# PV CLIMATE

PROJECT DESIGN DOCUMENT

# Nguru Landscape Forest Project

## Nguru landscape, Morogoro, Tanzania

Version 3.0
02 July 2025

Developed by:


Project partners:

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Validated by:

Preferred by Nature

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# Overview

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| **Project Title:** | **Nguru Landscape Forest Project** |
| **Location:** | Nguru Mountains, Mvomero district, Morogoro Region. Tanzania |
| **Version:** | Version 3.0 |
| **Project Coordinator:** | The project is designed, developed and implemented by the PAMS Foundation (PAMS) in cooperation with Trees for All.<br>The contact person for each organisation is as follows:<br>PAMS (Michele Menegon – michele@PAMSfoundation.org)<br>Trees for All (Jeroen van der Horst-jeroen.van.der.horst@treesforall.nl) |
| **Validator:** | Preferred by Nature<br>Contact person: Pablo Rodriguez Noriega<br>prnoriega@preferredbynature.org |
| **Validation Date:** | 02 July 2025 |
| **Project Intervention(s):** | Forest restoration, Agroforestry, Forest protection |
| **Project Participants:** | The project works with individual farmers and village councils. They own the land on which the project is implemented. Participating farmers are subsistence farmers of the local communities. The village council is a component of the village government headed by a chairman whose role is to plan and coordinate activities, provide assistance and give advice to villagers. For the forest restoration and agroforestry components, the project enters into 30-year land partnership agreements with the smallholder farmers and village councils.<br>Community households are the target group in the pilot phase and in the various expansion phases of the project itself.)<br>There are 31 villages in the entire project area and an estimated 2 500 households will participate when the project reaches its final stage. |
| **Project Area:** | The project is located in the Nguru Landscape, covering a total of 6 200 ha to be reforested through forest restoration and agroforestry. As a start of the project, a pilot area of 200 hectares has been planted with native tree species near the village of Pemba for forest restoration in planting season 2023/2024. Another 300 ha in the same area is planted in planting season 2024/2025 for the second crediting year.<br>The overall project region is mainly located in the degraded area (3 200 ha) northwest of Mkingu Forest Nature Reserve, and in the corridor (3 000 ha) between Mkingu and the Kanga Forest Reserve, which is now severely deforested.<br>The project's strategy is to involve villages that are located within the project region in case the villages themselves request to do so and the conditions for inclusion are suitable. In this way, the project is more resilient in terms of reaching the target area (which can potentially be |

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| | exceeded) and has a greater spatial and socio-economic impact on the landscape.<br><br>The progression in terms of reforested area (cumulative) is planned as follows:<br>2023/2024: 200 ha (done)<br>2024/2025: 500 ha (in process)<br>2025/2026: 1 000 ha<br>2026/2027: 1 600 ha<br>2027/2028: 2 400 ha<br>2028/2029: 3 250 ha<br>2029/2030: 4 050 ha<br>2030/2031: 4 900 ha<br>2031/2032: 5 600 ha<br>2032/2033: 6 200 ha |
| **Project Period:** | Crediting period of 30 years with the project starting on the 28 March 2023. |
| **Methodology:** | The project follows the PM001 Agriculture and Forestry Carbon Benefit Assessment Methodology. |
| **Expected Carbon Benefit:** | Forest restoration with tree planting: Roughly we forecast a potential intervention area of approximately 2 500 hectares. The expected sequestration is 495.7 tCO2 per hectare, meaning 99 145 tCO2 for the 200 hectare pilot.<br><br>Assisted Natural Regeneration: technical specifications still in progress. Roughly we see a potential intervention area of approximately 2 500 hectares and expect a sequestration of around 350 tCO2 per hectare.<br><br>Agroforestry: technical specifications still in progress. Roughly we see a potential intervention area of 1 200 hectares and expect a sequestration of around 200 tCO2 per hectare.<br><br>For the total project of 6 200 hectares to be reforested this results in a potential carbon sequestration of 2.35 million tCO2. Note that this figure is on the conservative side. |
| **Expected Ecosystem Benefit:** | Recovery and expansion of the degraded sub-montane forest. Protection of remaining natural forest. Improvement of ecosystem services such as enhancing micro-climate, soil structure, water quality and the overall increase in resilience of the ecological system through the integrated project approach. |
| **Expected Biodiversity Benefit:** | Improvement of the populations of endangered and endemic tree species by planting up to 120 native tree species and assisted natural regeneration. Supporting forest restoration and conservation and hence improving the habitat of numerous elevation-restricted, rare and often endemic plant and animal species of the Nguru forest. Recovery of the forest/wildlife corridor between two Forest Reserves resulting in the re- |

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| | establishment of gene flow between the populations of many species that are now isolated. |
| **Expected Livelihood Benefit:** | Long term annual income for participating farmer households from annual payment and PES scheme as regulated by the partnership agreement. Cash income from seasonal labour from project activities such as nursery work, planting, maintenance and patrolling. Benefits from improved crop production of agroforestry plots and value chain development of crops such as vanilla. Community benefits from additional carbon revenues. |

# Executive summary

The Nguru Landscape Forest Project is a community-based project at landscape level with the mission to bring back the natural forest in the Nguru Mountains of Tanzania. Driven by local demand, PAMS Foundation initiated this project in collaboration with Trees for All. Our focus is on restoring biodiversity, connectivity and functioning of ecological systems on the one hand, and improving livelihood opportunities, resilience and food security of the participating communities on the other. The project interventions are forest restoration by tree planting and assisted natural regeneration, and agroforestry to cover 6 200 ha of the project region. To reinforce the integrated landscape approach, forest protection of the adjacent forest reserves has been added as a project intervention. Long term finance is secured through the sales of carbon credits derived from forest restoration and agroforestry under the Plan Vivo Standard. A first pilot area of 200 ha with tree planting has been started in 2023/2024, followed by expansion with 300 ha in planting season 2024/2025.

Our project area is situated in the Nguru Landscape which is part of the globally important Eastern Arc Mountain forests. This mountain range was first described as distinct from surrounding Afromontane habitats in the 1980s due to the exceptional proportion of rare species. The level of endemism is high. However, the natural forest has declined by more than 70% since the beginning of last century due to agricultural expansion. Also the Nguru Landscape is under severe pressure. The wider project region includes two central government Forest Reserves: Mkingu Forest Nature Reserve (23 888 ha) and Kanga Forest Reserve (7 183 ha) that consist of lowland, submontane and montane forest and which are threatened by encroachment and illegal logging. The surrounding areas are largely degraded by slash and burn agriculture for subsistence needs (maize, cassava, beans) and there are extensive fields of sugar cane, wood plantations and settlements. Some parts are practically devoid of trees.

PAMS Foundation works as a non-profit conservation organisation closely together with communities on anti-poaching and wildlife trafficking and has already established connections with the villages of the Nguru Landscape. In summer 2021 there was the request of the village leader of Pemba to help them out of the vicious circle of land degradation and poverty. After a few informal exchanges and stakeholder consultations with village councils and district authorities, PAMS came up with the plan for reforestation with native trees on fallow and agricultural land of the village households. The proposal is to implement a system with annual payments regulated by a partnership agreement, for farmers that were willing to use part of their land for tree planting and using, appropriately involved and trained, members of the Village Natural Resource Committees (VNRCs) in project monitoring, data collection and assistance activities. In return for the cash during the project lifespan, PAMS receives the rights of the carbon credits to finance the integrated Nguru Landscape Forest project. There was a lot of enthusiasm and willingness amongst the villagers to join. After a thorough FPIC process, a feasibility study & land evaluation assessment, and numerous meetings with authorities and government agencies, this resulted in the design of a project that aims to restore a degraded area of 6 200 ha.

Trees for All came in as a project partner by the end of 2022. As a Dutch Foundation with the mission to reforest the planet with benefits for climate, people and nature, it shares the same values and vision with PAMS. Trees for All amongst others ensures the seed-funding and contributes to the certification process with its technical expertise and experience.

The project started in 2023 with a pilot consisting of the set-up of a community nursery and the planting of a variety of native tree species on 200 ha of land adjacent to Mkingu Forest Nature Reserve. Many women took part in the nursery work and plantings. Due to severe deforestation in the past, we decided that forest restoration by tree planting is the core intervention in the current area of 3 200 ha that nowadays consists of agricultural fields, fallow and abandoned land. The 3 000 ha in the expansion phase is a mosaic of fields, shrubland, severely degraded forest and forest remnants where both tree planting and assisted natural regeneration will take place. The intention is to establish a corridor that connects Mkingu Forest Nature Reserve with Kanga Forest Reserve and ensures the gene flow of many endangered and endemic species.

As mentioned before, forest restoration by planting a mix up to 120 native tree species and partially by assisted natural regeneration in less degraded areas is the principle intervention of our project. However, after consultations with the participating communities we concluded that forest restoration can only be effective if it is combined with improved agriculture and protection of the remaining forests in the area. Based on the needs of the households to diversify their crops to improve resilience and their wishes to get income from products with market value, we proposed the set-up of agroforestry models. Community households can participate on a voluntary basis, receive training from our technical advisor EPINAV, specialised in improving farming practices, and establish their plots based on their species preferences and priorities. Concerning forest protection, we introduced a Village Forest Guards (VFG) program in the project area. Based on PAMS' extensive experiences in the past, patrolling teams will be established that consist of community members and rangers of the Tanzania Forest Service (TFS). The community members who are willing to join, receive a thorough training and become Village Forest Guards. They patrol in the forest reserves and the surroundings to control illegal activities such as encroachment, hunting and logging. Being aware that these guards have not an easy task as many of their fellow villagers are involved in these activities, we use a soft approach with a series of actions aimed at making illegal activities undesirable. The forest rangers will support the VFGs and provide law enforcement for which PAMS signed an MoU with TFS at national level. Next to patrolling, the Village Forest Guards are fully equipped to prevent and extinguish fires.

This integrated approach for the Nguru Landscape Forest Project requires a lot of budget over the long term. We consider the voluntary market of carbon credits as a viable instrument to finance the project activities. Simultaneously, we aim at maximizing the benefits for the participating communities and we see them as the managers over the forest resources in the long term. Due to the focus on social impact combined with reforestation we feel comfortable with the Plan Vivo Standard. We elaborated for this PDD the Technical Specifications for forest restoration by tree planting in order to enhance the issuance of fPVCs for the pilot phase of 200 ha. The revenues of the sale of PVCs will cover the annual payments to the participating farmers and the implementation of project activities such as planting, maintenance, protection and monitoring. We calculated that we pay 74.7% of the carbon revenues as cash to the participants in the form of annual payment, labour payment and village council contribution during the crediting period of 30 years. This is apart from taxes and project investment such as supervision, planting material, technical expertise and equipment.

We expand the project stepwise together with the communities, authorities and other stakeholders in order to bring back the forest cover in the Nguru Landscape. We have planned to restore the 6 200 ha project area gradually in the subsequent years until 2033. At the same time, we started the preparations for the agroforestry component as project intervention which aims to strengthen food security of the participating households and improve income from products with market value such

as vanilla and cardamom. Like forest restoration, we see agroforestry as a credit generating strategy and the technical Specifications are underway. Concerning forest protection as a project intervention, the first patrolling teams with Village Forest Guards have been formed and trained. Their activities supported by the Tanzania Forest Service will certainly result in a decrease of encroachment in the Mkingu and Kanga Forest Reserves and less wildfires and illegal activities in the project area. The revenues from carbon credits from reforestation and agroforestry will cover the costs of forest protection.

The ultimate goal of our project is to restore, extend and conserve the natural forests of the Nguru Landscape in the long term, far beyond the project period. This would have numerous benefits for the ecosystem, the people and biodiversity in the region. In essence, everybody knows and agrees with it. However, the reality is another one and we have to overcome the challenges. As the village leader said: “We would do anything to get out of the challenges we are in.’’ PAMS with Trees for All, the communities, authorities and other stakeholders are deeply engaged in the projects’ outcomes. We aim at a project lifespan of 30 years with carbon revenues to cover the expenses of the activities and ensure financial income for the participants. We have elaborated a solid monitoring scheme to measure the impact of our integrated approach that involves the active participation of the community households in data collection and analysis. Simultaneously, the monitoring results foster transparency, capacity building and ownership.

After project closure, we foresee a transition phase with various scenarios to ensure project permanence. Extension of the crediting period, a selective logging of the planted forests and turning the project area into Village Forest Reserves are amongst the viable options. Key is that the farmer households and village councils continue to receive incentives and benefits. Over time, we firmly believe that the communities can manage their own resources and keep the forests flourishing.

# 1 General Information

**Nguru Landscape as the project region**

The Nguru Landscape is part of the globally important Eastern Arc Mountain forests. This mountain range was first described as distinct from surrounding Afromontane habitats in the 1980s due to the exceptional proportion of rare species. The level of endemism is high. BirdLife International has labelled the area as an 'Important Bird Area' and Conservation International recognizes the Eastern Arc to be part of the 'Eastern Afromontane Biodiversity Hotspot'. The Eastern Arc is also one of WWF's 'Global 200 Ecoregions'. The South Ngurus are particularly important for their amphibian fauna and have more strict endemic species than some entire biodiversity hotspots in the world. The area includes two Central Government Forest Reserves: Mkingu Forest Nature Reserve (23 888 ha) and Kanga Forest Reserve (7 183 ha) that consist of lowland, submontane and montane forest and which are surrounded by extensive areas of subsistence agriculture, sugar cane and teak plantations, woodlands and settlements. The total area of the Nguru mountain block is estimated to be 1 703.26 km2 of which 340.4 km2 (20% of the total) is forest. The mountains rise from 320 m a.s.l. to 2 400 m a.s.l in the Mkingu Forest Nature Reserve. Based on data from weather stations at low and mid-altitude, mean annual temperatures vary here between 12 – 24 °C with rainfall records between 1 000 mm – 2 100 mm per year and peaks of rainfall exceeding 3 000 mm, with considerably more rainfall estimated at higher altitudes.

**Local communities**

The households of the communities in the Nguru Landscape are the target group of the project and consist of subsistence farmers and smallholders. During stakeholder consultations, it appeared that the Wanguru and Wakaguru are the dominant ethnic groups and they consider themselves as the original inhabitants of the area. The Wazigua, Maasai, Waluguru, Wachagga, Wapare, Barabaig, Wabena, Wasukuma, Wakinga, Wahehe, Wangoni, and Wanyakyusa are all immigrants to this region.

**Socio-economic situation**

The main agricultural activities in the Nguru Landscape are the production of sorghum, maize, sweet potato, cassava, yam, sugar and rice. On the western side beans and maize are staple crops, which are traded in the main commercial centre. On the eastern/southeastern side, the Mkindo River, a watercourse in the catchment area, provides irrigation for the biennial paddy cultivation. Sugar cane is extensively cultivated in the areas around the Mtibwa sugar mill, located on the eastern side of the forest reserve. In the areas adjacent to the forest reserve and to some extent even within the reserves, the main agricultural activities are banana, coffee, yam and cardamom. This part of the landscape, on the edge of the Nguru Mountains, is densely populated and serves as a supplier of agricultural products to the commercial centre areas and larger towns in the region.
The southern, western and north-western sides of the forest landscape are characterised by poor accessibility, isolation from markets and very basic social services. Due to these conditions, there is a low level of extraction and trade in forest and agricultural products compared to the eastern side. The population in this area has generally lower welfare levels than the households on the eastern side.

**Drivers of land use change, deforestation and degradation**

According to the data showcased by Global Forest Watch in 2024, between 2002 and 2022, the Nguru Project area lost 4 670 ha of tree cover, representing a decrease of 9.7% of the tree cover measured in 2000. In addition, during the same time period the protected forest reserves close to the project (Mkingu Forest Nature Reserve and Kanga Forest Reserve) lost 1 290 ha, representing a decrease of 5.6% of primary rainforest.

The project region is under pressure mainly due to agricultural expansion. The eastern side is the commercial centre and the Mtibwa sugar mill has attracted many people seeking job opportunities in sugarcane cultivation and processing. Besides the fact that sugarcane production relies on the water sources of the Nguru Forest Reserve, production has had a significant impact on the landscape of South Nguru in several ways. An increasing number of locals are turning to sugarcane production by smallholders as a preferred income-generating activity. As an indicator of the positive economic influence of sugarcane production, an increasing number of houses are being built with bricks instead of the cheaper mud houses. Since firewood is needed for the production of bricks, demand has increased dramatically. This has caused the depletion of most of the remaining trees in the landscape surrounding the forest reserves. In addition, the Mtibwa sugar factory uses a considerable amount of firewood to start boilers in the processing of sugar cane, part of which is suspected to be extracted from the forest reserve. In the forests on the western side of the forest reserve, the trees are already depleted and the firewood and timber situation could create local conflicts in the future.

Cultivation within the forest reserves is an important activity for the local inhabitants. The village of Ubiri is a centre of cardamom production, a perennial crop that requires partial shade and cool temperatures, and for which reasons farmers cultivate it in the forest. The cardamom growers interviewed lamented the lack of other options, besides illegal logging for cardamom cultivation, to obtain a reasonable income. While cardamom cultivation mainly takes place on the eastern side of the forest reserve, cultivation is slowly being introduced on the western and north-western side, as rumours have spread that no penalties are imposed against people who open the forest for cardamom.

Currently, there is a kind of 'open access' to most forest products in most villages adjacent to the forest reserves. A local resident explained the 'open access' situation as follows: “Nguru is open to everyone, but sometimes you have to pay someone to get in.” Particularly in the south-eastern, western and north-eastern parts of the landscape, the locals are used to very limited supervision by the Tanzania Forest Service (TFS), which, partly due to a lack of human and financial resources, exercises insufficient control to ensure adequate protection of the forest. As a result, the Mkingu Forest Nature Reserve and the Kanga Forest Reserve have become prime locations for illegal timber extraction. Timber from forest reserves is considered of higher quality than locally grown eucalyptus and is therefore preferred for the construction of houses and furniture. Another part of the stock is sold outside the villages, in central markets.

Hunting no longer appears to be a widespread activity in the forest reserves as before. Some informants attribute this to hunting in previous decades, which greatly reduced the presence of hunted species and drove the remaining animals deeper into the forests. This claim has been supported by informants living in areas adjacent to the forests, who say they no longer suffer from animal raids on crops. In the Kanga forest reserve, some animal species, such as duikers and

occasionally buffaloes and elephants, are present more frequently, which induces villagers around Mkingu to go hunting illegally in the Kanga forest.

Pastoralists (Wamaasai, Mangáti and Barbaik) use grazing areas within the landscape of South Nguru. They normally enter the landscape for a couple of months during the dry season. Pastoralists graze their cattle in the wider landscape, bordering the forest and occasionally within forest reserves. Grazing patterns sometimes conflict with the interests of local farmers, as they destroy watercourses and fields when cattle cross the area. According to informants, there seems to be a slight increase in the number of conflicts as many areas are becoming drier, forcing herders to move further into the project region.

During field trips of our project team, the following types of disturbance were recorded within Nguru South, Mkindo and/or Kanga Forest Reserves: agricultural encroachment including cardamom, banana and yam cultivation in the forest understorey and forest clearance for bean and cocoa cultivation; timber harvesting; livestock grazing; pole cutting; firewood collection; hunting for duiker, bush pig, primates, hyrax and other mammals; wild bird and insect collection for trade; gold mining; fire and charcoal production. There are also settlements within the Nguru South Forest Reserve at Ubiri. Our team considered that the level of disturbance caused by cardamom cultivation, hunting and timber harvesting had reached critical levels and that urgent action is needed. In conclusion, the South Nguru landscape is a diverse landscape. The area has globally important biodiversity values and it is of national importance for its water catchment services. Threats to the forest are critically high and hence urgent action is required to address these threats.

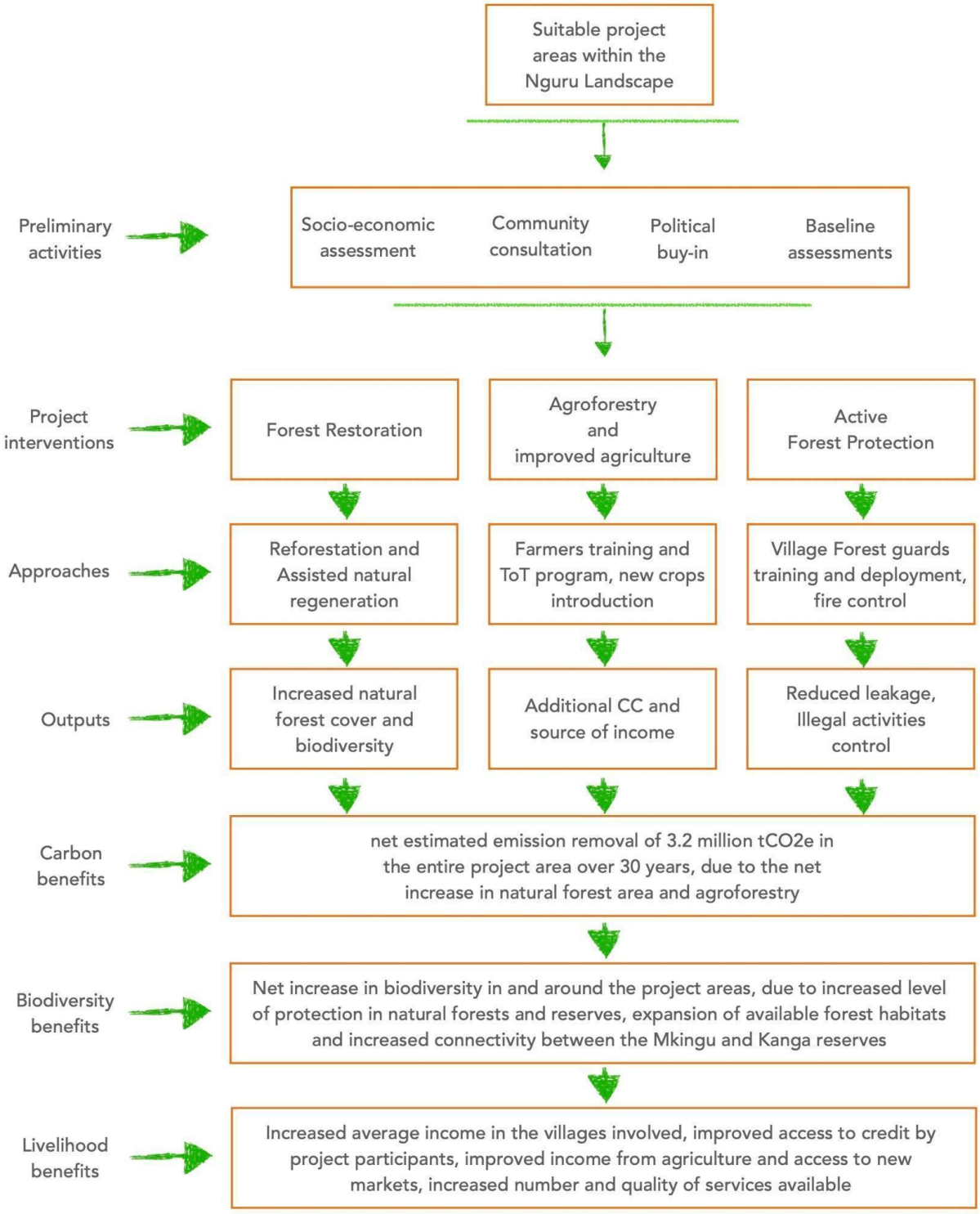
**Tree planting, ANR and agroforestry plan for the total project region of 6.200 ha:**

| Planting year | Tree planting in ha | ANR in ha | Agroforestry in ha | Cumulative project area in ha |
|---|---|---|---|---|
| 2023/2024 | 200 | 0 | 0 | **200** |
| 2024/2025 | 300 | 0 | 0 | **500** |
| 2025/2026 | 400 | 50 | 50 | **1 000** |
| 2026/2027 | 400 | 100 | 100 | **1 600** |
| 2027/2028 | 400 | 250 | 150 | **2 400** |
| 2028/2029 | 300 | 350 | 200 | **3 250** |
| 2029/2030 | 250 | 350 | 200 | **4 050** |
| 2030/2031 | 250 | 400 | 200 | **4 900** |
| 2031/2032 | 0 | 500 | 200 | **5 600** |
| 2032/2033 | 0 | 500 | 100 | **6 200** |
| **Total** | **2 500** | **2 500** | **1 200** | **6 200** |

## 1.1 Project Interventions

The Project Interventions that are carried out to reach our objective and to tackle the drivers of land use change, deforestation and degradation are the following:

**Figure 1**. Summary diagram of project activities and benefits



### 1.1.1 Forest restoration

The forest restoration activity will be carried out in the whole project region, including the pilot of 200 ha and up to 5 000 ha, with the main purpose of further improving the average income from the local community. In our project we distinguish between: a) Forest Restoration on severely degraded land through tree planting (1 111 seedlings/ha) and, b) Forest Restoration through Assisted Natural Regeneration, eventually supported with enrichment planting where needed.

Forest restoration through planting of native tree species is the principle intervention of the project. It involves restoring natural forests with reforestation in the project area of approximately 6 200 ha. This area is currently agricultural land, fallow or abandoned land, which was deforested between two hundred years and a few decades ago. The area borders the forests of the Mkingu Forest Nature Reserve which extends for about 23 388 ha across the South Nguru Mountains. Farming households living adjacent to the Forest Reserve can voluntarily join the project by leasing out a portion of the land they have available for cultivation. In doing so, they get compensation and still have enough land for their own cultivation activities for food security and small-scale local trade. At the same time, they can use the other sections of their land contributed to the project to get extra income related to the project activities. These participating farmers are the primary project activity implementers. Each farmer is responsible for the planting and maintenance on his or her own land. For the work they receive a payment from the project. In case they do not have the time or means to do this work, other people from the community are employed to implement the work on their behalf.

The land contributed to the project for reforestation will be planted with up to 120 native tree species belonging to the natural forest ecosystem such as *Khaya anthotheca*, *Isoberlinia scheffleri* and *Albizia gummifera* (see Annex 17 for the complete species list). The participating households will sign a 30-year land partnership agreement where they commit to the development of the planted trees into a diverse, healthy forest without felling any trees over this 30 years project period. Simultaneously, PAMS commits to pay to the participants an annual payment for 30 years, regulated by a partnership agreement, both to individual farmers and the village councils according to the legal ownership of the plots of land. In order to ensure the compliance of the agreements signed between PAMS and the participating farmers, the district provided technical and legal assistance, and drew up a new land use plan for the area incorporating the land use change, and the issuance of Certificates of Customary Rights of Occupancy (CCRO).
After the period regulated by the partnership agreement, there is a transition phase of ten years (from year 30 to year 40) during which the forest is subject to a Payment for Ecosystem Services scheme extension and a selective logging mechanism that compromises max 1% harvesting of the standing trees per year. We expect to have sufficient funds from the 30 year crediting period to continue payments to landowners from year 30 to 40. Over the next 30 years we will develop a management plan for after year 30. One option we will discuss over the coming years is to incorporate the plantings to become a village forest reserve in order to ensure project permanence.

Concerning the planting strategy, we apply a model with a planting density of 1 111 seedlings per hectare, as this is a necessary trade-off between the costs of producing and planting seedlings and the number of seedlings that would actually be found in a naturally regenerating open field. For the first three years after planting, it is necessary to replant dead seedlings (beating-up or restocking) and to cut back herbaceous and climbing species that might otherwise smother seedlings. We plant a mix of species that includes a large majority (around 80 percent) of pioneer species, which are

adapted to strong light exposures and grow fast. Such a strategy allows canopy closure in a relatively short time, reducing the maintenance significantly. We plant short lived pioneers (as *Trema orientalis, Bridelia micrantha, Harungana madagascariensis)* with a lifespan of 20-30 years together with long lived pioneers such as *Khaya anthoteca* and *Milicia excelsa* which can survive for centuries and become elements of the canopy.

The remaining percentage of the planting mix consists of species with harder, heavier woods that will grow more slowly but live longer and hence take over the place of the pioneer species. The slower growing species, like *Allanblackia stuhlmannii*, *Beilschmiedia kweo* and *Cola scheffleri* are usually species with restricted range, endemic, and at risk of extinction. Moreover, they are species usually producing medium and large fruits capable of supporting a more complex animal community. The density of 1 111 seedlings per hectare also stems from a need to be able to 'standardize' the planting effort and be sure that the correct number of seedlings (and subsequent carbon stocking estimates) is accurate. The number is derived from a 3 m x 3 m planting scheme. Thirty years after planting, the number of standing trees is modelled to drop from 1 111 to 847 (see also the calculations and explanations in Annex 7).

Furthermore, from an early stage we observe natural regeneration dynamics: first from coppice-shoots originating from rootstock left in the fields by the farmers, and later, once canopy closure has been reached, from significant seed fall derived from forest species in the vicinity.

In areas where active reforestation with a density of 1 111 planted seedlings per hectare is not necessary due to the presence of more or less degraded natural vegetation, the project intends to promote the recovery of natural forest using Assisted Natural Regeneration (ANR). The idea behind this approach is to accelerate natural successional processes by removing or reducing barriers to natural forest regeneration, eventually supported by enrichment planting for which we will adhere to the guidelines set forth by the Tanzanian Forest Restoration Research Unit.
The effectiveness and quality of forest restoration through ANR can be significantly improved with some level of enrichment planting. Enrichment planting is particularly recommended where there is insufficient canopy closure due to low densities of natural regenerants or where the desired tree species are absent among the natural regenerants. When the remnant forest is distant from the ANR site and there are not enough seed-dispersing animals, enrichment planting may be required to reintroduce the full range of late successional forest tree species. This process can be implemented during the initial stage of ANR or after three to four years, depending on the level of canopy closure and the species present. Additionally, we will consider the costs and benefits of enrichment planting to enhance the ecosystem.
ANR with enrichment planting will mainly be implemented in the corridor area, between Mkingu and Kanga forest reserves, and possibly in other areas during the expansion phase of the project. It is important to recognize that ANR and enrichment planting are not mutually exclusive options for forest restoration. Even in areas with plentiful natural regeneration, there can be sections that lack enough wildlings to form a tree canopy within the desired time frame. Furthermore, enrichment planting may be necessary to complement natural regeneration for several reasons, such as restoring species that are economically, ecologically or socially valuable.
**For the ANR and enrichment planting approach, we start to establish the baseline scenario in the corridor area by the end of 2024. The Technical Specifications will be elaborated in the expansion phase, after project registration under the Plan Vivo Standard and before the first verification round.**

### 1.1.2 Agroforestry

With the project, we promote agroforestry as a Project Intervention that contributes to sustainable forest management and provides multiple benefits to both the environment and local communities for several reasons. Agroforestry is also a crediting activity and will cover in the end phase 1 200 ha or roughly 20% of the entire project area. Depending on the adopted strategy, it may fall under the current Technical Specifications for tree planting or require the development of new Technical Specifications, which will be produced if necessary.

- Restoring soil health on cultivated farms, thereby increasing the production of subsistence and cash crops and consequently improving the income of local farmers;
- Strengthening food security by improving the cultivation of food crops within agroforestry plots and diversifying the local diet by cultivation of for example fruit trees;
- To provide farmers with legal alternatives to grow crops that need shade, such as cardamom, outside the adjacent Mkingu Forest Nature Reserve, which they currently use illegally for its cultivation;
- Diversifying farmers' income by both including low-maintenance crops such as native forest fruit trees and higher income crops like vanilla;
- Provide farmers with fast-growing, non-invasive tree species for household needs such as the production of poles and wood for house construction;
- Increasing the net carbon sequestration of our project and using the carbon revenues partly as incentives for the implementation of the agroforestry practices.

In addition to what has been described above, the introduction of agroforestry activities, or more generally related to the improvement of agricultural practices, plays a primary role in making the project perceived as an improvement compared to the traditional activities that underpin the household economy in the project area.

**Current situation**

In the current project area, agroforestry approaches are almost absent or badly implemented. Wild trees are rarely left standing and even cardamom that would require tree cover, is very often grown in full sunlight (in contrast to the illegal cardamom farms in the forest reserve that are grown in the shade of large forest trees). Bananas are usually cultivated in full sun too. This is probably due to a situation where species suitable for agroforestry were introduced after the landscape had been massively deforested and plants like cardamom and banana were simply planted in place of maize and beans. Hence, the introduction of agroforestry and permaculture approaches with our project will be carried out in a context where the practice is still little dispersed or not at all functioning in a structured way.

**Identification of areas and selection of crops with the project**

The identification of areas suitable for agroforestry as well as the selection of species to be used and the approaches to be employed, are defined through consultation with the local farmers and supported by the agroforestry and improved agriculture experts involved in our project. This process will start in the course of 2024. Each decision will be made in a participatory manner and in such a way that it meets the primary needs of the rural population. The agroforestry areas will improve pathways and corridors that enable the movement of species, the flow of ecological processes and

the exchange of genetic diversity between forests. The introduction of shade-trees and fruit trees has many reasons:

(i) shade-trees will provide the micro-climatic and edaphic conditions for cash-crops such as Vanilla and Cardamom to grow and provide better yields;
(ii) shade-trees will provide mulch, preserving moisture in the soil in the dry season and increasing soil organic matter and soil fertility;
(iii) shade-trees can be pruned when young, and provide fuelwood and material for construction of small utensils, larger trees can be thinned/felled and provide valuable wood as well as construction material;
(iv) fruit-trees will provide benefits i & ii as well as providing fruits both for local consumption and trade (locally for most fruits and international markets for fruit bearing species such as Allanblackia).

Among the more traditional agroforestry tree species, the project also aims to promote and multiply native bamboo species as a new fast-growing perennial crop within the agroforestry plots of the target communities. We will be highlighting the various applications of bamboo in agriculture, livestock feeding, domestic energy, food and beverage production, household utensils and manufacturing. The potential of this species as a nature-based solution will be highlighted, thus demonstrating how bamboo can serve as an additional source of income for farmers. Furthermore, the project will emphasise the soil-stabilising and soil-improving capabilities of local species of bamboo, as well as its value for carbon sequestration.

**Approach**

The plots where agroforestry will be implemented, are owned by the farmers and are located within the project area. Training sessions and access to demonstration plots will be open to anyone who wants to learn new techniques and implement them on their own land, whether they are participating in the project activities or not. We take this wider approach in order to maximise the impact on the landscape.

Selected agroforestry plots can be interspersed with reforested areas or located in those parts of the project area that are less suitable for forest restoration. In the same way, the land can either be owned by participating farmers or farmers who do not take part in the forest restoration component. The overall aim is to create a mosaic of land uses and to optimise the amount of land under improved management, as well as the related benefits for the local communities. Ideally, by the end of the project lifespan, the entire landscape should be dominated by restored forest and more efficient and sustainable agricultural approaches.

The participating farmers will be taught through a Training of Trainers (ToT) programme at the training centre of our partner EPINAV, which is specialised in sustainable agricultural practices and has extensive experience in training farmers. To support the implementation of agroforestry practices, seedling nurseries of indigenous tree species and other appropriate non-invasive trees will be established or improved, if already existing. The seedlings will be distributed to farmers for planting in their agroforestry plots. In addition, nurseries, partly established ad hoc and managed by local community and partly in the existing sites, will produce seedlings of various crops identified during the farming system analysis, in order to ensure a diverse range of crops for the agroforestry

systems. These activities will strengthen existing farming systems and promote sustainable agroforestry practices in the villages within our project area.

Various agroforestry practices will be implemented (and tested) in the area: on steeper (>30/40°), drier slopes woodlots with very little intercropping will be favoured, while on more gentle slopes (<30°) the density of trees can decrease in favour of a large amount of crops. In this latter scenario, land will be prepared with medium to large terraces, increasing the amount of rainfall absorbed by the soil and drastically decreasing erosion and run-off of topsoil. Boundaries of farmers participating in the agroforestry activity will be planted with fast-growing, non-invasive species such as *Acrocarpus fraxinifolius*, providing fuelwood in the first few years and valuable wood from year 8 onwards (while always providing ecosystem services).

Demonstration plots will be established in the land of farmers who agree first to take part of the agroforestry initiative (early adopters) and in number of at least two per village. Additional tree/bamboo nurseries will also be established to promote alternative and sustainable sources of charcoal production. We plan to implement agroforestry on an area of at least 20% of the reforested area, equivalent to 1 200 hectares in the final expansion phase.

**Market access**

Market analyses will be conducted for the most promising crops to facilitate long-term partnerships with private actors. In addition, we have recently started discussions with the organisation of the international MacFruit fair, which is held annually in Italy. These exchanges are facilitated by a consultant specialised in the sector and the idea is to create a direct link between the project producers and the European market. We also plan to have a stand with representatives of the local farmers at the fair in the 2025 edition. Farmers will be organised into local associations with representatives who will negotiate prices and conditions for the community whenever there is an opportunity to do so, for example at the MacFruit agricultural fair.

Please note that the agroforestry component was not considered a carbon crediting activity during the pilot period of our project. We want to take our time to consult and discuss with farmers about their preferences in terms of species, densities, intercropping models, etc., and we also subcontract an agronomist with vast experience in the project region. In the subsequent phases of the project, we will establish the baseline scenario of the agroforestry component and estimate the tonnes of $CO_2$ sequestered during the years of activity, in order to integrate it with the reforestation component as a crediting activity. **For this, we will start elaborating the Technical Specifications of agroforestry separately in 2025 or later, after project registration under the Plan Vivo Standard and after testing the first AF models.**

### 1.1.3 Forest protection

Unlike the previous project interventions of forest restoration & agroforestry, **forest protection is not a crediting activity**, as the focus is on protection within the Mkingu Forest Nature Reserve and Kanga Forest Reserve which are government owned and managed by TFS and therefore not eligible for carbon credits under the current project set-up. Nevertheless, our strategy aims at increasing the forest cover in the project area together with the forest restoration and agroforestry activities. In fact, this project intervention will strengthen the protection of the existing natural forest in both reserves and their surroundings. The forest protection activity could concern an additional REDD+

project to be implemented in collaboration with TFS within the government protected forest areas (Mkingu FNR and Kanga FR), which would then be in juxtaposition with the current forest restoration project.

The project has already started collaborating with Tanzania Forest Service (TFS) and intends to support the training and deployment of an adequate number of rangers in forest reserves, which are currently the target of poaching, deforestation and intensive encroachment. In close collaboration with the TFS, the approach is to carry out a Village Forest Guards programme aimed at reducing and eventually eradicating illegal activities that are still present in the natural forest. The Village Forest Guards are recruited from neighbouring villages and trained as scouts to undertake patrols. After the training, they start working side by side with the TFS rangers who are responsible for the control of the Nguru region.

This activity aims to make the Mkingu-Kanga Forest Landscape safer by detecting and minimising illegal activities which are the drivers of biodiversity loss and deforestation in the reserves. We plan to undertake regular training, involving 25 Village Forest Guards each time, with the first training already taken place in February 2024. These trainings last between 20 and 30 days and include basic, advanced and refresher training. The course focuses on both classroom and real- life outdoor training, covering issues like survival skills, first aid, tracking, de-snaring, equipment use, maintenance and teamwork. The team also dives down into operational procedures, like data collection and surveillance, investigation and arrest procedures and human rights. Although activities such as arrest procedures will be conducted by the authorised TFS staff, it is advisable that the Village Forest Guards are also familiar with them in order to prevent them from taking actions that compromise the lawfulness of the evidence collected and, above all, that they are trained on the rights of the persons they are dealing with. In addition, it enables them to have a fundamental understanding of the different roles and responsibilities, thereby laying great emphasis on respect for and collaboration with local communities. During these training sessions, good relationships are established and consequently Village Forest Guards act as important informers within a larger informer network. Our approach includes:

- train 2 additional trainers (ToT);
- support VFGs to go on regular patrols in the Mkingu Forest Nature Reserve and, as a long-term plan, in Kanga Forest Reserve.
- support in form of guards allowances, food rations and transport costs, equipment and uniforms.

Each month, Village Forest Guards rotate from a pool of 30, based on previous performance, availability and current health and fitness. Patrol teams are a mix of VFGs from different villages to minimise collusion and may undertake rapid response patrols, responding to illegal activities, especially concerning the control of encroachment due to the illegal cultivation of cardamom in the reserves. At least 25% of the VFG teams shall be composed of women, who will be supported for specific gender-sensitive needs. The patrols will be coordinated by TFS and PAMS, in partnership with the relevant District Game and Forest Office.

The costs of training village forest guards for the project area, equipping them and deploying them are fully covered by our project. Furthermore, in the near future we would like to evaluate a REDD+ project in government forests to strengthen protection activities and expand protection activities in

partnership with TFS. These concern also forest reserves not adjacent to the project area (e.g. Nguu Forest Reserve in the wider Nguru region).

PAMS has vast experience in the training and deployment of rangers and village game scouts for over 15 years, with nowadays over 350 scouts active in the field, especially in the anti-poaching and anti-illegal wildlife trafficking activities. These activities are implemented in close collaboration with government authorities in various parts of Tanzania. Such an approach helps us to conserve the existing natural forest and control or eliminate the possibility of leakages from the project. Within the project area, there is currently very limited control on illegal activities undertaken by the local authorities. The implementation of training, enabling regular patrolling, and facilitating the necessary law enforcement action and prosecution (resulting in heavy fines or even prison sentences) will greatly reduce illegal activities being undertaken. This will be coupled with awareness-raising activities at the village level. Collectively, these actions will discourage individuals from undertaking illegal activities in the current natural forests.

More in general, PAMS works closely with and supports various Government Conservation and Law Enforcement Agencies and the work described in this activity is enabled through MoUs with the Ministry of Natural Resources and Tourism, the Tanzania Police Force, the National Prosecution Services and TFS. See Annex 2 for the signed MoUs.

In order to prevent damage caused to natural forest by wildfire or fires triggered by farmers, the project is also in the process of setting up rapid response fire-fighting teams to ensure that the fire does not get out of control whenever a farmer wants to burn his plot of land, both within the project area and in the surroundings.

**Overview scheme of the 3 Project Interventions in the project area and wider project region:**

| **Project intervention** | **Crediting Activity** | **Area to be reforested (6 200 ha)** | **Project region (including Forest Reserves, 26 433 ha)** |
|---|---|---|---|
| 1.Forest Restoration | Yes | 5 000 ha | - |
| 1.1 Tree planting | Yes | 2 500 ha | - |
| 1.2 ANR | Yes | 2 500 ha | - |
| 2. Agroforestry | Yes | 1 200 ha | - |
| 3. Forest Protection | No | 6 200 ha | 32 633 ha |

**As a result of the integrated approach of these 3 Project Interventions, we expect the following Benefits:**

### 1.1.4 Carbon Benefits

The total carbon benefits of the project are made up by carbon benefits from Forest Restoration and Agroforestry. As mentioned above, Forest Protection will not be a crediting activity. Carbon benefits for the Forest Restoration component with tree planting are quantified using the PM001 method as

explained in Annex 7. For the Agroforestry component and Forest Restoration using Assisted Natural Regeneration the technical specifications still have to be developed. Below we will use very rough estimates to give an indication of the total carbon benefits within the project area.

Agroforestry will take place in the same landscape as Forest Restoration, creating a mosaic of land uses with contiguous natural and agroforestry areas. The total project area consists of two areas of 3 200 and 3 000 hectares respectively. The first area is currently under subsistence agriculture and is practically devoid of any tree cover. We plan to implement forest restoration with a planting density of 1 111 trees/ha on 2 500 ha over the entire project area, while the agroforestry component will comprise roughly 20% of the land (1 200 hectares). Based on the outcome of the technical specification (Annex 7) the Forest Restoration component (2 500 hectares) is expected to generate a net estimated emission removal of approximately 1.24 million tonnes of $CO_2$.

The second area, the Kanga corridor, is partially covered by degraded vegetation. Restoration of this 3 000 ha area will be a combination of Forest Restoration with a planting density of 1 111 trees/ha when there is no tree cover, and Assisted Natural Regeneration when (secondary) vegetation is still present. The technical specifications for the Assisted Natural Regeneration are still to be developed. We use a conservative estimate of 350 ton $CO_2$/ha for this latter project activity, approximately 30% lower than forest restoration with 1 111 trees/ha, to make a rough estimate of the total carbon benefits. Restoration of this second area (2 500 hectares) will account for approximately 875 000 tons of $CO_2$. For the agroforestry component the technical specifications still have to be developed. A conservative estimate of 200 tons $CO_2$/ha and an expected area of 1 200 hectares would provide an additional emission removal of 240 000 tons $CO_2$. This would bring the total estimated carbon benefits to 2.35 million tons of $CO_2$ for the entire project area of 6 200 ha.

### 1.1.5 Livelihood Benefits

The reforestation activity will secure the participating farmers a rent based on a Payment for Ecosystem Services (PES) scheme during the total lifespan of the project. These payments are direct economic benefits from the annual payment to the individual farmer for the contribution of one or more of his plots to the project. Constant, predictable and contractually defined revenue can greatly facilitate the households' access to bank loans. This makes it easier for them to do investments in their own business. In turn, this approach will likely change the basic economic and livelihood structure of the villages in the project area, moving from a situation characterised by subsistence farming to one where it is possible to start diversifying economic activities. Ultimately, each participant will receive, in the long term and in accordance with national policy, a 74.7% share of carbon revenues generated by the project. This includes annual payments (59.3%), salaries to project participants for clearing, planting and weeding (11.4%) and payments to other community members for work in the nursery, seed collection, monitoring and patrolling (3.9%). For a detailed description of the benefit sharing mechanism we refer to section 5.4 of this PDD.

Additional benefits arise from agroforestry and improved farming techniques, both in terms of increased income due to higher productivity of current crops as the introduction of new crops and consequent access to new market areas. Furthermore, agroforestry will be a crediting activity, so an additional share of carbon credits is produced through this activity.

In addition to the benefits derived from the land rents, further benefits are associated with the salaries paid to the households hired by the project or employed in seasonal work. Many people

who do not participate directly in the project, have access to benefits directly or indirectly from the project's presence in the area. The project activities create employment opportunities, also for people who do not participate with their own land, for example in the nursery or during planting and maintenance of the plots. Other examples are the people involved in the forest protection activities such as the village forest guards and rangers. Also the farmers who do not have a partnership agreement with the project, but still can attend training sessions, visit demonstration plots, and have access to new cultivation techniques and/or introduced crops to produce on their farms.

So far, the money received for rent, crop compensation and labour has been primarily utilized by the participating community households to enhance their quality of life. This includes purchasing better food, improving or building houses, and buying motorcycles for transportation and opening new small businesses. Furthermore, the households that run businesses or services locally will also benefit from the increased revenues circulating in the communities of the project area. We anticipate that some services, such as services related to road management, access to health services or to controlled water, or services related to mobile wallets, which are actually rare in the area, will become more widespread and more efficient as a result of our project implementation.

Not less important to mention: the indirect benefits due to the implementation of the project interventions and that will lead to improvement of the ecosystem services (better micro-climate, hydrology, soil), less land degradation and erosion, more biodiversity including pollinators and a healthier environment (more diversity due to agroforestry). The project is also planning to pilot and subsequently implement at larger scale the use of energy saving devices, e.g. gas stoves, to reduce pollution and exploiting the forest for firewood and charcoal. Although very difficult to quantify, these impacts of the project can be considered as long-term livelihood benefits for many community households in the wider project area.

### 1.1.6 Biodiversity Benefits

Our project activities will involve planting of endangered and endemic tree species that are at risk of extinction due to overexploitation and climate change. With the planting of 120 native tree species through the project, we expect an overall increase of biodiversity due to the restoration that mimics the natural, diverse forest. Moreover, the project represents a significant expansion of the sub-montane forest and consequently the habitat of numerous elevation-restricted, rare and often endemic plant and animal species of the Nguru forest. Through our project interventions, we expect better conditions for species such as for example the IUCN vulnerable and decreasing Nguru endemic reed frog Hyperolius burgessi and the Eastern Arc endemic tree Beilschmiedia kweo, and the near endemic Millettia sacleuxii, severely exploited and decreasing across its range. The latter is a poorly known tree that was scientifically recorded and known from seven individuals only after its discovery in 1894, and only twice after 1955, once in 1987 and once in 2004. It has not been recorded in the east Usambaras mountains since 1918 and it is thought to be extinct there. We managed to find two trees in the project area and collected almost 7 000 seeds, of which 5 162 germinated (at the time of writing this document) and are happily growing in the nursery. We believe and hope that these actions may save the species from extinction (see also a recently published article on Mongabay: https://news.mongabay.com/2024/07/extinct-trees-found-in-tanzania-sparks-hope-for-ecosystem-recovery/).
Another significant aspect concerning the benefits for the biodiversity component is the restoration of a forest corridor reconnecting the Mkingu forest with the Kanga forest. In reality, this is a fundamental wildlife corridor that has been absent for decades and which, over time, would allow

for the re-establishment of gene flow between the populations of many species that are now isolated in the two massifs. We expect the passage of species that use the Kanga forest seasonally, such as buffalo, leopards and elephants.

### 1.1.7 Ecosystem Benefits

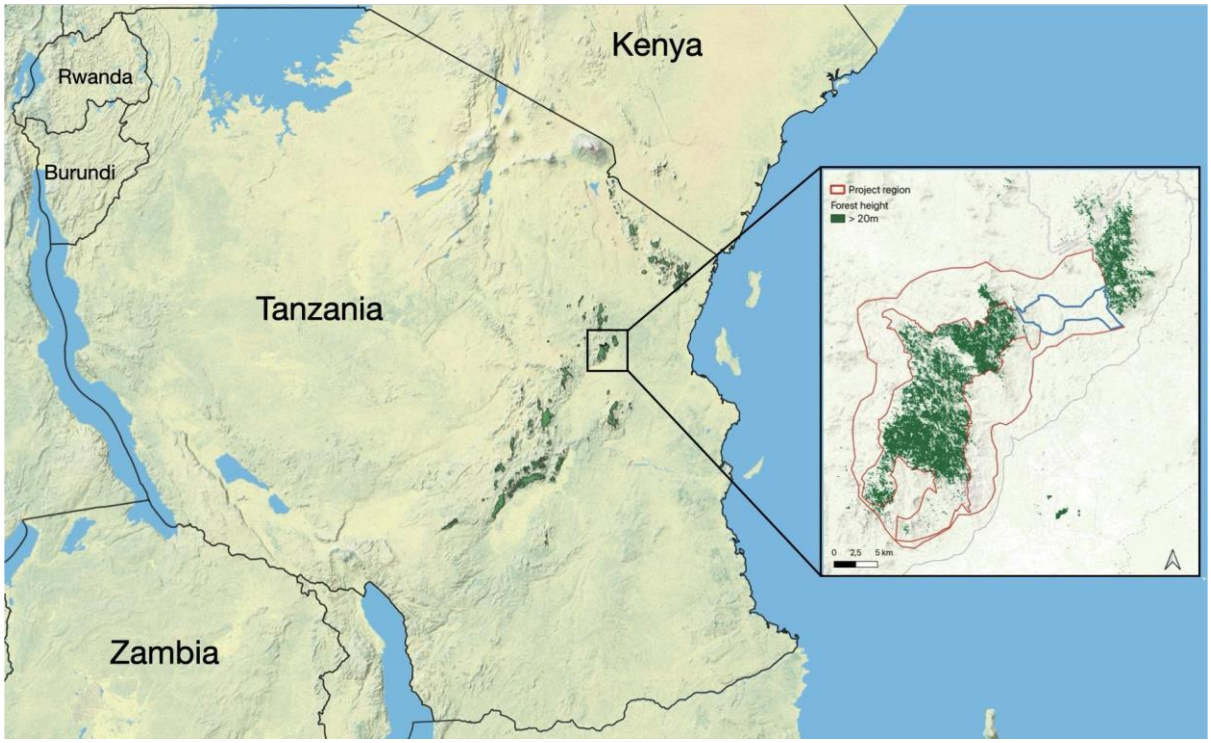
Expanding the forest area through Forest Restoration would significantly increase the area of sub-montane forest. Moreover, Forest Protection as part of our project intervention will lead to less deforestation and degradation in the Mkingu Forest Nature Reserve and Kanga Forest Reserve and eventually facilitate natural regeneration. As a result, we expect a positive impact on the frequency and predictability of rainfall at low altitudes. Further ecosystem benefits concern improvement of soil structure, stabilisation of soil fertility, avoided erosion and improvement of both surface and ground water quality and the general increase in the resilience of the ecological system that the project helps to create.

## 1.2 Management Rights

### 1.2.1 Project Boundaries

**Project region**

The project region is located in the Nguru landscape with the Nguru Mountains (with the Mkingu Forest Nature Reserve) and Mount Kanga (with the Kanga Forest Reserve). The Nguru Mountains, whose height rises from 320 m a.s.l. to 2 400 m a.s.l. within the Mkingu Forest Nature Reserve, are located in the Mvomero District of the Morogoro Region in Tanzania. As mentioned above (see 1.1), this region is part of the globally important Eastern Arc Mountain forests.



**Map 1.** Geographical location and extent of the project region. The map in the inset shows in green the area covered by forest with trees equal or taller than 20 m. which roughly corresponds to the protected areas of Mkingu Nature Forest Reserve (inner red polygon) and Kanga Forest Reserve. The area between the forest (inner red polygon) and the red outer polygon represents the project region, where project activities can take place The blue polygons in the inset represent the area identified as corridor (see also Map 3).

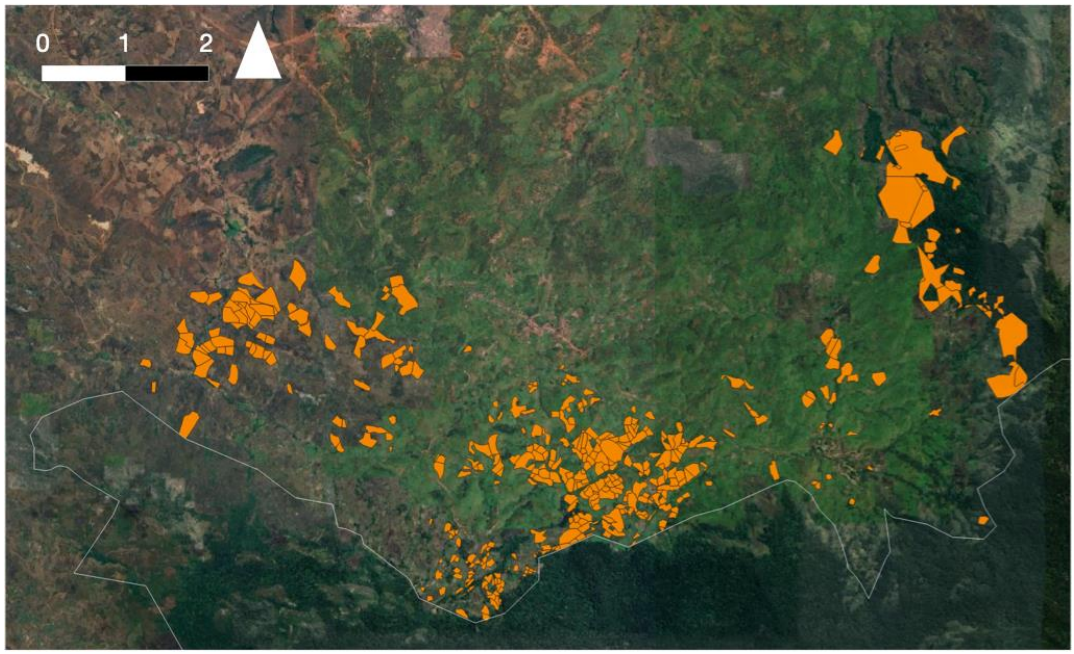
**Overall project region of 6 200 ha to be reforested**

The actual project region includes most of the environmentally suitable areas around the Nguru South massif (which includes the Mkingu Forest Nature Reserve) and part of the area between the Nguru South massif and Kanga Mountain (which reaches the foothills of the Kanga Forest Reserve).

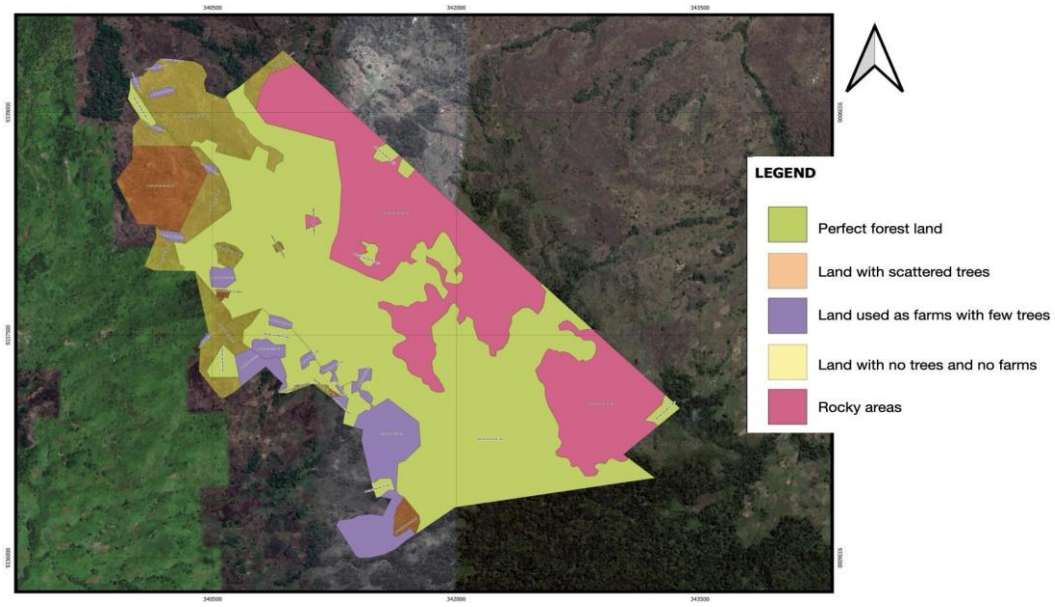
Within this project region, two main areas of respectively 3 200 ha and 3 000 ha each have been identified and form the core of our project. There is the possibility to include smaller areas. From this total of 6 200 ha approximately 80% will be restored by tree planting and ANR, and 20% will be allocated to agroforestry.

Within the project region two main current project areas are identified:

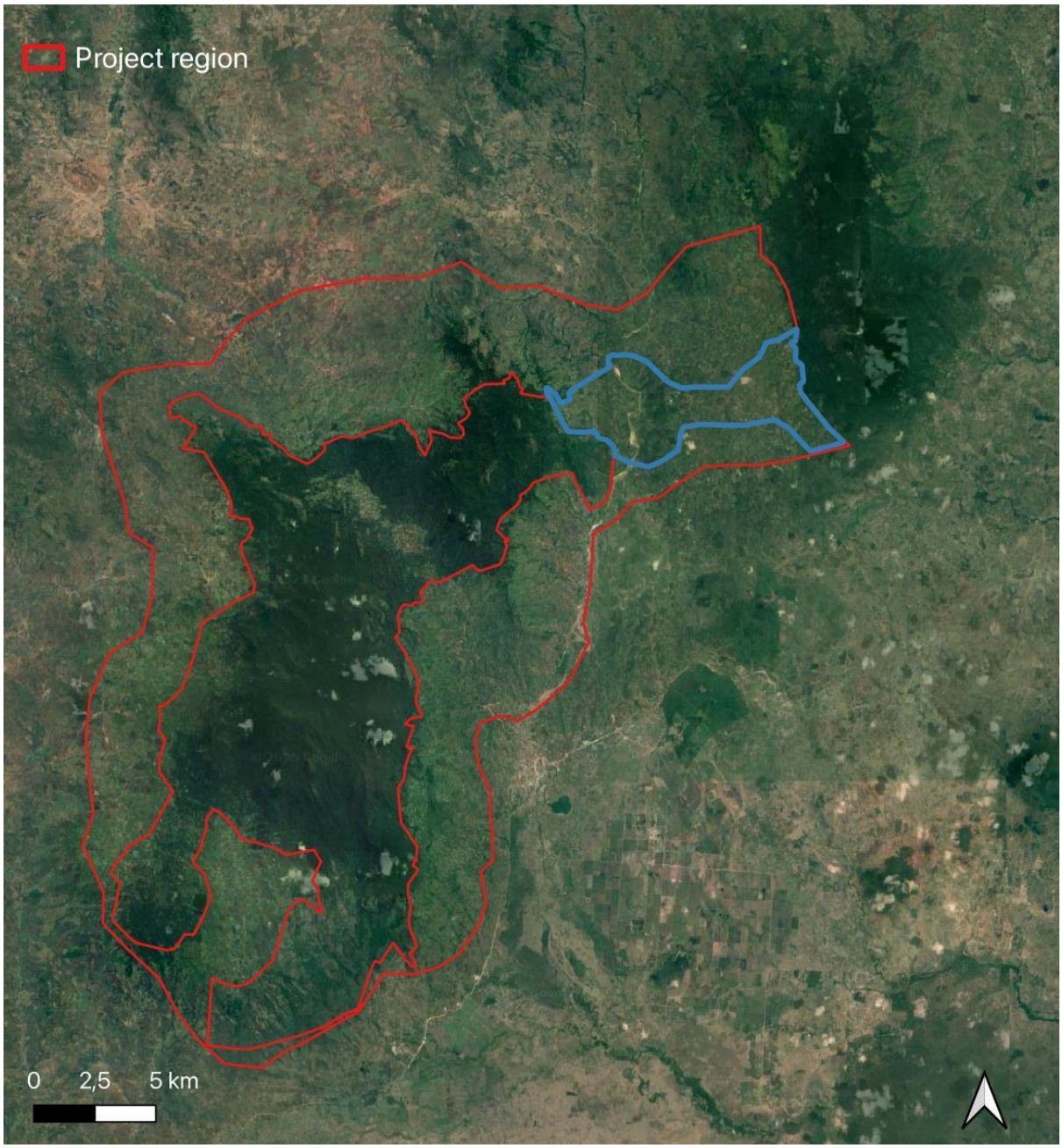
1. **Pemba and Gonja Villages** in the Nguru landscape, **measuring a total of 3 200 hectares** and which includes the current 200 ha pilot area. The pilot area will be used to test and develop best practices, which can then be scaled up in subsequent phases of the project. This will cover developing community empowerment and benefit sharing mechanisms, technical and operational approaches, reporting and monitoring mechanisms and financial models.
2. **Corridor area of 3 000 hectares** between the Nguru mountains (with the related Mkingu Forest Nature Reserve) and Mount Kanga (with the Kanga Forest Reserve), which are now separated by a deforested valley of approximately 5 km wide. The project activities start in the next phase. Once reforested, this corridor connects the Mkingu Reserve with Mount Kanga.




**Map 2**. The map above illustrates the farms participating in the project as of April 2025. The white line represents the boundary of the Mkingu Nature Forest Reserve while the larger polygons on the right represents the platable areas of Vuga Village Forest Reserve, located within Gonja village land and included as part of the project. Different areas have been identified to isolate plantable zones while excluding forested and rocky areas from consideration. A detailed view of Vuga is provided in the map below.




**Map 2.1**. The map provides a detailed view of the various land uses within the Vuga Village Forest Reserve, allowing for the identification of areas suitable for planting.




**Map 3.** The map above illustrates the project region, defined by the area between the outer red polygon and the boundary of the Mkingu Nature Forest Reserve. It also highlights the designated corridor, where remote sensing analysis of vegetation has been conducted. Please note that the final shape of the corridor may vary.

**Pilot area of 200 ha and the Village Forest Reserve**

The project area is located in the Nguru Landscape. A pilot area of 200 ha has been planted in Pemba and Gonja villages in planting season 2023/2024. Pemba and Gonja Villages are located in the northeastern part of the Morogoro Region along the Nguru Mountains. The Villages are some 45 kilometres from Turiani Town and the two places are connected by a graded earth road. The pilot area, which is formed partly by Disanga and Ndeme A hamlets in Pemba village land and by hamlets in Gonja village land, can be accessed by a narrow earth road that traverses a hilly landscape.
The village of Gonja also decided to participate in our project with 3 separate, partially cultivated Village Forest Reserve (the yellow area on the right side of the map above). In this case, the areas to

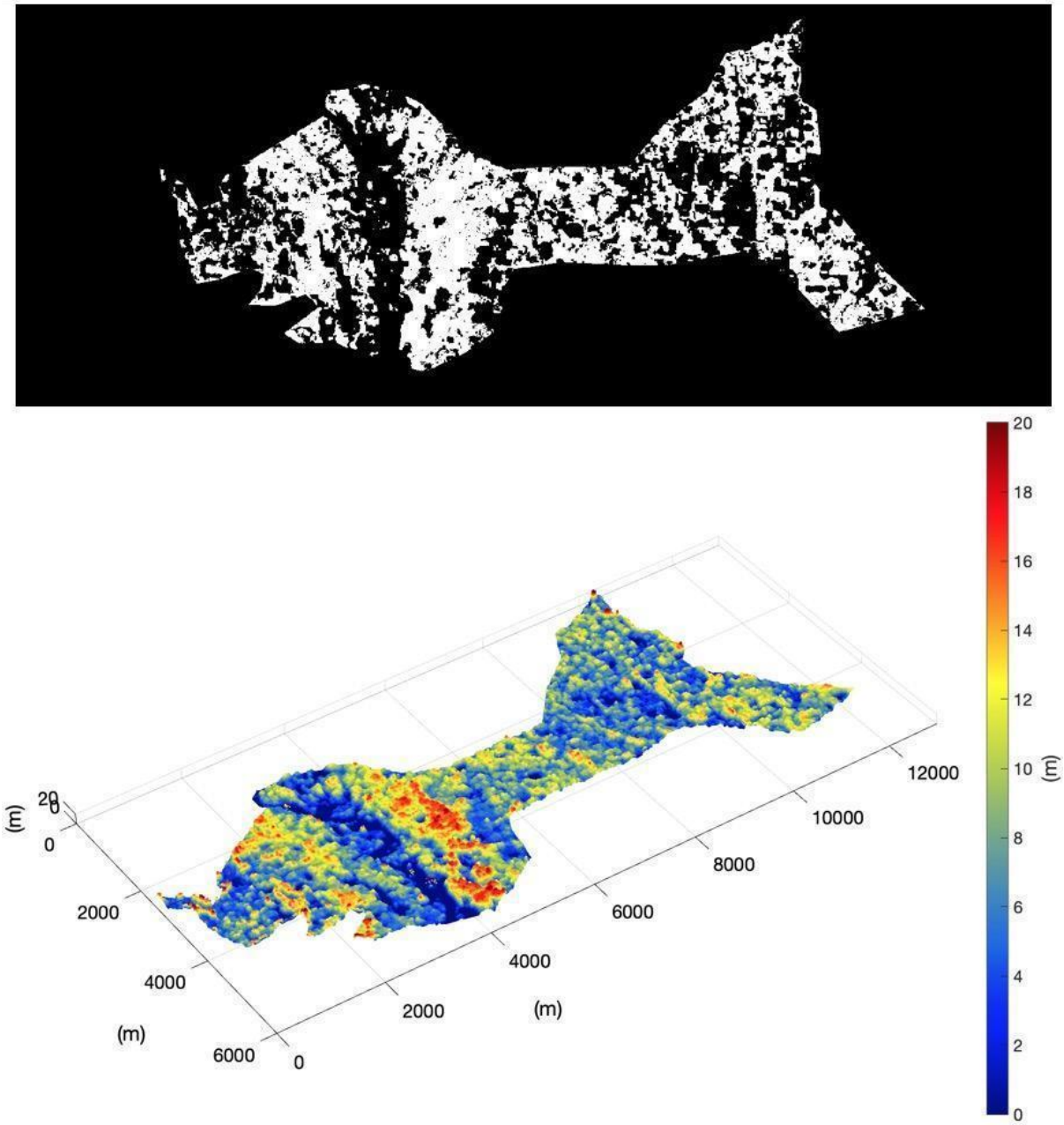
be reforested, totalling about 100 ha, could be sufficient to produce the necessary resources to ensure the effective protection of areas where the forest is still in good condition.

**Corridor area**

The corridor is located in the territory of Msolokelo, Difinga and Kwadoli villages and covers the area between the Nguru South and Kanga Mountains. It is an area of great ecological importance as it serves to re-establish connectivity between the Mkingu Forest Nature Reserve and Kanga Forest Reserve (see Map 4 & 5 below).


**Map 4.** Satellite image showing the approximately 3,000 ha polygon representing the corridor connecting the Mkingu Forest Nature Reserve with the Kanga Forest Reserve (see also map 5).

Reforestation activities, similar to those in the Pemba/Gonja area, will be combined with Assisted Natural Regeneration (ANR) in the corridor as this part of the project area is covered with degraded and secondary vegetation. The assisted natural regeneration approach should recover a vegetation structure similar to the original forest. In locations where ANR is not feasible, enrichment planting will be carried out. As the corridor area is a combination of farmland and patches covered by secondary and/or degraded vegetation, we used remote sensing data (NDVI and GEDI satellite data on tree height) to estimate the proportion of land to be planted and the proportion in which to intervene with ANR. These data also help us to establish the baselines.




**Map 5.** These maps show the areas where the combination of tree height based on GEDI satellite data is greater than 5m and the maximum NDVI value between January and October (when deciduous trees have their leaves) is greater than 0.5, thus highlighting the areas (in white on the map) that are covered with shrub or tree vegetation, in this case 52% of the total, which will be subject to ANR (above). The second (below) map is a 3D representation of tree height based on GEDI data, where the colours identify the height of the trees. Areas from deep blue to pale blue might therefore be suitable for reforestation, while in areas ranging from blue/green to red the ANR intervention might be more appropriate.

### 1.2.2 Land and Carbon Rights

In Tanzania, land is categorised from Management and Administrative perspective into three components: Village Land, Reserved Land and General Land. Village Land is land found within the boundaries of a village, Reserved Land is land which is reserved for specific purposes such as forests or public infrastructure and utilities, meanwhile General Land is land which is neither Village Land nor Reserved Land. The administration of General Land is vested in the Commissioner for Lands who issues the Granted Right of Occupancy. Village Land is administered by Village Councils which may issue a landholder with a Customary Certificate of Right of Occupancy (CCRO) while Reserved Lands are administered by specific statutory bodies or authorities.

The Project Area is located within village boundaries, thus the entire Project Area is held under a customary tenure system, which is administered under The Village Land Act CAP 114, RE 2019. According to section 27 paragraph (a) of CAP 114, the ownership of the Village land can be provided in an indefinite term under the CCRO. Villagers usually do not have any formal documents certifying ownership or right to use the land they cultivate. One of the benefits they receive from our project is the processing and covering of costs for issuing individual CCRO certificates, which subsequently demonstrate a customary ownership right to the land (whereby one formally acquires an asset that can be used, for example, to request a bank loan). Once issued the CCRO, the village council may determine and require the holder to pay annual rent. However, such practice is left at the discretion of the Village Council and upon consultation of the Land Commissioner.

The land on which the project is implemented, is owned by individual farmers and village councils through the traditional/customary ownership. When an individual farmer or community household wishes to participate in the project, they do so by making part of the land they cultivate available, and only then can they participate. Most of the land parcels of individual farmers rented out to the project for tree planting are between 0.4 ha to 2.0 ha (1 to 5 acres in size).
If the land belongs to the village, the participating entity is the village. If there are farmers cultivating land owned by the village, the village can ask them to leave that land and assign another land to the farmer, or let the farmer cultivate it. The village has a few plots of larger size, up to about 50 acres.

In preparation of the pilot area of 200 ha for our project, two surveys were conducted to all 215 land parcels in Pemba village. The first, aimed at determining the socio-economic situation of the local communities, was conducted by PAMS staff. The second was carried out by a team of specialists and had as objective to determine property boundaries, ownership, crops cultivated on the land and associated income, and land value. Both assessments can be found in Annex 18. This approach used for the pilot will continue in the subsequent phases, including procedures for issuance of CCROs.

Our project enters into 30-year land partnership agreements with the farmers and village councils that own the project land. The reforestation area includes areas owned by both individual farmers and the village. The owners of the land, whether the land is privately owned or belonging to the village, receive annual payments for the reforested land. Partnership agreements are examined by the district attorney, district and village authorities and are signed with the corresponding village councils and households.

A team of land valuation and leasing experts conducted a detailed survey of all properties to GPS the boundaries, studied the relevant documents and checked that neighbouring properties were in agreement on the boundaries (see the box at the end of the paragraph for quality control procedures). A file was then compiled in which each owner identifies his plot, posing in a photograph with a placard noting the details of their plot, including land registry number and size, so

as to certify that there are no boundary disputes. In addition, each plot has been georeferenced and mapped, and all characteristics entered into a database.

As a next step, a Certificate of Customary Rights of Occupancy (CCRO) has been established in addition to the partnership agreements that have been signed with each owner or with the village council in case the land belongs to the village and which binds the use of the land for the project. The Village Land Act of 1999 vests the ownership of rural land in the Village Councils and individuals, grants villages the right to specify zones for land use and create Village Land Forest Reserves and recognises CCRO as proof of ownership by an individual. CCROs are used to formally allocate parcels of village lands to individuals or groups. The collective nature of the title means that transactions and subdivisions can only take place with the consent of the entire group, thus providing greater tenure security to at-risk communities and minorities.

Due to the implementation of our project, a new land use plan for the current project area of 3 200 ha within the village of Pemba and Gonja was drawn up in cooperation with the district authorities who update the established uses of the various areas within the project area. The combination of individual contracts, the updated Land Use Plan and the CCRO, which involves the entire community, provides an effective tool for forest restoration and agroforestry models over the long term.

The right to the benefits generated by the sequestration of $CO_2$, e.g. through the sale of carbon credits in the voluntary carbon market, belongs to PAMS. Partnership agreements regulate the transfer of carbon rights to PAMS in exchange for a 30-year annual payment. Thus, the project follows a Payment for Ecosystem Services schedule where PAMS receives the carbon credits and the participants get the annual payments in order for planting, maintaining and protecting the trees on their land. The project aims to sell them as fPVCs and rPVCS in the beginning with an option to eventually sell vPVCS in the expansion phase. For the 200 ha pilot with tree planting, Trees for All will retire the allocated fPVCs and cancel them from the Market register. If any PVCs are for resale in the expansion phase, we make sure that the participating farmers receive maximum benefits from the final market price. See also the partnership agreement in Annex 12.

**Quality management for the survey of land parcels** as conducted to all project area sites involves both Quality Assurance (QA) and Quality Control (QC) to ensure accuracy and compliance.
As part of Quality Assurance, stakeholder awareness creation is conducted for landowners and local leaders to explain the survey process, the importance of each step in ensuring accuracy, and the roles of each stakeholders. In conducting the actual survey, neighboring land parcel owners are normally engaged to verify the correctness of the recorded boundaries. They fill out attestation forms, which are further validated by the village chairperson, to confirm the accuracy of the boundaries shown by the specific project area owner. Additionally, the survey is conducted in the presence of a local leader, typically a member of the Village Land Committee, as part of validation. High-precision equipment, such as Differential Global Positioning Systems (DGPS), and standard software packages like Quantum GIS (QGIS), are also used to minimize errors (into millimeters) during data collection and processing.
Quality Control focuses on verifying the accuracy of the survey outputs. A senior registered and licensed land surveyor checks and confirms that all farm boundaries have been correctly joined and that all corner points have been accurately connected. Each project area is individually inspected to ensure precision. Furthermore, since the project area is adjacent to the Mkingu Nature Reserve, special attention is given to ensuring that all surveyed parcels lie within the village boundaries and do not encroach upon reserve land. Together, these QA and QC measures ensure accuracy of the survey results.

**Table 1.3.2 Land and Carbon Rights (summary)**

| Project Area | Ownership and user rights status | Carbon rights | Evidence |
|---|---|---|---|
| The project area falls entirely within the lands of several villages that are administered in the same way. Consequently, regardless of which village it is, we consider the various portions of the project area as a single administrative entity. | Being within the village boundaries, the entire Project Area is held under a customary tenure system, the administration of which is as provided by The Village Land Act, CAP 114, RE 2019, and administered by the Village Councils. Moreover, according to section 27 paragraph (a) of CAP 114, the ownership of the Village land can be provided to an individual/household in an indefinite term under the issuance of a Customary Certificate of Right of Occupancy (CCRO). | Payment for ecosystem services agreements regulate the transfer of carbon rights from the participating household to PAMS in exchange for a 30-year annual payment. Thus, PAMS receives the carbon rights and the landowner receives annual payments. The project must be registered as a carbon project in line with the National Carbon Trading Guidelines, OCT 2022 and the Environmental Management Act, Cap191 (See Annex 19). | The annexes illustrate respectively the national policy regarding projects producing carbon credits (Annex 19), the example of a partnership agreement (Annex 12) regulating the transfer of carbon rights, and an example of a CCRO certificate issued to farmers participating in the project (Annex 20). |

# 2 Stakeholder Engagement

## 2.1 Stakeholder Analysis

### 2.1.1 Stakeholder Identification

**I Primary stakeholders**

I-A Project proponent & project partner

**PAMS** is the owner of the Nguru Landscape Forest project and in charge of project planning and coordination, central and local government relations, community relations, implementation on the ground and signing of agreements and monitoring (see also 2.2 for a broad description). PAMS has no permanent presence in the project area, but is present in the field with a project team during the project implementation phase. We also have a field office and accommodation located in Pemba.
The Dutch Foundation **Trees for All** is the direct collaboration partner of PAMS for the project. Trees for All acts as the main donor, collaborates on the certification process and facilitates the sales of PVC's. Trees for All has no presence in the project area, but carries out regular field visits for engagement and monitoring purposes. The division of roles and responsibilities between PAMS and Trees for All for the entire project lifespan is further outlined in table 2.2.2.
PAMS and Trees for All share the same vision in carrying out projects for the benefit of communities, ecosystem restoration and climate mitigation. We have common values and ethics and complete each other with expertise in organisational & financial management, project implementation and communication.

**I-B Local stakeholders**

**Village households in the project area**: individual farmers own the land on which the project is implemented. The number of participating households is estimated to be around 2 500 for the entire project area of 6 200 ha and 185 for the 200 ha pilot plot. The project enters into 30-year partnership agreements with the smallholder farmers that voluntarily set aside a part of their land for reforestation. Households that own land within tree plantation area, receive annual payments for their parcels that have been planted. Partnership agreements are examined by the district attorney, district and village authorities and then signed with the corresponding households. In addition, many of the local households who contribute their land to the project, are employed in the project on a full time or seasonal basis to carry out activities such as planting, weeding and patrolling. Moreover, village households will profit from the implementation of agroforestry activities to improve their subsistence production and income from the harvest of crops such as vanilla and fruits.
Notice that we expect that there will be no need to hire labour from outside the local villages, as the type of work envisaged by the project remains substantially within the framework of agrarian activities traditionally conducted by the participating community households. Often, there is a temporal displacement between the labour needs on the farms and in the restored areas, allowing for efficient use of local labour resources. We have successfully managed the first 200 hectares without needing to hire extra labour, and the population density appears consistent across the entire project area. Population density may be lower in the corridor area but there we work mainly with ANR and enrichment planting which require substantially less labour.

**Village councils of Pemba and various sub-villages**: the current reforestation area is 3 200 ha and is located in the village of Pemba and the two hamlets Disanga and Ndeme, which have a total of 8 700 inhabitants. The corridor of 3 000 ha, which will be restored in the next phase, includes the villages of Digalama, Difinga and surrounding sub-villages. Villages are governed by Village Councils. The Village Council is composed of a president or chairperson elected by the village assembly and village committees dedicated to issues such as planning, finance, economic affairs, social services, security, forest protection, water resources, and so on. The functions and roles of the Village Council include planning and coordinating activities, assisting and advising villagers engaged in agriculture, forestry, horticulture, industry or any other activity, and encouraging village residents to undertake and participate in communal enterprises. In the context of our project, Village Councils receive annual payments for planted land that has not been claimed by any family that can prove ownership. Partnership agreements are signed with the corresponding Village Councils for the project period and they receive annual payments that should be used for activities and services which benefit the entire community. Again, the annual payment mechanism is examined by the district attorney, district and village authorities.

**Village Natural Resource Committees and CBOs:** as envisaged in the 2002 Forest Act, villages can form Village Natural Resource Committees (VNRCs), defined as committees responsible for the overall management of village forest areas on behalf of the Village Assembly. The VNRCs play an important role when it comes to the management of land and natural resources. They control illegal activities, facilitate the demarcation of land for individuals and land under forest management and conservation, coordinate and plan reforestation initiatives on village lands, including preventing or discouraging any type of agriculture or encroachment into the forest. Moreover, the Committees control fires both in the forest adjacent to the village and in the project area itself through the formation and operation of firefighter teams, and promote accountability among community members and update on forest management guidelines.
Given their relevance for the project, we will provide capacity building in Natural Resources management and monitoring, and operationalize the VNRCs in the concerned villages. Preliminary discussions with District authorities and the Tanzania Forest Service will be held in order to have full agreement on the roles and modes of operation. Additionally Community-Based Organizations (CBO) which are locally formed and officially registered groups representing community members who come together to address common needs or interests, play a crucial role in fostering development by promoting collaboration, sharing knowledge, and mobilizing resources. They act as a bridge between communities and external stakeholders, such as government agencies and development partners like PAMS, and are often involved in managing natural resources, supporting agriculture, and implementing community-driven projects to improve livelihoods and sustainability.

### II Secondary stakeholders

**District, regional and national authorities**: the Mvomero District and the Morogoro Region are also involved in the project, ensuring that the actions undertaken comply with national laws, local and national development plans, and providing technical and legal assistance on actions such as updating the land use plan, issuing the CCRO's and providing general technical and legal assistance. Their involvement follows a series of introductory meetings of the project at both the Morogoro Region and Mvomero District levels, in order to create a common understanding of the project activities and

its benefits, who all will be involved in the project, land management, livelihood and biodiversity benefits, as well as compliance with regional and national laws and regulations.

**Tanzania Forest Service (TFS)**: is a semi-autonomous government Executive Agency whose establishment is supported by the Executive Agency Act, the National Forest and Beekeeping Policies. TFS is administered through The Forest Act and Beekeeping Act, which provides a legal framework for the management of forests and bee resources. The agency develops and manages forest and bee resources sustainably in collaboration with stakeholders in order to deliver sufficient and quality goods and services to meet local and international socio-economic and environmental needs. TFS is the main partner with regard to the protection of the natural forest adjacent to the project area and is the government agency mandated to work in this meaningful sense.
In collaboration with TFS, we recruit personnel from the local community for the set-up of our forest guard's programme. The selected community members receive extensive training and form teams of forest guards that will carry out law enforcement in the natural forest and do regular patrolling in the project area. Where and when needed, they will team up with TFS rangers. The relationship with TFS is guided both by a MoU between PAMS and the Ministry of Tourism and Natural Resources, under which TFS is governed, and a MoU recently signed directly with TFS (Annex 2), which provides guidelines for the collaboration between PAMS and TFS on forest conservation activities, *sensu lato*, in Tanzania, involving projects implemented by PAMS. The plan is to ensure the protection of natural forests well beyond the lifetime of our project, so the relationship with TFS is a long-term one and the MoU will be renewed in case. (the MoU between PAMS and TFS also covers nature conservation activities in other areas of the country).

**National Carbon Monitoring Center (NCMC)**
The National Carbon Monitoring Centre (Based at Sokoine University of Agriculture and managed in collaboration with the Vice President Office through a co-chair of the NCMC Board) has the role of approving and verifying projects on Tanzanian soil that produce carbon credits and ensuring that the projects are conducted in accordance with national policy. The specific objectives of the Centre are:

- To manage, develop, sustain operations of the national GHGs inventory and REDD+ MRV systems and facilitate validation of results for the UNFCCC and International community in collaboration with VPO;
- To maximise usefulness of the data generated and develop different programmes and projects with a technical GHGs and REDD+ MRV component and define steps in MRV training, researched, consultancies and dissemination;
- To coordinate national GHGs inventory and national forest inventories;
- To harness available national capacity and support from regional and international expertise to operationalize the GHGs and REDD+ Inventory System; and
- To advise policies related to GHGs emissions and mitigation actions.

All projects involving the production and sale of carbon credits in Tanzania must be approved by the NCMC, and the approval occurs following the submission of the project document (the PDD in our case) and hence allows the project to legally produce carbon credits in Tanzania. In our case, the application form, which is based on the PDD, and the necessary documents have already been submitted, after all the relevant points were clarified in a series of meetings to ensure that the way the project was developed and implemented was compliant with the national regulations. Currently, we are waiting for the final approval.

**Table 2.1.1 Stakeholder Analysis**

| Stakeholder Group | Stakeholder Type | Impact | Influence | Engagement |
|---|---|---|---|---|
| Village households | Local stakeholder | Highly positively impacted by the project | High positive influence on the project | Involved in the project design, annual payments for contributing private land through agreements, participation and paid labour for planting, maintenance and protection of the reforestation sites, harvesting and income of AF-products, active participation in long-term monitoring. |
| Village Council | Local stakeholder | Highly positively impacted by the project | High positive influence on the project | Support in land use planning and stakeholder consultations, annual payments for contributing village land through agreements, revenues for community development and improvement of rural livelihood, diversification of products from AF. |
| Village Natural Resource Committees | Local stakeholder | Highly positively impacted by the project | High positive influence on the project | Support to set-up and capacity building of VNRC's, budget for natural resource management and implementation of activities such patrolling, fire prevention and -fighting and monitoring. |
| District authorities | Secondary stakeholder | Moderately positively impacted by the project | High positive influence on the project | Support to proper land use planning and natural resource management, revenues from the sale of credits through taxes. |
| Regional authorities | Secondary stakeholder | Limited positively impacted by the project | Moderate impact on the project | The regional authorities are important to ensure the political buy-in of the project at the higher level, they are an important interface both with the district and directly with the villages, and they supervise the activities within the regional territory. |

| | | | | |
|---|---|---|---|---|
| National Carbon Monitoring Center (NCMC) | Secondary stakeholder | Moderately positively impacted by the project | High impact on the project | The National Carbon Monitoring Centre (NCMC) is the national authority designated by the central government for the registration, supervision and control of compliance with national sector laws and regulations, for all projects involving the production and sale of carbon credits. Therefore, its involvement and approval of the project is mandatory, which is done on the basis of the PDD document submitted to the international reference standard. |
| Tanzania Forest Service (TFS) | Secondary stakeholder | Moderately positively impacted by the project | Moderate impact on the project | The TFS at national level will profit from our project through the co-management approach of forest reserves with communities. At local level TFS benefits from capacity building, budget for operations and improved collaboration with village households. |

### 2.1.2 Indigenous Peoples and Local Communities

In the project area, nearly all residents belong to the Wanguru ethnolinguistic group, a longstanding local community with deep ties to the region. Although they speak their own language and many local place names reflect Wanguru heritage, they are not classified as indigenous peoples under the IUCN Environmental and Social Management System. Accordingly, there are no indigenous representatives within the community, and project activities are designed to fully respect and support the rights of the local population. Additionally, the villages host a minority of pastoralists, primarily Maasai, who, though formally recognized as indigenous, are recent arrivals to the area. These pastoralists actively participate in village decision-making through assemblies, and their grazing needs are accounted for in the village Land Use Plans. Village households may own and cultivate land through the Customary Certificate of Right of Occupancy (CCRO) and are permitted to collect limited Non-Timber Forest Products (NTFPs), such as medicinal plants and firewood, from designated forest areas.

Village governance is led by the village assembly, which includes all villagers aged 18 and over, and elects leaders to form the village council. Decisions impacting individual families are typically made at the family level, while broader community decisions are managed by the village council.

Women are often active participants in decision-making processes, though challenges remain. Project-related benefits are generally allocated to families, with access to these resources influenced by family dynamics. To enhance gender equity, we plan to implement targeted educational programs. Many project activities, such as nursery work and seed collection, are well-suited to women and have attracted female participation, with women comprising approximately 70% of those involved. To promote inclusivity, the project has prioritized stakeholder engagement, regular consultations, and transparent communication to ensure community perspectives are integral to project planning and execution. An initial livelihood assessment was conducted to understand local socio-economic conditions and shape support strategies. Grievance mechanisms have also been established for Wanguru farmers and other project stakeholders. Further assessments and consultations with Maasai pastoralists are ongoing to address any impacts on their grazing practices, ensuring their needs are respected and mitigating potential long-term conflicts.

During the dry season, nomadic Wasukuma and Maasai pastoralists often pass through the surrounding areas, though they are not directly involved in the project. These groups sometimes use village land for grazing when it is not cultivated, which can occasionally lead to conflicts, particularly when land has been unused for extended periods. In such cases, village authorities usually initiate negotiations with pastoralists, allocating temporary grazing areas or requesting them to relocate. Our project intends to remain neutral in these negotiations and will avoid utilizing disputed land.

**Table 2.1.2: Indigenous Peoples and Local Communities**

| **Indigenous Peoples or local communities.** | **Rights to land or resources in the project area(s)** | **Governance structure** | **Involvement of women and marginalised groups** | **Engagement** |
|---|---|---|---|---|
| In the project area, all members of local communities, as residents of villages within the region, enjoy equal rights under Tanzanian law and customary practices. The area is home to two ethnolinguistic groups: the Wanguru, who are predominantly | In Tanzanian villages, customary land rights are recognized under the Village Land Act of 1999, which grants communities authority over their land through the Village Assembly and Village Council. Land is allocated and managed | Governance in Tanzanian villages centers on the Village Assembly, comprising all adult residents as the main decision-making body, while the Village Council, led by the Chairperson, implements decisions and oversees daily affairs. Specialized committees | Women actively participate in decision-making processes as equal members of the Village Assembly, contributing their voices to governance and resource management decisions. Among the Wanguru, the matrilineal cultural structure further enhances women's roles | The project engages Indigenous Peoples and local communities through the established village governance structures, including the Village Assembly and Village Council, ensuring broad participation and representation. These bodies facilitate |

| | | | | |
|---|---|---|---|---|
| farmers and represent the vast majority of people, and the Maasai, primarily pastoralists. Community governance ensures that land use and resources are allocated equitably, respecting both agricultural and pastoral livelihoods. | according to customary practices, with provisions for ensuring equitable access, including for women and marginalised groups. To formalize these rights, individuals or groups can obtain a Certificate of Customary Right of Occupancy (CCRO), issued by the Village Council and registered with the district land registry. CCROs provide legal documentation of land ownership. | handle specific sectors, and traditional leaders provide advisory support in cultural and dispute matters. | and influence in the community. This tradition grants women significant authority in matters of land inheritance and family decision-making, giving them a stronger position compared to many other village contexts. | transparent decision-making and ensure that all community membersWhile working through this structure, the project remains vigilant for any instances of marginalization and, when identified, addresses them through tailored, ad hoc solutions to promote inclusivity and equitable participation. |

### 2.1.3 Disputed Land or Resources

Disputes over property boundaries in our project area were identified as one of the possible reasons for conflicts between participating farmers, village councils and other stakeholders. Potential disputes regarding the current phase of the project were resolved in the phase of defining the boundaries of the individual farms, during which the owner and neighbouring farmers agreed on the boundaries and on the validity of the ownership documents of the plots by accepting and signing the document certifying ownership for the project database.

There is an ongoing case involving illegal cultivation by some farmers within a village-owned plot, again a peaceful solution is expected with compensation for the farmers and the identification of alternative plots in the area. In this particular case, we decided not to proceed further in order not

to fuel further conflicts, so the land in question was excluded from the project for the time being. Further assessment will be performed regarding land parcels that are not yet surveyed. The issue is constantly updated through formal and informal consultations with the parties involved. The project does not intend to exert any pressure and leave the resolution of the dispute to the relevant Village Authorities.

A further potential source of conflict concerns the presence of pastoralists, mainly Maasai and to a lesser extent Wasukuma. Although they have no access rights, it happens that pastoralists use village areas as grazing grounds and conflicts may arise between the village and the pastoralists when the village intends to use portions of land for the project that are subject to grazing (especially during the dry season) by pastoralists. In the project area, the presence of pastoralists is limited and in general we do not intend to accept any plot of land that could generate conflicts or whose rights of access and use are not clearly defined and shared.

The project intends to take a very cautious and soft approach to disputes, leaving them to be resolved by the competent authorities and intervening only if compensation on long-term-land-use plans is necessary.

## 2.2 Project Coordination and Management

PAMS is the Project Lead and in charge of project planning and coordination, central and local government relations, community relations, implementation on the ground and signing of agreements and monitoring.

PAMS is a non-profit conservation organisation registered in Tanzania with headquarters in Arusha (NGO registration document is attached in Annex 2). We have an MoU with the Ministry of Natural Resources and Tourism and have recently signed a MoU with TFS that specifies amongst others the Village Forest Guards programme. Our key focus areas are combating illegal wildlife trafficking, anti-poaching, promoting human-wildlife coexistence, environmental education, forest protection and restoration, and sustainable livelihoods. PAMS was founded in Tanzania on 3 March 2009 and is also registered in the United States as a 501 ©(3) (2015) and in Italy (2018) in order to channel donor funds from the USA and Europe to Africa. The current directors are: Krissie Clark, Dr. Ally Namangaya, Dr Michele Menegon, Elisifa Ngowi and Samson Kassala.

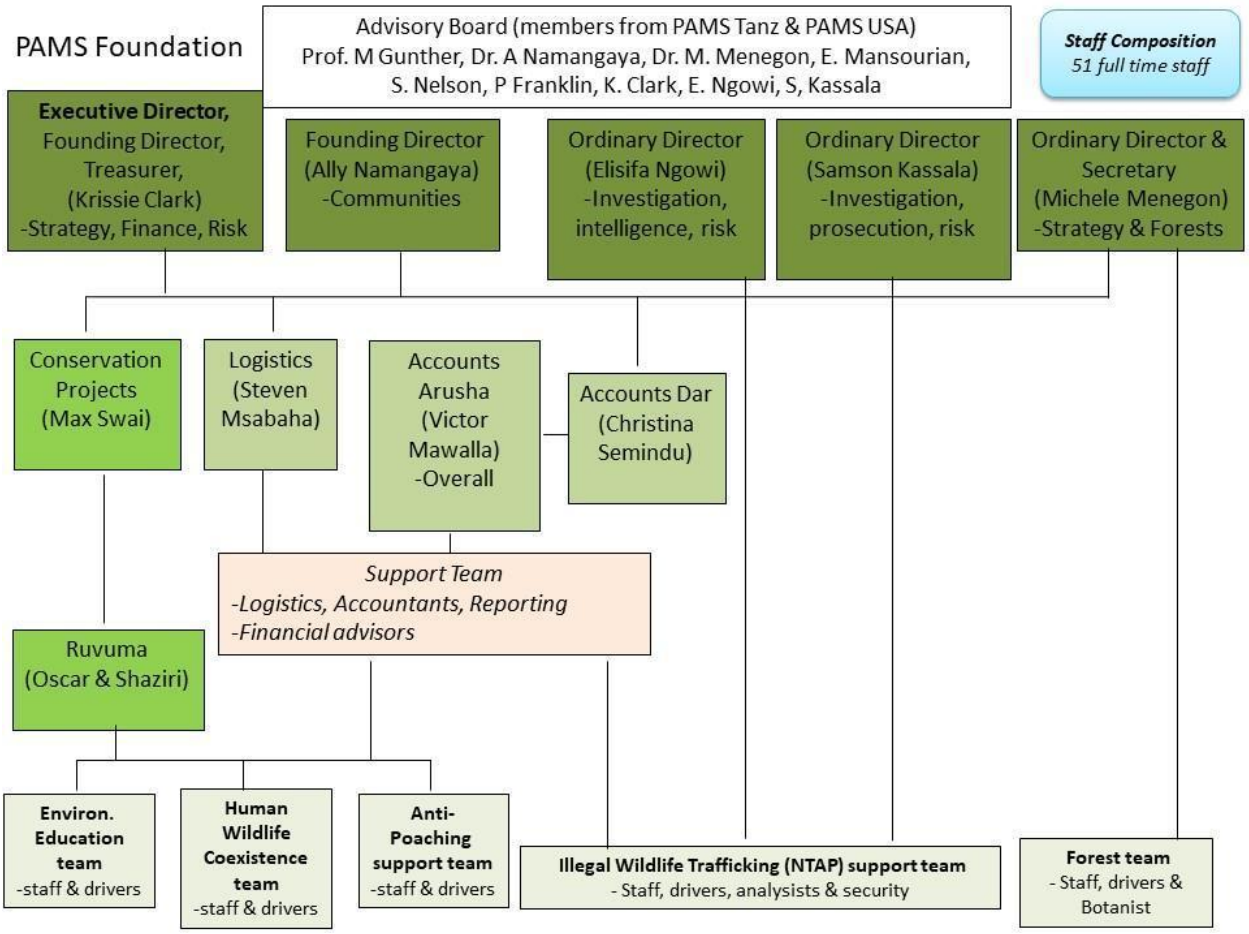
We as PAMS believe that successful conservation is about collaborative and supportive relationships. For well over a decade, our willingness to listen, support and work with communities and farmers in wildlife areas has built strong relationships and led to great collaborative successes. We have been able to help people live sustainably and harmoniously with nature by supporting them in testing and adopting new strategies. Likewise, our collaboration with governments, law enforcement, criminal justice agencies, task forces, private enterprise, schools and other NGOs shows that sustainable conservation successes are the result of good partnership and teamwork.

In Tanzania, PAMS currently employs 50 full-time staff, all of whom are Tanzanian citizens. Our ‘family’ has a rich diversity of skills and knowledge, ranging from community leaders with basic education to highly educated and well-respected retired government officials. Our organisation is structured as a decentralised team-of-teams with high levels of flexibility and trust (see table 2.2.1 below for the organizational chart of PAMS) . This allows for open, horizontal communication. It also empowers teams to sense, interpret and adapt to the complex and often uncertain environments in which we work. Our workflow is designed to minimise administration and maximise focus on our

core mission. We work closely with and support various Community Based Organizations, Government Conservation and Law Enforcement Agencies, as well as partners in other countries.

As PAMS, we have more than a decade of experience in community-based protection of miombo woodland areas and more recently in small-scale reforestation activities to restore vegetation in wildlife corridors and village areas. It is also worth mentioning that project coordinator Dr Michele Menegon and Andrea Bianchi of PAMS have exceptional expertise in conservation, biodiversity monitoring and research in East Africa's forests. The former has conducted scientific research and biodiversity monitoring in the Eastern Afromontane forests in Tanzania, Mozambique, Rwanda, DRC, and Ethiopia for over 25 years, particularly in the forests of the Eastern Arc Tanzania. His work has led to the definition of the biological importance of many previously little-known forests, the implementation of protection programmes, and the discovery of dozens of species new to science. Andrea Bianchi is a tropical botanist who has conducted extensive research in the forests of the Eastern Arc, building up a solid botanical knowledge and discovering and describing numerous plant species new to science. In the past, he worked at the Trento Science Museum's tropical greenhouse, which houses a reconstruction of a Tanzanian montane forest, where he extensively experimented with germination techniques of indigenous species. He also worked as the lead botanist in a carbon certified reforestation project in the Udzungwa Mountains of Tanzania, where he further refined his knowledge on germination and care of indigenous species.

**Table 2.2.1 Organisational chart of PAMS.**



Our work is enabled through Memorandums of Understanding (MoU) with:

- Ministry of Natural Resources and Tourism
- Tanzania Forest Service (TFS)
- Tanzania Police Force
- National Prosecution Services
- Institute of Judicial Administration
- Six Community Based Organizations

PAMS is in charge of project planning, coordination, managing community relations, implementation and defining agreements and operational arrangements. We also handle relations with the government, both nationally, regionally and locally. This includes Morogoro Regional Administrative Office, Morogoro Region Forest Office, Mvomero Administrative District Office, Mvomero District Forest office, Ward Executive Officer & Ward Councillor, Village Councils and individual farmers (landowners).

The Nguru Landscape Forest project is developed in collaboration with Trees for All. Trees for All (TfA) is a Foundation based in the municipality of Utrecht, Voetiusstraat 2, 3512 JM, the Netherlands with CCI number 34124154. Its mission is to support tree planting projects with solid partners in the Netherlands and abroad for a better climate, more biodiversity and healthier living conditions. It has a portfolio of projects varying from food forests to mangrove and peatland restoration and includes projects certified by Plan Vivo (ArBolivia, Scolel'te, EthioTrees). The annual budget of Trees for All for 2023 was 9.8 million euros and is entirely collected with donations from individuals and business partners in the Netherlands.

PAMS and Trees for All will have shared responsibility over the assignment of credits in the registry. We will create an account for the Nguru project and retire the credits in the registry on behalf of the party who funded this, this could be either Trees for All or other interested organizations. Trees for All will receive the fPVCs of the 200 ha pilot (2023/2024) and cancel them from the Markit-register on behalf of their donors. Trees for All will also receive a large part of the fPVCs of the 300 ha in the expansion phase of 2024/2025 with the same purpose of cancelling them. PAMS and Trees for All will discuss the opportunities for the issuance of the PVCs of the future tree planting efforts, always with the aim to ensure maximum benefits for the local stakeholders from the sales of the PVCs.

**Table 2.2.2 Division of Project Coordination & Management Functions between PAMS and Trees for All for the entire project period of 30 years.**

| **Project Coordination and Management Function** | **Responsible** |
|---|---|
| Stakeholder engagement during project development and implementation | PAMS |
| Ensuring conformance with the Plan Vivo Standard and compliance with applicable policies, laws and regulations | PAMS/TfA |
| Developing technical specifications, land management plans and project agreements with project participants | PAMS/TfA |
| Ensuring that the PDD is updated with any changes to the project | PAMS/TfA |

| | |
|---|---|
| Registration and recording of management plans, project agreements, monitoring results, and sales agreements | PAMS/TfA |
| Managing project finances and dispersal of income to project participants as described by the benefit sharing mechanism | PAMS/TfA |
| Managing Plan Vivo Certificates in the Plan Vivo Registry | PAMS/TfA |
| Preparing annual reports and coordinating validation & verification events | PAMS/TfA |
| Securing certificate sales and other means of funding the project | PAMS/TfA |
| Assisting Project Participants to secure any legal or regulatory permissions required to carry out the project | PAMS |
| Providing technical assistance and capacity building required for project participants to implement project interventions | PAMS |
| Monitoring progress indicators, livelihood indicators and ecosystem indicators and providing ongoing support to project participants | PAMS/TfA |
| Measurement, reporting and verification of carbon benefits | PAMS/TfA |

## 2.3 Project Participants

The main project stakeholders are the individual farmers and village councils. Given the nature and geographical location of the activities undertaken by the project, we expect benefits in terms of improved livelihood for the farmers and, at community level, for the village. The land in the project area is owned by individuals through traditional/customary ownership, most of the land plots vary in size between 0.4 ha to 2.0 ha (1 to 5 acres) and based on the information gathered, the land is worked by the family of the owners, with very few exceptions. In one case, where the amount of land owned is significantly larger, documents on when and how it was acquired were acquired, showing that the ownership was in place before the project began. Agriculture is the major economic activity practised in the four villages, hence different crops are grown depending on the nature of topography. Crops that are cultivated for commercial purposes are cardamom, cocoa, banana, yams and beans. In the project area maize and cassava are staple food and very few of the farmers are able to produce a surplus of them for commercial purposes.

Farming is mostly subsistence by using traditional tools, as the topography of the area does not allow the use of animals or mechanisation; hence it is practised by using hand hoes. There is no application of pesticides and fertilisers in the area. The prices of the crops vary from one farmer to another depending on the quality of crops, distance from the farm to the centre and the infrastructures for transportation. The only means of transporting crops from the villages is by motorcycle. The farmers have no mandate of setting the prices of the crops rather than the buyers who come with the prices. Shifting cultivation is highly practised in the villages surrounding the project area. Due to this practice, farmers have been leaving their farms uncultivated (fallow) for certain periods, moving to other pieces of lands and coming back to their previous piece(s) of land whenever they feel like the soils have recuperated enough fertility for better production. During the survey, fallow periods were found to be varying from one farmer to another, but 90% of all the interviewed farmers leave their farms fallow for the period of 1-5 years.

Most of the farmers involved in our project belong to the Wanguru ethnolinguistic group and they are not identified as indigenous peoples according to the IUCN Environmental and Social Management System. However, they consider themselves as the original inhabitants of the area. In the greater area, occasionally there are also nomadic herders of the Wasukuma or, less often, Maasai ethnic group, who are not involved in the project. Potential project participants that are not resident within the project area will be less than 1% of total participants of the projects, and will be workers with specialised technical skills (i.e. tree nursery management), until these skills are taught to and 'owned' by the local people.

Farmers who participate in the project, allocate only a portion of their land to reforestation so that food security is guaranteed. These households are also part of training activities for the improvement of agricultural practices, their stabilisation and the use of permaculture and agroforestry techniques. One of the aims of agroforestry as a project intervention is to provide an alternative to shifting agriculture which is still widely practised in the area. Participating farmers receive training in Good Agriculture Practises (GAP). The assumption is that the change in land use towards forest and agroforestry will decrease the use of shifting cultivation practices such as slash and burn.

Concerning forest protection activities, the project includes the participation of village councils and forest guards. These latter are scouts recruited from the local community and properly trained. They assist the rangers of the Tanzania Forest Service (TFS) who are in the lead of all operations conducted in the project area.

**Table 2.3: Project Participants (grouped by village, area or region)**

| **Project Participant** | **Participant Type*** | **Location of Residence** | **Typical Land Holding** | **Land and Natural Resource Use** |
|---|---|---|---|---|
| Individual farmers (landowners) can voluntarily allocate portions of their private land | All project participants are of type I | The location of the participants' residence in relation to the project area includes the villages wishing to join the project voluntarily, which fall within the project region, which can be described as a ring-shaped area | The typical area of land owned or managed by each participant is a portion of agricultural land, normally of a few acres, on which subsistence farming is practised and which in the past, from a few decades to a few | The typical use of land or natural resources within the project region and by potential participants is agriculture, mainly subsistence agriculture, while areas where there is still natural vegetation are |

| | | | | |
|---|---|---|---|---|
| | | around the Mkingu Nature Forest Reserve, and which in the east extends to the foothills of Mount Kanga (see map in section 1.1) | centuries, was covered with evergreen or semi-deciduous rainforest | used, sometimes illegally as in forest reserves, for firewood harvesting, extraction of timber for construction, to make charcoal and hunting of animal species, both legally and illegally. |
| Villages within the project region can designate specific areas of village land and allocate that land to the project. | | | | |

* Type I = Project Participants that are resident within the Project Region; who manage and use land or natural resources within the Project Region for subsistence or small-scale production; and are not structurally dependent on year-round hired labour for their land or natural resource management activities; Type II = Project Participants that do not meet the Type 1 definition.

## 2.4 Participatory Design

The Pemba village area, located on the northern edge of the Mkingu Forest Nature Reserve, was identified as one of the areas within the Nguru Landscape with the right characteristics for a reforestation project. On a particular day while out in the field, the chief of the Disanga sub-village, whom we had known for a few years, stopped us and asked us to help them out of the economic challenges they were facing. ''Crops are poor, we don't have the funds to make even small investments, we have no surplus and we are far from the markets,'' he said and continued: ''I don't see how we can get out of the situation we are in, if not with some help.'' We reflected on his situation and asked: ''If we propose to work with you and turn your fields into a forest and you and your fellow villagers into tree farmers, and look at the trees as they grow, without being cut down, and pay you more than traditional crops do, do you think this would be accepted in the village?'' His answer was straight forward: ''We would all do it right away. We would do anything to get out of the challenges we are in.'' That day we decided that Pemba was the place to start with our project.

In the following weeks, after informing the District authorities of our intention to explore the possibility of setting up a reforestation project in the area, we conducted a survey to understand the basic economic conditions and income levels in some villages, including Pemba (see Annex 18). The

study confirmed the basic socio-economic situation, meaning that the local population, composed exclusively of farmers, has an income level that places them within the category of subsistence farmers, as their agricultural production is mainly used for household consumption and the share of the product allocated to trade is on average very small. We started to design the project and decided that participation in the project is on a voluntary basis. Farmers are free to decide at an individual level, whether to join or not, without pressure from the village council or district level government.

The next step was to get endorsement for the project at a Regional level, which was done through a consultative meeting at the Morogoro Region Head Office. Following their high level approval (see annex 15 for letter of support and Annex 4 for photos of delegates during the meeting), the Regional authorities together with the PAMS team moved on to having discussions with District authorities and Pemba Village Council (see photos in Annex 4), all of whom supported the project and agreed to provide the necessary oversight in their respective roles.

Following the above high level endorsement, several public meetings and numerous informal meetings with the local community were conducted to ensure that the entire village assembly and the village council were sufficiently informed about all relevant aspects of the project (see photos in Annex 4). During these events, materials were distributed amongst the participants to let them fully understand the project dynamics, benefits and potential challenges. We asked the village council to act as a focal point for farmers interested in joining the project, in which they were tasked to collect any questions, doubts or other issues, so that they could be discussed in public at the next meeting. The content of the partnership agreement was firstly discussed with the District authorities, including the legal department, and presented in detail with the individual signatories. The partnership agreement is in Swahili and English (see Annex 12). The manner and timing of land preparation and planting were discussed with the community and individual participants.

The next steps concerning agroforestry activities will also require detailed participation with the communities, regarding the choice of species to be planted,  the possibility of planting plots of fast-growing trees for different uses, the organisation and management of fire control teams as well as patrolling teams in collaboration with Tanzania Forest Service. Every relevant decision is discussed and developed in consultation with the community, both through formal meetings and informal consultations. This participatory approach is also the project's way of maintaining a close relationship with the village councils, farmers and other relevant stakeholders. It enables us all to know at an early stage what goes well and what needs to be changed.

A team of land tenure and surveying experts started to geo-reference the boundaries of the farms whose owners decided to join. The team remained in the field for weeks to continue geo-referencing farms and answering doubts and questions from community members. In order to get a good understanding of the succession of activities by the participants, the detailed list and timing of the activities, along with a map of the area with all plots of land identified, with the name of the owner, were hung in large format at the village office, so that they could be consulted at any time.

The site for the tree nursery was identified in June 2022 and soon thereafter we started collecting seeds together with the community members. Activities in the nursery and the signing up of farmers who wanted to join the project continued for several months, and so did the geo-referencing of the property boundaries. Most nursery work was carried out by women. In close collaboration with the District legal office, the partnership agreement was drawn up. Once the number of participating

plots of land reached 200 ha, a series of meetings began. These meetings continued daily for about two weeks, during which the terms of the contract were explained individually to each farmer who decided to participate, followed by land use planning and eventually signing of the contracts. From July 2022 onwards, farms were clustered in blocks and prepared for the planting of the seedlings. The planting began in the second half of March 2023 as soon as the rains became persistent.

## 2.5 Stakeholder Consultation

### 2.5.1 Design Phase Consultations

Formal and informal stakeholder consultations are for us a crucial part to define the right project approach and to inform and exchange with the relevant stakeholders about the opportunities and challenges that come along with the implementation of the project interventions. All relevant communication is in the local language and carried out by our Tanzanian staff. Awareness-raising activities, explanation of the contract and of the project implementation modalities are done not only in the course of village meetings and assemblies, but also on an individual level, with each participant, where each line of the partnership agreement is or will be explained in detail. Furthermore, each participant can at any time go to the local PAMS office located in Pemba village and ask for further explanations. We also prepare information material with pictograms and in Swahili which will be available in all village offices describing and explaining the basic elements of the project.

The following stakeholder consultations have been organized in the design phase:

- Consultations with the Regional Authorities, District Authorities and Village Council about the project design, approach and the social & ecological benefits that derive from participatory forest restoration in the Nguru Mountains. During the meeting with the Regional Authorities, they explained that they were very aware of the importance of forests and the important role Morogoro Region (and the Districts within it) has to play since its rainforest areas are also the key water catchments for much of the country. They were conscious of other carbon projects in the region so have some understanding of how they work and the carbon market, and they were proud that the National Carbon Monitoring Centre is based in their regional capital. They also expressed their appreciation regarding the trusted relations PAMS Foundation with the Tanzania Government thanks to our community conservation work and close collaboration with the government to combat Illegal Wildlife Trade. They also shared how they liked our project design and how it was community focused. Consequently they endorsed the project (see Annex 15 for letter and photo of meeting) and accompanied us in next level down meetings with the relevant District and relevant village government. The meeting with the District and Village leaders went well and they were happy to know the project had already been endorsed at the Region level. It was also agreed that the District would lead the revision of the Land Use Plan and issuing of CCROs.
- Introductory open meetings with the villagers about the project design, activities, benefits, lifespan etc., and about the possibility to join the project on a voluntary basis through making part of their land available for tree planting. These meetings were free for all to attend and were attended in large numbers by the community households. The participants showed a lot of interest in the project and in principle support. At these meetings common questions included: requesting the benefits of the project to be re-explained; clarification on

the lifespan of the project and noting that it was very long and will therefore be for the benefit of them and the next generation; wanting to know if they can still cultivate their crops when the planted tree saplings are still small; and what the rental payment per acre would be. It was agreed that anybody interested in participating, should submit his/her name to the village office, so the survey team can include them in the survey plans. We explained that only upon signing of the partnership agreement they will be fully committed to the project and at any stage before they can pull out.

- Survey team and village council meeting - the survey team explained to the village council in detail the methodology which will be used to survey. It was about the sophisticated instruments to measure the boundaries and work out the size of the land, as opposed to the traditional methods which involved counting the number of steps. The village council was intrigued by GPSs and had lots of questions about it. They also discussed and agreed which leaders should be present in the field during [1] surveying, [2] further discussions with the land owner and [3] explaining the partnership agreement and signing of partnership agreements. They also suggested that the farm neighbours had to be present during the surveying process.
- In field meetings with individual farmers and surveying land. Those farmers who expressed an interest in the project were met in the field on their farm and underwent a consultative process in which the project was re-explained and numerous questions were asked by the survey team about the ownership of the land, their neighbours, what other land they have, crops growing on the land etc. and the farmer also had an opportunity to ask questions about the project. If they were still interested and the land still seemed viable for the project following these discussions, it was surveyed and the outcome of the survey was explained to the land owner. This latter step also included consultation of the neighbours to ensure they agreed on the boundaries.
- Individual consultation with farmers concerning the partnership agreement. The assigned village leader, survey team, PAMS and the District Lawyer discussed the partnership agreement line for line with the interested farmer. Any clarification needed was discussed and if the farmer was still happy to proceed, he or she signed the agreement. A common question in this process from the farmers included enquiring what happened if they died, who then takes over the contract.
- Meetings with representatives of Tanzania Forest Service (TFS). PAMS has a good relationship with TFS at national level due to joint action on wildlife trafficking and poaching. Now we were interested to collaborate at community level with a focus on forest protection to enable TFS offices to work with Village Forest Guards. They were very positive about this and facilitated the process to elaborate a Memorandum of Understanding between PAMS and TFS, which was signed a few months later (see Annex 2).
- Exchanges with EPINAV, our agriculture technical advisor, about the opportunities of integrating the agroforestry component into the project approach. Based on our data, wishes of the farmers and field conditions, EPINAV designed a plan for agroforestry models and activities that would fit with the overall implementation of our project in the Nguru mountains.
- Consultations with representatives of the National Carbon Monitoring Center (NCMC): exchanges about the possibility to register our project as a carbon project and the benefits for the communities. They were positive about our project and provided us with a hard and soft copy of the National Carbon Trade Guidelines. They also clarified that the legislation requires carbon projects to be a 'legal person' and seeing PAMS Foundation is an NGO

registered in Tanzania, it can undertake carbon projects in Tanzania. They also explained the registration process and associated costs and welcomed us to register once we got to that stage.

### 2.5.2 Stakeholder Engagement Plan

Our approach is based on the principle that the project must be well rooted in the participating communities to become successful. This means that socio-economic, environmental and climate impact is achieved through participatory planning, collaborative action and shared reflection with our key stakeholders. Therefore, farmers and village councils are key and project implementation is dynamic in nature, as project progress will be driven by the feedback and wishes of participants and the opportunities and challenges faced on the ground. Within the engagement activities we maintain a special focus on gender inclusion and vulnerable groups. The project actively tries to include women and members of vulnerable groups as much as possible in stakeholder meetings, implementation of project activities as well as in decision making. In addition, our project maintains constant relations with regional and district authorities, involving them whenever necessary and organising regular visits to the project area, so that there is maximum transparency and constant buy-in from them. Our project stakeholder engagement plan consists of the following components:

- Consultations with stakeholders at each stage of project implementation and the various nursery, land and planting preparation cycles;
- Creation or updating of the land use plan, developed in collaboration with the village council, district and participating farmers;
- Strengthening and structuring the capacities of Village Natural Resource Committees (VNRCs) so that over time they can become the reference entities for natural resource management and monitoring, inside and outside the project area;
- Implementation of a permanent training and ToT programme, jointly elaborated with EPINAV, other partners and community members in order to improve agricultural techniques and agroforestry models;
- Joint action plan with Tanzania Forest Services (TFS) and communities on protection and patrolling of forests and control of illegal activities within the forest reserves.

During the design phase of the project, we have hosted several stakeholder consultations as is described in paragraphs 2.4 until 2.6. Also we carried out several assessments which are documented in Annexes 5 (Initial FPIC), 9 (Environmental and Social Screening Report) and 10 (Environmental and Social Assessment Report).

To gain insights into vulnerable groups, landless individuals, and the Maasai minority in the project villages, a specific assessment is underway for the broader potential project area and the raw data regarding the current project area (Pemba and Gonja villages) have been analysed. In general, obtaining precise demographic data from the village council proved challenging due to limited or outdated data. However, we gathered estimates that can be refined through ongoing data collection efforts. Current estimates suggest that the proportion of landless individuals ranges from approximately 2% in Gonja to 8% in Pemba, where there is a higher number of immigrants and non-residents. Landless people in these areas are often involved in trade-related activities. Additionally, survey responses indicate that an estimated 5 to 10% of residents might have special needs, a category that may also include elderly individuals. These residents typically live within family units and receive support from relatives or the Tanzania Social Action Fund (TASAF).

While there are no Maasai or other pastoralist groups in Gonja village, a hamlet within Pemba village is home to an estimated 300 Maasai, who are integrated into the village community and actively participate in village life and decision-making processes. The village's land use plan also designates specific grazing areas to support the Maasai and other pastoralist groups. As the project progresses and community engagement deepens, we expect to gain a more detailed understanding of specific needs and circumstances. Based on the findings gathered so far, we will determine targeted actions to enhance the inclusion of vulnerable groups in the project.

During the expansion phase of the project, farmer recruitment is entirely voluntary and facilitated through a combination of sensitization meetings and self-initiated engagement. Project staff visit villages within the project area to hold informational meetings with village governments and farmers, explaining the project in detail. After these meetings, villages or individual farmers can voluntarily approach the project to gather more information, request land surveys (if eligible), and, if they choose, join the initiative. Farmers in neighboring villages may also observe the project's benefits and independently express interest by requesting sensitization meetings or seeking further information. Additionally, the selection of villages for expansion considers practical factors, such as proximity to existing nurseries or the feasibility of establishing new ones, particularly when significant voluntary interest is expressed to justify the associated costs and efforts. Today, some two years after the start of the consultations, there is an active exchange of information on a daily basis between villages, participants, and the project, and it is our intention to ensure that this virtuous exchange remains intense throughout the life of the project.

## 2.6 Free, Prior and Informed Consent (FPIC)

PAMS' approach to all our community-based projects is that we put great emphasis on the fact that there must be a genuine expression of need for the project on behalf of the local community. It must also be implemented in the most participatory way possible.

### *Overview of FPIC*

The concept of FPIC has been developed as a response to operations with a negative impact on indigenous peoples in the developing world. It has so far mainly been used by companies investing in forestry operations such as logging. Several principles are also applicable to a reforestation project as our Nguru Landscape Forest project:

- Information and communication – a two way exchange of all the information is essential, so that people can make informed decisions about the proposed operation and those running the operation can access feedback.
- Consent and negotiation – FPIC is a continuous process throughout the relationship between outsider and local people. Initial consent is key, but people also need to be included in future decision making. People must understand that they have the power to reject the proposals. FPIC should be conducted through traditional authorities and should involve as many people as possible, including marginalised people. It must be appreciated that there may be different concepts of what it means to give consent and consent must be given freely.
- Time – FPIC is time consuming but ultimately gives greater stability. People must be given time to consider the information provided before making a decision.
- Rights – FPIC recognises that indigenous people have the right to determine how their lands are used.

*Legal background*

FPIC is gradually being included as a principle in international law and jurisprudence which deals with indigenous peoples.

*Local communities*

Much of the literature about FPIC deals with indigenous peoples and there are few references to local communities. It is not clear how rights gained by indigenous people would apply to local communities. Indigenous peoples are often not recognized administratively. In the Tanzanian context there are two important challenges, namely that [1] people in villages may not be consulted about what happens in their forests, and that [2] pastoralists who use the forests as grazing grounds for their livestock, are often not included as stakeholders in the village management plans.

*Approach*

Our approach to the implementation of FPIC was developed through discussion within our project management team, consultation of the literature on FPIC and on the basis of the experience of PAMS Foundation in working with local communities in other parts of the country. As a first step, some basic precepts were agreed upon and plans were drawn up around the following main elements:

- Reach as many people as possible and make a determined effort to reach the most vulnerable and marginalised groups;
- Provide people with key information about the project in a way that it is easy for them to understand;
- Be careful not to raise expectations, particularly with regard to carbon financing, given the uncertainties currently surrounding the carbon market, operational costs and national policy;
- Ensure that people in the communities understand that they have the opportunity to accept or reject the project.

**FPIC timelines**

In general, village governance is structured so that every decision is shared as much as possible among the families and is discussed in public assemblies. The project has been the subject of numerous village meetings, all possible information has been provided at district level and has been made public, so that anyone can go to the village or project office at any time to discuss the project, how it will be implemented or if they have any doubts. More than a year passed between the first introductory meetings, the series of feedback received and the necessary follow-up with potential participants and the signing of the first agreements.
In addition, each farmer who showed interest in the project, has been approached in individual meetings, where the agreement and all other aspects of the project were explained line by line. It should also be remembered that participation in the project is on a voluntary basis and farmers are free to decide whether or not to join the project and may withdraw at any time until the agreement is signed. Regarding the inclusion of any vulnerable groups, where an opportunity or need exists, specialized partnerships (such as the Tanzania Women Lawyers Association - TAWLA) can be engaged to work directly with village authorities to support the adoption of gender-sensitive village regulations that promote or enhance women's participation in decision-making processes at the village level.

**Village meetings**

The initial design phase included a socio-economic survey (Annex 18) and a series of introductory meetings, formal and informal, aimed at understanding whether there was a genuine intention to want to change or improve current conditions. These meetings were held between March and June 2022.

Once it had been ascertained that in general terms the village households wanted to change the current set-up in order to improve their living conditions and that the proposed approach was considered worthy for further study, meetings were held that extended to a larger portion of the population. These meetings were moderated by our Tanzanian staff in Swahili and with the active participation of the local village government.

Since there was a genuine intention to change the current conditions, project and district staff conducted village-level meetings (including hamlets) to reach as many community members as possible. They explained the project, everyone's roles and responsibilities, the benefits the communities will gain from conserving and restoring their forests and how the project will proceed. Knowing that there would be questions or requests for further explanations, numerous other meetings were organised with the village council and inhabitants, both formal and informal, in the weeks that followed, to satisfy as much as possible any curiosity or need for clarification.

Participation in the project is on a voluntary basis and farmers are free to decide whether or not to join the project. The PES-based annual payment and CCRO definition processes were conducted under the supervision of the district legal office and with the assistance of the relevant district technical offices. The agreement between PAMS and local community members was explained and discussed individually, in the local language and by experienced technical staff, which took several weeks. A family financial management course for community members participating in the project was also conducted to help participants manage the extra income the project will provide them.

**Sensitisation Meetings**

During the early stages of the project, some of the potential participants continued to have doubts about how the project would run, the financial part, how to participate, etc., so awareness-raising meetings were held at the beginning of each stage in order to improve the farmers' understanding of the project modalities.

**Free:** village councils and farmers are free to decide whether or not to join our project.
**Prior:** the first meetings held by PAMS in the project area took place one year before the start of activities on the ground.
**Informed:** PAMS is extremely transparent with councils and villagers regarding the project design and implementation. Maps, timelines and actions are printed in poster format and hang in the village office. PAMS responds quickly and openly to any questions from villagers and villagers.
**Consent:** partnership agreements are signed when the landowner voluntarily decides to join, after having received from PAMS, the village council and the various district technical offices, all the necessary information to make a decision. Farmers who wish to participate in the project, may join if they have land available in the areas identified for the various expansion phases of the project. They may express their interest during the awareness meetings that will be held every year at the beginning of the expansion phase for that particular year. The text of the partnership agreements

was drafted by an expert in land evaluation and management. The partnership agreements were then reviewed both by the district and the village authorities until the final version was agreed upon. The content of the contract was then discussed both collectively and individually with each farmer who wished to participate in order to ensure that each part of the contract was well understood by the participants. The changes in land use due to the project design made it necessary to develop a new land use plan for Pemba village, which was developed in collaboration between the district, village authorities and PAMS Foundation.

**Seeking consent**

Participants join the project voluntarily after going through a process that includes village meetings, information from the district, individual meetings and constant access to information to dispel possible doubts. Once the partnership is signed, as it is a formal act and governed by the laws of the country, the participant may follow the grievance mechanism to discuss any dissatisfaction that may lead to changes in the agreement, which must however be in accordance with the applicable law. Should the participant wish to sell the land, this can be done if the agreement is transferred to the buyer.

In a carbon credit project under Tanzanian law, community members who voluntarily join and sign a 30-year contract with the project proponent can periodically reconfirm their consent through legally established mechanisms. This can be achieved by including clauses in the contract that outline consent verification intervals  every five. During these intervals, both parties can review the agreement to ensure alignment with evolving circumstances, reaffirm commitments, and address concerns. Reconfirmation can be documented through a written addendum or formal acknowledgment signed by both parties. Additionally, regular community engagement meetings can provide an avenue for transparent communication, fostering trust and ensuring that participants remain informed and voluntarily committed throughout the project duration.

**Updating stakeholders**

All stakeholders are constantly and actively informed about the progress of the project, both the district and the region authorities actively participate in the dynamics and communications, frequently visiting the project and providing assistance and guidance to the participants. Many of the activities, such as issuing CCRO certificates or drafting or updating land use plans, involve the district directly and regularly.

**Participation in the Expansion Phase**

The project's success hinges on voluntary participation from farmers who recognize tangible benefits to their livelihoods. To foster this engagement, it's crucial to ensure the project aligns with the local landscape, is clearly understood, and builds a foundation of trust among stakeholders. Initial involvement from early adopters often serves as a catalyst, encouraging wider participation as trust in the project grows and its benefits become evident. Support from district and regional authorities further bolsters this trust. Our strategy involves deploying experienced staff adept at nurturing relationships in rural settings, alongside technical experts who ensure optimal project implementation. In rural contexts, positive word-of-mouth is a powerful tool, contingent on the

project's ability to deliver on its promises. Beyond our current operational villages, we are exploring opportunities in neighboring areas for the expansion phase.

To enhance recruitment during the project's duration, we will implement two primary strategies:

1. **Leveraging Natural Information Flow:** We will capitalize on the organic dissemination of information among farmers. As participants share their positive experiences, this word-of-mouth approach encourages others to join, a method particularly effective in rural areas where personal interactions and the emulation of successful livelihood activities are prevalent.

2. **Conducting Awareness-Raising Meetings:** We will organize meetings in villages within the project region that possess appropriate socio-economic and climatic characteristics. These sessions aim to inform and motivate potential participants, ensuring widespread understanding of the project's benefits.

Once a sufficient number of farmers in a village express interest—often during these awareness meetings—we promptly initiate land surveys, sometimes as early as the next day, to maintain momentum. As activities commence, additional farmers typically become interested, drawn by co-benefits such as permanent and seasonal employment opportunities in nurseries, seed collection, planting, and weeding.

Furthermore, the PAMS Foundation is committed to non-discrimination, ensuring that all outreach and engagement strategies are inclusive and equitable, thereby fostering a welcoming environment for all community members.

**Grievance mechanism**

A grievance mechanism is in place to ensure that project participants, community members or any other person/entity that is negatively affected by the project have an accessible way to voice concerns or provide feedback about project activities. This can be done through on site project coordinators, through village elders and community leaders or by email to info@PAMSfoundation.org. Instructions on utilizing the grievance mechanism have been provided to village offices, and project participants have been informed about the process. Additionally, secure boxes have been installed, allowing participants to submit messages, including anonymous concerns or feedback, regarding any issues or challenges they may encounter.
Grievances will be handled by PAMS staff that are not directly involved in the project activities and, if needed, a representative of the National Carbon Monitoring Centre will act as an independent arbitrator. For the full documentation on the grievance mechanism please see section 3.18 of the PDD.

### 2.6.1 FPIC Legislation

In fact, there is no application for the description of indigenous people in Tanzania related to the habitants of the project area. Consequently, when the project is implementing the requirements of UNDRIP and ILO169, it's applied to local communities as they are not classified as indigenous people by the local laws.

**Table 2.6.1: National Legislation and International Standards on FPIC**

| Legislation/ Standard | Relevance to Project | Compliance Measures |
|---|---|---|
| UNDRIP | -FPIC guidelines ensure indigenous involvement in decision-making.<br>-FPIC ensures indigenous participation in decisions affecting their rights, land, and resources. | PAMS emphasises the genuine expression of need for the project by the local community:<br><br>-Projects are implemented in a participatory manner, ensuring community involvement;<br>-Key information about the project is provided to the community;<br>-Time is allowed for decision-making, respecting the communities' right to make informed choices;<br>-These principles align with the requirements of free, prior, and informed consent outlined in UNDRIP and FPIC regulation. |
| ILO 169 | -Equal benefit from rights and opportunities is mandated.<br>-Peoples' right to determine land use.<br>-Participation is key, involving as many people as possible.<br>-Transparency in decision-making processes is crucial.<br>-Inclusion of vulnerable and marginalised groups is essential.<br>-The process includes information, communication, consent, negotiation, and decision-making time. | PAMS ensures compliance with ILO196 through its implementation strategies:<br>-PAMS has developed an approach for consultation that includes respecting the customs and traditions of the communities involved;<br>-PAMS engages with local communities, acknowledging their historical connection to the land and respecting their rights;<br>-PAMS ensures that the community households understand that they have the opportunity to accept or reject project participation, thereby respecting their right to self-determination;<br>-PAMS conducts village meetings to engage with community households, providing information about the project's benefits and ensuring equal opportunity for participation;<br>-PAMS emphasizes that participation in the project is voluntary, ensuring that decisions are made freely without coercion;<br>-PAMS' approach to FPIC involves a two-way exchange of information, ensuring that communities can make informed decisions about the proposed operation and exercise their right to determine land use;<br>-PAMS conducts village meetings and additional sessions to engage with community households, ensuring broad participation in the decision-making process;<br>-PAMS promotes transparency by providing key information about the project in an understandable way and answering questions to ensure clarity;<br>-PAMS provides trainings on financial management to help participants manage extra income from the |

| | | |
|---|---|---|
| | | project, considering the needs of vulnerable and marginalised groups within the community;<br>-PAMS involves traditional authorities and community members in discussions and decision-making processes, ensuring their voices are heard and respected;<br>-PAMS ensures a comprehensive process by providing information, engaging in communication, seeking consent, negotiating terms, and allowing sufficient time for decision-making, as specified by the principles of FPIC. |

# 3 Project Design

## Baselines

### 3.1 Baseline Scenario

The current project area, defined as the 3 200 ha reforestation area including the pilot site, is predominantly used for subsistence agriculture by the village households of Pemba and Gonja. At the time of the project start, the area was completely deforested, with the exception of a few isolated trees often planted by farmers themselves and fallow land that show signs of recent fires and is mostly covered with bracken. We used AR-TOOL 02 for the determination of the baseline scenario.

We identified three potential alternative baseline scenarios: 1) continuation of pre-project land use; 2) reforestation of the land within the project area in the absence of our project; 3) move from subsistence agriculture to commercial agriculture focused on cash crops. Based on the barrier analysis we identified the continuation of pre-project activities, a landscape dominated by a mix of annual and perennial crops, as the most likely baseline scenario. Furthermore, we expect that without the planned forest protection interventions (such as the set-up of Village Forest Guards teams trained by PAMS and deployed in collaboration with the Tanzania Forest Service) the current trend of encroachment of the natural forest, with cutting both undergrowth and canopy trees and cultivation of various plants requiring shade such as cardamoms and yams will continue to increase, compromising large areas of the natural forest within the Mkingu Forest Nature Reserve. This trend will have an extremely negative impact on the forest biodiversity and resilience of the region.

In summary, without the project we assume that the area, once a forest, would remain a subsistence farming area, subject to unsustainable agricultural practices with increasing degradation of soil, surface water and local biodiversity and with an increasing incidence of illegal activities depleting the forest within the Mkingu Forest Nature Reserve. For the full argumentation about the selection of the baseline scenario see Annex 7.

### 3.2 Carbon Baseline

Carbon stock change under the baseline scenario is conservatively estimated to be zero. For detailed argumentation and calculation of baseline carbon stock change, please see the technical specification attached in Annex 7.

#### Table 3.2 Total net-greenhouse gas emissions under the baseline scenario

| Year | Baseline emissions (t $CO_2e$) |
|---|---|
| 1 | 0 |
| 2 | 0 |

| | |
|---|---|
| 3 | 0 |
| 4 | 0 |
| 5 | 0 |
| 6 | 0 |
| 7 | 0 |
| 8 | 0 |
| 9 | 0 |
| 10 | 0 |

**Baseline re-assessment**

The management rights will not be modified during the crediting period. PAMS remains in charge as project proponent and implementer of the Nguru Landscape Forest project during the entire crediting period and Trees for All will operate as the direct project partner for the same period. The partnership agreement with the local stakeholders is the PES mechanism for transferring the carbon rights and ensuring the benefits for the participating farmers and village councils who remain the landowners of the reforested parcels.

**Technical specifications of ANR and Agroforestry**

Apart from this technical specification of forest restoration by tree planting, we aim to finalise the two other technical specifications (Agroforestry and ANR in the corridor) by the end of 2025. In October/November 2024 we do a thorough assessment of the baseline scenario in the corridor and start assessing the opportunities regarding agroforestry systems. Regarding the agroforestry part, we take our time to consult and discuss with farmers about their desires in terms of species, densities, intercropping models, etc. We also hire or subcontract an agronomist with vast experience in the project region.
For the Agroforestry component the baseline will be very similar to the carbon baseline in the technical specification for forest restoration by tree planting, since the implementation will be done in exactly the same landscape.
The baseline of the ANR component in the corridor will be different, since land use in the corridor and existing vegetation is only partly comparable to the current project area. For the re-assessment of the carbon baselines for the three technical specifications we plan to align this with the second verification, which we expect after 7-9 years of project implementation.

## 3.3 Livelihood Baseline

### 3.3.1 Initial Livelihood Status

In March 2022 a Cost Opportunity Survey was conducted by PAMS staff and in September 2022 the Valuation for Market Rental Rate Assessment was conducted by land evaluation consultant David Ignace Tarimo. For full documentation of these two socio-economic studies please see Annex 18.

From this survey it became clear that agricultural activities in the project area depend mainly on local climatic conditions and natural soil fertility recovery. Due to the positive impact of the nearby rainforest, farmers are often able to have two harvests per season. The plains are the most fertile and are cultivated mainly with beans, maize, cassava and sugarcane, while the slopes are used for the cultivation of perennial crops such as cardamom, banana and yam.

The income that households obtain from cultivation varies according to the size of the plots of land and the combination of the cultivated crops. These variables were used to estimate an average annual income and to calculate an average rent, based on an average opportunity cost analysis for the area. In other words, an income approach was used where property value is determined from the income generated by the property, cost savings and the cash flows. According to the Direct Comparative Model (DCM), the Annual Market Rental Rate for the subject land is around TZS 100 000 (€ 39.9) per acre or TZS 250 000 (€ 100) per ha, while the Profits Model estimates a rental rate of about TZS 109 000 (€ 43.5) per acre or TZS 272 500 (€ 109) per ha. Based on the information collected, the amount of the annual payment was then estimated. For more information we would like to refer to Annex 18.

### 3.3.2 Expected Livelihood Change

It is important to think about possible changes in the project area during the crediting period. How would the project area develop if the project would not be there? What would this mean for the livelihood of the local stakeholders? The local stakeholders, as specified in section 2.1.1, are Village Households, Village Council and the Village Natural Resource Committees. Based on our current knowledge, there does not appear to be any socio-economic segregation of specific groups. In terms of gender, it is not easy to identify the differential economic dispositions of various household members. The initial assessment of vulnerable groups is currently underway, and preliminary analysis of raw data from the project area reveals no pressing issues, including for the Maasai minority, as we expect project impacts to be uniformly beneficial across all groups.

As part of technical specification (Annex 7) we have identified three alternative land use scenarios:

1) Continuation of the pre-project land use as described in the previous paragraph;
2) Reforestation within the project boundary without the presence of the project;
3) Increase in agricultural production of cash crops such as cardamom due to increase in demand and investment from (inter)national actors. This would mean a shift from predominantly subsistence agriculture to more commercial and intensive land use.

Scenario 3 could possibly, in the short term, lead to higher income and would be beneficial for the livelihoods of the local stakeholders. In the long term we expect that this scenario would lead to an increase in encroachment of the Mkingu Forest Nature Reserve, since cardamom grows better in the shade, which would not only be illegal but also lead to decreasing ecosystem services provided by the forest reserve. In the long term this would have a negative effect on the livelihood of local stakeholders. Based on a barrier analysis we concluded that the most likely baseline scenario, in absence of the project, would be continuation of the pre-project land use. For more details on the argumentation please see the section barrier analysis in Annex 7.

Continuation of the pre-project land use would in our opinion mean a business as usual scenario. Given the relative isolation and remoteness from main roads, the subsistence economy and the lack of economic means to invest, as well as the distance to markets, it is expected that the initial livelihood status won't easily change if current socio-economic conditions persist. We expect that

the current livelihood conditions could persist for decades, including the trend towards the destruction of the nearby Mkingu natural forest (in the absence of law enforcement), which in the long term could lead to a worsening of local climatic conditions and a general worsening of conditions for agriculture.

## 3.4 Ecosystem Baseline

### 3.4.1 Initial Ecological Conditions

The project area before the start of the project activities was, and still partly is, an agricultural landscape, where local households have cleared the land, replacing over time almost all plant and, consequently, animal species of the original forest ecosystem. As a result, the area has turned into an ecologically simplified agrarian landscape, where ecosystem complexity is reduced to a minimum and where there are almost no elements that help maintain plant and animal diversity, such as hedgerows, trees or scattered groups of trees of indigenous species. The area is subject to seasonal slash and burn, and in general the implemented household practices have resulted in a drastic reduction in the species diversity present in the original environment. Furthermore, the type of subsistence farming currently applied is likely to result in reduced soil organic carbon and crop production, loss of topsoil fertility and increased erosion.

The project area is bordered by the Mkingu Forest Nature Reserve. The Mkingu Reserve, although relatively less well known than other forests in the Eastern Arc Mountains, is particularly important for the presence of contiguous rainforest from the plains to the highest peaks, up to 2 400 m a.s.l., totalling over 26 000 ha of closed-canopy forest. It is among the largest remaining areas of rainforest in the entire Eastern Arc biome and, indeed, in Tanzania. The forest is exposed to the humid south-easterly trade winds, which allow locally high rainfall (annual average of 1 800 mm/year, with areas reaching over 3 500 mm/year). The Mkingu Reserve is home to at least 16 strictly endemic vertebrate species and 23 vertebrates endemic to the Eastern Arc, including IUCN Endangered and Critically Endangered species. Many other vertebrates, new to science, have been discovered and not yet formally classified. In the Nguru Mountains, there are at least 137 (25%) of the 554 plant taxa endemic to the Eastern Arc Mountains plant species endemic to the Eastern Arc.

Despite the dramatic and documented increase in illegal deforestation (according to Global Forest Watch from 2001 to 2021, Mkingu Forest Nature Reserve only, lost 1.95k ha of tree cover, equivalent to an 8.7% decrease in tree cover since 2000), it's still one of the largest undisturbed blocks of montane forest remaining in Tanzania. Indeed, the current total absence of control means that illegal access to forest resources is accepted, even though it is known to be illegal, and in the absence of the project or other initiatives aimed at reducing or eliminating illegal activities within the natural forest, and ensuring constant control of the territory by the competent authorities, and in view of the observed increase in forest loss due in particular to encroachment, a continued degradation of the forest environment and possibly the local or total extinction of endemic or threatened species is expected.

### 3.4.2 Expected Ecosystem Change

As argued in section 3.3.2 and given the barrier analysis in Annex 7, the most likely baseline scenario, in absence of the project, would be the continuation of pre-project land use. For the Mkingu and

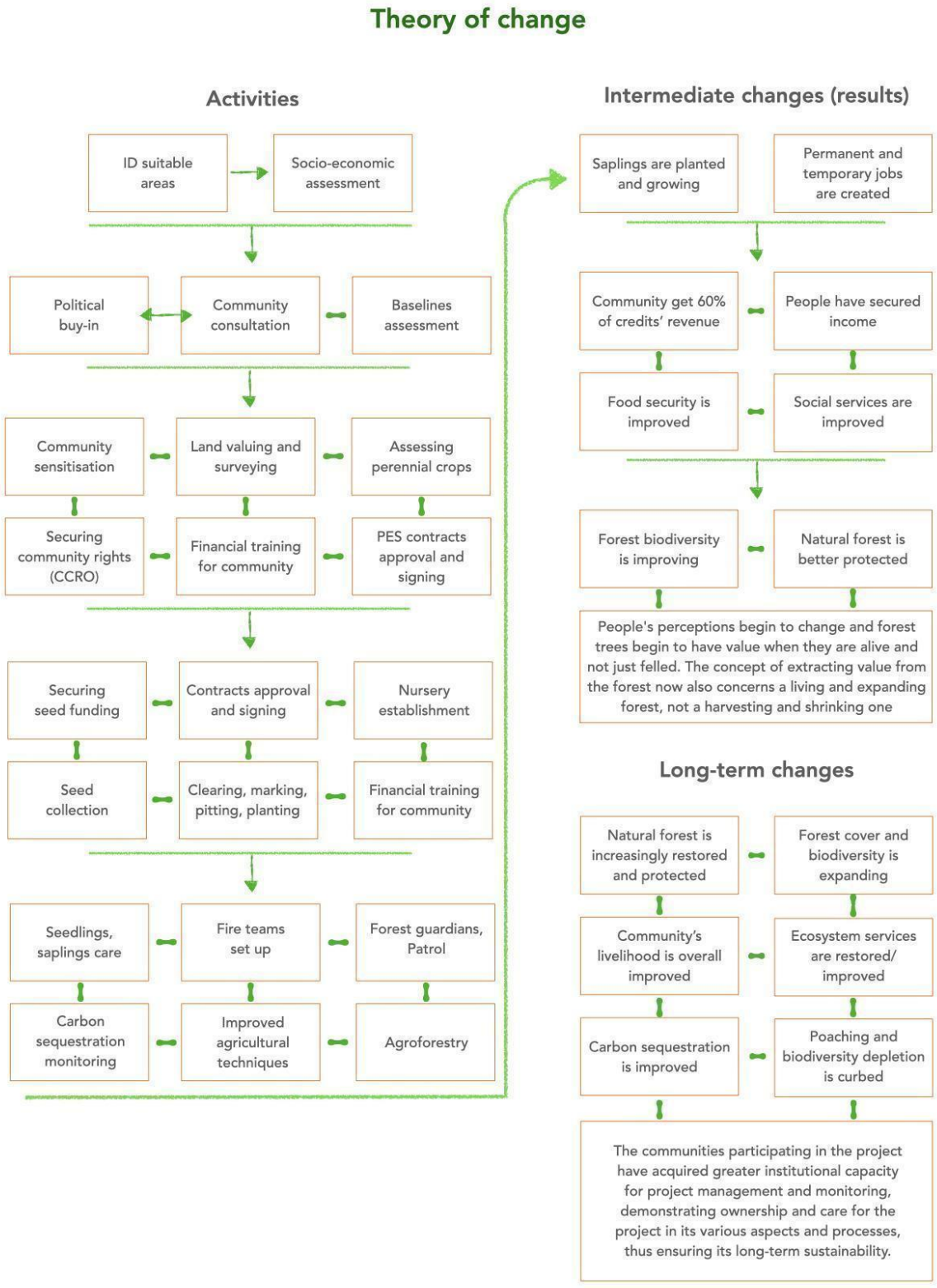
Kanga Forest Reserves this would mean a continuation of encroachment, leading to further degradation of the natural forest, its biodiversity and the ecosystem services.

Within the project area itself, the continuation of pre-project agricultural activities and methods, such as slash-and burn and felling the few trees that are left, would most likely lead to a decrease in natural vegetation on agricultural land. In Annex 7 we argue that carbon stock change in both woody and non-woody biomass is zero under the baseline scenario. This is a conservative estimate since we actually expect a decrease in trees and shrubs that are currently still present in the project area. For the Pemba area, dominated by subsistence agriculture with short fallow periods, we therefore expect a steady decrease in ecological conditions. Natural vegetation cover and soil fertility are expected to decrease due to prevailing poor agricultural practices, which will have a negative effect on the biodiversity that is still present in the agricultural landscape.

In the corridor between Mkingu and Kanga Forest Reserve agriculture is less intensive. Fallow periods are longer leading to a baseline in which natural vegetation cover is higher compared to the Pemba project area. For this project area we are currently working on an inventory of vegetation under the baseline and recent trends in vegetation cover. First impressions are that vegetation cover is decreasing due to agricultural activity, which would also lead to a negative change in ecological conditions in the corridor area. Because of a higher presence of natural vegetation and slightly different ecological conditions we will develop a separate technical specification for the restoration of the corridor. We are currently researching the possibility to work with ANR methods and/or lower planting densities. In general, we expect that the ecological conditions within the entire project area and adjacent forest reserves will deteriorate under the pre-project land use. The main indicators for this are decreasing natural vegetation, decreasing soil fertility and decreasing habitat for the rich biodiversity of the project area.

## Theory of Change

**Figure 2.** Summary diagram representing the Theory of Change



## 3.5 Project Logic

The overall aim of our project is to restore part of the natural forest cover of the Nguru Landscape that has been lost over the past decades and centuries with an integrated approach focused on restoring biodiversity, connectivity and functioning of ecological systems on the one hand, and improving livelihood opportunities, resilience and food security of rural communities on the other.

The means by which this aim will be achieved, is through the adoption of more productive and sustainable resource management practices that are technically feasible and socio-economically sound. Furthermore, the financial and operational components of the project are designed to be sustainable based on current policy and expected market trends. As a result of current discussions, it appears that the intention is to make the policy less restrictive so Tanzania could become more attractive to carbon investors, in which case the project would have a larger operating margin than the current one.

With the project implementation, we will monitor in detail the most relevant ecological and biodiversity aspects, as well as impacts on livelihood and other relevant social aspects such as access to and quality of services, resulting from the presence of the project, both in the project area and in the adjacent natural forest.

The fluctuations in the voluntary carbon market will not have an impact on the agreed annual payments rates in the pilot area of 200 ha since financing has already been ensured. Fluctuations could potentially have an impact on future project expansion areas. In case the carbon price rises, this would mean that, besides the annual payments, more revenues would flow towards the communities and participating households. Lower carbon prices would oblige us to look for funding sources other than carbon credits. Priority is to have the financing secured for the entire 30-year annual payments period before signing any new partnership agreements.

After the crediting period of 30 years, a viable strategy is to allow selective logging of the planted forest on an annual basis of 1% of the land. This would foster ownership of the involved community households and generate more benefits which will be partially used to keep the forest in good conditions (replanting, maintenance, fire belts, protection, etc.). While working on the technical specifications, we made estimations of the overall carbon stock within the forest restoration plots when applying a 1% harvest rate between year 30 and year 50. This was done by increasing the mortality rate with 1% for the 20-year period between year 30 and year 50.
Based on our data, the total amount of carbon sequestration (ABG + BGB) still increases until year 50. Meaning that even with a 1% harvest rate applied we can assure that the carbon sequestered between year 1 and 30 will be guaranteed.
Important to mention here is that the extrapolation to year 50 does not include natural regeneration, which would plea for an even higher carbon sequestration after year 30. It however, also does not include limitations due to maximum DBH or height per species or limitations due to average carbon storage in Eastern Arc forests (684 ton CO2/ha).

In summary, our project aims to:

- Contribute to climate mitigation and adaptation;
- Increase forest cover, water retention and soil quality within the villages;
- Improve the resilience of the participating communities and households;

- Increase food security of participating households;
- Increase and diversify smallholder farmers' income;
- Increase gender mainstreaming in forestry;

- Increase the habitat for endangered and endemic forest species;
- Foster the recolonization of locally extinct species and secure their populations;
- Reduce future forest degradation by addressing drivers of forest degradation and deforestation;

| | **Description** | **Assumptions/Risks** |
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| **Outcomes** | | |
| Carbon Benefit | Forest Restoration through tree planting as Project Intervention will result in an estimated 495.7 $tCO_2$ removal per ha for the project lifespan of 30 years.<br>The aim is to restore 6 200 ha of forest through a combination of tree planting, Assisted Natural Regeneration and Agroforestry. This will result in roughly 2.4 million tCO2 removal (see 1.2.4).<br>Forest Protection as a Project Intervention will reduce forest degradation and deforestation in the project area and thereby stabilizing carbon pools. | A1: The planted area will show at least 90% tree survival adding natural regeneration and the economic benefits transferred to local communities, through annual payments, additional benefits from agroforestry and legal land use definition tools such as Land Use Plan and CCRO, together with control and protection activities on the ground, will ensure the permanence of the forest cover.<br>A2: fully equipped patrolling teams of Village Forest Guards in combination with engaged communities and law enforcement of Tanzania Forest Service will sharply reduce the risk of illegal activities and fires that could affect the standing biomass and carbon pools in the project area. |
| Livelihood Benefit | Long term annual income for participating farmer households from annual payments and PES scheme.<br>Cash income from seasonal labour from project activities such as nursery work, planting, maintenance and patrolling with high involvement of women especially for nursery work.<br>Benefits from improved crop production of agroforestry plots and value chain development of crops such as vanilla.<br>Community benefits from additional carbon revenues. | A3: community members are well paid and feel so committed to our project objectives that they will implement all project activities successfully despite the time and efforts they require.<br>A4: the benefits of the introduction of agroforestry models that strengthen food security and increase market value of products will overcome the traditional agricultural practices and resistance to the project. |

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| Ecosystem Benefit | Recovery and expansion of the degraded sub-montane forest and protection of remaining natural forest.<br>Enhancing the populations of endangered and endemic species both flora and fauna, and providing gene flow through the recovery of the forest/wildlife corridor.<br>Improvement of ecosystem services such as enhancing micro-climate, soil structure, water quality and the overall increase in resilience of the ecological system. | A5: The combination of seed collection from mother trees in the remaining forests and purchase of available seeds at the Tanzania Tree Seed Agency are sufficient to achieve the target of planting of 120 different tree species for ecosystem restoration.<br>A6: The long term financial & associated benefits from integrated project approach convince the communities that it's better to 'have a tree standing than felled' and that indeed the combination of forest restoration, agroforestry and forest protection lead to a more resilient environment. This may not necessarily fit the Nguru system, and there is no data to state this, but we have directly observed, and collected related data, on how the frequency of rain is greater above the forest canopy than in the nearby cultivated areas. |
| **Outputs and activities** | | |
| **Output 1** | Carbon sequestration through reforestation and restoration in the project region | The project envisages the reforestation of 6 200 ha of degraded land through tree planting of native tree species (2 500 ha), assisted natural regeneration and/or enrichment planting (2 500 ha) and agroforestry of a mix of native and naturalized species (1 200 ha). The carbon sequestration is an estimated 1.25 million tCO2e for tree planting, 875 000 tCO2e for ANR and 240 000 tCO2 for agroforestry, giving a total of roughly 2.36 million tCO2e.<br>Seeds of these species for tree planting are often collected directly from the remaining forest. Assisted Natural Regeneration will be mainly achieved by removing disturbances that prevent it, namely fire, overgrazing and firewood/construction wood collection. For agroforestry we use seedlings of native and naturalized species combined with crops. |
| Activity 1.1 | Forest restoration through planting of native tree species | The main risks are:<br>[1] Seed shortage, which will be addressed by having seed collectors throughout the Nguru Mountains and other mountain blocks in the Eastern Arc. We are also developing a closer relationship with the Tanzania Tree Seed Agency that can provide seeds of many species found in the Eastern Arc. We have also built a |

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| | | seed bank where seeds can be safely stored for a long time.<br>[2] Climate change and the unpredictability of rainfall, which can decrease the survival rate. However, our project is small enough to adapt to local conditions and plant quickly when needed. The location, close to a large mountain massif, should ensure more than in other places a sufficient level of rainfall, even if distributed abnormally throughout the year.<br>[3] Fire, which in the first 4-5 years could burn newly planted seedlings or established saplings; fire-fighting teams will be trained, fully equipped and ready to act quickly.<br>[4] Pests and diseases: an outbreak of pests (mostly insects) or diseases (fungal infections) could increase the mortality of planted seedlings. Both are managed by planting a wide range of tree species to avoid the chances of species specific pests and/or diseases becoming a nuisance (E.g. the pioneer and canopy dominant *Khaya anthotheca,* despite being a very fast grower and a species with very high survival rate, is never planted above 25% density to avoid the insurgence of the shoot borer *Hypsipyla robusta*). Although not all pests are fully identified or described in the literature, planting each species at low densities serves as a reliable safeguard to reduce the risk of infestations.<br>[5] Droughts could pose challenges in any tree-planting initiative. However, this area of Tanzania is among those with the most reliable rainfall patterns and quantities. Additionally, the project incorporates a diverse mix of tree species, some of which are better adapted to dry conditions than others, ensuring that a drought would only affect a portion of the seedlings. Conversely, floods are more frequent in this region, particularly in valley bottoms, as seen during the El Niño event of November 2023. To mitigate this, seedlings in valley bottoms are now planted at the end of the rainy season, using a specific mix of species adapted to waterlogged soils. This approach ensures that |

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| | | seedlings grow tall enough to withstand flooding in the subsequent rainy season.<br>[6] Grazing is unlikely to occur, as the majority of people in the project area are farmers. Cattle and goats pose similar risks to cultivated crops as they do to planted seedlings and saplings. Formal and informal agreements between farmers and pastoralists clearly define grazing areas, and the project avoids planting in those zones. Grazing by wild animals is, unfortunately, not an issue due to their extremely low population, which is currently confined to the nature reserve. The main concern arises from rats, which have been observed chewing the root collars of *Afzelia quanzensis*, resulting in the death of some seedlings and stunted growth in others. In response, the project is now planting a smaller proportion of this species. |
| Activity 1.2 | Forest restoration through Assisted Natural Regeneration | The main risks and assumptions are:<br>[1] Fire, which is the single main issue preventing natural regeneration in the corridor area. Fire lines will be cleared, patrolled and maintained throughout the dry season and fire-fighting teams are ready to act quickly.<br>[2] Firewood and construction wood collection will be addressed by supporting every household taking part in the project with seedlings of fast growing trees.<br>[3] Pests and diseases: an outbreak of pests (mostly insects) or diseases (fungal infections) could increase the mortality of planted seedlings. This is less of a problem in a natural regeneration setting where, usually, a variety of species regenerate, decreasing the possibility of species specific pests.<br>[4] Droughts could pose challenges in any restoration initiative. However, this area of Tanzania is among those with the most reliable rainfall patterns and quantities, and seedlings germinated or regenerated naturally are more resilient than planted ones.<br>[5] Clear land-use plans and ongoing discussions with farmers and pastoralists are essential to |

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| | | ensure that regenerating areas are effectively excluded from grazing zones. |
| Activity 1.3 | Agroforestry through planting of native tree and naturalized species combined with crops | We assume that farmers join the project in sufficient numbers despite initial resistance. In fact, farmers may not want to change their traditional way of farming, but exposure to the benefits derived from the project and the creation of model agroforestry enterprises will be able to provide them with tangible evidence, which is usually enough to overcome initial mistrust.<br>The main risks to the agroforestry component include seed shortages, mitigated by establishing seed collectors in the Nguru Mountains, collaborating with the Tanzania Tree Seed Agency, and maintaining a seed bank for long-term storage. Climate change and unpredictable rainfall may reduce seedling survival, but the project's adaptability and proximity to a reliable rainfall area minimize this risk. Fire poses a threat in the first 4-5 years, countered by trained and equipped firefighting teams. Pests and diseases are managed by planting a diverse mix of tree species at low densities to prevent outbreaks, Drought impacts are reduced through species selection, while flood-prone valley bottoms are planted with flood-adapted seedlings after the rainy season. Grazing risks are mitigated by clear land-use agreements. |
| **Output 2** | Farmer households and village councils have received income from annual payments of contributed land, incentives from implementing project activities such as maintenance, monitoring and patrolling and increased food security and additional income as a result of improved agriculture & agroforestry on their land. | The project is based on the payment of an annual amount to farmers as immediate monetary compensation for the use of land by the project so that in addition to the benefits gained from the sale of the credits, farmers see an assured annual income and it is assumed that farmers will continue to be satisfied with receiving this amount.<br>The project plans to continue to increase the benefits for households according to carbon market trends, thereby offering a sustainable and economically viable alternative for possible future initiatives of large cocoa and avocado companies in the region. |

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| Activity 2.1 | PES payments through legalised partnership agreements | Payment system is in place for annual payments directly to the participants; There is a risk that due to project cost variations and fluctuations in credit prices, the annual payments to farmers may at times exceed the project's financial capacity. To mitigate this risk, the exploration of instruments such as the establishment of a trust fund is underway. This fund would regularly receive deposits to create a financial reserve capable of covering these fluctuations. |
| Activity 2.2 | Project activities such as nursery work, planting, maintenance and protection are carried out. | All activities are rewarded and supported by the village councils and relevant stakeholders. There is a direct link between effort and benefits for the participants. |
| Activity 2.3 | Income from improved agriculture & agroforestry. | Climate change associated with prolonged droughts and floods can affect the plantings. Pests and plagues such as rodents occur in the area and damage seedlings. The diversification of crops and tree species in the agroforestry models makes them less prone to pest and diseases and the effects of climate changes. The market for crops can fluctuate through external causes. Emphasis is put on diversification for food security and perennial crops that improve soil structure and micro-climate such as cacao and fruit bearing trees. |
| **Output 3** | The sub-montane forest has been restored and populations of endangered forest species have been increased through the combination of forest protection and reforestation. | Encroachment for farming purposes and poaching levels can remain unsustainable if forest protection is not effective, especially through passive means such as snares. Intensifying patrol activities and regularly removing snares should make poaching too risky and unprofitable. Additionally, it is possible to establish a network of informants in the villages to gather detailed information on ongoing activities and implement effective prevention strategies |
| Activity 3.1 | The planting of endangered and endemic tree species that are at risk of extinction due to overexploitation and climate change. | With the planting of 120 native tree species through the project, we expect an overall increase of biodiversity due to the restoration that mimics the natural, diverse forest. Risks associated with climate change can be mitigated by selecting the most suitable sites for species at risk, considering both altitude and |

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| | | ecological conditions, to reduce the impacts of a changing climate. |
| Activity 3.2 | The restoration of a forest corridor reconnecting the Mkingu forest reserve with the Kanga forest reserve, mainly by assisted natural regeneration and a strict fire prevention & extinguishing scheme. In reality, this is a fundamental wildlife corridor that has been absent for decades and which, over time, would allow for the re-establishment of gene flow between the populations of many species that are now isolated in the two massifs. | This fundamental wildlife corridor would allow for the re-establishment of gene flow between the populations of many species that are now isolated in the two massifs. There is a risk of not being able to establish a sufficiently wide and compact forest corridor to allow the movement of large animals such as elephants and leopards due to the fragmented nature of the plots allocated to the project by farmers. To mitigate this risk, multiple smaller corridors can be created, integrated with agroforestry plots to form a suitable environment for wildlife passage. Additionally, deterrence measures can be implemented to prevent animals, particularly elephants, from entering and damaging farms. These measures include passive deterrent methods such as chili fences. |
| Activity 3.3 | Tanzania Forest Service (TFS) is facilitated by PAMS through an MoU and carries out patrolling with Village Forest Guards (VFG) and law enforcement and fire prevention throughout the forest reserves and reforested areas in the project region. | MoU with TFS has been signed in the beginning of 2024 and ensures the accomplishment of TFS in terms of human resources and law enforcement. The extension of the MoU will be enhanced by the large network of PAMS at high political level.<br>Budget for the training, loans and equipment of VFG has been secured for the first years. Long-term support will be secured by fundraising. There is already a high interest of potential donors to support forest and biodiversity conservation.<br>We assume that a sufficient number of candidates from the communities are interested in participating in the VFG training and subsequently becoming part of the patrolling teams. We have seen in similar cases that, in addition to the job opportunity represented by the establishment of VFG teams, there is a desire to help improve the legality of operations and usually the village encourages such initiatives by creating a suitable social environment.<br>The local political situation can be a risk as encroachment is encouraged to gain consensus. |

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| | | In this case, we have the mandate to work at higher political levels to try to resolve the situation. |

### Technical Specification

As mentioned before, we have elaborated the Technical Specifications for Forest Restoration through tree planting, see the outcome in Annex 7. The Technical Specifications for Forest Restoration through Assisted Natural Regeneration and the Technical Specifications for Agroforestry are still to be developed. This will happen after project certification during the expansion phase of our project.

## 3.6 Project Activities

**Table 3.6 Project Activity Summary**

| **Project Intervention** | **Project Activities** | **Inputs** |
|---|---|---|
| Forest Restoration | -Planting of a mix of native and endangered tree species on the land owned by participating farmers and village councils.<br>-Implementation of Assisted Natural Regeneration, eventually supported by enrichment planting, on land with degraded forest vegetation.<br>-Maintenance, protection and monitoring of the planted and restored forests by the project team in close coordination with the participating farmers and village councils. | **Project management:** Hiring and training a management team to supervise all reforestation activities.<br>**Human resources:** Hire and train local community to carry out seed collection, nursery management, clearing and weeding, planting, and patrolling<br>**Financial Resources:** Funds to cover the costs of leasing land, purchasing materials, paying workers, and all other expenses related to the project activities.<br>**Monitoring:** Permanent plots and suitable remote sensing based software to monitor changes in forest cover and biomass. |
| Agroforestry | -Introduction of Agroforestry models on land of participating farmers.<br>-Training of participating farmers on agroforestry techniques and improved agriculture in collaboration with EPINAV.<br>-Value chain development of crops and products harvested in the agroforestry plots. | **Knowledge and Training:** Training farmers and project participants on agroforestry practices, benefits, and management techniques.<br>**Quality Seeds and Seedlings:** Selection of appropriate tree and crop species, including native and economically valuable species.<br>**Market Access:** Knowledge and connections to local and broader markets for the sale of agroforestry products (e.g., fruits, nuts, timber), including value-added processing information. |

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| | | **Financial Resources:** Funding to cover the initial costs of setting up AF systems, including the purchase of inputs, payment for labor, and other establishment costs.<br>**Monitoring and Evaluation Systems:** Tools and techniques to assess the development and impact of AF practices on biodiversity, soil health, crop yields and economic outcomes. |
| Forest Protection | -Set-up of Village Forest Guards (VFG) program with participation of community members and in collaboration with Tanzania Forest Service (TFS).<br>-Training of community members as VFGs and provision of equipment.<br>-Patrolling teams of VFGs and forest rangers to control the project area in order to prevent fires and reduce illegal activities. | **Supervision:** staff of PAMS and Tanzania Forest Service to guide and train the Village Forest Guards.<br>**Human resources:** Hire local community members as Village Forest Guards (VFG) to carry out patrolling and fire prevention & fighting.<br>**Financial Resources:** Funds to cover the costs of patrolling and firefighting equipment.<br>**Monitoring:** suitable software to monitor forest protection related activities. |

Besides the mitigation measures and risks mentioned in the table above, it is important to elaborate further on two overall project risks and the way we mitigate those risks: reversal risks and leakage. In this section, we provide here a brief summary:

**Reversal risks**: we have assessed social, economic, environmental and administrative risks of reversal effects. The main most pressing risks, based on impact and likelihood (score higher than 5), resulting from this analysis are:

-Community support for the project is not maintained;
-Fires, and;
-Extreme weather events.

For these, and other risks, we have elaborated mitigating measures. An extensive description can be found in section 3.12 of this PDD.

**Leakage**: for each of the main project interventions ([1] forest restoration, [2] agroforestry and [3] forest protection) we have identified possible causes for leakage and mitigation measures. For all of these interventions, the main risk for leakage is due to possible displacement of agricultural activities to areas that currently consist of forests. For more detail please see section 3.12 on leakage.

For the Forest Restoration component of the project we have estimated leakage using the approved methodology PU004. Although mitigation measures are in place we cannot be certain that the Forest Restoration activities will not lead to any leakage. For this activity we have included a leakage discount factor of 3%, as demonstrated in the technical specification (Annex 7). For the ANR and Agroforestry component we will thoroughly assess leakage risks while working out the technical specifications for each intervention, and when needed also apply a leakage discount factor.

## 3.7 Additionality

We believe that the main barriers to the implementation of a reforestation project, or any other medium/large-scale project requiring specific funds and technical expertise, are mainly due to the lack of exposure and knowledge about the possible options and the lack of minimum economic means that are necessary for any investment by the local population that is still engaged in subsistence farming. In this section we discuss the additionality of the three components. The additionality assessment of the forest restoration component can also be found in Annex 7.

In addition, the low level of schooling, the remote and poorly connected location and the lack of exposure to land-use practices other than those currently in use, make it difficult to imagine an endogenous drive that could lead to the start of a large-scale reforestation project.

The intervention of an external entity, in our case PAMS in partnership with Trees for All, is a necessary condition for the design and implementation of a project such as the one at hand, as we bring in the necessary technical knowledge, the institutional capacity and the initial required capital. In the course of time, it cannot be ruled out that, as a result of the exposure to our current project, members of the local community, perhaps with some sort of external guidance, may plan and implement similar projects in other areas of the Nguru Landscape.

From a cultural point of view, and this has been the case for centuries, the forest in our project area has been considered profitable as a place for hunting or when it is cut down, either for the use and sale of timber, or to make room for shade-growing crops such as cardamom, bananas or yams. Therefore, there is a need for a sort of cultural leap to start thinking of the forest in different terms, that is to say: as an entity that can produce economic and environmental benefits while it grows and not when it is cut down.

Over the last few decades, exposure to awareness campaigns about the risks of climate change and the negative impact of forest degradation and deforestation on ecosystem services and thus agricultural productivity, has done part of the job, making it easier to accept a project that intends to recover the forest as it was a few generations earlier. A minimum knowledge of the importance of safeguarding the environment has also been spread in rural areas. This, in combination with direct experience of a fluctuating and changing climate, which sometimes makes farming problematic, has helped to make acceptance of our project easier and more urgent, despite having components that are difficult to understand for the smallholder farmers, such as the role of the international carbon market.

The Mkingu Forest Nature Reserve was established in 2008 and acquired, on paper, a protection status comparable to that of a National Park. The neighbouring Kanga Forest Reserve has slightly less protection, allowing some non-destructive uses of forest resources, such as the collection of firewood and medicinal plants. Both forest reserves, like hundreds of others in Tanzania, are managed by the Tanzania Forest Service as an entity under the Ministry of Natural Resources and Tourism. Due to the huge amount of forest and nature reserves, the available resources of TFS are largely inadequate to even provide minimal control over illegal activities in the forests they manage. Mkingu and Kanga are no exceptions and consequently suffer from a lack of law enforcement.

This lack of law enforcement in the forests creates a political side-effect. It happens that local politicians invite people to use protected forests to expand their farms, in order to gain easy consensus and knowing that there will probably be no consequences. We know that, based on

experience gained in other areas of Tanzania, a well-structured partnership with TFS and the provision of the necessary resources to train, equip and deploy a sufficient number of scout teams (village forest guards) in the Mkingu and Kanga forests, supported by a network of informants who help to act intelligence-led, would quickly result in a drastic reduction in illegal activities such as poaching, logging and encroachment for agricultural purposes within the natural forest.

Similar to the reforestation part, we believe that the main obstacle to the realisation of agroforestry practices at scale is due to the lack of exposure and knowledge of the options and the lack of economic means required for any investment by the local population that consists of smallholders who are engaged in subsistence farming. Here again, the intervention of an external entity, in our case PAMS in partnership with Trees for All, is a requirement for the design and implementation of a project that goes beyond the initiative of individual farmers. We can bring both the necessary technical knowledge and the required start-up capital so that new practices and crops can quickly spread across the territory, simultaneously ensuring the necessary access to markets. In the course of time, there is a possibility that, following exposure to the current project, local households, eventually with external guidance and financial support, may expand the agroforestry practices by themselves.

T**able 3.7 Additionality Assessment Summary**

| **Project Intervention** | **Main Barriers** | **Activities to Overcome Barriers** |
|---|---|---|
| **Forest restoration** | **Without the implementation of our project, several significant barriers would impede the initiation and development of reforestation efforts in the targeted area:**<br>**-Economic Constraints:** The local communities, primarily subsistence farmers, lack the financial resources required for investment in reforestation activities. This economic shortfall is a critical barrier that restricts their ability to engage in or initiate forestry projects.<br>**-Limited Knowledge and Exposure:** There is a prevalent lack of awareness and understanding among the communities regarding the diverse methodologies and benefits of reforestation. The absence of this knowledge hinders the community's capacity to value and implement reforestation autonomously.<br>**-Educational Shortcomings:** The low level of schooling within the | **To address the aforementioned barriers and facilitate our reforestation efforts, the following activities have been designed as part of our strategic approach:**<br>**-Provision of Technical Knowledge and Expertise:** Bringing in experts to provide the technical knowledge needed for reforestation and to introduce sustainable agroforestry practices to the communities and participating farmers.<br>**-Alternative financial income to the farmers from the land annual payments:** long term partnership agreement with the farmers, to change to land use from agricultural farming to forest protection of restored area and agroforestry.<br>**-Capacity Building and Training:** Educating and training the community members and local stakeholders on the importance of environmental conservation and how to implement reforestation and agroforestry practices effectively.<br>**-Cultural Shift and Awareness Campaigns:** Encouraging a cultural |

| | | |
|---|---|---|
| | community further exacerbates the difficulty in assimilating new and complex concepts such as those related to reforestation and sustainable land management.<br>**-Geographical and Infrastructural Limitations:** The remote nature of the project area, compounded by poor connectivity, poses significant challenges to the dissemination of information and the implementation of reforestation practices.<br>**-Cultural Perceptions:** Historically, the forest has been valued for immediate economic gains through activities such as hunting and timber harvesting, rather than for its ecological benefits. A shift in cultural perspective is required to appreciate the forest as a living entity that provides environmental and economic benefits through its growth rather than its destruction. | change in the perception of forests from being valuable only when cut down or hunted in, to being seen as beneficial in terms of their growth for both economic and environmental reasons. This is partly achieved by building upon previous awareness campaigns about the risks of climate change and the negative impacts of deforestation.<br>**-Community Engagement:** Involving local households in the project, which may, over time, encourage them to adopt and expand reforestation practices independently.<br>**-Monitoring and Evaluation:** Establish a robust monitoring and evaluation system via permanent plots and suitable software, to assess the progress of reforestation efforts, adaptively manage interventions, and document lessons learned for future scalability. |
| **Agroforestry** | **-Lack of Capital: the set-up of agroforestry plots with crops such as** vanilla and cardamom and woodlots requires initial investment for purchasing plants and equipment, and maintaining them until they reach maturity and become profitable.<br>**-Technical Knowledge:** Specific expertise is needed to establish AF models and cultivate crops with market value, including planting techniques, pest management and harvesting processes.<br>**-Market Access:** Farmers lack access to markets to sell their products at fair prices, including international markets, which are especially important for cash crops like vanilla and cardamom.<br>**-Labor Intensity:** agroforestry with crops such as vanilla and cardamom is labour-intensive, requiring significant efforts for pollination (in the case of vanilla), maintenance and harvesting, which | **-Agroforestry model design:** Assisting in the design and implementation of AF models that optimize the growth of both trees and understory crops without resource competition.<br>**-Financial Support and Microfinance:** Providing loans, grants, or microfinance options to farmers for initial investment in agroforestry models.<br>**-Training:** Conducting workshops and training sessions on the cultivation, care, and harvesting of AF plots, including pest and disease management.<br>**-Cultural Integration:** Engaging with community leaders and using participatory approaches to integrate new agroforestry practices with respect to traditional methods.<br>**-Market Development and Linkages:** Establishing connections with local and international buyers, developing cooperatives and creating supply chains for crops/products with market value. |

| | | |
|---|---|---|
| | can be a challenge for smallholder farmers. | |
| **Forest Protection** | **-Persistence of Slash-and-Burn Farming:** Traditional slash-and-burn practices, which are often part of the local agricultural cycle, result in wildfires and repeated forest clearing and degradation, hindering natural regeneration efforts.<br>**-Unsustainable Firewood Collection:** Overharvesting of firewood can prevent the growth of young trees and reduce the seed bank, which is crucial for natural regeneration.<br>**-Lack of Alternative Livelihoods:** Without other sources of income, local populations may not be willing or able to cease activities that degrade the forest.<br>**-Limited Awareness and Education:** There may be a lack of understanding about the long-term negative impacts of current land-use practices and the benefits of forest conservation. | **-Set-up of the Village Forest Guards program**: patrolling teams of community members (VFGs) and Forest rangers of TFS to effectively control the project area.<br>**-Fire Management and Control:** establish a fire management strategy, including the creation of firebreaks, training of the Village Forest Guards as firefighters, and promoting safe burning practices.<br>**-Community Education and Awareness**: educational campaigns together with the Village Natural Resource Committees (VNRC) to raise awareness about negative impacts of current practices and the long-term benefits of forest conservation.<br>**-Enforcement of Forest Protection Laws:** working with the local and national authorities to strengthen the enforcement of forest protection laws.<br>**-Monitoring and Evaluation: I**mplement a monitoring and evaluation system to track the progress in patrolling and fire & encroachment incidents. |

## 3.8 Carbon Benefits

The expected carbon benefits resulting from the forest restoration component of this project are defined in the technical specification (Annex 7). Below we provide a summary of the figures.

**Table 3.8a Expected Carbon Benefits Summary**

| **Project Intervention** | **Baseline Emissions (t $CO_2e$/ha)** | **Project Emissions (t $CO_2e$/ha)** | **Leakage Emissions (3%, t $CO_2e$/ha)** | **Carbon Benefit* (t $CO_2e$/ha)** |
|---|---|---|---|---|
| Forest restoration (with tree planting) | 0 | -709.8 | 21.29 | 688.51 |
| Forest Restoration (with ANR)** | Not available | Not available | Not available | 350 |
| Agroforestry** | Not available | Not available | Not available | 200 |

*Carbon benefit (t $CO_2e$/ha) = baseline emissions - project emissions - leakage emissions
[ 0 - ( -709.8) – 21.29 = 688.51]

**The values of Carbon benefit have been estimated by the project coordinator as technical specifications were not available for these project interventions at the time of the validation.

**Table 3.8b Plan Vivo Certificate Potential**

| **Project intervention** | **Carbon Benefit ($tCO_2e$/ha)** | **Project Area (ha)** | **Total Carbon Benefit (t $CO_2e$)** | **Risk Buffer (20%, $tCO_2e$)** | **Achievement Reserve (10%, $tCO_2e$)** | **Potential PVCs ($tCO_2e$)** |
|---|---|---|---|---|---|---|
| Forest restoration (with tree planting) (per hectare) | 688.51 | 1 | 688.51 | 137.7 | 55.08 | 495.73 |
| Forest restoration (with tree planting) (200 ha pilot) | 688.51 | 200 | 137 702 | 27 540 | 11 016 | 99 145 |

As mentioned before we aim to implement three different activities: (1) Forest restoration with tree planting, (2) restoration with ANR and (3) agroforestry. A rough estimate is that we made is that we will implement 2 500 hectares of forest restoration and ANR and 1 200 hectares of agroforestry. For the forest restoration component we have finalized the technical specifications. For the other two activities the technical specifications will follow in a later stage. To give an impression about the total potential carbon sequestration in the project we used a rough estimate of 350 tons CO2/ha for the ANR component and 200 tons CO2/ha for the agroforestry component. Since we have not worked out the technical specifications yet we cannot provide values for the leakage discount factor and risk buffers. The numbers might differ significantly based on field data we will collect in the coming years.

| **Project intervention** | **Carbon Benefit ($tCO_2e$/ha)** | **Project Area (ha)** | **Total Carbon Benefit (t $CO_2e$)** | **Risk Buffer (20%, $tCO_2e$)** | **Achievement Reserve (10%, $tCO_2e$)** | **Potential PVCs ($tCO_2e$)** |
|---|---|---|---|---|---|---|
| Forest restoration (with tree planting) | 688.51 | 2500 | 1 721 275 | 344 255 | 137 702 | 1 239 318 |

| | | | | | | |
|---|---|---|---|---|---|---|
| (2.500 ha intervention area) | | | | | | |
| Assisted Natural Regeneration (with limited tree planting) | 350 | 2 500 | | | | 875 000 |
| Agroforestry | 200 | 1 200 | | | | 240 000 |
| Total expected sequestration potential | | 6 200 | | | | 2 354 318 |

Risk Management

## 3.9 Environmental and Social Safeguards

### 3.9.1 Exclusion list

None of the activities/topics shown on the Exclusion List of Annex 8 is or will be integrated in our project design and implementation. Our project promotes positive impacts on the ecosystem, biodiversity, rural livelihoods and climate.

Regarding potential adverse effects, it should be noted that we exclude village land for reforestation which could trigger conflicts between the village households and/or nomadic pastoralists who commonly use the land.

Similarly, we will also not use invasive tree species that could harm the ecosystem and biodiversity in the project area. We only use indigenous and endemic tree species for the reforestation component and we use native and naturalised tree species for the agroforestry component.

### 3.9.2 Environmental and Social Screening

Below we provide a brief summary of the environmental and social screening per topic. For more elaborated information and sources please consider the complete environmental and social screening report as attached in Annex 9:

**Vulnerable Groups:** The majority of the residents in the project area are part of the Wanguru ethnic group. To our knowledge, and also based on the evidence that acquiring land in the Nguru area is still relatively cheap, all Wanguru farmers own land. Although the amount of land owned can vary

considerably, every farmer can participate in the project, regardless of the size of their parcel. This applies for the related project activities including agroforestry too.

Although small in numbers, there are however some landless groups and a small group of Maasai pastoralists who have grazing grounds assigned according to village rules. Important to mention here is that the project provides both direct benefits to participants with land and indirect benefits through reforestation on community land and employment in project activities for all community members. Although, in general, local livelihood conditions are well understood by the project staff, the living conditions of these landless groups, and that of other minorities such as people with disabilities or very low incomes, need to be better understood. Especially to see if the project activities disproportionately affect these groups.

During October 2024 an additional assessment of vulnerable groups was carried out, and the data collected indicates no significant issues regarding inequalities in livelihood, income, or access to resources. Among the Wanguru, the matrilineal social structure ensures better access for women to opportunities. Additionally, individuals with disabilities are typically embedded within family networks and, in some cases, receive support from the Tanzania Social Action Fund (TASAF). The assessment also found no pressing issues among minority groups, including the Maasai. Project impacts are expected to be uniformly beneficial across all stakeholder groups. Despite these positive findings, the situation will continue to be monitored to ensure inclusivity, and strategies for targeted support will be implemented if needed.

**Gender Equality:** Our project provides a range of employment opportunities, from seed collection in the forest to nursery care, planting, and maintenance. In line with our commitment to improving women's economic access, the majority of these positions are currently held by women, who make up approximately 70% of nursery workers. At this stage, we can promote women's employment by selecting female candidates for roles that match their skills, though family-based labor divisions and the distribution of land-generated payments continue to follow traditional norms. In Pemba, for instance, women hold primary decision-making power within households, supporting our goal of fostering gender equity. Looking ahead, we plan to further formalize gender inclusivity in employment and financial access by adapting contracts—reviewed every three years—to ensure equal opportunities for work and equitable access to funds generated from land payments. The predominant Wanguru ethnic group in the project area also follows a matrilineal social structure, in which lineage and inheritance are passed through the mother's line. This structure shapes social organization, property rights, and family roles, with women playing a central role in family heritage. The Wanguru's matrilineal system strengthens maternal family bonds and grants women significant influence within both family and community, aligning well with our project's gender equity objectives.

**Human Rights:** the project is seen as an alternative way of cultivating the land and fits into existing village dynamics, we therefore do not expect to prevent people from fulfilling their economic or social rights. Furthermore, participation in project activities is on a voluntary basis.

**Community, Health, Safety & Security**: the project aims to contribute to more effective management of land and natural resources but recognises the risk of exacerbating social conflicts related to access to land and resources. A real risk factor is the more or less declared opposition from those who currently cultivate or hunt illegally within protected forests. Possible tensions may arise when the Village Forest Guards' patrolling programme starts in collaboration with the Tanzania

Forest Service. This is due to the fact that both the members of the VFG teams and the people illegally cultivating in the forest reserves are part of the same community. Such a type of situation is common and well known to the PAMS team, the reason why we adopt a 'soft' approach wherever possible. It aims at limiting conflicts, combining law enforcement with a series of actions aimed at making illegal activities undesirable, such as the fact that those known to conduct illegal activities in the reserve cannot join the project until they abandon these activities.
Since the project takes place on (former) agricultural land there is a risk that the project triggers land conflicts between farmers. With regard to land disputes, the project intends to ensure, in cooperation with the district and region, that during the implementation or updating of land use plans, both farmers and the minority of pastoralists have access to the land they need for their activities. The project's strategy is to identify potential conflicts before entering into an agreement. This identification is done through consultation by the project staff with the project participant and through the land evaluation team. This way most land related conflicts are identified at an early stage. Disputes caused by illegal activities, pastoralists entering cultivated land illegally, will be entrusted, as is already the case, to traditional resolution mechanisms via village councils.

Additionally, we see the possibility of an increase in human-wildlife conflict in the area. Currently wildlife that could cause damage to people and their produce are not present in the region. This could change when habitat connectivity in the project area is increased. PAMS has vast experience with both the mitigation of HWC through passive means and compensation in case animals cause damage.

**Labour and Working Conditions:** the type of work that the project envisages remains substantially within the framework of the agrarian activities traditionally conducted by the involved community. Moreover, both joining the project and involvement in specific project activities are on a voluntary basis. The working conditions are in line with Tanzanian labour laws and participants are remunerated for the work they put in.

**Resource Efficiency, Pollution, Wastes, Chemicals and GHG emissions:** there is no risk that the project activities will release pollutants into the environment, cause waste or hazardous materials, or that the project will result in significant consumption of energy, water or other resources, or significantly increase greenhouse gases. The only negative element is the current use of non-reusable plastic polytubes; we plan to purchase re-usable seedling trays as soon as the necessary funds become available.

**Access Restrictions and Livelihoods:** the project does not include any activity that could restrict peoples' access to land or natural resources where they have recognised rights (customary and legal). In case of the reforestation activities, participants are able to cultivate crops for the first 3 years (cardamom for the first 5) if this does not damage the planted seedlings. After this period they, voluntarily, agreed on not cultivating their land. Existing restrictions, such as the rules in place in the adjacent forest reserves, will remain in place. However, due to increased surveillance farmers could perceive it as new access restrictions. The (Maasai) pastoralists are only allowed to graze their cattle on designated grazing lands, however in reality they also use fallow lands. Since the project could lead to a decrease in fallow land the pastoralist could experience a decrease in grazing land. Important to mention here is that these activities within the reserves and outside the grazing lands are and were already illegal before the project started. In order to mitigate the effects on their livelihoods the project intends to introduce a number of measures, also in the form of alternative resources, as well as to provide an attractive alternative, including employment opportunities.

**Cultural Heritage:** the project area is not designated or intended as a cultural site, including international and national designations, and does not include important physical cultural resources or natural features or resources of cultural significance.

**Indigenous Peoples:** Most of the farmers involved in the project belong to the Wanguru ethnolinguistic group and represent the local community that traditionally resides in the area. The Wanguru are indigenous to the area, but are not identified as Indigenous Peoples according to the IUCN Environmental and Social Management System. In fact they share the same social, cultural and economic characteristics as in the rest of Tanzania and their status is not governed in whole or in part by their customs or by special laws or regulations. The village also hosts pastoralists, mainly Maasai, who participate in village decision making through assemblies and have grazing lands as defined by the Village Land Use Plans. The Maasai are formally considered Indigenous Peoples but do not originally live in the project area.

**Biodiversity and Sustainable Use of Natural Resources:** there is no risk that project activities will cause adverse impacts on biodiversity. For the restoration and ANR approach we will exclusively make use of native tree species. For the agroforestry interventions we plan to use several exotic non-invasive species such as fruit trees and some fast growing species such as *Acrocarpus fraxinifolius*, to provide (fuel)wood. Growth and regeneration of these trees will be monitored closely. There is no reason to think that the project could lead to the unsustainable use of natural resources.

**Land Tenure Conflicts:** The entire project area is subject to a customary tenure system, the administration of which is provided for in the Village Land Act 114, RE 2019. Beforehand disputes over property boundaries were identified as one of the possible reasons for conflicts. In the land valuation survey and mapping phase of the pilot area, each property owner was invited to check with their neighbours on the definition of boundaries and once all parties were in agreement, they signed both their own and their neighbours' boundaries, so any possible conflicts were resolved in the pre-project phase. The survey conducted found no encumbrances that would hinder the disposition of use rights as required by the project. Besides this all project activities are implemented in accordance with applicable laws and under the supervision of the Village Council.

Land tenure is clearly defined and documented in the project area, but, as mentioned earlier, there is still a risk that a conflict over land might appear. Especially between legal land owners and pastoralist communities. One of the co-directors of PAMS, a lecturer at Ardhi University in Dar es Salaam specialized in land conflicts and disputes, recently organized a workshop for all PAMS project staff. In the workshop the staff looked at legal, traditional and customary aspects of land disputes. The main aim was to identify possible risks the project might face over time and come up with possible solutions and strategies to minimise this risk.

**Risk of Not Accounting for Climate Change**: in general, there is awareness of the long-term climate predictions, based on the IPCC models, concerning Tanzania. More specifically, the project site falls in a particularly rainy and stable area, as it is close to a 2 400 m high mountain massif, which represents a physical barrier to the inward movement of wet monsoon and non-monsoon currents from the Indian Ocean. In addition, the more than 340 $km^2$ of sub-mountain and mountain

rainforest, spread over the Nguru Mountains and nearby Mount Kanga, provide a further element of climate stabilisation.

**In summary:**

The risk assessment below is a result of the analyses of the project proponent and the screening report performed by Plan Vivo project officers as part of the PDD review in July 2024.

| **Risk Area** | **Likelihood (1-5)** | **Magnitude (1-5)** | **Significance (low, moderate, severe, high)** |
|---|---|---|---|
| Vulnerable Groups | 3 | 3 | Moderate |
| Gender Equality | 2 | 2 | Low |
| Human Rights | 1 | 4 | Low |
| Community, Health, Safety & Security | 2 | 2 | Low |
| Labour and Working Conditions | 2 | 2 | Low |
| Resource Efficiency, Pollution, Wastes, Chemicals and GHG emissions | 2 | 1 | Low |
| Access Restrictions and Livelihoods | 3 | 3 | Moderate |
| Cultural Heritage | 1 | 2 | Low |
| Indigenous Peoples | 2 | 3 | Moderate |
| Biodiversity and Sustainable Use of Natural Resources | 2 | 2 | Low |
| Land Tenure Conflicts | 2 | 2 | Low |
| Risk of Not Accounting for Climate Change | 2 | 2 | Low |
| Other – e.g. Cumulative Impacts | 1 | 1 | Low |

### 3.9.3 Environmental and Social Assessment

The Environmental and Social Impact Assessment (ESIA) for the Nguru Landscape Forest Restoration Project contains the expected or potential risks and impacts that the project could have on the environment and the local population, and the measures to mitigate or contain these risks and impacts (see the full report in Annex 10).

The scope of this Environmental and Social Impact Assessment (ESIA) study is to methodically evaluate the potential environmental repercussions of PAMS' activities associated with the proposed project. The ESIA adhered to the pertinent laws and policies of the Government of Tanzania. Additionally, the ESIA process has been conducted to establish a monitoring framework that the project management will follow during both the design and operational phases.

The main objectives of this EIA study were to:

- establish a detailed documentation prevailing baseline conditions before project construction commences;
- identify the anticipated environmental impacts of the project and the scale of the impacts;
- propose mitigation measures to be taken during and after implementation of the project;
- document the consultation process undertaken to inform potential project stakeholders as well as the attitude of the stakeholders towards the project;
- consider stakeholders' views and suggestions regarding the project's design;
- consider various alternatives to the project to meet the intended objectives and discuss alternative methods for developing the project to ensure that the project is justified from a broader environmental and social perspective.
- develop an Environmental and Social Management Plan (ESMP) with mechanisms for monitoring and evaluating the compliance and environmental performance which shall include the costs of mitigation measures and the time frame of implementing the measures.

This ESIA report has been prepared in line with NEMC Environmental and Social Assessment Guidelines, Tanzania's Environmental Management Act (2004), EIA and Audit Regulations (2005) and its subsequent regulations of 2018 (G.N. No. 474 of 2018).

**Methodology & Desk study**

The parameters of this evaluation were determined in accordance with the stipulations outlined in the Environmental Management Act, 2004 Cap 191, with a specific focus on the Environment Impact Assessment and Audit Regulations, 2005, and the revised regulations of 2018. These regulations distinctly articulate the methodology for conducting the Environmental Impact Assessment (EIA) process. A guiding checklist was formulated by a team of consultants to guarantee the comprehensive collection of essential information during the field visit. Additionally, relevant documents were gathered and an in-depth examination of essential secondary data was carried out. The scrutinized documents encompassed initial reports for the Project, the socio-economic profile of Mvomero Districts, pertinent environmental policies, legislations, and guidelines. The desk review yielded significant information regarding the project's background, objectives and design of the proposed project. This process provided the reviewing consultants with additional insights concerning the project and a comprehensive understanding of the scope of work.

**Field Visit**

The main objective of the field visit was to collect necessary information relevant for the study. Field studies involved the inspection of the project site for assessing the existing conditions of the reforestation project. Appraisal of environmental conditions of the project site and areas that might be impacted by the project – hydrology, flora, fauna, and appraisal of land use and assessment of other relevant socio-economic parameters. However, during the site visit, the consultants also took advantage of the expertise of the local people to gather specific knowledge about the project site, such as the presence and locations of burial and cultural, and archaeological sites, concealed public services/utilities, etc. that are likely to be affected by the project activities.

**Project staff & experts**

Some of the project staff conducted part of the fieldwork required for the project. In particular Dr. Michele Menegon and his colleagues conducted several wildlife surveys, some of which were

published in scientific journals or available in the form of technical reports. Mr. Andrea Bianchi conducted floristic and vegetation surveys available in form of unpublished reports, Mr. David Tarimo as a licensed land value consultant coordinated the land value and land ownership surveys, and Mr. Richard Tadey Paul handled the socio-economic surveys. Finally, Mrs Magdalena L. Mlowe and Rosemary C. Nyirenda completed the ESIA report as licensed consultants of the National Environment Management Council of Tanzania (NEMC).

### 3.9.4 Environmental and Social Management Plan

In the following table we consider the environmental and social risks and potentially negative impact of our project on the project region and local stakeholders and give a description of the mitigation measures in place and related project activities. We have aligned the risks with the outcomes of 3.9.2 (Environmental & Social Screening) and 3.9.3 (Environmental & Social Assessment), and cross-referenced with the content of table 3.5 (Project Logic).

**Table 3.9.4 Environmental and Social Risk and Impact Mitigation Measures**

| Risk/Impact | Mitigation Measures | Related Project Activities |
|---|---|---|
| The use of non-reusable, polyethene bags in large numbers for the tree seedlings can pollute the environment. | We purchase reusable seedling trays as a sustainable alternative and collect the polyethene bags after planting. | 1. Make budget available for the purchase of reusable seedling trays.<br>2. Sensitizing nursery workers and planters of the collection of the polyethene bags.<br>3. Control by project staff in the field if bags are collected properly. |
| Potential risk that women are under-represented in the project activities and not renumerated in an appropriate way. | Project staff is encouraged to select female candidates for activities such as seed collection and nursery work. Policy of PAMS to renumerate men and women equally for the project activities. Active gender mainstreaming program launched. (cross-reference Outcome A3) | 1. Plan of gender mainstreaming in project activities.<br>2. Stakeholder consultations with the village councils including gender awareness.<br>3. Sensitisation of the community households by the Village Natural Resource Committees (VNRCs) regarding responsibilities & tasks and renumeration. |
| Potential risk of not including vulnerable groups as ultimate beneficiaries of the project | The project will go beyond the initial assessment to continuously gather detailed information on vulnerable individuals or groups within the project area. | 1.Conduct ongoing assessments to identify and monitor vulnerable individuals or groups within the project area, ensuring that their needs |

| | | |
|---|---|---|
| | This ongoing effort will inform the development of targeted strategies to ensure these individuals are among the project's beneficiaries. For instance, in the case of people with special needs, the project will explore options to involve their family members, either directly as project participants or as laborers, thereby creating meaningful engagement and support for these households. (Cross-reference Outcome A4 & activity 2.2) | are understood and considered throughout project implementation.<br>2.Develop targeted strategies to include these vulnerable groups as beneficiaries, such as engaging family members of individuals with special needs as participants or laborers within project activities.<br>3.Create regular feedback mechanisms to ensure that vulnerable groups have a voice in project decision-making processes, allowing for adjustments based on their unique circumstances and needs. |
| Participating farmers and community households have less land available for cultivation which can potentially affect food security and their livelihoods. | Project encourages people to lease fallow/ remote land for tree planting and only a small portion of their total land under cultivation. Participating households remain the property owners and receive stable annual income from the land lease during the entire project lifespan.<br>Project promotes actively agroforestry and improved agriculture practices to increase productivity and marketing opportunities of cash crops (cacao, cardamom, vanilla), and to mitigate the risk of leakage.<br>(Cross-reference Output 2 & activity 2.1 and 2.2) | 1.Partnership agreements that provide the participants income security from annual payments.<br>2. Additional income from project activities such as planting, maintenance and protection.<br>3. Introduction of agroforestry and improved agriculture practices in the project area, including marketable crops. |
| Potential risk of tensions or conflicts between families or between village councils and farmers due to land disputes | The project's strategy is to identify potential conflicts before entering into an agreement with village councils and community households. In the land valuation survey and mapping phase of the pilot area and extension phase, farmers who want to participate need to check with their neighbours on the definition of boundaries of their parcel.<br>Any plot whose ownership or right of use is not clear, or documented, will not be included in project activities in | 1. Land-use planning with the district authorities and village councils.<br>2. Partnership agreements with participants and issuance of Certificates of Customary Rights of Occupancy (CCRO). |

| | | |
|---|---|---|
| | order to avoid potential disputes.<br>The same procedure applies for land owned by the village council.<br>(Cross-reference activity 3.3) | |
| Access restrictions to the use of natural resources and land in the Forest Reserves for livelihood needs of local households | The project uses a 'soft approach' regarding illegal activities such as poaching, logging and encroachment within the Forest Reserves.<br>Simultaneously, the project will ensure that households who rely on these resources are offered viable alternatives, such as participation in agroforestry and improved agricultural activities on legal land outside the reserves and employment opportunities within the project, including roles as forest guards or laborers.<br>This approach aims to maintain or improve the livelihoods of affected families, thereby reducing leakage and fostering positive perceptions of the project among the community, while also supporting conservation goals.<br>(Cross-reference Outcome A2 & A4 and activity 1.2 [2]) | 1.Sensitization of village councils and community households on the regulations regarding the extraction of natural resources within the government owned Forest Reserves.<br>2.Collect detailed information through forest patrol activities on any limitations to natural resource access, including instances of illegal use, and maintain a comprehensive database to track these cases.<br>3.Assess situations where providing alternative livelihood options is necessary or advisable, identifying sustainable alternative land use (agroforestry/improved agriculture) and employment opportunities within the project for affected individuals or their family members. |
| Potential risk of no active participation of indigenous people (e.g. Maasai) in the project activities | The project will leverage the results of preliminary assessments that indicate that the Maasai community is not marginalised and participates in decision-making processes, with grazing areas clearly defined in village land-use plans.<br>Building on this foundation, the project will encourage the Maasai to participate in project activities, including providing opportunities for involvement as workers, to ensure their meaningful engagement and project benefits.<br>(Cross-reference activity 1.1 [6] and 1.2 [5]) | 1.Regularly monitor the participation of indigenous people in project activities to ensure their ongoing engagement and active involvement.<br>2.Ensure that indigenous communities are well-informed about the project's goals, activities, and benefits, providing them with clear access to opportunities such as temporary or permanent jobs and roles as project participants. |

| | | |
|---|---|---|
| Potential risk of an increase in human-wildlife conflict in the area by creating the wildlife corridor in the expansion phase of the project. | PAMS has vast experience with both the mitigation of HWC through passive means and compensation in case animals cause damage. (Cross-reference activity 3.2) | 1. Identification and Communication of Sensitive Animal Areas.<br>2.Establishment of HWC Monitoring Teams in collaboration with TFS and government stakeholders.<br>3.HWC Incident Data Collection.<br>4. Creation of HWC Mitigation Unit: Establish a specialized unit consisting of Village Forest Guards (VFS) and provide training on mitigation methods. |

### 3.9.5 Native Species

For the Forest Restoration as Project Intervention only native species are used (see also the full species list in Annex 17).

For Agroforestry as Project Intervention, focus is on the use of native species where possible. However, a few non-native and naturalized species with market value will be introduced into the project area in order to get more benefits in terms of NTFP's or wood.

**Table 3.9.5: Non-Native Species Overview**

| **Project Intervention** | **Non-Native Species Planted/ Introduced** | **Justification** | **Risk Assessment and Management** |
|---|---|---|---|
| Agroforestry | *Acrocarpus fraxinifolius* - Shingle Tree | A fast growing tree, with good quality timber. Branches (or whole trees) are used for firewood. Leaves provide good mulch. A nitrogen fixing species. *Acrocarpus* could (and will) be replaced by fast growing native species even though we have not found any native species capable of attaining the same growth rates. Also, when seeds of similar, valuable native tree species are found, they are used in the forest restoration project intervention. | It is not recorded as an invasive species in Tanzania (or one that commonly regenerates naturally) where it is widely planted. It is a light-demanding species and germination could only occur in open fields, where farmers would remove any seedling during site preparation. |
| Agroforestry | *Theobroma cacao* – Cocoa | A valuable cash crop providing cocoa and cocoa butter. Also used in agroforestry settings, where it can be mixed with crops (if planted at a lower | There are no records of these species being invasive in Tanzania. If left abandoned, cocoa plantations quickly |

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| | | density) or with other cash crops (such as cardamom) as well as fruit trees, as bananas. There are no native alternatives to cocoa. | regenerate with native species only. |
| Agroforestry | *Vanilla planifolia* – Vanilla | One of the most valuable cash crops that can be cultivated in the tropics. Native species of *Vanilla*, such as *Vanilla perrieri* (found in the immediate vicinity of the project) and *Vanilla imperialis* do not produce aromatic pods. | Vanilla needs hand pollination in order to produce seeds, and a species-specific symbiont fungus to germinate. If harvesting of pods ceases and cultivation abandoned, the plants would stop producing seeds. |

## 3.10 Achievement of Carbon Benefits

We use an achievement reserve of 10% of the total amount of fPVC's, after the deduction of the standard 20% permanent buffer of Plan Vivo. This is an insurance against non-achievement of carbon benefits and for mitigating risks with the underperformance of individual farmers participating in our project.

## 3.11 Reversal of Carbon Benefits

In the following table we consider the impact and likelihood of risks for the long-term maintenance of the carbon benefits from our project and we give a description of the mitigation measures in place to reduce the impact or likelihood of the risk factor. We have cross-referenced our activities with the content of table 3.5 (Project Logic).

**Table 3.11 Risk of Reversals**

| Risk Factor | Impact | Likelihood | Mitigation Measures* | Score |
|---|---|---|---|---|
| **Social** | | | | |
| Land tenure and/or rights to climate benefits are disputed | 2 | 2 | The project ensures with a rigid land survey that project participants have valid land ownership documents, supports CCRO issuances in close collaboration with the district authorities and we avoid the inclusion of land for the lease to the project on which there is a likelihood of conflict (output A1). | 4 |
| Political or social instability | 1 | 1 | Tanzania has always been a socially and politically stable country, and there is no reason to believe that it will not continue to be so. Moreover, potential tensions at the central political level rarely affect rural communities significantly. A mitigation measure is our strategy is to keep project | 1 |

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| | | | activities separate from political elements and always be super-partisan. Another is to be all-inclusive, giving all local people the opportunity to join the project on a voluntary basis regardless their background or gender. | |
| Community support for the project is not maintained | 3 | 2 | The project ensures tangible benefits for the participants and local stakeholders throughout the project lifespan. We provide annual payments as part of the PES agreements (activity 2.1) and create employment opportunities through project activities (activity 2.2) resulting in economic benefits. Furthermore, we introduce improved agricultural practices, agroforestry systems, and strengthening market linkages by value chain development to strengthen food security and create income opportunities (activity 1.3 and 2.3).<br><br>Additionally, we support the establishment and enhancement of essential village services, providing a set of additional benefits that make the project more beneficial to the entire community. Care is taken to foster strong relationships at both social and interpersonal levels between the project, its staff, the community, and local authorities. Ensuring that engagement and discussions with the local stakeholders are active and inclusive remains a core priority during the entire project lifespan, reinforcing the project's role as an essential part of community life. | 6 |
| **Economic** | | | | |
| Insufficient finance secured to support project activities | 2 | 2 | We have elaborated a solid and detailed financial strategy to cover the implementation of all planned project activities and a series of measures that can function as a buffer in case of unexpected events related to policy changes or market fluctuations or other dynamics beyond proper planning. Buffer strategies may concern the involvement of donors, the diversification of the 'product' (tree donations instead of carbon credits) and the correct strategy and operation of the trust fund. Furthermore, our financial plan is based on conservative calculations. | 4 |

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| Alternative land uses become more attractive to the local community | 2 | 2 | During the project lifespan, it is likely that alternative uses of the land may be considered by some participants, so our strategy to reversals is, in addition to the legal constraint represented by the partnership agreement, to keep the economic benefits that the project produces at household level sufficiently attractive. We ensure that at least 60% of the carbon revenues go directly to the participants by transparent annual payments (Output 2). If the price of carbon credits has the trend that is predicted, the share in addition to annual payment should remain a sufficiently good incentive, especially if combined with agroforestry and improved agricultural activities (activity 2.1, 2.2 & 2.3). We consider the option to combine these incentives related to the issuance of biodiversity credits, an activity currently being evaluated. | 4 |
| External parties carry out activities that reverse climate benefits | 1 | 1 | In the event that external parties carry out programs that reverse climate benefits and in case there is no way to prevent this from happening through negotiation or legal restrictions, the project would still represent an important factor of mitigating the negative effects generated by these activities through the combined strategy of carbon removal (reforestation) and avoided CO2 emission (forest protection), see output 1. | 1 |
| **Environmental** | | | | |
| Fire | 3 | 2 | Fire management is one of our most important tasks to carry out, and we are implementing this by creating fire prevention and extinguishing teams composed of community members from the Village Natural Resource Committees. These teams are fully trained, in place, and equipped with the necessary tools to carry out their responsibilities effectively (mitigation measure #3, activity 1.1). They are dedicated to ensuring that whenever a farmer wants to use fire in the traditional way, they are informed and ready to intervene to prevent the fire from getting out of hand. Additionally, they are tasked with responding to any fire outbreaks and ensuring that such threats are brought under control as quickly as possible. The community has demonstrated a positive | 6 |

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| | | | buy-in to this approach, further strengthening the effectiveness and sustainability of fire management efforts. | |
| Pest and disease attacks | 2 | 1 | Being a project that uses indigenous species that are well adapted to local climatic and soil conditions, the possibility of disastrous pests and disease attacks is low. In general, the correct management of the relevant variables (control of humidity levels and sun exposure, density of seedlings susceptible to pests attacks, etc.) minimises the occurrence of such an outbreak (activity 1.1, mitigation measure 4) . | 2 |
| Extreme weather or geological events | 2 | 3 | Extreme weather events are among the risk factors happen with a high probability, particularly excessive rainfall with the danger of flooding near the nursery or excessive drought during seedling germination and planting periods. However, the area is not prone to landslides or other geological events, and flooding risks have been mitigated through careful planning. Key sites, such as nurseries, are now located in elevated areas with a very low risk of prolonged submersion. In 2023, a flood partly affected the nursery, prompting its relocation to a safer, elevated location. Additionally, for planting sites in valley bottoms where temporary submersion could occur, planting at the end of the rainy season further reduces this risk. Measures are also in place to ensure sufficient irrigation to manage periods of excessive drought, supporting the long-term success of restoration activities (activity 1.1, mitigation measure 5). | 6 |
| **Administrative** | | | | |
| Capacity of the project coordinator to support the project is not maintained | 3 | 1 | We function as a cohesive team, ensuring that all members of both the project team and the broader organization are consistently updated and actively engaged throughout all stages of the project (operating as a team of teams). This includes cross training and knowledge sharing. This approach facilitates seamless transitions in the event of unexpected circumstances, such as the prolonged unavailability of a specific team member, | 3 |

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| | | | including the project coordinator. By fostering a culture of collaboration and shared responsibility, we mitigate the risk associated with any individual's absence, ensuring the project's capacity even amidst challenges. | |
| Technical capacity to implement project activities is not maintained | 2 | 1 | We have elaborated a strategy to maintain technical capacity within the project which involves:<br>• Conducting regular training sessions to update team members on evolving technologies relevant to the project.<br>• Promoting cross-training among team members to broaden skills and reduce reliance on individuals.<br>• Training local stakeholders such as the Village Natural Resource Committees and village councils so they 'own' the technical capacity to implement the activities themselves in the long term.<br>• Engaging external experts for specialized support when internal expertise is lacking.<br>• Offering constructive feedback and support to address skill gaps or performance issues.<br>• Creating contingency plans to address disruptions in technical capacity, such as partnering with other organizations or accessing external resources. | 2 |

## 3.12 Leakage

In the table below we describe the risk of leakage and leakage mitigation measures for each project intervention. For the Forest Restoration component of the project we have estimated leakage using the approved methodology PU004. We conclude that, although the mitigation measures presented below are in place, we cannot be certain that the Forest Restoration activity will not lead to leakage at all. We have therefore included a leakage discount factor of 3%. For the complete argumentation please see Annex 7.

The Agroforestry component is still under development, meaning that the Technical Specifications for this project intervention still have to be finalised. The risks and mitigation measures in the table below will be elaborated further during this process. We are not sure yet if a leakage discount factor for the Agroforestry component will be installed since we consider the project intervention as a risk mitigation measure by adding trees and improving agricultural production in already existing agricultural fields.

For the Forest Protection component of the project it is important to mention that it is not considered as a crediting activity. In fact, the forest protection component can be seen as a mitigating measure for leakage resulting from the Forest Restoration intervention since regular patrolling with Village Forest Guards and law enforcement will significantly reduce the risk of illegal

activities, particularly encroachment in the forest reserves for farming. However we still analyse the risks and mitigation measures associated with this project intervention in the table below.

**Table 3.12 Leakage Risk Mitigation**

| Project Intervention | Leakage Risk | Mitigation Measures* |
|---|---|---|
| **Forest restoration** | We identify two possible causes of leakage:<br>Displacement of Agricultural Activities**:** participating farmers decided to use part of their land for the project. Most of the land was still used as agricultural land. Joining the project means taking part of their land out of production. There is a risk that farmers will search for new land to compensate for the loss in agricultural production. This could potentially lead to increased encroachment of the forest reserves or (secondary) forest patches in the project area. It is unlikely that there will be clear cutting within the forest reserves. The most likely form of leakage will be clearance of the understory growth to enable the cultivation of cardamom. We assume that half of the forest biomass is cleared, leading to a potential carbon emission of 75 ton C per hectare (see Annex 7 for full explanation).<br>Wood Harvesting Shifts**:** although forest cover on agricultural land in the project area is low, under the baseline farmers still obtain some timber and firewood from their plots. During the crediting period farmers are not allowed to harvest wood, being restricted to the collection of dead wood. This restriction in access to timber and/or firewood might lead to increasing extraction of the resources from outside the project boundary, most likely within the boundaries of the Forest Reserves. This form of | Participation in the project is voluntary and the project is designed in such a way that it maximizes the incentives for farmers and communities dedicating part of their land to forest restoration. The main mitigating measures are:<br>Community Engagement and Incentivization**:** we actively involve the local community in decision making processes. The annual payments match the income that participants would normally obtain from cultivating the land, leading to a steady yearly income while labour/time investment is lower. There is a strong economic incentive to join. The project does not lead to a decrease in income, which mitigates the risk of leakage resulting for purely financial reasons. (mitigation measures of activity 2.1)<br>Sustainable Alternative Livelihoods**:** since part of the participants' land is taken out of production, the project must ensure that overall agricultural production is still sufficient to maintain food and nutrition security for the participating families. The project therefore helps farmers to adopt good agricultural practices. One way of doing this is to establish agroforestry plots in which staple crops (maize, beans etc.) are combined with cash crops (vanilla, cardamom etc.) and fast-growing native tree species (timber, firewood). Improved agricultural practices will lead to improved productivity and less need for slash and burn practices. Besides, the cultivation of cash crops will lead to higher income compared to current agricultural practices. (mitigation measures of activity 1.3)<br>Comprehensive Land-Use Planning**:** it is essential that the forest restoration activities are well embedded in local land-use plans and that there is no debate on land rights. Together with the District authorities and the Village Council of |

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| | leakage could result in occasional collection and harvesting of trees within the forest reserves and in some instances will be paired with clearance of understory for cardamom cultivation. | Pemba, the existing land use plan was revised to include the project activities and Certificates of Customary Rights of Occupancy (CCROs) were issued to each farmer participating in the project. This will be done in each of the participating villages, before onset of project activities. (mitigation measures of risk 5 of activity 1.2)<br>Education and Awareness Programs**:** it is extremely important to create awareness about the value of the trees within the project area and the forests in the Forest Reserves. This has been addressed in various formal meetings with the Village Council and Village Natural Resource Committees. Besides there is continuous informal dialogue between project staff and participating community members to create awareness.<br>Monitoring and Enforcement: in order to monitor and decrease illegal activities within the Forest Reserves a MoU has been signed between PAMS and the Tanzanian Forest Service (TFS). Forest protection is an integral part of the project and Village Forest Guards from the community will be trained to patrol the Forest Reserves and project area to identify illegal activities and enforce the law, together with TFS. It is extremely important to have eyes on the ground and monitor encroachment. (mitigation measures of activity 3.3)<br>Policy Advocacy: PAMS has a long track record working with the Tanzanian government. The signing of a MoU with TFS was a major step towards improved protection of the forest reserves in the project area. Forest protection laws and policies are quite strict but TFS has limited manpower and resources for law enforcement in the Mkingu and Kanga Forest Reserves. Because of the project, an additional budget is available for forest protection in collaboration with TFS. (mitigation measures of activity 3.3)<br>Carbon Accounting Safeguards: as argued before, we have to acknowledge that there is a risk of leakage, even after implementing all mitigation measures. We |

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| | | therefore decided to incorporate a leakage discount factor of 3% for the forest restoration component of the project (for detailed argumentation see Annex 7). |
| **Agroforestry**<br><br>(the technical specifications for the Agroforestry component still have to be developed, the leakage risks and mitigation measures for this project activity will be elaborated in a later stage) | The main aim of the agroforestry component is to introduce good agricultural practices, as alternatives to slash and burn under the baseline, and to diversify and increase income from agricultural production. By introducing agroforestry systems in which incorporate crops like cardamom, cacao and vanilla we intend to decrease the cultivation of these crops within the forest reserves. Having said this, agroforestry is key in preventing leakage resulting from the forest restoration component.<br>Besides being an important leakage mitigation measure, there is also a risk that agroforestry activities lead to:<br><u>Displacement of Agricultural Activities:</u> most farmers in the project area are subsistence farmers, meaning a large part of their production is used for sustaining the dietary needs of their own families. This is shown by the fact that a large part of the production is focused on staple crops like maize and beans. In Pemba these two crops add up to 71% of the total crops grown. In other Villages there is already a stronger focus on agroforestry crops like cardamom and cacao (large part of which are illegally grown inside the forest reserves). If agroforestry interventions lead to restrictions on traditional farming practices of staple crops, farmers might clear forests outside the project area to maintain their agricultural production of these crops. | As mentioned before, the agroforestry component is still in the process of being designed. During this process it is essential to put the necessities and desires of the communities in the first place. They should be the ones deciding which crops to grow. In order to mitigate the risk of leakage we should fulfil the needs of the farmers in terms of: [1] continuity of production of staple crops to ensure food and nutrition security; [2] desirable cash crops to be grown within the agroforestry plots, and; [3] firewood and timber so that they don't have to extract this from the forest reserves.<br>Mitigating measures that are to be put, and will be put, in place are:<br><u>Community Engagement and Incentives:</u> Village Council and community members will be actively involved in the project design and implementation. An important part of this is the design of a Benefit Sharing Mechanism for agroforestry products. (mitigation measures of activity 2.1)<br><u>Integrated Land Use Planning:</u> as with the forest restoration it is essential that the forest restoration activities are well embedded in local land-use plans and that there is no debate on land rights. (mitigation measures of risk 5 of activity 1.2)<br><u>Monitoring and Enforcement:</u> Village Forest Guards who have been trained by the project will, together with TFS, monitor illegal activities inside the forest reserves and enforce the law. By having eyes on the ground we are aware of trends in illegal activities and expect to prevent future illegal events from happening (mitigation measures of activity 3.3).<br><u>Market Development for Agroforestry Products:</u> due to the limited accessibility of the project area it is important to facilitate market access for the agroforestry products. This could involve the creation of |

| | | |
|---|---|---|
| | | supply chains and processing facilities to ensure fair prices and stable demand. (mitigation measures of activity 1.3)<br>Access to Sustainable Energy Sources: in the project area people rely on firewood for energy. In order to prevent increased logging and collection in the forest reserves we have to provide alternatives. This could be in the form of fast-growing tree species to plant on their plots or alternative sources of energy such as (solar) cookstoves.<br>Collaboration with Neighbouring Villages: in order to prevent shifting of agricultural production to other villages the project should engage with these villages outside the project area to promote the adoption of sustainable management practices. The ultimate goal of the project is sustainable land use in the entire Nguru Mountains landscape.<br>Leakage risk and mitigating measures for the agroforestry component will be elaborated on further during the design of the activity and as part of the separate technical specification that will be developed for this activity. |
| **Forest protection**<br><br>(forest protection is not a crediting activity, however it is still important to assess the leakage risks and mitigation measures associated with this activity) | The forest protection component is one of the most important measures of the project to prevent leakage resulting for the forest restoration and agroforestry crediting activities. There is still a risk that forest protection within the project area will lead to an increase in encroachment and other illegal activities in other areas, outside the project area. The Mkingu and Kanga Forest Reserve contain vast areas of forests. Protection should cover the entire area, not only the forests directly bordering the project communities. If not, there is a risk that illegal activities from community members will shift to other parts of the forest reserves. | Several mitigating measures have been put in place:<br>Collaboration with relevant authorities: a MoU has been signed with TFS, which is responsible for the protection of the Mkingu and Kanga forest reserves. The Village Forest Guards of the project will collaborate with TFS, who are officially mandated to arrest people committing illegal activities. This way the impact of the Village Forest Guards goes beyond monitoring (mitigation measures of activity 3.3).<br>Patrols outside project area: it is imperative to spread the vigilance over a larger area, also areas outside the project area, to prevent leakage of illegal activities. Over time, several teams of Village Forest Guards have to be installed, rotating between different regions of the forest reserves (mitigation measures of activity 3.3). |

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| | | Education and Awareness Programs: the final goal is prevention of illegal activities instead of monitoring them and convicting the perpetrators. For this it is important to raise awareness about the importance of the forests inside the reserves. The Village Forest Guards, as members of the project communities, fulfil a key role in this. |

* Cross reference with activities from Section 3.5

## 3.13 Double Counting

There are currently no other REDD+ or reforestation projects in the area where our project is implemented, while the Mkingu Forest Nature Reserve might be part of the Nationally Determined Contributions (NDC's) of Tanzania as it is classified as government land. However, as mentioned earlier, our project intervention of forest protection in the Mkingu Reserve should be considered a non-crediting activity with the aim to strengthen the conservation of forest resources in the wider area (see also the letter of no objection and approval of the Nguru project from the Tanzanian government in Annex 15).

# Agreements

## 3.14 Land Management Plans

Land use plans are regulated by the Land Use Planning Act, 2007 (Act No. 6 of 2007), which provides the procedures and processes by which land use in a planning area or zone is prescribed, managed, monitored and evaluated. The Act sets out the issues that must be included in all land use plans (including in relation to water and forest resources) and establishes environmental protection requirements. For the purposes of this Act, planning authorities include the village council and the district council. All land use plans prepared by the concerned planning authorities will be relevant at every level, including proposals for the determination or designation of land for various uses, including cultivated land, rural land, forest land, conservation of protected or traditional areas and other sensitive areas.

In the context of our project with the villages already participating or likely to participate in the project, land-use plans may be present, need updating or have not been made yet. Concerning the village of Pemba, where our project started with the pilot phase of 200 ha, PAMS in cooperation with the Mvomero District authorities and the Village Council supported the process to revise the existing Land Use Plan for the village. This updating of the village Land Use Plan was led by a District team in collaboration with the village council, who undertook the necessary discussions with the village community members, surveying and compilation, and had it finally signed off following consensus at a village assembly meeting (see Annex 11). Having this Land Use Plan in place ensure that the change in land use change due to our project activities from crop lands to reforested areas with applicable indigenous species is secures and captured in the land use plans, along with the issuance of Certificates of Customary Rights of Occupancy (CCRO) to each landowner who is participating in the project.

Concerning land management plans specific to the project, a detailed survey of the farmer plots who have voluntarily opted to be part of the project, was undertaken by a professional surveying team. This was done to geo-reference all the participating farms that lie in mosaic across the village land. The process included extensive stakeholder consultations with the village council and community members. Assigned village leaders, farmer owners, neighbours and survey team members were all present during the physical surveying process and also during the signing of partnership agreement process which was done in front of the District Lawyer. Through the consultative process, the exact location, boundaries and size of each parcel of land that make up the mosaic-like project areas were confirmed and captured digitally. All participating local farmers and their direct neighbours were in agreement with these boundaries; they physically walked through the project area, seeing their boundaries and signing off on them, with photographic evidence of their presence shown on the contract.

The Land Management Plan consists of the list of individual farms with the activities to be implemented and their dates (see examples in Annex 11). Each farmer can control what happens on his or her own farm and the timing of implementation. Farms are classified into groups on the basis of distance from the nursery and each owner can see what and when is happening on his farm.

To make it easier for participants to understand the map and related activities, georeferenced maps have been created that allow them to 'see' their position on the map in real time using a smartphone, so that the farmer can see where he is at the moment it is happening, and observe the real landmarks around him (trees, houses, road, etc.).

The field project coordinators have maps of all the plots of land available, which are used in discussions with the farmers in the field. The maps can also be given to the participants if they have a suitable device.

There were also discussions detailing the project activities and associated timelines, together with a map of all identified plots and with names of the owners, which was hung in a large format at the village office of Pemba. Project activities included planting times and methodologies, maintenance requirements, protection requirements and monitoring activities to enable reforestation during the project lifespan.

Having in hand the measurements and location of the individual farms that make up the designated project area all digitised, along with data on indigenous tree species that will be planted, the ratio mix of these species on each parcel of land, tree species growth rates, anticipated survival rates, knowledge of soil conditions, local climate etc. For all plots, seedlings are planted at a 3m x 3m spacing, equal to 1 111 trees per hectare, or 450 seedlings per acre (see species list in Annex 11). Using the PM001 methodology we are able to work out carbon sequestration rates and associated carbon benefits for the planting areas.

The carbon revenues will be used to facilitate the participating landowners to manage the tree plantings on their plots and related follow-on activities with our guidance in such a way that a sound recovery of the forest is guaranteed. This means also no tree felling on the planted parcels during the 30 years of the agreement. We aim at a permanent forest cover with natural processes in the project area and to keep the farmers and village councils committed to a long term approach after project closure.

Our aim is to also have incentives come from the carbon revenues related to agroforestry, but for this we strive for a broader management design that includes improvement of the agricultural part and the value chain development of more commercial products such as vanilla. As mentioned earlier, we will develop and implement the agroforestry component in close collaboration with the farmers and village councils at a later stage of the project, together with the relevant technical specifications.

## 3.15 Crediting Period

Our project is based on a long-term reforestation project with a planting mix of up to 120 indigenous species and generates ex-ante carbon offsets using the (average) volume sequestered during the crediting period.

We have established a crediting period of 30 years, commencing from the year when trees are planted on the land of each participant. The partnership agreements are for 30 years with an annual payment until the end of the crediting period.

The crediting phase of 30 years was chosen to allow sufficient time for the transition from an agrarian and severely degraded landscape to a mosaic of natural forest and agroforestry, in both cases with management that favours sustainability and where possible, ecological functionality and increased biodiversity. This solid approach shows our intention to generate permanent land-use change, a net increase in biodiversity and the recovery of full ecological functionality at landscape level.

While working toward the end of the initial crediting period, the intention is to make the restored forest permanent with access in the form of selective sustainable logging (1% of standing volume per year) for construction and wood processing purposes, so no increase in emissions, and with the possibility to establish a Village Forest Reserve, see also the topic of ‘project permanence’ in paragraph 3.20.

## 3.16 Benefit Sharing Mechanism

In our project, we have established a robust benefit sharing mechanism to ensure fair and equitable distribution of the revenues generated from the sale of Plan Vivo Certificates. As the project proponent, it is our priority to see that a significant portion of this income, specifically at least 60% after the deduction of charges, taxes, or similar fees by the host country, is allocated to our project participants and local stakeholders. This policy is rooted in our commitment to support the communities and individuals directly involved in our project, ensuring that they receive the financial benefits they deserve.

To operationalize this commitment, we have taken the following specific measures:

1. **Trust Establishment:** We have placed the revenue from the project's carbon forward and carbon credits sales into a Trust. This Trust is governed by a deed that mandates the allocation of at least 60% of the income from the sale of Plan Vivo Certificates directly to the project participants and local stakeholders.
2. **Annual Payments:** These beneficiaries receive annual payments, which are a crucial part of our revenue-sharing model.

3. **Payment Distribution:** We can utilize a payment dashboard, or other tools, for the efficient distribution of payments. This system allows us to directly transfer funds to the bank accounts and mobile wallets of our project participants.
4. **Funds Distribution Based on Milestones:** We have established pre-agreed milestones, such as the establishment of nurseries and tree planting activities, which are integral to the distribution of funds.
5. **Long-term Milestones:** We also monitor long-term goals, including the growth of planted forests and zero illegal logging or farming activities in the planted area, which are critical for the sustainability of our project.
6. **Monitoring and Compliance:** Our team is responsible for monitoring the project's progress and ensuring compliance with these milestones. We are also prepared to implement corrective actions if deviations are detected or issues arise that could affect the project's permanence.

**Process of designing the benefit sharing mechanism**

The process of dispersing funds and benefits to our project participants is meticulously designed. It involves a clear mechanism that accounts for various dependencies and is supported by our continuous monitoring efforts, target setting, and readiness to take corrective actions when necessary.

In the very beginning of the project, a socio-economic survey was conducted to analyse the current income level of the local communities (Annex 18). Based on the results of this survey, a sustainable payment level per ha was set up. 'Sustainable' here means that the participating farmer is able to earn from the reforestation activity an amount even higher than what he/she earns otherwise.

Long term partnership agreements were negotiated with the farmers with the annual payment level derived from the socio-economic survey and by meeting the long term sustainable goals of the project. A financial model was then elaborated ensuring that more than 60% of the Plan Vivo Certificates revenues will be distributed to the project participants during the project life span.

**The percentage allocation of income from the sale of Plan Vivo Certificates to different stakeholders:**

- Community: 74.7% of the income is allocated to the landowners and other community members that contribute to the project (village councils and smallholder farmers). This is higher than the mandatory 60% by Plan Vivo and 51% determined by the Tanzanian government. On top of the 51%, in line with Tanzanian regulations, 10% of the income should go to the Village Council (6% for adjacent villages and 4% for local government councils for conservation activities). The project complies with Plan Vivo (60%) and Tanzanian Government (61%) requirements for benefit sharing.
- Government Tax: 9% of the income is set aside for Government tax (this is in line with Tanzanian legislation).

The percentages above are calculated based on real costs for the 200 ha pilot in 2023 and 300 ha extension in 2024/2025. From the costs we concluded the minimum PVC price is $16.00 of which

$11.94 are community payments. For full argumentation of the benefit sharing mechanism we refer to section 5.4 of the PDD.

**Non-Overlap with Tanzania's Nationally Determined Contribution (NDC)**

The project exclusively involves private landowners who voluntarily manage their own farmland, which is not included in Tanzania's Nationally Determined Contribution (NDC) under the Paris Agreement. By focusing on private lands and collaborating directly with individual farmers, the project operates independently of the country's formal NDC obligations, ensuring no overlap with national carbon accounting or government-led initiatives. This approach aligns with local land rights and international carbon market standards without conflicting with Tanzania's climate commitments.

## 3.17 Grievance Handling Protocol

The grievance mechanism is designed to provide an accessible platform for project participants to voice concerns or feedback regarding project activities, conduct of the implementing team, or involved partners. It aims to foster trust between stakeholders and the project, facilitating necessary adjustments for improved project activities. While a formal protocol for expressing concerns or feedback on project activities is now in place, we have found that the village's community structure—comprising the council, informal gatherings among community members, and interactions with local project staff—facilitates rapid information exchange. The small size of the communities enables an efficient flow of communication. An effective communication network has emerged between local PAMS staff, project staff, and village and district authorities, allowing for a continuous exchange of both operational updates and individual concerns. The project office, situated within the village, is regularly visited by both project participants and other community members, creating a reliable access point for inquiries and feedback. For example, village authorities recently reached out to the office to address concerns raised by residents regarding the project's impact, particularly in relation to the reduction of illegal activities within natural forests.

Below is the outline regarding the eligibility criteria for filing a complaint, the submission process, and the internal procedures for addressing and responding to grievances by PAMS Foundation and partners. The procedure ensures fairness, transparency, and confidentiality throughout.

Who Can File a Grievance?

- Individuals and groups residing in the project area or impacted by project activities.
- Any person or entity believing that the project may negatively affect them.
- Representatives can file on behalf of others with proper authorization and identification of the affected parties.
- Anonymous complaints are accepted but might limit the verification process.

Misuse of the grievance mechanism, such as submitting malicious or disparaging complaints, won't be tolerated.

Grievance Eligibility

- The complaint should pertain to project activities or conduct of the project team or partners.
- It must detail the main adverse effects.
- There should be a clear link between the project actions and the grounds for the grievances.

Submitting Grievances can be raised by:

- Verbally contacting the designated project coordinator on-site, who will guide through the complaint process and ensure proper documentation.
- Village elders and community leaders can relay grievances through usual customary practices, ensuring local acceptance, and then onto onsite project coordinator
- Written complaints via mail, email, to info@PAMSfoundation.org

Essential Information for Grievance Submission Include:

- Complainant's details.
- Specifics of the complaint, including location, date and potential harm caused.
- Relevant supporting information and suggested actions taken to resolve the issue.

Grievance Resolution Process

- Oversight by a Project Management Team comprising PAMS Directors, not directly involved in project implementation.
- Acknowledgment of receipt within five working days.
- Evaluation of urgency and eligibility.
- Assessment of risks for all involved parties.
- Transparent planning and communication of the grievance examination process.

Fact-Finding and Investigation

- Detailed investigation of grievances while safeguarding data and individuals involved.
- Collaboration with external experts if required for resolution.

Resolution and Response

- Collaborative development and implementation of an action plan based on investigation findings.
- Documentation and communication of actions taken, conclusions, and follow-up plans.

Information Dissemination and Monitoring

- Regular updates to stakeholders and management during the resolution process.
- Scheduled monitoring and evaluation of the resolution process.

Non-Retaliation Policy

- Strong disapproval of retaliation against genuine reporters.
- Whistleblower protection measures in place.
- Disciplinary actions against employees engaging in retaliation.

Where needed, a representative from the National Carbon Monitoring Centre will be used as an independent arbitrator for mediating resolutions of any grievances that cannot be otherwise resolved.

## 3.18 Project Agreements

The process of defining agreements with the project participants is structured in various stages. Potential participants - e.g. local farmers and other community members- are informed through village meetings organised by the project together with the village council. During these meetings in the pilot stage, the project staff extensively explain to the attendants what the project is all about, including the aim, approach, benefits and project lifespan. With the expansion of the project over the subsequent years, it is highly likely that many of the future potential project participants will hear about the project from other farmers who have already participated, regardless of this, they will always still go through the initial introductory meeting.

After being informed, potential project participants can take part in a series of acquaintance meetings that the technical staff of our project carries out in each specific village in the project area. Questions can be asked and there will be more in-depth information about what it means to participate in the project. At this stage, farmers can express their non-binding intention to join the project.

During the next phase, farmers can request their land to be surveyed for potential tree planting. A team of professional land surveyors will do the surveying and assess their land, which will then be discussed with each relevant farmer/land owner. If the farmer still voluntarily wants to participate and knows the size of land that he/she intends to contribute to the project (as the team ensures the farmer still has enough other land available to farm on), an individual meeting will be arranged and the conditions will be discussed. The content of the partnership agreement (previously reviewed and approved by District authority) and the respective responsibilities are explained in detail. At this point the farmer can decide whether or not to sign the agreement.

The agreement will be signed between the farmer and the project for a period of 30 years, commencing with the first planting round. As mentioned earlier, the farmer will always remain the owner of the land, but transfers his/her carbon rights to the project for the project lifespan. As outlined in the legislation (Carbon Regulation in Tanzania (Environmental Management - Control and Management of Carbon Trading Mechanisms Regulations, Government Notice Number (G.N No.) 636 of 2022), 51% of the carbon revenues are paid directly to the participants who are the land owners and 6% shall be entitled to adjacent villages whereas 4% shall be entitled to local government council for conservation activities. In total the project will pay 74.7% of the income from PVCs to communities. For a breakdown of the benefit sharing please see section 5.4 of the PDD.

## 3.19 Project Permanence

From year 30 on, after the crediting period, we foresee a transition phase with various scenarios to strengthen project permanence. Extension of the crediting period is one of the options that will be discussed with the participating farmers and village councils. This strategy ensures incentives from the carbon revenues which will decrease over time as the forest becomes mature and the carbon sequestration curve will flatten. We expect this to happen around year 37.
Selective logging of the planted forests is also seen as an option. A part of the planted tree species

produce valuable timber which could be used for household needs and the local market. In this case, we aim at 1% of the standing volume per year with replanting to meet the sustainability criteria. The logging will be carried out under supervision of TFS and in collaboration with the project team.
The conversion of the planted forest parcels into a Village Forest Reserve is a third option. There are a few Village Forest Reserves (comparable to the status of a 'community forest') in the wider Nguru Landscape and there is actually one established Village Forest Reserve that forms part of our current project area. Village Forest Reserves are gazetted and protected through by-laws, while at the same time the community households can harvest NTFP's, fuelwood and timber for subsistence purposes. As mentioned earlier, the various options will be discussed with the participants and village councils towards the end of the project lifespan. At the moment, unless appropriate compensation can be defined, we do not see the intervention of TFS and the creation of a government forest as feasible, as the owners would lose their rights to the land.

# 4 Monitoring and Reporting

## Indicators

PAMS Foundation with its partners identified a set of KPIs to monitor and measure effectiveness and progress towards achieving the economic, social and environmental goals of the project. Profitability is measured using annual budgets and by measuring social and environmental returns on investment (KPIs) that are derived from the Theory of Change (Figure 2).

Forest restoration by tree planting and ANR is a very dynamic process, not a rather linear growth process as for example woodlots or simple agroforestry models. Our restoration approach is mimicking natural patterns and includes highly variable processes such as competition between the species, succession and natural regeneration. Indeed our project is not aiming at maximising the carbon stocked, rather at constituting a diverse and functioning ecosystem. We will plant short- and long-lived, fast-growing pioneer species alongside slow-growing, shade-tolerating species that have a poorer natural dispersion (due to lack of disperses or lack of healthy populations of these species due to human activities), the latter will grow into canopy dominant and emergent elements, together with the long-lived pioneer species.

The need of planting trees, versus a more desirable ANR arises from the observed arrested succession due to a combination of causes, mostly invasive grasses and bracken ferns, as well as a lack of seed rain. Indeed, abandoned coffee, tea and cardamom plantations, where bracken fern does not establish, show a fast secondary forest development. These processes will have their impact on the carbon sequestration and storage during the project lifespan and beyond. So, in contrast with plantation forestry where maximization and predictability is an important goal, in our scenario spatial and temporal variability is a good outcome as it is characteristic of natural forests and their dynamics and processes. Consequently, we will constantly compare the outcome of the field measurements to the default expectations of the technical specifications and update the predicted carbon accumulation trajectories based on the measurements.

Regarding the monitoring approach, it is worth noting that we include as many participating farmers and villagers as possible to collect the monitoring data, for various reasons: (1) equity/social development goals, (2) participation by local communities translates into more engagement, empowerment and thus better protection and (3) cost effectiveness.

Such a participatory monitoring approach is not only cost-effective and efficient, it will also enrich the knowledge of the local people, increase transparency and strengthen engagement initially and gradually the ownership of the project.

## 4.1 Progress Indicators

| **Output/activity** | **Indicator** | **Means of verification** |
|---|---|---|
| **Carbon benefit** | | |

| | | |
|---|---|---|
| Activity 1.1: increase of carbon sequestration through tree planting for reforestation | # of ha restoration<br>% of survival rate<br><br># of aboveground biomass stock per hectare per year<br># of belowground biomass stock per hectare/year<br># of soil organic carbon content /ha/year | Please see paragraph 4.2 |
| Activity 1.2: increase of carbon sequestration through Assisted Natural Regeneration | # of ha ANR<br>% of survival rate<br><br># of aboveground biomass stock per hectare per year<br># of belowground biomass stock per hectare/year<br># of soil organic carbon content /ha/year | |
| Activity 1.3: increase of carbon sequestration through agroforestry | # of ha agroforestry<br>% of survival rate<br><br># of aboveground biomass stock per hectare per year<br># of belowground biomass stock per hectare/year<br># of soil organic carbon content /ha/year | |
| **Livelihood benefit** | | |
| Activity 2.1: increase in income of farmers through partnership agreements | # of participants with partnership agreement<br># of annual income from annual payments per participant<br><br># of farmers trained in reforestation | Please see paragraph 4.3 |
| Activity 2.2: increase in income of village households through employment in project activities | # of villagers employed for project activities<br># of annual income from employment per household<br><br># of women involved in paid project activities | |

| | | |
|---|---|---|
| | % of women involved in paid project activities | |
| Activity 2.3: income from improved agriculture and agroforestry | # of farmers/village households trained in AF | |
| **Ecosystem benefit** | | |
| Activity 3.1: the planting of endemic and/or endangered tree species | # species planted<br><br># of endemic species<br><br># endangered species | Please see paragraph 4.4 |
| Activity 3.2: restoration of forest corridor between Mkingu and Kanga Forest reserves | # of ha restored in corridor<br><br># of km left to realize connection | |
| Activity 3.3: avoided forest degradation and deforestation through protection | # of ha of forest cover in forest reserves<br># of reported illegal activities affecting the forest<br># of wildfires | |

## 4.2 Carbon Indicators

As specified in the technical specification the following carbon pools and emission sources will be accounted for: aboveground and belowground woody biomass, soil organic carbon, nitrogen fertilisers and fossil fuel use. In Annex 7 we have provided the argumentation and ex-ante estimations for each of these pools and sources. During the course of the project period we will also monitor the development of each of these factors, to verify if the actual sequestration is in line with our estimations in the technical specifications. Below we describe the indicators that will be used to do so. For the agroforestry and ANR intervention we still have to develop the technical specifications. For the sake of completeness we have included similar indicators below for these interventions.

**Aboveground woody biomass and belowground woody biomass**

For the monitoring of AGB the project will install permanent sample plots (PSPs) in the field. For the first year of planting we have installed 10 PSPs. For each planting year new PSPs will be added, making sure we have a sufficient sample size for each intervention and strata. Below we present the indicators that will be collected during planting and with measurements of PSPs. Belowground woody biomass will be calculated based on the aboveground woody biomass, using a root-to-shoot ratio of 0.25 as published by Cairns et al (1997).

| Project Intervention | Carbon Indicator | Means of Verification |
|---|---|---|
| Forest restoration through tree planting | Number of trees planted per ha<br><br>Number of species planted | Seedlings are counted before planting and the correct number and species mixture is prepared for each farm. For each farm we will register the amount of trees planted and the species composition. This is crucial to determine survival in both the short and long term. During the measurement of PSPs all seedlings will be identified on a species level. All planted seedlings receive a tag, just as all trees with a DBH > 10 cm. |
| | Tree height | Tree height is measured annually in permanent sampling plots (PSPs) by project staff and forest ambassadors. Height will only be measured for planted seedlings, with the main aim to collect growth data that can be used to improve and develop species specific allometric equations.<br><br>For naturally regenerated or remnant trees only DBH will be recorded. |
| | % of sapling survival | Survival of saplings is measured annually for 3 years on all the farms. The first three years beating up will take place. After year 3 survival rates will be measured annually in the PSPs. |
| | Growth | Diameter at breast height (DBH) changes will be recorded annually in PSPs, for both planted seedling and natural regeneration. |
| | Species Inventory | Number of individual trees and species (planted and regenerated naturally) is recorded annually in permanent sampling plots (PSPs). |
| | Remnant trees | As argued in Annex 7 we expect remnant trees that are present under the baseline scenario, to disappear if the current land use is continued. Trees can be used for (fire)wood or can die due to damage from frequent burning. Native trees that are left in PSPs will thus be considered to be additional and will hence be measured.<br><br>Fruit trees such as mango and jackfruit will be left out of the measurements since we would expect those trees to be protected under the baseline scenario. |
| Forest restoration through ANR and/or enrichment planting | Number of trees planted | Before planting an inventory will be made of present trees. Based on this we will decide how to apply enrichment planting. After planting we will create an overview of species present in each |

| | | |
|---|---|---|
| | Number of species planted<br><br>Number of trees regenerated | plot. This is crucial to determine survival in both the short and long term.<br><br>During the measurement of PSPs all seedlings will be identified on a species level. All planted seedlings receive a tag, just as all trees with a DBH > 10 cm. |
| | Trees height | Tree height is measured annually in permanent sampling plots (PSPs) by project staff and forest ambassadors. Height will only be measured for planted seedlings, with the main aim to collect growth data that can be used to improve and develop species specific allometric equations.<br><br>For naturally regenerated or remnant trees only DBH will be recorded. |
| | Saplings survival | Survival of saplings is measured annually for 3 years on all the farms. The first three years beating up will take place. After year 3 survival rates will be measured annually in the PSPs. |
| | Growth | Diameter at breast height (DBH) changes will be recorded annually in PSPs, for both planted seedling and natural regeneration. |
| | Species Inventory | Number of individual trees and species (planted and regenerated naturally) is recorded annually in PSPs. |
| Agroforestry | Number of trees planted<br><br>Number of species planted | Seedlings are counted before planting and the correct number and species mixture is prepared for each farm. For each farm we will register the amount of trees planted and the species composition. This is crucial to determine survival in both the short and long term. During the measurement of PSPs all seedlings will be identified on a species level. All planted seedlings receive a tag, just as all trees with a DBH > 10 cm. |
| | Tree height | Tree height is measured annually in permanent sampling plots (PSPs) by project staff and forest ambassadors. Height will only be measured for planted seedlings, with the main aim to collect growth data that can be used to improve and develop species specific allometric equations.<br><br>For naturally regenerated or remnant trees only DBH will be recorded. |

| | | |
|---|---|---|
| | Saplings survival | Survival of saplings is measured annually for 3 years on all the farms. The first three years beating up will take place. After year 3 survival rates will be measured annually in the PSPs. |
| | Growth | Diameter at breast height (DBH) changes will be recorded annually in PSPs, for both planted seedling and natural regeneration. |
| | Species Inventory | Number of individual trees and species (planted and regenerated naturally) is recorded annually in PSPs. |

**Soil organic carbon (SOC)**

In Annex 7 an estimation is made of the expected removals by SOC. Over the course of the project period we will take soil samples in the PSPs and analyse the results in a lab in either Kenya or Tanzania. Soil samples will be taken every 3-5 years (depending on the verification cycle) in the PSPs. Samples will be taken at a depth of 30 cm in 5 different points in the PSP, each corner and the centre of the PSP. Based on the organic matter and bulk density we can calculate SOC stock in the plot and extrapolate this to the planting area.

| **Project Intervention** | **Carbon Indicator** | **Means of Verification** |
|---|---|---|
| Forest restoration through tree planting | Baseline SOC stock | For each PSP we will take a soil sample in year one to determine the SOC stock under the baseline scenario. Soil will be analysed in a lab. |
| | SOC stock change | Every 3-5 years we will repeat the soil sample to see how SOC stock is developing over time. This allows us to check if the actual SOC stock change is in line with the estimated SOC stock change. |
| Forest restoration through ANR and/or enrichment planting | Baseline SOC stock | For each PSP we will take a soil sample in year one to determine the SOC stock under the baseline scenario. Soil will be analysed in a lab. |
| | SOC stock change | Every 3-5 years we will repeat the soil sample to see how SOC stock is developing over time. This allows us to check if the actual SOC stock change is in line with the estimated SOC stock change. |
| Agroforestry | Baseline SOC stock | For each PSP we will take a soil sample in year one to determine the SOC stock under the baseline scenario. Soil will be analysed in a lab. |
| | SOC stock change | Every 3-5 years we will repeat the soil sample to see how SOC stock is developing over time. This |

| | | |
|---|---|---|
| | | allows us to check if the actual SOC stock change is in line with the estimated SOC stock change. |

**Nitrogen fertilisers (N2O)**

In year one we have used fertilisers on a very small scale in the nursery. Use of fertilisers under the baseline scenario is neglectable (see Annex 7) in the current project area. During the course of the project we will reassess the use of fertilisers in both the project and baseline scenario, and adjust accordingly if needed.

| Project Intervention | Carbon Indicator | Means of Verification |
|---|---|---|
| Forest restoration through tree planting | Fertiliser use by project | The use of fertilisers in the nursery will be monitored. In case we use more fertiliser we will account for increased emissions through a change in the technical specification. |
| Forest restoration through ANR and/or enrichment planting | Fertiliser use by project | The use of fertilisers in the nursery will be monitored. In case we use more fertiliser we will account for increased emissions through a change in the technical specification. |
| Agroforestry | Fertiliser use by project | The use of fertilisers in the nursery will be monitored. In case we use more fertiliser we will account for increased emissions through a change in the technical specification. |

**Fossil fuel use (CO2)**

In Annex 7 we determined fossil fuel use under the baseline scenario and accounted for fossil fuel use due to project activities. We will monitor the fossil fuel emissions that are directly linked to project activities and adjust accordingly over the course of the project period.

| Project Intervention | Carbon Indicator | Means of Verification |
|---|---|---|
| Forest restoration through tree planting | Fossil fuel use by project | We will assess:<br>- use of project cars (#km);<br>- (inter)national flights of project staff. |
| Forest restoration through ANR and/or enrichment planting | Fossil fuel use by project | We will assess:<br>- use of project cars (#km);<br>- (inter)national flights of project staff. |
| Agroforestry | Fossil fuel use by project | We will assess:<br>- use of project cars (#km);<br>- (inter)national flights of project staff. |

**Leakage**

For the Forest Restoration as project intervention we have included a leakage discount factor of 3% (see argumentation in Annex 7).

For the Agroforestry component, we are not sure yet if a leakage discount factor will be installed since we consider this project intervention as a risk mitigation measure by adding trees and improving agricultural production in already existing agricultural fields.

The Forest Protection we also consider as a mitigating measure for leakage since patrolling with Village Forest Guards and law enforcement will significantly reduce the risk of illegal activities, particularly encroachment in the forest reserves for farming.

For the monitoring approach on leakage, we make several key assumptions:

- Farmers participate in the project voluntarily, leasing small portions of their land for forest restoration while retaining enough land for agricultural production to meet at least their subsistence needs. The project team closely monitors land allocations to ensure that farmers do not lease out a significant portion of their land, which could compromise food security. This minimizes the risk of agricultural displacement.
- Illegal activities within the forest reserves are rarely driven by leakage. For instance, encroachment for farming—such as the cultivation of cardamom—is often incentivized by external market forces, such as companies seeking high-value cash crops. In terms of forest protection, the overarching goal is to reduce or eliminate all illegal activity within natural forests, enhancing forest integrity and biodiversity protection beyond what would be expected due to leakage alone. To distinguish leakage from external drivers, patrolling reports will document the ownership of illegal farms. If a participating farmer is found to have encroached upon the forest reserve, corrective measures will be taken, as such actions violate both the law and the partnership agreement.
- Since nearly all village land outside the forest reserves is privately owned, encroachment-related leakage on other people's land is highly unlikely. Additionally, village council-owned land is strictly regulated, making unauthorized occupation rare without council approval.
- Clearing bush on fallow land owned by project participants will not be classified as leakage. In traditional agricultural systems, these lands are typically cultivated in rotation, meaning their use for farming is part of established land-use practices rather than displacement caused by the project.

| **Project intervention** | **Carbon Indicator** | **Means of Verification** |
|---|---|---|

| | | |
|---|---|---|
| Forest Restoration | Displacement of agricultural activities<br><br>Wood harvesting shifts | # of project participants starting new agricultural practices elsewhere<br><br># of project participants using fuelwood and timber from other sources (survey) |
| Agroforestry | Displacement of agricultural activities | # of project participants starting new agricultural practices elsewhere |
| Forest protection | Encroachment by farming<br><br>Illegal wood harvesting | # illegal farms of project participants in the Forest Reserve reported by the patrolling teams<br><br># incidents of illegal logging and wood harvesting in the Forest Reserve reported by the patrolling teams |

## 4.3 Livelihood Indicators

| **Livelihood Indicator** | **Means of Verification** |
|---|---|
| Number of project participants in the forest restoration, per village | This data is retrieved from the project database |
| Number of project participants in the agroforestry, per village | This data is retrieved from the project database |
| Income generated to project participants from the PES | This data is retrieved from the project payments/accounting records |
| Income generated to project participants from carbon revenue share | This data is retrieved from the project payments/accounting records |
| Income generated to project participants from wage labour | This data is retrieved from the project payments/accounting records |
| Number of community members involved in forest protection/fire control per village | These data are retrieved from the records of the members involved in the various activities, kept in |

| | |
|---|---|
| | the project office and shared with the village council, and regularly transferred to the project database. The data collection and tracking app Cluey, will also be used to collect relevant data that will be stored digitally in the database |
| Number of project participants involved in capacity building/training | These data are retrieved from the records of the members involved in the various activities, kept in the project office and shared with the village council, and regularly transferred to the project database. The data collection and tracking app Cluey, will also be used to collect relevant data that will be stored digitally in the database. |
| Number and type of training delivered to project participants | These data are retrieved from the records of the members involved in the various activities, kept in the project office and shared with the village council, and regularly transferred to the project database. The data collection and tracking app Cluey, will also be used to collect relevant data that will be stored digitally in the database. |

## 4.4 Ecosystem & Biodiversity Indicators

| **Ecosystem Indicator** | **Means of Verification** |
|---|---|
| Change in natural forest cover | A combination of remote sensing tools and monitoring field surveys every 5 years |
| Change in hectares of restored forest | Annual field measurements with group of villagers |
| Change in hectares covered with AF | Annual field measurements with group of villagers |
| Change (#) in forest associated species in the restored area against the baseline | Monitoring field surveys every 5 years |

# Monitoring

## 4.5 Monitoring Plan

**Carbon monitoring**: we distinguish between measurements of tree plantings, assisted natural regeneration plots, agroforestry models and soil carbon content.
Concerning tree planting, we establish plots following each planting season, determined by the ratio of the area planted in a given year to the total target. The plots will be measured between a few months and 3 years. After this period, we set-up Permanent Sample Plots (PSP) according to the different strata. In the first years focus is on parameters such as planting density, species composition and survival rate; in the PSP we also include tree height and DBH. The monitoring will be carried out by trained community households and under supervision of the PAMS project staff. The project will also monitor tree growth through remote sensing. All data from the plots are

recorded using suitable monitoring tools. Results will be shared with the village councils, relevant local stakeholders and donors. See for a detailed description 4.2 & 4.7.
For the carbon assessment of forest restoration with assisted natural regeneration and agroforestry we use a similar approach. The difference between measurements on tree planting and ANR is that with the latter we look more deeply into the regeneration of saplings and their temporal and spatial distribution. With agroforestry, there will be less dynamic patterns and minimal natural regeneration, while growth rate will be more linear.
In line with the criteria of the Plan Vivo Standard, we will measure the sample plots at least once per verification cycle and carry out a verification by the VVB every 5 years as both forest restoration and agroforestry are crediting activities. We are aware that it is a challenge to measure carbon stocks of restored forest accurately and that current approved methods as the PM001 are actually more relevant for agroforestry and forest plantations, not for natural forest. During the project expansion phases we hope to come up with more convenient methods such as the MYRLIN model that does take into account natural regeneration and dead wood.

**Livelihood monitoring**: although we aim to improve livelihoods of the participating communities in the project area, it is very difficult to measure to which extent our project contributes to crucial aspects such as welfare, health and resilience of households. We also want to avoid 'claims' such as 'x number of households of the project area are positively impacted' or '% less poverty among participating farmers'. What we can and will do, is to monitor more straightforward numbers about the people involved in the project activities, the income per household derived from PES and wage labor, and the number of participants of training and other forms of capacity building. We also will carry out surveys to assess the rate of satisfaction of the communities with the project and related activities. We will monitor livelihood aspects in a participatory and transparent manner. Data are retrieved from the payments and account records as well as data collection with the tracking app Cluey. Relevant data will be stored digitally in the database, respecting obviously the privacy of the participants. See for a detailed description 4.3 & 4.8.1.

**Ecosystem & biodiversity monitoring**: since our mission is to bring back the natural forest in the Nguru Landscape, it is important to understand that we prevail ecosystem restoration over maximizing carbon potential from reforestation efforts. There is hardly any robust and scientific based information about restoration processes of tropical forests at scale and over considerable time. Our project is an opportunity to closely follow the succession stages of restoration and analyse the most effective approach: tree planting with framework species, ANR, a combination of planting and ANR? In combination with scientists from the Smithsonian Institution, we set-up a solid and detailed monitoring scheme with data collection at plot-level as well as landscape level. Apart from the fact that we collect useful data for science, it helps us adapt our ecosystem restoration strategy over time. All of this will be worked out in close collaboration with the community members who help with data collection and share local knowledge about the flora and fauna. A detailed science based monitoring plan with the support of researchers is under construction.
The same applies for the biodiversity component. As mentioned in 2.2, with Dr Michele Menegon as project coordinator and Andrea Bianchi as chief operations, PAMS has two staff members with exceptional expertise in conservation, biodiversity monitoring and research in East Africa's forests. Data on biodiversity come from numerous surveys conducted over the years by Menegon and colleagues and, with regard to the floristic component, more recently by Bianchi. We are currently in the process of defining expanded biodiversity monitoring protocols, which will be used to define trends against the current baselines in a more detailed manner than required by the project, in order to assess trends both within forest reserves and with regard to the dynamics of recolonisation of

areas between forests. Monitoring will be based on both traditional approaches such as photo trapping, and PAM (Passive Acoustic Monitoring) and sampling of media such as air and water to obtain long-term environmental DNA data. See for a detailed description 4.4 & in particular 4.8.2.

## 4.6 Progress Monitoring

| Outcome/activity | Nr | Indicator | Annual Target | Mitigation if milestone missed |
|---|---|---|---|---|
| **Carbon Benefit** | | | | |
| Activity 1.1: increase of carbon sequestration through tree planting for reforestation | **P1** | # of ha restoration | Year 1 = 200 ha<br><br>Year 8 = 2 500 ha<br><br>See table section 1.1 | Progress might be slower or faster as expected, meaning that it can take longer or shorter than the expected 8 years to plant 2 500 ha with this method. No mitigation measures needed. |
| | **P2** | % of survival rate | Year 1-3 = 100% (replanting takes place)<br><br>Year 30 = 76% | In case mortality is higher in year 1-3, we will increase replacement planting.<br><br>Higher or lower mortality during year 4-30 is not a problem as long as CO2 sequestration is on track. See P3 and P4. |
| | **P3** | # of aboveground biomass stock per hectare per year | Year 1 = 0<br><br>Year 30 = 521<br><br>For carbon curves and yearly expected sequestration see Annex 7. | In case the monitoring of PSPs shows sequestration is lower or higher as expected we will adjust the carbon curves accordingly. In case sequestration is lower we will use the project buffer to account for deficit of credits.<br><br>In the worst case, that deficit is higher than 10% |

| | | | | |
|---|---|---|---|---|
| | | | | project buffer we will have to make sure to compensate for the deficit in other ways, for example by increasing the project area. |
| | **P4** | # of belowground biomass stock per hectare/year | Year 1 = 0<br><br>Year 30 = 130<br><br>For carbon curves and yearly expected sequestration see Annex 7. | See above |
| | **P5** | # of soil organic carbon content /ha/year | Year 1 = 47 ton C/ha<br><br>Year 30 = 63 ton C/ha<br><br>For argumentation behind this estimate see Annex 7. | Soil samples will be taken during the project period to verify the expected amount of SOC.<br><br>In case field observations do not match estimations we will use the project buffer (see above). |
| Activity 1.2: increase of carbon sequestration through Assisted Natural Regeneration | **P6** | # of ha ANR | See table section 1.1 | Progress might be slower or faster as expected, meaning that it can take longer or shorter than the expected 8 years to plant 2.500 ha with this method. No mitigation measures needed. |
| | **P7** | % of survival rate | The design of the ANR component still has to be developed. As soon as the technical specifications are done we can | Will be a similar approach to what is written in activity 1.1. |

| | | | | |
|---|---|---|---|---|
| | | | provide annual targets. | |
| | **P8** | # of aboveground biomass stock per hectare per year | See above | See above |
| | **P9** | # of belowground biomass stock per hectare/year | See above | See above |
| | **P10** | # of soil organic carbon content /ha/year | See above | See above |
| Activity 1.3: increase of carbon sequestration through agroforestry | **P11** | # of ha agroforestry | See table section 1.1 | Progress might be slower or faster as expected, meaning that it can take longer or shorter than the expected 8 years to plant 1 200 ha with this method. No mitigation measures needed. |
| | **P12** | % of survival rate | The design of the AF component still has to be developed. As soon as the technical specifications are done we can provide annual targets. | Will be a similar approach to what is written in activity 1.1. |
| | **P13** | # of aboveground biomass stock per hectare per year | See above | See above |
| | **P14** | # of belowground biomass stock per hectare/year | See above | See above |

| | | | | |
|---|---|---|---|---|
| | **P15** | # of soil organic carbon content /ha/year | See above | See above |
| **Livelihood Benefit** | | | | |
| Activity 2.1: increase in income of farmers through partnership agreements | **P16** | # of participants with partnership agreement | Year 1 = 150 farmers (200 ha)<br><br>Year 30 = 2 500 farmers (6 200 ha)<br><br>This is a rough estimation of the amount of participants needed to reach the 6 200 ha target. | In case we will not have sufficient interest from farmers we will engage with more villages in the project region. |
| | **P17** | # of annual income from annual payments per participant | Related to # of participants and relative land plot size. The amount of payments will be monitored over time. | We will make sure to have sufficient funds to pay annual payments to each participant by securing the necessary budget upfront. |
| | **P18** | # of farmers trained in reforestation | See P16 | See P16 |
| Activity 2.2: increase in income of village households through employment in project activities | **P19** | # of villagers employed for project activities | Year 1 = 40 people employed<br><br>Year 30 = 400 people employed<br><br>This is a rough estimation of the amount of people needed to cover work in the nurseries, forest protection, forest | See P16 |

| | | | | |
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| | | | ambassadors etc. etc. | |
| | **P20** | # of annual income from employment per household | related to working hours | n.a. |
| | **P21** | # of women involved in paid project activities | Year 1 = 24<br><br>Year 30 = 240<br><br>The objective is to have approximately 60% of women employees. | n.a. |
| | **P22** | % of women involved in paid project activities | Year 1 = 60%<br><br>Year 30 = 60%<br><br>The objective is to have approximately 60% of women employees. | n.a. |
| Activity 2.3: increase in income of village households through agroforestry (AF) | **P23** | # of farmers /village households trained in AF | No specific target yet, rather achieving a satisfying level of participation across villages | In case we will not have sufficient interest from farmers we will engage with more villages in the project region. through increasing sensitization activities, support in finding valuable markets, avoidance of intermediaries. |
| **Ecosystem Benefit** | | | | |
| | **P24** | # of species planted in the project | Year 1 = 15<br><br>Year 2 = 50 | Not a big risk for the project if the amount of |

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| Activity 3.1: the planting of endemic and/or endangered tree species | | | Year 10 = 120<br><br>The objective is to steadily increase the amount of different species to approximately 120. | different species are lower as expected. |
| | **P25** | # of endemic species | Year 1 = 5<br><br>Year 10 = 15 | If the amount of endemic species is lower than expected, this doesn't pose a big threat to the project. We are however confident we will reach a high number of Eastern Arc endemic species. |
| | **P26** | # of endangered (VU, EN, CR) tree species | Year 1 = 5<br><br>Year 10 = 20 | If the amount of endangered species is lower than expected, this doesn't pose a big threat to the project. We are however confident that we will reach a high number of endangered tree species. |
| Activity 3.2: restoration of forest corridor between Mkingu and Kanga Forest Reserves | **P27** | # of ha restored in corridor | Year 3 = 50 ha<br><br>Year 10 = 2 500 ha<br><br>See table section 1.1 | Progress might be slower or faster as expected, meaning that it can take longer or shorter than the expected 8 years to plant 2.500 ha with this method. No mitigation measures needed. |
| | **P28** | # of km left to realize the connection | Year 3 = 10 km<br><br>Year 10 = 0 km<br><br>The objective is to create a connection between the two | The final objective is to create a corridor, it is not a big deal if the connection will be realized a few years earlier or later. |

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| | | | reserves in year 10. | |
| Activity 3.3: avoided forest degradation and deforestation through protection | **P29** | # of ha of forest cover in forest reserves | Based on the data collected by Village Forest Guards, reduce tree loss by 15% annually.<br><br>The objective is to reduce or eliminate the impact of illegal tree cutting within the natural forest, both for timber production and to create areas for cultivation. | |
| | **P30** | # of reported illegal activities affecting the forests | Based on the data collected by Village Forest Guards, reduce the incidence of illegal activities by 15% annually.<br><br>The objective is to reduce or eliminate all illegal activities that alter or compromise the forest's ecological functionality. | |
| | **P31** | # of wildfires | Reduce the incidence of slash-and-burn farming, which often results in | |

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| | | | wildfires, by introducing alternative practices. Ensure that selected village members and Village Forest Guards are equipped and trained to prevent and extinguish fires. Establish rapid-response firefighting teams to ensure that fires remain under control whenever a farmer intends to burn their plot of land, both within the project area and its surroundings. The objective is to create conditions that minimize wildfires near and within the forest. | |

## 4.7 Carbon Monitoring

Carbon monitoring will be based on the measurement of permanent sample plots (PSPs), as briefly mentioned in section 4.2 (Carbon Indicators). In this section we will describe the strategy we use for sampling, stratification and on the set-up of PSPs.

For the 200 ha pilot phase we have randomly selected 10 farms. In each of these farms we established a PSP, approximately in the centre of the reforested plot, to decrease edge-effects. The dimensions of each PSP are 20 by 25 metres. The dimensions will be slope corrected to make sure each PSP is 500 square metres. Each corner is permanently marked by a rebar and a coordinate that is accurate to the centimetre level in case the rebars cannot be found back. Whilst measuring the PSP in the field the area is subdivided into 20 quadrants of 5 x 5 metre to facilitate measurements. Carbon indicators mentioned in section 4.2 will be recorded by the monitoring team.

For each planting year we will add new PSPs. With a rough estimate of 1 PSP per 20 hectares this would mean that we will have approximately 300 PSPs for the total project area of 6 200 hectares. In the initial stages of the project the PSPs will be measured annually. Depending on budget and

feasibility we might decide to measure each PSP once during each verification cycle, meaning once every 3-5 years.

The 200 ha pilot area is quite homogenic in terms of existing vegetation, soil quality and land use. In this pilot area we have therefore not applied any additional stratification for the random selection of farms. When the project area will be expanded and ANR and agroforestry intervention will be implemented, additional stratification will be needed to make sure carbon estimates are correct for each of the intervention areas. We will have a strata for each of the three different interventions and possibly for distance to forest, altitude and species composition. The stratification strategy will be developed more into detail over 2025, parallel to the development of the technical specifications of ANR and agroforestry and the instalment of PSPs for the planting of 2025.

## 4.8 Livelihood and Ecosystem & Biodiversity Monitoring

### 4.8.1 Livelihood Monitoring

Table 4.3 describes the indicators used to monitor the livelihood status of project participants and other local stakeholders, and the risks of negative social impacts. The livelihood indicators were defined on the basis of discussions with individual farmers and at extended meetings, and based on the accumulated experience of PAMS Foundation staff over the years of working with communities. The potential income generated by agroforestry activities, including that from land preparation, seed collection, nursery preparation and management, is of primary interest, and participation in activities has been high from the outset. Optimal participation of women in community meetings and project activities is one of the objectives the project aims to achieve and for which specific strategies are implemented. A tangible improvement in the livelihood of the participants, and by inference, of the entire community, is among the main objectives and a critical element of long-term success. In the course of 2024, through ad hoc designed questionnaires and on the basis of the information collected during 2022/23, the baseline will be compiled. During the project expansion, dedicated surveys will be conducted to monitor and perform the metrics defined in Table 4.3.

### 4.8.2 Ecosystem & Biodiversity Monitoring

The project will start a long term camera-trapping monitoring plan, with multiple objectives:

- built a checklist of mammals that occur in the project area, both within and outside the protected forest, setting the baselines for Mkingu FNR and for the areas to be restored.
- monitor, yearly, the occurrence of species and potentially, and most interestingly, the return of forest associated species in the restored area.
- Build robust, species-specific datasets necessary to investigate different ecological aspects related to the spatio-temporal patterns of the species, including occupancy analysis, activity patterns, response to environmental factors and anthropogenic disturbance, and colonisation patterns.

Starting in the dry season of 2024, we will sample the Mkingu Forest Nature Reserve and the project area using a standardised protocol for monitoring terrestrial vertebrates (TEAM network 2011). Camera traps will be placed at a density of approximately one camera per 2 square kilometres. Sampling points will be selected to be representative of the habitat and the elevation gradient of the

study area. We will use occupancy, the estimated probability of the occurrence of a species in a set sampling site, as the metric of choice to investigate spatial and temporal patterns of the species.

Moreover, the presence of other vertebrate species of animals not captured by the camera trapping plan will be detected casually or during transects (at day and night) by project members. Record of vertebrates and transects walked will be recorded through the data collection app Cluey.

Change in forest associated plant species will be studied in the restored areas with the aid of 25 square metres plots, following Condit (1998) and Effiom et al. (2013). The plots will be divided in 25 quadrants of 1 square metre each to facilitate sampling of seedlings and sapling. In each plot all plants with true leaves equal to 1 metre or less are recorded, identified and herbarium samples collected if identification on site is not possible.

Biodiversity in Mkingu Forest Nature Reserve will also be compared to planted/restored areas through environmental DNA (eDNA) techniques, which have been already tested out in the pilot, including malaise traps for flying invertebrates, PAM (passive audio monitoring) and DNA extracted directly from the air using a small fan and 22 µm Pore Size filters.

### 4.8.3 Sharing Monitoring Results

Livelihood Monitoring:

A report will be produced every five years and shared with Plan Vivo, moreover it will be translated in Swahili and shared with Mvomero District.

Ecosystem Monitoring:

An annual report will summarize all results, detailing the sampling methodology and outlining project objectives and key findings. Each step of the process, particularly fieldwork, will be documented and shared on PAMS/Tf platforms and/or social media channels. This report will be distributed to local communities and stakeholders to raise awareness about wildlife presence throughout the corridor and its significance for ecosystem preservation and functionality. Additionally, every 3 to 4 years, the results will be scrutinized in a peer-reviewed scientific publication.

Carbon Monitoring:

The outcomes of the monitoring plan will be compiled into monitoring reports and submitted to Plan Vivo. A synopsis of both the monitoring plan and each report will be emailed to the district executive directors of Mvomero district. The findings of each report will be condensed, translated into Swahili, and presented at village assembly meetings in Pemba Village, Disanga, and Gonja subvillages.

## Reporting

## 4.9 Annual Report

An annual report will be prepared each year by the project team in order to regularly document progress and challenges and provide all relevant stakeholders with a clear and concise overview of project performance and operations. The report results will also be shared with our project partners and in particular with the participating farmers and communities.
The report will cover the PAMS financial year, starting on 1 April and ending on 31 March, with a submission date to Plan Vivo of 31 May the following year. The report will include all data on

activities undertaken, results achieved in comparison with the previous year's programme, a summary of monitoring results and the operational plan for the following year.

## 4.10 Record Keeping

Data on project participants are recorded in a dedicated database, which indicate numerous information such as participants' full name, identification, contact number, spouse details, farm valuation number, what training they attended, payment details, village, district, size of the farm etc.

Hard copies of partnership agreements are kept at PAMS head office.

Monitoring data is collected and stored in a database such as number of trees planted, number of seedlings in nurseries, number of polytubes filled, saplings mortality etc.

Similarly Plan Vivo Certificates will be in Plan Vivo Markit Registry and also stored in a dedicated PAMS database.

In time, the project also aims to prepare a digitized data collection system through a dedicated mobile app.

See examples of the PAMS databases in Annex 14.

# 5 Governance and Administration

## 5.1 Governance Structure

The governance structure of the Nguru Landscape Forest project implemented by PAMS includes a steering committee consisting of representatives from PAMS and Trees for All. This steering committee holds regular meetings and is responsible for discussing and defining the higher-level strategies for the project. It includes topics such as the general lines of implementation and development of the project, the financial modus operandi and the technical/financial aspects related to long-term strategies and aspects of certification and verification of results.

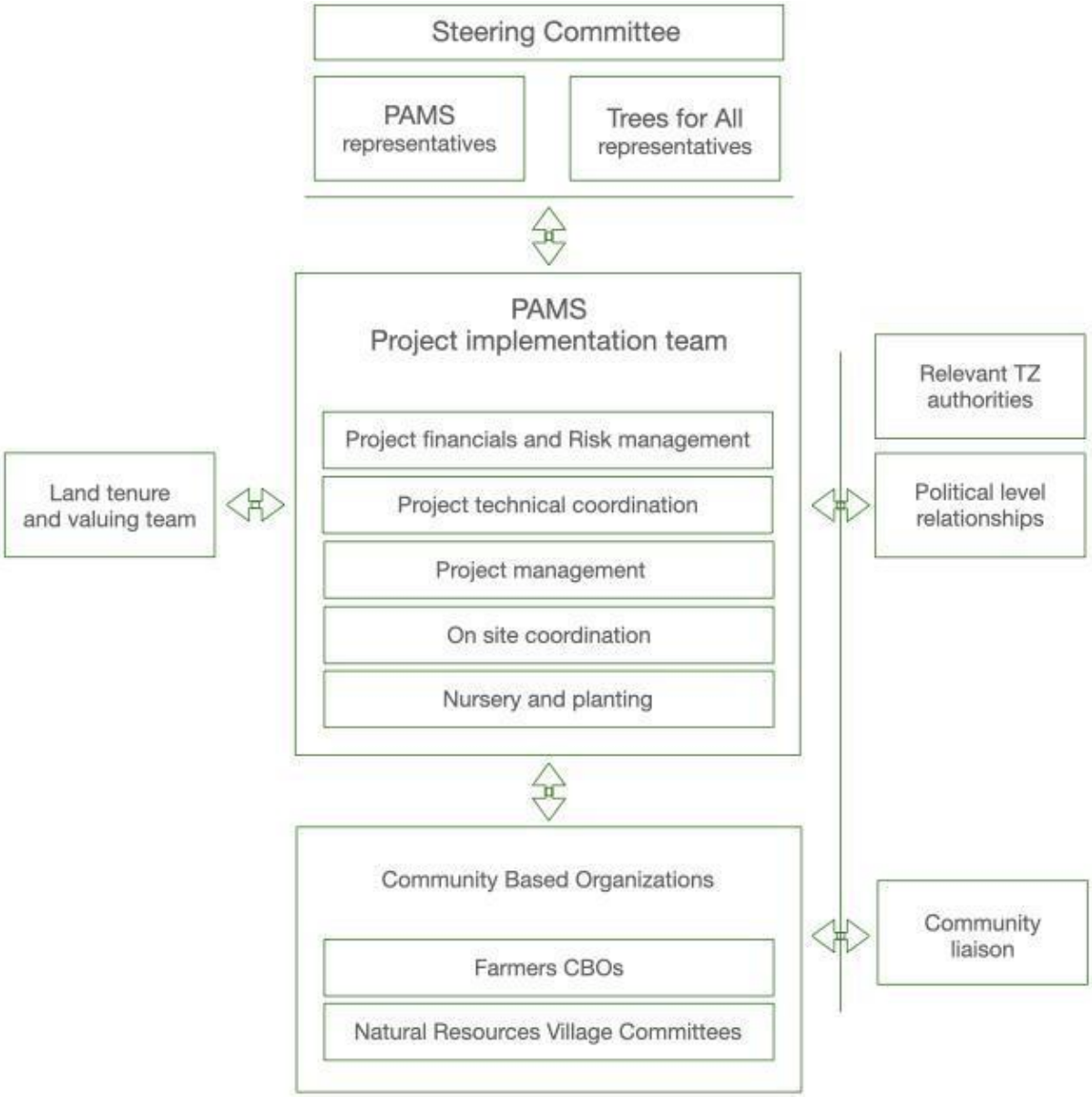
Two directors of PAMS - Krissie Clark and Dr Michele Menegon - are engaged in the steering committee and supervise the Nguru Landscape Forest project. The two other directors of PAMS are well-respected retired government officials, with one director who has an outstanding service record as Head of Intelligence at the President's office and the other with the Tanzanian Police heading up all Criminal Investigations for the Country. They are specialists in risk management and ensure that all the necessary official and unofficial government endorsements are in place at the local, regional and national level.

PAMS financial and administrative arm of the implementation team has over 14 years of experience managing large grants funds of over 4.5 million dollars a year, using internationally accepted standards which are audited annually. These same principals and experience will be used for the day-to-day financial management of our Nguru Landscape Forest project.

The project implementation team is composed entirely of PAMS staff, supported closely by its Directors. It comprises various sectors with their respective managers who interact with each other frequently, informing each other about developments and possible difficulties. The sectors include project financial and risk management and general technical coordination. The team holds regular meetings on the various aspects of the project to ensure full and informed participation in all aspects, regardless of expertise. The on-site coordinator and the nursery and planting caretaker, who reside permanently at the project site, deal with both the coordination, community engagement and relations, and the technical aspects of seed collection, nursery and planting management. The project manager, assisted by the local coordinator and nursery supervisor, is responsible for holding the necessary meetings, both formal and informal, with the farmers or their representatives, the village council and community representatives, whenever there are decisions to be made or aspects for which wider discussions are needed. The same applies to issues that may affect the District or Region. A team of external experts meets and discusses with participants the more technical aspects of land management and ownership. It is also the intention of the project to have a specific partnership for long-term training on the financial management, both at household and village level, regarding the funds obtained from project activities.

The project management collaborates closely with both Community-Based Organizations (CBOs) representing farmer groups and the Natural Resources Village Committees to ensure inclusive decision-making and align objectives with local priorities. The CBOs also serve as a vital link between beneficiaries and agricultural specialists from EPINAV, promoting knowledge sharing on good agricultural practices to improve crop production. Group leaders play a key role in managing demonstration farms, guiding members, and implementing technical instructions from EPINAV

through PAMS, especially in the absence of on-site EPINAV staff. This collaborative approach fosters community ownership, enhances agricultural productivity, and supports effective natural resource management.




The implementation team also liaises with local and central policy and government authorities relevant to our project and coordinates the activities of a technical land tenure and valuation team. This latter team is active at the start of each expansion phase of the project, ensuring that the boundaries of the potential reforestation plots are correctly defined, that there are no boundary disputes, and that compensation and annual payments are properly calculated. The project team can, if necessary, also involve external technical experts, such as foresters and carbon experts, who provide knowledge and expertise on a specific topic.

The primary participants or stakeholders in the project are local communities who undergo a sensitization process, creating awareness about the project's objectives, activities, benefits, and

avenues for their involvement. Following this, individuals are given time to reflect and discuss the information with their families. Those expressing interest in participation, voluntarily add their names to a list at the village office.

Upon inclusion in the project, the team initiates detailed engagement, allowing participants the freedom to either proceed or withdraw if their interest wanes. Once actively involved, participants can share feedback directly with the project coordinator, the village government, or the ward councillor. Subsequently, this feedback undergoes review by the PAMS Team, and necessary actions are promptly implemented. This iterative process ensures continuous communication and collaboration between the project team and the local communities.

Overall, the governance structure and decision-making process of the Nguru Landscape Forest project have been designed to be transparent, inclusive and responsive to the needs and perspectives of the project participants, local stakeholders and other organisations collaborating in the voluntary carbon credit market.

## 5.2 Equal Opportunities

As stated in the PAMS Employee Manual, we uphold a staunch commitment to equal opportunity employment. Aligned with the overarching principles of the organization, PAMS pledges that individuals it employs, collaborates with, or supports will not face discrimination based on race, ethnicity, age, sex, sexual orientation, marital status, origin, disability, creed, political belief, religion, or HIV status.

Moreover, the reforestation project places a premium on fostering opportunities for local communities, thereby bolstering economic empowerment and nurturing sustainable livelihoods. Through a multifaceted approach, which includes recruiting and training community members in tree planting and forest management techniques, the project catalyses skill development and job creation. These efforts not only amplify the capacity of local residents to actively participate in reforestation activities, but also instils a profound sense of ownership and stewardship over rejuvenated forest ecosystems.

The project offers an array of work opportunities, ranging from seed collection in the forest to tending to the tree nursery, with a deliberate focus on encouraging female participation. This deliberate effort has resulted in a notable prevalence of approximately 70 percent of nursery work being undertaken by women. While roles involving weeding and planting are open to individuals of all genders, the project remains mindful of minimizing the potential for elite capture of project benefits. By fostering extensive community consultations and embracing participatory decision-making processes, the project endeavours to ensure equitable distribution of benefits among all stakeholders.

## 5.3 Legal and Regulatory Compliance

PAMS and Trees for All are committed to ensuring full compliance with all legal and regulatory requirements in Tanzania. Our project will comply with the regulations set by the Ministry of Natural Resources and Tourism and the Ministry of Agriculture on Land Management and we will work closely with the National Carbon Monitoring Centre and other relevant government agencies to align the project with national policies and regulations related to carbon credits. We will also maintain transparent and accountable practices in all aspects of the project to ensure compliance with these policies and guidelines. By adhering to Tanzania's current policy on carbon credit projects, we intend

to contribute to the country's sustainable development goals and support its efforts to mitigate climate change (see also letter of approval and no objection in Annex 15).

Hereby an overview of some of the key legal and regulatory compliance requirements for our Nguru Landscape Forest project and a list of relevant authorities:

**Land and resources management**: The Ministry of Natural Resources and Tourism and the Ministry of Lands, Housing and Human Settlements are responsible for land management in Tanzania. The project must comply with land-use and resources use regulations set by these ministries.

**Environmental Impact Assessment**: The National Environmental Management Council (NEMC) is responsible for conducting environmental impact assessments in Tanzania. The Plan Vivo project must comply with the environmental regulations set by the NEMC.

**Greenhouse Gas Emissions Assessment**: The National Carbon Monitoring Centre is responsible for assessing greenhouse gas emissions in Tanzania. The Plan Vivo project must work closely with the National Carbon Monitoring Centre to ensure accurate assessments of greenhouse gas emissions.

Our project team will regularly review and monitor compliance with these policies, laws and regulations throughout the project's implementation and take appropriate actions to ensure that the project operates in full compliance. We will also seek guidance and input from relevant authorities, technical experts and stakeholders to ensure that the project meets all relevant requirements and standards. Overall, our project team is committed to implementing the project in a manner that is environmentally and socially responsible, while ensuring that it generates positive impacts for the local community and contributes to global efforts to address climate change.

| Topic | Yes/No/Unsure | Details |
|---|---|---|
| **Is there a national registry for land-based carbon projects?** | Yes | National Carbon Monitoring Centre, located at Sokoine University of Agriculture in Morogoro (close to our project area), is the vehicle for reporting on carbon stocks and their changes as well as coordinating the national MRV-processes for the Government of Tanzania. |
| **Are carbon rights defined in national legislation?** | Yes | Carbon rights are defined in terms of what shares of the sale of carbon credits must go to the various stakeholders. This includes a 61% share of the revenue that goes to local communities residing in the project areas. |
| **Are there any carbon pricing regulations existing or in development (e.g. emissions trading scheme or carbon tax)** | No | There is a carbon policy that regulates the production and sale of carbon credits produced in the country, and while there is currently no indication of the prices at which carbon credits produced domestically can be sold, there is a 9% tax on revenue produced by projects operating domestically and a |

| | | |
|---|---|---|
| | | registration fee equivalent to 1% of the average annual revenue. |
| **Does the country receive or plan to receive results-based climate finance through bilateral or multilateral programs?** | Yes | Tanzania's main climate finance sources are from multilateral funds - UNFCCC and non UNFCCC, and development partners, e.g. World Bank, African development bank, GIZ and others. Bilateral and multilateral funds are discussed and regulated in the Nationally Determined Contribution document published in 2021. |
| **Are there any other relevant regulations, policies or instruments?** | Yes | In addition to the policy published in October 2022 on how to register and implement projects that produce carbon credits on Tanzanian territory and regulate their trade, the Tanzanian government published in 2021 a document called Nationally Determined Contribution that identifies Tanzania's climate change adaptation targets by 2030 |

**Table 5.3: Legal and Regulatory Compliance**

| **Policy, Law or Regulation** | **Relevance** | **Compliance Measures** |
|---|---|---|
| Land Act, 1999<br>(No. 4 of 1999) | The Land Act in Tanzania is a critical legal framework that governs land tenure, ownership, and management in the country. Its importance lies in several key roles:<br>1. Secure Land Rights: The Land Act provides a legal basis for land ownership and tenure, offering security to individuals, communities, and businesses by defining their rights to use, occupy, and transfer land. This is particularly crucial for communities traditionally dependent on communal land, ensuring their rights are recognized and protected.<br><br>2. Land Use Planning and Management: It establishes guidelines for sustainable land use planning and management. This includes delineating different land uses (agricultural, residential, commercial, etc.), setting standards for land utilization, and facilitating proper land administration and titling.<br><br>3.Conflict Resolution: The Act provides mechanisms for resolving land disputes. With clear legal provisions, communities have a | PAMS and its partners are committed to ensuring full compliance with all legal and regulatory requirements in Tanzania, and the project will comply with the regulations set by the Ministry of Natural Resources and Tourism and the Ministry of Agriculture on Land Management. |

| | | |
|---|---|---|
| | framework to address conflicts arising from land rights, boundaries, and usage, thus promoting peace and stability.<br><br>4. Investment and Economic Development: Clear and secure land rights encourage investment in agriculture, infrastructure, and other sectors. It provides a conducive environment for economic growth by assuring investors and businesses of their land-related rights.<br><br>5. Preservation of Natural Resources: The Act includes provisions for conservation and protection of natural resources. By regulating land use and management, it aims to prevent degradation, promote sustainable practices, and safeguard ecosystems. | |
| Forest Act, 2002<br>(Act No. 7 of 2002) | The Forest Act in Tanzania is a crucial legislation that governs the management, conservation, and utilization of forests in the country. Its role and importance for communities in Tanzania are significant:<br><br>1. Community Forest Management: The Forest Act allows for the establishment of Community Based Forest Management (CBFM) programs. These programs empower local communities to actively participate in the management of nearby forests. Through CBFM, communities gain legal recognition of their customary rights to forests, enabling them to sustainably use and benefit from forest resources while contributing to conservation efforts.<br><br>2. Livelihoods and Socioeconomic Benefits: The Forest Act, by allowing communities to engage in sustainable forest management, supports their livelihoods, income generation, and food security.<br><br>3. Conservation and Biodiversity: The Act includes provisions for the protection of forest ecosystems, endangered species, and habitats. Through community involvement in forest management, local knowledge and practices often contribute to the conservation of unique flora and fauna. | PAMS and its partners are committed to ensuring full compliance with all legal and regulatory requirements in Tanzania, and the project will comply with the regulations set by the Ministry of Natural Resources and Tourism and the Ministry of Agriculture on Land Management. |

| | | |
|---|---|---|
| | 4. Cultural and Traditional Importance: The Forest Act recognizes the cultural ties that communities have with forests, ensuring their participation in decision-making processes concerning these areas.<br><br>5. Conflict Resolution and Enforcement: Similar to the Land Act, the Forest Act provides mechanisms for conflict resolution related to forest resources. It also outlines penalties for illegal logging, deforestation, and other activities that harm forests, promoting enforcement and compliance with sustainable forest management practices. | |
| Environmental Management (Control and Management of Carbon Trading Mechanisms) Regulations, Government Notice Number (G.N No.) 636 of 2022 (the Regulations) | Goal: The document aim to bolster the country's efforts in reducing greenhouse gas emissions, thereby lessening climate vulnerability. They prioritise environmental conservation and sustainable socio-economic development.<br><br>Principles: These Guidelines are anchored in key principles emphasising sustainable development, environmental integrity, local participation, transparency, efficiency, adherence to international standards, and the inclusion of socio-economic and environmental co-benefits.<br><br>Objectives: The overarching objective is to outline national procedures and requirements for conducting carbon trading projects in Mainland Tanzania and Zanzibar. Specific objectives include: a) Establishing transparent procedures and requirements for carbon trading projects. b) Guiding cost and benefit-sharing schemes within these projects. c) Formulating institutional and administrative frameworks for implementing carbon trading projects. d) Raising awareness among investors, decision-makers, and stakeholders about carbon trading opportunities across different sectors. | We will work closely with the National Carbon Monitoring Centre and other relevant government agencies to ensure that our project is aligned with national policies and regulations related to carbon credits. We will also maintain transparent and accountable practices in all aspects of the project to ensure compliance with these policies and guidelines. By adhering to Tanzania's current policy on carbon credit projects, we intend to contribute to the country's sustainable development goals and support its efforts to mitigate climate change. |
| Environmental Management (Control and Management of Carbon Trading) (Amendment) Regulations, 2023 | The Amended Regulations have significantly expanded the objectives initially covered in the Regulations, which now seek to mobilise climate financing from local and international sources to support the reduction of greenhouse gas emissions for purposes of fostering green investment and facilitating capacity building for mitigating and adapting to climate change. | According to the Amended regulation, we can negotiate with local community to reach a revenue sharing mechanism with the local community |

| | | |
|---|---|---|
| Environmental Impact Assessment and Audit Regulations, 2005 (G.N. No. 349 of 2005). | These Regulations provide rules relative to the procedures for and carrying out of environmental impact studies and environmental audits as provided for under the Environmental Management Act. | The requirement for an Environmental and Social Impact Assessment depends on the project's potential impact on the environment and local communities. Although a tree-planting project involving farmers, where there is no change to the land-use plan (i.e., the land remains designated for agricultural purposes), may not require a full-scale ESIA, we still decided to do a full ESIA. |

## 5.4 Financial Plan

As with many sections within this PDD, the financial plan described below is based on the restoration component (500 ha) that has and will be implemented during 2023 and early 2025. Since we have started this intervention in 2023 already we have a good understanding of the total funding needed and the benefit sharing mechanism. For the ANR and agroforestry component of the project we don't have such a detailed budget yet, since we are still designing and researching the exact project activities needed and the potential income from carbon revenues.

The funding needed for the first 500 hectares of the project has been covered by Trees for All and PAMS. Together PAMS and Trees for All have secured funding for the implementation of all project activities and the payment of lease to farmers for the full 30-year period. The total needed and secured funding for 500 ha is approximately 3.5 million euros. For details on the payment tranches and division of expected (f)PVCs between PAMS and Trees for All please see Annex 2.

So far the available funding has been used for the nursery setup, first-year annual payments, staff salaries, labour, equipment, meetings, as well as weeding and planting activities for the years 2023 and 2024. The seed funding from PAMS and Trees for All has laid a strong foundation for the project's future expansion. The financial model is based on the issuance of fPVCs from the project. In the unlikely event that there are problems in certifying the project, so in case that issuing carbon credits is not feasible, the project plans to turn to donations for tree planting to ensure contractual payment obligations towards project participants can be met.

Below we give a summary of all anticipated project costs for the 200 ha and 300 ha areas, which started in 2023 and 2024. Through these figures we come to a minimum fPVC price that is needed to cover all project costs, taxes and certification costs. We also demonstrate that we comply with the benefit sharing requirements of Plan Vivo and the Tanzanian Government.

| **Project costs (500 ha)** | **USD (500 ha)** | **USD (per ha)** | **USD (per credit)** | **Percentage** |
|---|---|---|---|---|
| **Implementation costs:** | | | | |

| | | | | |
|---|---|---|---|---|
| Nursery | 128 773 | 258 | 0.51 | 3.2% |
| Surveying & signing | 165 953 | 332 | 0.66 | 4.1% |
| Annual payments | 2 389 414 | 4 779 | 9.48 | 59.3% |
| Annual payments and related taxes | 631 | 1 | 0.00 | 0.0% |
| Clearing | 23 458 | 47 | 0.09 | 0.6% |
| Planting | 29 240 | 58 | 0.12 | 0.7% |
| Weeding | 358 580 | 717 | 1.42 | 8.9% |
| Mortality planting | 49 148 | 98 | 0.20 | 1.2% |
| Fire protection | 51 480 | 103 | 0.20 | 1.3% |
| **Fixed costs:** | | | | |
| Coordination & logistics | 160 494 | 321 | 0.64 | 4.0% |
| Monitoring | 42 494 | 85 | 0.17 | 1.1% |
| Forest protection | 55 368 | 111 | 0.22 | 1.4% |
| Regulatory costs | 12 030 | 24 | 0.05 | 0.3% |
| Capital items | 17 774 | 36 | 0.07 | 0.4% |
| Administrative overheads | 86 551 | 173 | 0.34 | 2.1% |
| **Certification costs:** | | | | |
| Project validation (VVB) | 45 000 | 90 | 0.18 | 1.1% |
| Plan Vivo fees | 3 500 | 7 | 0.01 | 0.1% |
| PV issuance fee | 88 183 | 176 | 0.35 | 2.2% |
| **Total:** | | | | |
| Excluding 8% government tax | 3 708 071 | 7 416 | 14.72 | 92% |
| Including 8% government tax | 4 030 513 | 8 061 | 16.00 | 100% |

For the first 500 ha in the project we conclude that the minimum fPVC price should be $16.00 (€14.72) to be able to cover all costs for project implementation and the long term annual payments.

The information above applies to the funding for 500 ha while we strive to a total project area of 6 200 hectares. For the additional 5 700 hectares funding has not been secured yet. In order to reach

the 6 200 hectares a significant investment in the project is needed. The main funding mechanism we envision for future funding is through the sales of (f)PVCs. For this we see three main options:

1) Funding from Trees for All: TfA has experience with carbon markets and a wide variety of both small private and corporate donors who donate regularly to TfA. Part of this funding can be used for the realization of more hectares. Currently, Trees for All's funds are not sufficient to fund the full 6 200 hectare project over the coming years;
2) Funding from private donors: PAMS has strong relations with private and institutional donors that are interested in providing funding to the project. Donations can either be in return for (f)PVCs or out of other objectives from the funders. For instance, one funder is specifically interested in the biodiversity impact of the project and does not need (f)PVCs in return.
3) Large investors: another strategy would be to collaborate with investors that fund a large part of the project in return for the (f)PVCs. A condition in this scenario would be that part of the investors' profit has to flow back to the project participants to ensure a proper benefit sharing mechanism.

Although we have not yet secured funding for the full 6 200 hectares, we are confident in our ability to obtain the necessary resources for future planting years, particularly once the project is validated. The total estimated cost of the project is $40 000 000.

**Benefit sharing**

Our project is designed to maximize the benefits for the community. Both PAMS and Trees for All are not for profit organisations, so no profits will be made from the sales of (f)PVCs. The main source of income for participating farmers or Village Councils is the annual payment for a period of 30 years. In order to incentivize participants the annual payments are subject to a 3% annual increase. By spreading the annual payments over the entire crediting period the chance of farmers dropping out is decreased, thus helping project permanence. Besides income from annual payments the project will yield additional income for the local communities through employment.

At the same time the long-term annual payments are a big responsibility for the project proponents. Partnership agreements are signed before planting and each partnership agreement results in a payment obligation for a period of 30 years. This means we need to ensure that we have sufficient budget reserved for the entire crediting period. The financial model is based on ensuring the budget for annual payments, without speculating on future developments in carbon pricing. Meaning that the annual payments need to be reserved from the sales of fPVCs. As soon as fPVCs are sold, the money for the annual payments will be deposited in a Trust Fund or another suitable instrument. The funds are released on a yearly basis to cover the farmers' land annual expenses for the total duration of the project. This structure is set up to guarantee that the land annual payment is secured and paid for the full project term to ensure incentives for the communities continue over the project term.

Based on the budgetary information above we can assess how much of the fPVC income flows back directly to the community. The annual payments consist of 59.3% of the per unit price. Besides the annual payments, project participants benefit through income from various project activities. The total benefit to the community is expected to be as follows:

| Community payments | USD (500 ha) | USD (per ha) | USD (per credit) | Percentage |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Nursery | | | | |
| - Salaries nursery workers | 62 462 | 124.92 | 0.25 | 1.5% |
| - Salaries seed collectors | 5 050 | 10.10 | 0.02 | 0.1% |
| Annual payments | 2 389 414 | 4 778.83 | 9.48 | 59.3% |
| Clearing | 23 458 | 46.92 | 0.09 | 0.6% |
| Planting | 29 240 | 58.48 | 0.12 | 0.7% |
| Weeding | 358 580 | 717.16 | 1.42 | 8.9% |
| Mortality planting | 49 148 | 98.30 | 0.20 | 1.2% |
| Fire protection | | | | |
| - Salaries firefighting teams | 51 246 | 102.49 | 0.20 | 1.3% |
| Monitoring | | | | |
| - Salaries monitoring teams | 2 632 | 5.26 | 0.01 | 0.1% |
| Forest protection | | | | |
| - Salaries patrol | 37 755 | 75.51 | 0.15 | 0.9% |
| **Total** | **3 008 985** | **6 017.97** | **11.94** | **74.7%** |

The partnership agreements (59.3%) will be paid directly into the mobile wallets of the project participants. Most of the other activities, such as clearing, planting, weeding and mortality planting (11.4% in total) will be paid to the project participants in case they implement the activities themselves. In case the participants decide to outsource the activities, PAMS will pay other community members to implement the clearing, planting and weeding instead. Other community members (possibly also project participants) benefit through salaries paid for nursery work, seed collection, firefighting teams, monitoring teams, and patrol teams (3.9%). We can conclude that 74.7% of the project costs will flow back directly to the project communities. The biggest part to project participants and a smaller part to community members that do not participate with land in the project. The benefit sharing mechanism of this project is therefore in accordance with both Plan Vivo requirements (60%) and the Tanzanian carbon regulations (61%).

Calculations above are based on a minimum fPVC price of $16.00 (€14.72). In case credits will be sold for a higher price than this minimum fPVC price, the additional revenue will be used as much as possible to benefit the project communities. The exact mechanism for this still has to be developed. A first idea is that 75% of the additional revenues will flow back to project communities, for instance by increasing annual payments or developing a community fund. The leftover 25% of additional revenues could be used by the project proponents as seed capital to develop similar reforestation projects in Tanzania and/or other countries. The agroforestry component and Assisted Natural Regeneration component of the project are still in development. We strive for a similar benefit sharing approach in which a large part of the income from fPVCs will flow back directly to the community. We will provide a separate financial plan and benefit sharing mechanism for these project activities as part of the technical specifications.

## 5.5 Financial Management

PAMS Foundation adheres to stringent financial procedures to effectively manage all aspects of project income and expenditure, including funds generated from the sale of Plan Vivo Certificates.

Our commitment to financial integrity is evident through the following financial best practices:

**Qualified Team**: Our head accountant, a Certified Public Accountant, leads a dedicated team of accountants, ensuring expertise and professionalism in financial management.

**Advanced Accounting Software**: We employ QuickBooks accounting software, providing a robust platform for recording and tracking all income and expenses with precision.

**Policy Compliance**: A comprehensive Financial Regulations Manual guides our financial operations, and monthly bank account reconciliations are conducted to ensure compliance and accuracy.

**Approval Process**: All payments undergo a meticulous review and approval process led by the Chief Financial Controller, who is also the Executive Director. This step ensures alignment with available budgets before submission for further payment authorization.

**Dual Signatories**: To enhance accountability, every payment requires approval from two signatories, adding an additional layer of oversight.

**Budgetary Controls**: Implementing robust budgetary controls to monitor and manage project finances effectively, including periodic budget reviews to ensure alignment with organisational goals and priorities.

**Cash Flow Management**: Proactive cash flow management strategies to anticipate and address any potential shortfalls, ensuring the organisation's financial stability and ability to meet its obligations.

**Documentation and Record Keeping**: Emphasising meticulous documentation and record-keeping practices to facilitate transparency, accountability, and compliance with regulatory requirements.

**Risk Management**: Regular risk assessments to identify, assess, and mitigate financial risks, ensuring the organisation is well-prepared to navigate unforeseen challenges.

**Regular Financial Reporting**: Implementing regular and timely financial reporting mechanisms to ensure guide planning.

**Annual Financial Audit**: PAMS Foundation undergoes an annual financial audit conducted by independent auditors certified by nationally and internationally recognized regulatory bodies. Currently, PwC serves as our auditor. Audits are performed within six months after the financial year ends, maintaining transparency and accountability.

**Independent Financial Advisor**: To continuously improve our financial practices and enhance transparency, an independent financial advisory company provides regular reviews of our financial accounts. Their insights guide us in adopting and implementing best practices.

These financial best practices underscore our commitment to responsible and transparent financial management, ensuring that every resource is utilised efficiently and effectively to support our project activities. Similarly, **our carbon credits will be of high-quality** as they will be generated through rigorous and credible processes, ensuring that the emission reductions or removals they represent are genuine, measurable, additional, verifiable, avoid leakage, involve meaningful engagement with local communities and stakeholders, and sustainable (delivering additional social, economic and environmental benefits). The entire process of carbon credit generation, from project inception to credit issuance, will be transparent and traceable. This includes transparent reporting on methodologies, monitoring plans, and financial transactions.

# Annexes

Annex 1 – Project Boundaries
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