TerraFund for AFR100 Project Half-Year Report

July – December 2024

1.0: General Progress

1.1. General Summary and Overall Goals

Our 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 second phase of planting, 250 new farmers have planted 23,903 tree seedlings and 365 aloes seedlings provided by the project, while 120 farmers who initiated assisted natural regeneration are actively practicing under the team's guidance. With an average area of 1.2 hectares per farmer, the total area is estimated to be 144 hectares, and a total of 144,000 seedlings raised through assisted natural regeneration. Moving forward, restoration efforts, whether through assisted natural regeneration or seedling planting, are planned to continue over the remaining two planting seasons in both project sites. The initiatives are expected to be increasingly enhanced and refined during these phases to ensure greater success and sustainability. To ensure a consistent supply of seedlings to target farmers, the project team has continued to source seeds from multiple sources to raise aloe and tree seedlings at the KEFRI Baringo tree nursery. During the current reporting period, a total of 73,685 assorted tree seedlings and over 150,000 aloe seedlings were raised.

1.2 Progress So Far, including the Current Reporting Period

Since the inception of the project, we have planted a total of 192,208 trees seedlings, and 30,865 Aloes in the first 2 planting seasons, thereby restoring 192 hectares, 101 hectares in Tenges Ward (highland), and 91 hectares in Marigat Ward (lowland). In the previous reporting period, we planted 169,115 tree seedlings and 30,500 aloes in the two wards restoring a total of 169 hectares, 100,000 cypress seedlings in Tenges Ward and 69,115 in Marigat Ward. In the current period, we planted 23,903 tree seedlings and 365 aloes with 21,701 seedlings planted in Marigat Ward and 1,392 seedlings in Tenges Ward restoring 22 hectares in Marigat Ward and 1 ha in Tenges Ward. The numbers of seedlings raised in the reporting period were far below the target largely due to poor germination of selected species e.g *Prunus africana, Terminalia brownii* and *Cupressus lusitanica* among others. At the beginning of the reporting period, we lost a total of 300,000 juvenile aloe seedlings due to damping off disease caused by long periods of overflooding in the nursery. The aloes are very sensitive to waterlogging conditions which inhibit their growth. The seedlings distributed to the target farmers were obtained from our central nursery at Marigat. To support the TerraFund AFR100 Project, the existing KEFRI nursery in Marigat has been significantly expanded. This expansion increased the nursery's capacity to raise over 400,000 tree seedlings and 700,000 aloe seedlings annually, ensuring an ample supply of seedlings to meet the project's targets. Additionally, it is important to note that seedlings from the Farmer Managed Natural Regeneration (FMNR) plots are performing well.

During this reporting period, we have purchased additional tree and Aloe seeds and sown them in the nursery to be ready for planting during the third season which will be the anticipated long rainy season this year (March-May 2025). We are also making good progress in the assessment of seedlings survival as well as sensitization of farmers on

good silvicultural practices such as weeding, spacing, pruning, and protection of the planted seedlings from browsers.

We are still 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 and value-addition techniques. Those who have significant numbers of gum-yielding trees, such as *Senegalia senegal*, or trees producing commercial fruits like *Tamarindus indica*, mangoes, pawpaws, 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

In the next 6 months, we target to raise 400,000 assorted tree seedlings and 500,000 Aloes species, carefully selected based on farmers preferences. In total, we intend to raise 508,000 tree seedlings and 950,000 aloe seeds in the two subsequent reporting periods of the year 2025, which is 400,000 tree seedlings and 500,000 aloes in the January-June 2025 period and 108,000 tree seedlings and 450,000 aloes in July-December 2025. These will be planted during the third and fourth planting seasons, to restore an additional 308 hectares of land. To support this distribution, we will provide comprehensive training sessions on proper seedling handling and care techniques as well as proper tree and aloe seedling planting procedures. These trainings will equip farmers with the necessary knowledge and skills to maximize seedling survival rates and promote healthy growth on their farms.

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 this year, where over 4,000 people are to be engaged, and 22,000 are envisaged to benefit either directly or indirectly.

To date, 298 individuals have directly benefited from the project's activities. This includes 253 people involved in nursery establishment and management activities. 14 enumerators who assisted in collecting baseline data during the identification of potential target farmers. 8 volunteers which include 3 in the first reporting period and 5 volunteers in the current reporting period and 23 local administrators who served as contact persons between the project farmers and the implementation teams.

The 253 individuals engaged in nursery establishment and management participated in a variety of tasks, including but not limited to extraction and cleaning of seeds, site preparation, soil mixing, potting, pricking out, watering, and overall seedling care in the

nursery. Since the inception of the project we have involved 194 women out of 298 individuals engaged in our activities and 189 out of 298 have been youths translating to 65% and 63% respectively. During the reporting period we engaged 7 out of 27 people from the marginalized communities within Marigat translating to 27%.

2.2 Plans for the next 6 months

In the next 6 months during which time we envisage to intensify the seedlings production exercise for the long rain season, we hope to engage 180 part-time persons and 6 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 farmers' preferences and seedling needs after the first phase was the production of seedlings that meet the demands of the target farmers. Highly sought tree species were largely propagated. These included *Grevillea robusta* and Eucalyptus spp for target farmers from highland areas and *Terminalia brownii, Azadirachta indica* and *Grevillea robusta* preferred by farmers in lowland areas. This meant that we scaled down production of tree species least preferred by the farmers such as *Senna siamea* that farmers said affects bees and subsequent honey production. Additionally, we learnt 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 and first season planting experience 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 the 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 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 the 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 last six months of the project, we distributed and planted a total of 23,903 assorted tree seedlings and 365 aloe seedlings to farmers, schools and churches in both Marigat and Tenges wards, successfully planting 23.9 hectares of land. Assisted natural regeneration is also picking up significantly contributing to our overall restoration targets. We observed substantial natural regeneration on selected farms.

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 reporting period, 250 people directly benefited from the project. This included project beneficiary farmers and other community members present during meetings of the seedlings distribution exercise. Besides, early benefits were realized from the project including 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 continuously identify farmers' needs and preferences. This included demand for seedlings of trees with socio-economic value that were not initially included in the project contract or were insufficient in number and seedlings that were least preferred. For example, during the reporting period, farmers requested for the provision of *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 the 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

During the reporting period, the rainfall was depressed in both wards. Prior to planting period reports from Kenya Meteorological Department indicated that rainfall during the season was little. This informed our seedlings' production numbers. As such, a small number of seedlings were raised and distributed to farmers significantly affecting our seedlings production targets. Other challenges included, farmers' reluctance to pick the raised seedlings and lack of capacity to transport seedlings from central nursery to their farms. Similarly, there was general lack of understanding on socio-economic values of some valuable species such as *Senegalia senegal*, *Tamarindus indica* and aloe which have economic benefits of gum Arabic production, tamarind juice and sap/gel respectively.

Moreover, some farmers still did not fully understand the required silvicultural practices for managing seedlings and trees, resulting in low survival and unhealthy growth of the planted seedlings observed in some farms of the participating members.

During the reporting period we also experienced a problem of damping off caused by overflooding in the nursery leading to lose of 300,000 aloe seedlings. This greatly affected the sunken beds.

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 team deliberately created awareness on the importance of the species. 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.

To address the challenge on raising aloes, we purchased basin for use in raising the aloe seedlings before transfering to well prepared raised beds. We also covered the beds using polythene sheets to reduce the intensity of rains and subsequent floods. This has significantly improved germination and reduced mortality rates.

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 and have been raised for this year's planting exercise.

Looking ahead, we plan to increase the production of preferred species that are highly sought after by farmers and are well-adapted to the local environment to mitigate the low uptake of specific tree seedlings.

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.

Lastly, it is important to note that reliance on report from Kenya Meteorological Department is important to inform seedlings propagation to ensure that seedlings raised are commensurate with amount plantable during the 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. Additionally, there is need for continous asssessment of planted seedlings to ensure that any corrective action is taken at an appropriate time.

8.0 M**aintenance and monitoring activities undertaken over the past six months**

8.1 General overview

During the current reporting period of the implementation process, we conducted an assessment of the farms where trees were planted. We visited farms per sub-location and monitored the progress of the tree seedlings planted and also provided necessary technical advice on the maintenance of the seedlings. This includes watering where necessary, weeding and protection of planted seedlings. This was done for two weeks in this reporting period in 10 sub-locations in both wards. This will be continued on a monthly basis for the next 6 months. Where mortalities were recorded, replacements were made available to farmers.

We also did assessment of planted aloe seedlings in Mogotio area and established that farmers were not weeding the aloe seedlings planted on their farms, therefore we enlightened them on proper weeding. Good enough the aloe seedlings registered 98% survival rate.

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 December 2024, the trees planted had about 75% survival rate in the two wards. On the highland side the species had about 78% survival while lowlands had 72% survival. On the higher potential areas of the project, *Cupressus lusitanica* (exotic) was the dominant species with a 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 assessments 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 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 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 irreversible shock. These interventions are envisaged to significantly improve the survival and growth rates of the target 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 poor germination for some seedlings. The low demand for *Senegalia senegal* is such that about 14,000 seedlings are still available at the nursery. We are raising more of climate resilient species such as Neem, *Senna siamea*, *Melia azedarach* and *Terminalia brownii* among others, to improve our numbers in the nursery for replacement of the dead ones.

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

9.1 Involvement of Women and Youth

During the reporting period, our activities in the nursery mostly involved women (56%) and youths (88%) and the marginalized (26%). They were also trained on the skills of tree nursery establishment and management as well as the 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 were fully dependent on the women and youths available at home during the school holidays and this also contributed to the 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

51 people were directly employed during the period.

ii. Roles of new employees

During the current reporting period of the project implementation, a total of 51 community members were involved in various activities. All 51 were either full-time employees, part-time employees or volunteers. Out of this, 27 were fully engaged in tree nursery activities. The activities undertaken were land preparation which included mixing of soil, potting, sowing, watering, pricking out, sorting and root pruning among others. They were also involved in tree seedlings loading for transportation during seedling distribution process. We maintained 27 employees who were normally interchanged to take care of the produced seedlings for subsequent planting season and also maintain slow growing seedlings.

iii. Full-Time Jobs

The 27 full-time employees include 26 tree nursery workers and an intern who oversees the nursery management. Among the full-time employees 12 were male and 15 were female. The 27 nursery workers were in 18-35 years old category. To date we have engaged 253 community members in various tree nursery activities.

iv. Part-Time

We engaged 19 local administrators who assisted in identifying the farmers during monitoring and evaluation visits and also distribution of tree seedlings. The local administrators included 4 ladies and 15 men. All the local administrators were 36+ years old. To date we have engaged a total of 23 local administrators and 14 enumerators as part-time employees in the two project implementation sites.

v. Volunteers and their roles

There were 5 new volunteers.

The volunteers were students on attachment who were assisting in many nursery activities such as extraction and cleaning of seeds, seed pre-treatment, sowing seeds, sorting out seedlings, labeling, watering, stocktaking, recording seed germination test results and documenting various academic research activities of their interest.

3 volunteers were female whereas 2 were male. All of them were aged between 18-35 years. To date we have involved 8 volunteers in our activities over the past 2 reporting periods.

11.0 Livelihoods benefits

11.1 Training

250 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. During the monitoring and evaluation process conducted in Mogotio about aloes we sensitized farmers on proper planting procedures, management practices and general benefits. We also explained to them the existing opportunities arising from the recently constructed Zonken Aloe Company in Mogotio. During this reporting period we also sensitized the community members on the importance of planting and growing *Senna siamea* despite the local norm that it interferes with bee-keeping. We informed them of the benefits as a fodder tree, windbreak and also in intercropping system. This boosted the demand for *Senna siamea* amongst farmers. On proper tree planting procedure, the team demonstrated on the safely removal of seedling from the potting material and the importance of the process since the material can be re-used to raise more seedlings. Some farmers were also informed on the correct size of the hole and how

seedlings should be planted taking into account the positioning of the seedling shoot and care ensuring not burying the leaves.

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.

We have also trained farmers on proper tree nursery establishment and management in some sub-locations, for example farmers in Tebei sub-location, Tuluongoi location in Marigat Ward were trained on establishment and management of tree nursery.

11.3 Benefits to the community

The project benefited 301 people across the project area. This included 250 farmers who received aloe and tree seedlings or practice assisted natural regeneration and 51 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 1,204 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

Watering of seedlings in the Nursery

Distribution of seedlings in Tenges Ward during the reporting period

Sowing of Aloe seeds in basins