exercise, we hope to engage 150 part time persons and 5 volunteers who will include students on industrial attachment. The seedlings produced will benefit over 600 farmers across the project area.

3.0 How the project has responded to the local community priorities in this reporting period

3.1 Addressing Community Priorities

The first activity that we carried out after identifying the farmers to participate in the project was to undertake the baseline socio- economic study to understand their biometrics, priorities, their status on resource endowment, what they have done in the past and what they would like to do now and in future. The baseline made us to understand that farmers in the highlands are desirous to plant commercial trees, namely Cypress, Grevillea and Eucalypts in large quantities while those in lowlands prefer *Terminalia brownii*, *Tamarindus indica*, *Azadirachta indica*, *Grevillea robusta*, horticultural crops (Mangoes, Oranges). We also learned that *Senna siamea* affects bees and therefore should not be planted in large numbers. We also understood that termites attack is a common challenge especially during periods of drought hence the need to fully prepare to counter the challenge.

3.2 Community Involvement in Decision-Making

At household level, males are mostly vested with the powers to make decisions on land use, for example where to plant crops, trees, pastures, residential areas among other important decisions. With this information, we therefore made an effort to consult these household heads on the choice of species and planting configurations (boundary, woodlot, agroforestry, etc)

3.3 Outcomes Feedback, and Future plans

The baseline survey was able to help us to establish the species of trees to prioritize for raising in the tree nursery going forward. We also learned that *Senegalia senegal* is not prioritized by the community as it is naturally well distributed across the project area. Unfortunately, the common variety does not produce much gum. In addition, gum arabic is still an unknown commodity in many parts of Baringo County, especially the project area. We will therefore make efforts to identify and introduce high yielding variety in our subsequent planting efforts and carry out intensive training on commercialization of gum arabic across the project area. We also realized that Aloe is no longer a popular plant in the project area largely due to the failure of the past efforts to commercialize the products. Many of the participating farmers were reluctant to take Aloe for planting on their farms. The project will therefore make efforts to first link farmers to the markets and thereafter build their capacity to process Aloe products both at cottage and industrial levels. Fortunately an aloe factory is being built in Mogotio, which is an incentive. Meanwhile, we plan to fully promote community understanding on importance of various tree species planted by the project. For example, the medicinal value of tree species such as *Moringa oleifera,* introduced, *Tamarindus indica* tree domesticated and its products commercialized.

4.0 The three most important successes of your project during the past six months

4.1 Important achievements and detailed success stories

During the first six months of the project, we distributed and planted a total of 169,115 assorted tree seedlings and 30,500 aloe seedlings on farms and schools in both Marigat and Tenges wards, successfully planting 169 hectares of land. Assisted natural regeneration is also expected to significantly contribute to our overall restoration targets. Although we have observed substantial natural regeneration on selected farms, it has not yet been quantified.

Comprehensive training on planting procedures and seedling care was provided during the seedling distribution process. Farmers were also educated on how to conduct assisted natural regeneration effectively.

In this initial phase, 450 people directly benefited from the project, receiving various trainings and free seedlings. Early benefits included soil stabilization and the improvement of soil quality, particularly as some tree and aloe seedlings had already developed root systems.

Moreover, the project team was able to identify farmers' needs and preferences. This included a demand for seedlings of trees with socio-economic value that were not initially included in the project contract or were insufficient in number. For example, during initial

field visits, farmers requested *Warburgia ugandensis*, a tree highly valued for its medicinal properties by the local communities.

5.0 The most significant change observed as a result of the restoration work during the past six months

5.1 Community and landscape changes

The major impact seen was the increase in number of farms where agroforestry was practiced. Farmers added new lands for tree planting and growing at the same time mixed with the beneficial crops. In most farms where tree planting was done in time there was good harvest of vegetables & crops like groundnuts, beans, potatoes and they looked healthy as compared to farms where the crops were grown without trees. This led to increased demand for agroforestry trees especially *Grevillea robusta*. During the field visits new farmers made requests to be considered as participants because of the observed benefits the current beneficiaries are getting. This will in the long run contribute to Landscape restoration.

6.0 Challenges the project faced during the past six months

6.1 Description of challenges

Owing to the wet conditions during planting, it was very difficult to access a number of farmers due to poor roads during distribution of seedlings. This slowed down the tree planting exercise. Later, such farmers, especially from the lowlands were requested to collect the seedlings themselves from the central tree nursery despite their reluctance to do so. Some of the farmers cited lack of financial capacity to transport seedlings from nursery to their farms. Another major challenge was the low uptake of certain seedlings among the farmers. For instance, *Senegalia senegal,* known for its gum arabic production, and *Aloe secundiflora*, valued for its sap, saw limited interest despite their economic advantages. Generally, there was general lack of knowledge on socio-economic value and other benefits of the species. Awareness about the importance of Aloes, *Senegalia senegal* and other species with commercial potential will continuously be carried out going forward.

Additionally, many farmers demonstrated a limited understanding of proper seedling planting procedures and post-planting care. This gap in knowledge may have contributed to their hesitance in collecting and planting large number of the seedlings effectively.

6.2 Impact on Project

The team found that distributing seedlings directly to farmers within their local areas significantly motivated them to collect the seedlings for immediate planting. In response to the low uptake of *Senegalia senegal*, the technical team raised other species in the tree nursery that were most preferred by the farmers, such as *Azadirachta indica* (Neem). By ensuring that seedlings were delivered closer to farmers' doorsteps, we were able to maximize the distribution of available seedlings in accessible locations. This approach not only enhanced community engagement but also allowed more contact time with farmers for providing technical advice. Additionally, during the seedling distribution exercise, we conducted sensitization sessions on the importance of various species and proper planting procedures. This effort successfully increased the uptake of seedlings and encouraged subsequent planting activities.

7.0 Lessons learned as the project progressed and overcame challenges during the past six months

7.1 Overcoming Challenges

Recognizing the low turnout of farmers visiting the Marigat project nursery to collect seedlings, the team quickly arranged for the transportation of seedlings to nearby collection points. To address the issue of low uptake, species that were less popular among farmers were substituted with those that had higher demand.

Looking ahead, we plan to increase the production of preferred species that are well-adapted to the local environment to mitigate the low uptake of specific tree seedlings. If this approach proves feasible, we will consider replacing less favored species with those that are highly sought after by the farmers during seedling production.

Additionally, we intend to conduct intensive training sessions for farmers, focusing on the socio-economic importance of various tree species and proper tree planting procedures during the seedling distribution process. This initiative aims to enhance farmers' knowledge and encourage greater participation in the planting efforts.

7.2 Lessons Learned

From the challenges that have been noted so far, we have realized the need to fully create sufficient awareness to target farmers on the importance of planting certain species of trees, especially those with socio-economic potentials. We also learned that there is need to distribute seedlings before the onset of rains, especially to farmers in remote areas. It is therefore critical that nursery activities must begin early enough to ensure that seedlings attain plantable sizes before the wet season.

7.3 Future Applications

Timely production of tree seedlings is key. Again, involvement of beneficiaries in the selection of tree species to be raised is important. Constant community members' engagement will be our key priority area and advising them on the best management practices to be applied in tree growing.

8.0 Maintenance and monitoring activities undertaken over the past six months

8.1 General overview

For the first phase of the implementation process we conducted assessment of the farms where trees were planted. We were visiting farms per sub-location and monitoring the progress of the tree seedlings planted and also providing necessary technical advice on maintenance of the seedlings. This includes watering where necessary, weeding and protection of planted seedlings. This was done for three weeks in 12 sub-locations in both wards. This will continue on monthly basis for the first 6 months and every three months thereafter. Where mortalities are recorded, replacements will be made available to farmers.

8.2 Technology and Community Involvement Approach

In monitoring the tree planting progress, we used mobile application called flority. Here we took centrepoints and polygons of the restoration areas. This recorded the name of the farmer, planting date, area of the planting site and number of trees planted. It also recorded the applicable land use type and the distribution of the seedlings planted. The targeted farmers who are the beneficiaries always take care of the trees by maintaining them and ensuring they are protected from pests and diseases. Besides the use of Flority, we also transferred the tree survival data from the farmers assessed into an excel spreadsheet. This will be updated regularly for each farmer to check on progress in survival and the numbers of extra seedlings to replace the dead ones. Such data is envisaged to guide in estimating the total number of seedlings to be raised to cater for replacements.

8.3 Survival rate and growth rate

During the recent assessment conducted in June 2024, the trees planted had about 75% survival rate in the two wards. On the highland side the species had about 80% survival while lowlands had 70% survival. On the higher part *Cupressus lusitanica* (exotic) was the dominant species with high survival rate while the lower side *Azadirachta indica* (exotic) recorded high survival rate. Besides the neem tree, *Moringa oleifera* had higher growth rate since they had an average height of 0.7m metres by the time of assessment.

8.4 Adjustments based on monitoring data

From the field experiences and assessment carried out so far, we have seen the need to improve on the hardening off the seedlings so that when they are taken to the field for planting, they are able to withstand the harsh conditions and the sudden change of environment. Hardening off is the process of exposing a seedling to harsh conditions such as exposure to the sunlight and reduction in the watering frequency. Seedlings hardened off have higher chances of adapting to new conditions hence higher chances of survival. We are also selecting the right size of the seedlings to distribute to the farmers so that we avoid supplying them with overgrown seedlings which if not carefully tended can lead to slow growth rate and high mortality due to shock. These interventions will significantly improve the survival and growth rates of the tree species.

8.5 Replacement Planting

Since the onset of tree planting activities, most seedlings raised were distributed to farmers because the target numbers of seedlings were not met largely because of the unprecedented shortage of quality seed and poor germination for others. The low demand for *Senegalia senegal* is such that about 20,000 seedlings are still available at the nursery. We also retained about 4,000 for each of Neem, *Senna siamea*, *Tamarindus indica* and 1,000 *Ziziphus mauritiana* seedlings for purposes of replacing the dead ones. We are therefore giving farmers the species to replace those that have died. For example, we have since given out 5,600 *Senegalia senegal*, 1,400 Neem, 800 *Senna siamea* and 200 *Ziziphus mauritiana* as replacements.

9.0 Actions the project has taken during the reporting period to support women and/or youth to influence restoration activities and decisions in the project

9.1 Involvement of Women and Youth

During tree nursery site expansion, most of those engaged were mostly women (65%) and youths (20%) and the marginalized (15%). They were also trained on the skills of tree nursery establishment and management as well as importance of tree planting and growing towards environmental conservation. The same was also observed at household level during planting where women and youth were often involved in site preparation, tree planting and weeding, thus underscoring their importance in landscape restoration. In some parts the management and care of the trees was fully dependent on the women and youths and this also contributed to successful implementation of the project activities.

10.0 Contribution to employment

10.1 New people employed on the project

i. New Employees hired in the Past 6 months
263 people were directly employed during the period.

ii. Roles of new employees
During the first 3 months of the project implementation, a total of 263 community members were involved in various activities. All 263 were either full-time employees, part-time employees or volunteers. Out of this, 234 were fully engaged in the initial nursery establishment process. The activities undertaken were land preparation which included nursery site clearance (clearing trees, removing stumps and setting up the nursery beds), mixing of soil, potting, sowing, watering, pricking out, sorting and root pruning among others. They were also involved in tree and aloe seedlings loading for transportation during seedling distribution process. We maintained 5 employees who were normally interchanged to prepare for raising seedlings for subsequent planting season and maintain slow growing seedlings sown in the first season.

iii. Full-Time Jobs
The 5 full-time employees include 4 tree nursery workers and an intern who oversees the nursery management. Among the full-time employees 2 were male and 3 were female. The intern is below 30 years, 3 nursery workers were aged between 30-39years while one (1) was above 40 years of age.

iv. Part-Time
14 enumerators and 12 local administrators who also assisted in identifying the farmers. Enumerators included 6 ladies and 8 men. Local administrators included 4 ladies and 8 men.

v. Volunteers and their roles
There were 3 new volunteers. The volunteers were students on attachment who were assisting in many nursery activities such as sorting out seedlings, labeling, watering, stocktaking, recording seed germination test results and documenting various academic research activities of their interest.
2 volunteers were female whereas 1 was male. All of them were aged between 20 - 30 years.

11.0 Livelihoods benefits

11.1 Training

450 farmers were trained on proper planting procedure, post-planting care and general socio-economic value of different species of trees and aloes.

During the initial community engagements, the farmers were sensitized on socio-economic importance of species the project was promoting. For example *Senegalia senegal* products i.e gum arabic commercialization, *Tamarindus indica* for value addition of products from its fruits.

11.2 Income-generating opportunities

The project will begin addressing income generating activities in the 2nd year where we are planning to distribute bee-hives and processing of aloe products. For example, 1 ha of aloe farm is expected to produce 200-500 litres of sap annually.

11.3 Benefits to the community

Overall, the project directly benefited 713 people across the project area. This included 450 farmers who received aloe and tree seedlings or practiced assisted natural regeneration and 263 employees.

Based on our socio-economic/baseline survey most of the households in the study area has 4 household members on average. Therefore, the indirect beneficiaries from this project in the last six months is estimated to be more than 2,852 people. Tree planting is already an investment for the farmers since some of the early benefits are being realized such as improving soil quality and cover. Aloes are fast growing plants and their benefits would begin to be realized in the 2nd year. In the next few years, other products would be realized in future including fuelwood, bee forage, carbon stock among others.

12.0 Photos for some of the activities during the reporting period

Removal of excess trees and stumps to create space for tree nursery beds. Top soil was also removed from the site to be mixed with sand and manure for raising seedlings

Setting up nursery beds by placing a plastic lining to help to minimize the amount of water applied on seedlings daily and frequency of watering. The lining prevents leakage of the water during and after watering, thus keeping the roots moist for long. It also helps in root pruning by preventing the roots of seedlings from entering the soil

Conducting a roll call of the employees and duty assignment for tree nursery work during tree nursery establishment. Note the gender balance and age of the team

A section of the tree nursery with seedlings ready for distribution

A section of Aloe nursery with seedlings ready for Planting