



**PANDA MITI**  
**KIBIASHARA**  
PRIVATE FORESTRY PROGRAMME

# PRIVATE FORESTRY PROGRAMME

## PHASE I ACHIEVEMENTS



United Republic of Tanzania  
MINISTRY OF NATURAL RESOURCES AND TOURISM  
Forestry and Beekeeping



MINISTRY FOR FOREIGN  
AFFAIRS OF FINLAND





## Private Forestry Programme

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### Phase I Achievements

4 February, 2019



United Republic of Tanzania  
**MINISTRY OF NATURAL RESOURCES  
AND TOURISM**  
Forestry and Beekeeping Division



**EMBASSY OF FINLAND**  
DAR ES SALAAM

# **Private Forestry Programme**

## **Phase I Achievements**

**4 February, 2019**

**Private Forestry Programme – Panda Miti Kibiashara**

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Cover photo: Seedlings being raised at the container-based nursery of the Forestry and Wood Industries Training Centre, Mafinga



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## CONVERSION RATE

EUR to TZS                      1 EUR = 2,500.00 TZS

## **ACRONYMS AND ABBREVIATIONS**

DC	District council
EUR	Euro
FWITC	Forestry and Wood Industries Training Centre
IGA	Income-generating activity
KVTC	Kilombero Valley Teak Company
MFA	Ministry for Foreign Affairs of Finland
MNRT	Ministry of Natural Resources and Tourism
NFC	New Forests Company
NLUPC	National Land Use Planning Commission
OSP	Out-grower Support Programme
PFCTT	Private Forestry and Carbon Trading in Tanzania
PFP	Private Forestry Programme
SME	Small and medium enterprises
TC	Town council
TFS	Tanzania Forest Service
TGA	Tree growers' association
TGIS	Tree-Growing Incentive Scheme
TTGAU	Tanzania Tree Growers Associations Union
TTSA	Tanzania Tree Seed Agency
TZS	Tanzania shillings
VET	Vocational education and training
VETA	Vocational Education and Training Authority
VLUP	Village land-use plan
VSLA	Village savings and loan association

## **1. INTRODUCTION**

### **1.1 Purpose of this document**

This document recapitulates the main achievements of Phase 1 of Private Forestry Programme (PFP), from 2014 to 2019.

This document was prepared to meet the demand for a short, simplified version of the “Draft Phase 1 Completion Report” of PFP. The “Draft Phase 1 Completion Report” was approved by the programme’s Supervisory Board on 28 November, 2018, with the understanding that the document was based on the best information available at the time of approval and that it would be updated after the final data became available upon the closure of Phase 1.

### **1.2 Private Forestry Programme in a nutshell**

PFP is a bilateral development cooperation programme implemented jointly by the Ministry of Natural Resources and Tourism of Tanzania (MNRT) and the Ministry for Foreign Affairs of Finland (MFA). The programme’s overall objective is to increase income in the Southern Highlands of Tanzania by supporting private plantation forestry and strengthening wood-based industries.

The rationale behind supporting private plantation forestry in Tanzania was as follows:

1. Tanzania is one of the few countries in the world that still has land with the right climate and right soils for successful tree plantations.
2. Small-, medium-, and large-scale tree growers in the Southern Highlands are keen to expand tree plantation; in fact, a strong movement of tree growers exists.
3. Both plantation forestry and plantation wood-based processing have the potential to be profitable and environmentally and socially sustainable.
4. Private plantations and value-added production can have major positive economic, social, and environmental impacts at both the local and the national levels.

The programme operates in the Southern Highlands and Kilombero Valley. It supports villages in 11 districts of four regions, including Kilolo and Mufindi in Iringa Region, Ludewa, Makete, Njombe TC and Njombe DC in Njombe Region, Kilombero and Ulanga in Morogoro Region, and Madaba, Mbinga and Nyasa in Ruvuma Region.

The programme is a long-term partnership designed to consist of four phases. The first phase of the programme began on 1 January, 2014, and is currently scheduled to run until 31 March, 2019.

The programme’s key features are listed in Table 1. Figure 1 includes a map showing the programme’s area of operation and key geographic features.

Figure 2 presents the programme intervention logic in the form of a results chain. It lists the programme’s outputs and results and shows how they contribute towards achieving the programme’s overall objective.

**Table 1 Key features of Private Forestry Programme**

Overall objective	Promote sustainable and inclusive private forestry that boosts economic growth and helps alleviate poverty
Purpose of the first phase	Ensure that economically viable, sustainable and inclusive plantation forestry and related value chains provide employment to and increase the incomes of private forest owners, small and medium enterprises and vulnerable households in the programme area
Funding frame	<ul style="list-style-type: none"> <li>- MFA Finland EUR 19,493,376</li> <li>- Government of Tanzania EUR 985,950 (5% of total budget)</li> </ul>
Key stakeholders	<ul style="list-style-type: none"> <li>- Ministry of Natural Resources and Tourism of Tanzania</li> <li>- Ministry for Foreign Affairs of Finland</li> <li>- Steering committee and supervisory board members</li> <li>- Tree growers, wood processors and wood users</li> </ul>
Technical assistance	Indufor Oy and NIRAS Finland
Programme result areas and targeted results for the first phase	<ol style="list-style-type: none"> <li>1. <i>Enabling environment.</i> An environment which enables the expansion of sustainably managed private plantation forestry exists.</li> <li>2. <i>Plantation forestry development.</i> High-quality tree-growing and private plantation forestry have increased in the programme area and uphold sustainable and inclusive principles.</li> <li>3. <i>Small and medium enterprise development and product innovation.</i> The profitability and sustainability of SMEs within the forestry value chain have improved.</li> </ol>
Geographic area	Southern Highlands and Kilombero Valley of Tanzania
Key beneficiaries	Private tree growers, and wood-processing enterprises and users
Human rights and cross-cutting objectives	The programme is a progressive one: it upholds human rights principles in its processes and supports those tree growers' associations, business associations, and NGOs that themselves respect, protect, and fulfil human rights. The needs, concerns, and capacities of different duty bearers and rights holders, especially vulnerable groups like women, the landless and the disabled, are addressed by the programme's activities and expected results. Gender disaggregated data is used systematically when planning and monitoring interventions and their results.
Environmental safeguards	<ul style="list-style-type: none"> <li>- Informed villagers decide on planting areas using inclusive and participatory approaches during village land-use planning, which is itself facilitated by district land-use planning teams with PFP technical and financial support.</li> <li>- Natural forests, watercourses, wetlands, edaphic grasslands, and areas of scientific and/or cultural value are not disturbed.</li> <li>- Only the most viable of sites are selected. No planting is supported in areas that have less than an average of 1,000 mm of rainfall per year in order to avoid any problems in downstream water supply.</li> </ul>
Main environmental impacts	<ul style="list-style-type: none"> <li>- Reduction in the number and severity of wildfires</li> <li>- Improvements in the forest carbon sequestration and storage through the introduction of fast-growing species and conversion of about 12,000 ha of degraded grassland into forest plantations</li> <li>- Promotion of natural forest conservation by substituting sustainable wood waste-based fuel for <i>miombo</i> [<i>Brachystegia spp.</i>] charcoal and eucalyptus for natural hardwood in furniture manufacturing</li> </ul>

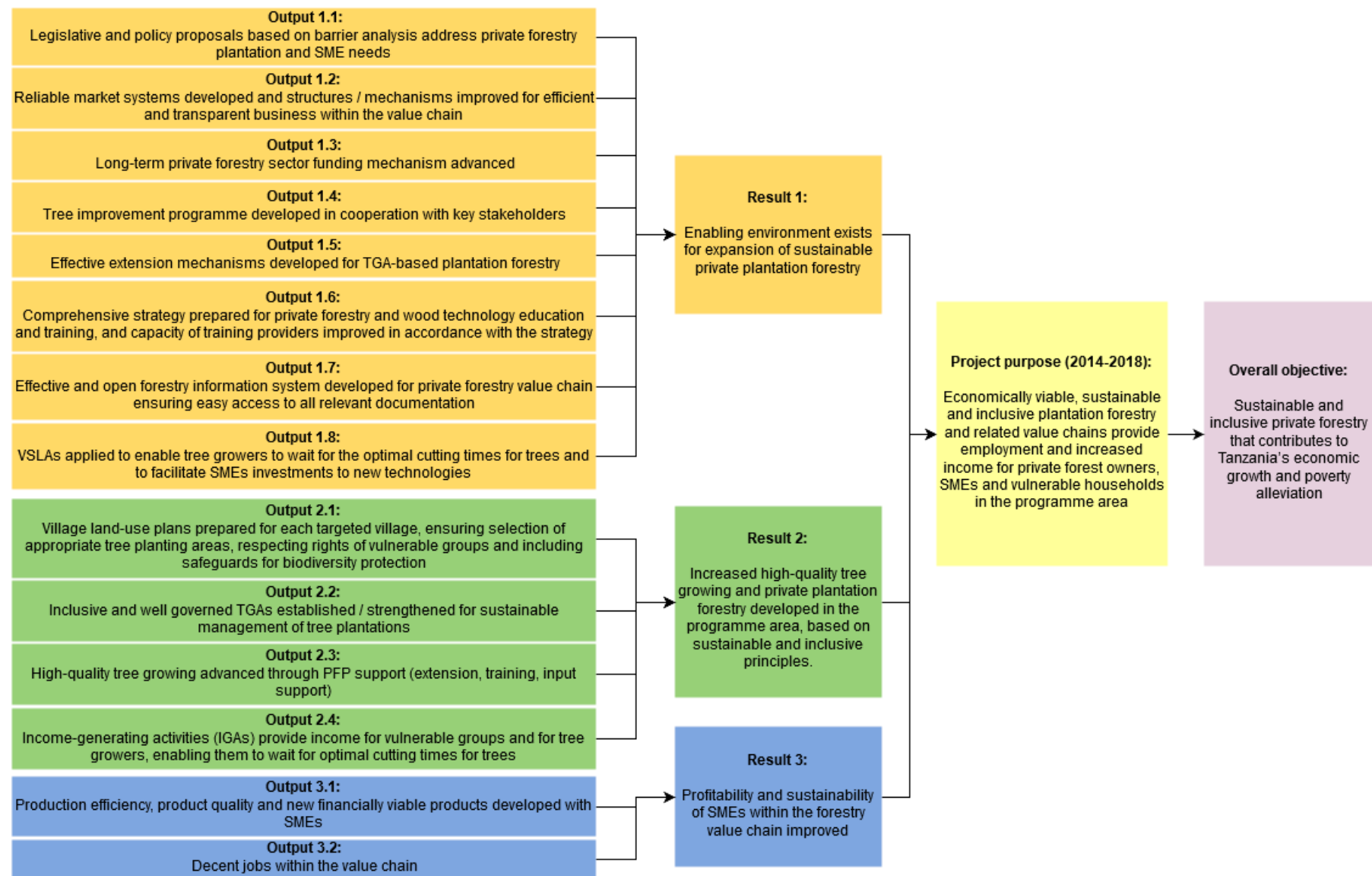


Figure 1 PFP-supported villages, seed orchards, training centre and industrial node





**Figure 2 Programme results chain**



## **2. PROGRESS TOWARDS ACHIEVING THE PROJECT PURPOSE**

The purpose of the Phase 1 (2014–2019) was, through delivery under three result areas, to ensure that economically viable, sustainable and inclusive plantation forestry and related value chains **increased the income** of and **provided employment** to private forest owners, SMEs and vulnerable households in the programme area.

### **2.1 Increased income and employment**

Plantation forestry is a long-term intervention, whose main return on investment comes at the end of the plantation rotation, when wood is harvested. Through supporting establishment of nearly 12,000 ha of smallholder plantations, the programme has generated an asset with net present value of about 17 million euros (at a discount rate of 6%) by December, 2018.

Studies carried out by the programme found that, over the last three years, the reported average annual income in the programme's core area of operation increased from TZS 1.8 million to over TZS 2.2 million. The wealth ranking scores and food security of beneficiaries also increased considerably, as did their access to health services.

In late 2018, since few plantations were mature enough to harvest, only a minority of the interviewed beneficiary tree growers reported having received income from selling wood. However, those who had sold wood earned more than half of their annual incomes from such sales. This profitability demonstrates the potential that tree growing has to support livelihoods in the programme's area of operation.

Under commercial management, these 12,000 ha of new plantations would also create about 400 jobs. In addition, if plantations are established on just half of the additional 19,000 ha of plantation investment facilitated by the programme, another 300–400 jobs will be created.

### **2.2 Expected long-term benefit from the programme**

Since plantation forestry has a long-term time horizon, its impact in terms of increases in income and employment will mostly be visible after Phase 1 has drawn to a close. Therefore, the fundamental value on PFP interventions and innovations lies in the programme's provision of new models for acting along the value chain. By generating higher returns than "business as usual," these models will provide incentives for change and be likely to spread. The models include the following:

- Models for plantation forestry which provide high-quality tree seeds and seedlings and set forth proper procedures for plantation establishment.
- Models for processing industries which incorporate suitable processing technologies and practises and support the proper management of the business side of matters.
- Models for strengthening equality among workers as well as standards for safe working conditions by raising awareness and training.

### 3. RESULT 1: AN ENABLING ENVIRONMENT EXISTS FOR THE EXPANSION OF SUSTAINABLY MANAGED PRIVATE PLANTATION FORESTRY

#### 3.1 Introduction to Result 1

The aim of Result 1 is to induce positive changes in the environment in which plantation forestry operates and, in that way, provide incentives to expand private plantation forestry, which, in turn, will lead to increases in income and employment.

The PFP Programme Document identified nine main barriers to the expansion of plantation forestry: lack of access to finance; risk of fire; lack of machinery, equipment and tools; lack of good-quality seeds; long-term nature of forestry; lack of market information; lack of technical expertise; inadequate infrastructure; and unsupportive land tenure laws.

The programme's target under Result 1 was to address at least four of these identified barriers. For this, Result 1 was structured into eight areas of intervention, or programme Outputs (as shown in Figure 2). This chapter presents the programme's main achievements in addressing the eight barriers as well as the changes (or expected changes) that its achievements have led to (or are expected to bring about).

**Figure 3** The risk of fire is a major barrier to forestry. Smallholder fire damage in Uchindile village, Kilombero (left) and PFP fire protection training campaign in Kifanya village, Njombe TC (right)



#### 3.2 Main achievements in Result 1

##### 3.2.1 Support for review of the National Forest Policy through broad stakeholder participation

The MNRT-led review of the National Forest Policy is now complete. PFP supported the broad participation of stakeholders in the drafting process and provided specialist knowledge on issues relating to smallholder plantation forestry and small wood-processing industries.

This achievement is likely to bring about the following changes:

- ⇒ A National Forest Policy that is based on a good understanding of smallholder private forestry and small wood processing industries and that will, therefore, provide an appropriate framework for inclusive and business-enabling forest strategy, legislation and regulations.
- ⇒ A National Forest Policy that reflects a “compromise of stakeholder opinions” and is therefore expected to be accepted and understood by stakeholders.



### 3.2.2 Strengthening of the process for preparing plans for equitable and optimized village land use

The programme strengthened the country's land-use planning process. It developed and piloted improved participatory planning methods and, in collaboration with the National Land Use Planning Commission (NLUPC), published a practical manual, "Tools and Spatial Technologies for Village Land Use Planning: A Practitioner's Manual for Active Community Engagement,"<sup>1</sup> for implementing those methods. The programme also helped update the national "Guidelines for Participatory Village Land-Use Planning, Administration and Management in Tanzania" published by the NLUPC in January 2019 and trained eight district planning teams in its area of operations in their use.

This achievement is likely to bring about the following changes:

- ⇒ An extension in land-use planning outreach by applying more efficient processes.
- ⇒ Opportunities for i) improving land governance and village development planning, ii) making village land use, including water source management and biodiversity protection, more equitable and optimal, iii) formalising land tenure, iv) reducing land conflicts, and vi) boosting investment due to the drafting of village land-use plans.

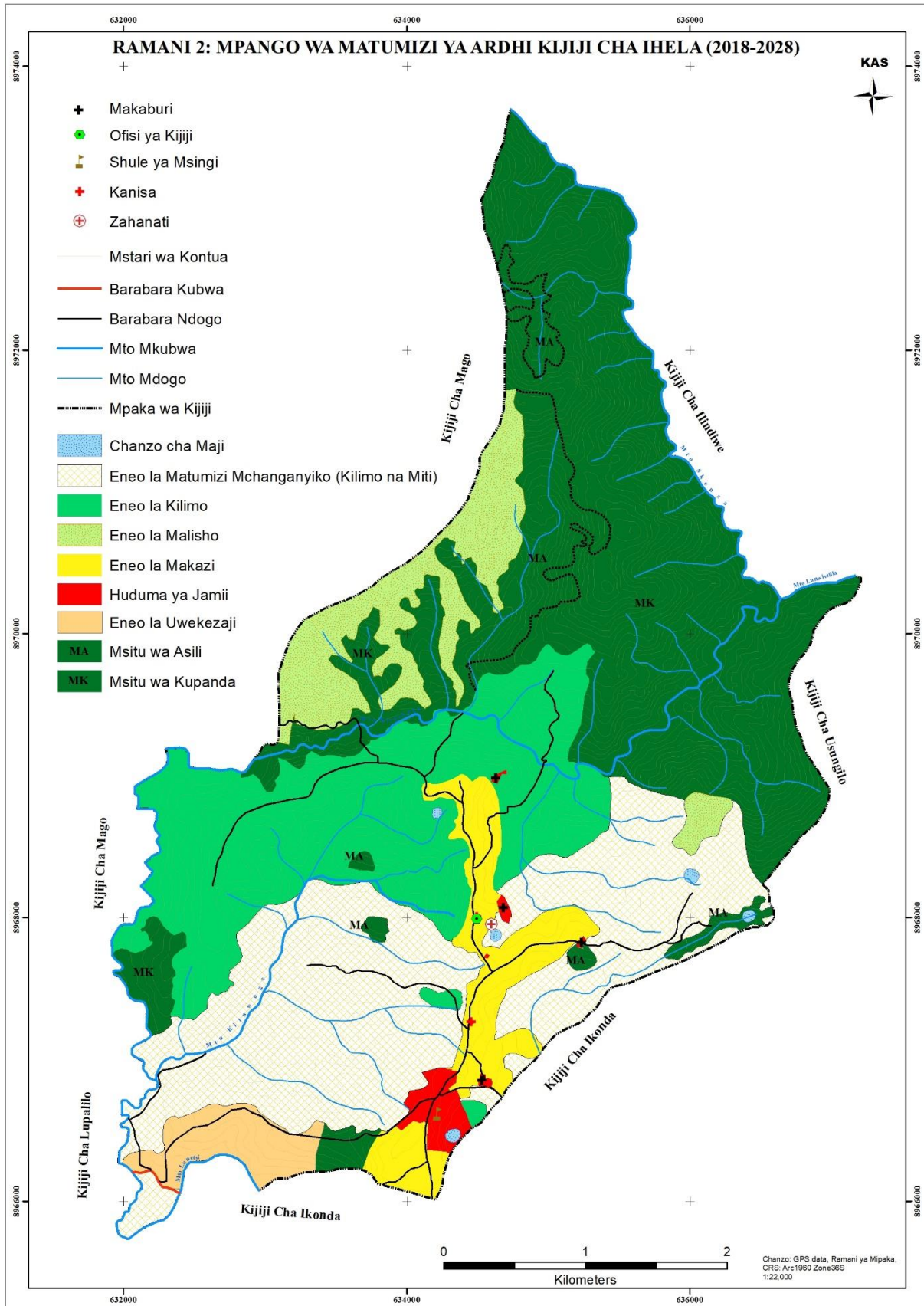
**Figure 4 Stakeholder meeting for the PFP-led development of a VLUP practitioner's manual in Morogoro**



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<sup>1</sup> <http://www.nlupc.go.tz/publications/guidelines>

**Figure 5 A VLUP map of planned land uses in the village of Ihela developed using the improved participatory planning methods with PFP support**



### 3.2.3 Availability of information on existing plantations and investment opportunities

The programme mapped plantations in the Southern Highlands in order to quantify existing plantation forest resources (Figure 7) and then carried out several comprehensive analyses of plantation value chains and opportunities for investment into plantations and forest industries in the area. The analysis also included further discussion of barriers to investment, information essential for generating a greater understanding of the barriers to and opportunities for forest-sector development among decision-makers and potential investors. The programme utilised the information to promote investment in the plantation value chain in the Southern Highlands.

One outcome of the studies was the identification and description of six existing and potential forest industry clusters in the Southern Highlands, including one in Mafinga/Mufindi District, for which a forest industry cluster development committee was established, and in Makete District, whose challenges were discussed with that district's government.

This achievement is likely to bring about the following changes:

- ⇒ Relevant and useful information that will inform the improvement of policy, legislative and regulative processes.
- ⇒ An increase in private investment in forest plantation value chains amounting to the acquisition of 19,000 ha of land.
- ⇒ Increases in rural employment and technology transfer (through the provision of models) to SMEs and the eventual improvements of local infrastructure.

**Figure 6** Six forest industry clusters identified in the Southern Highlands

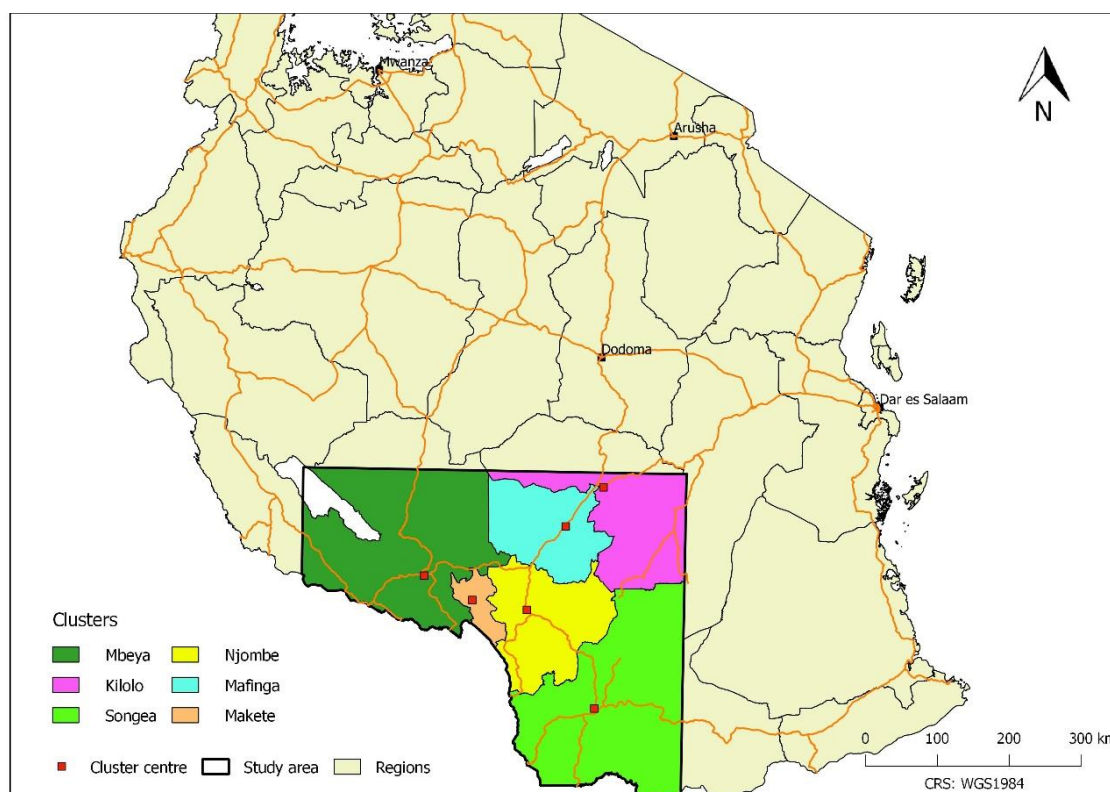
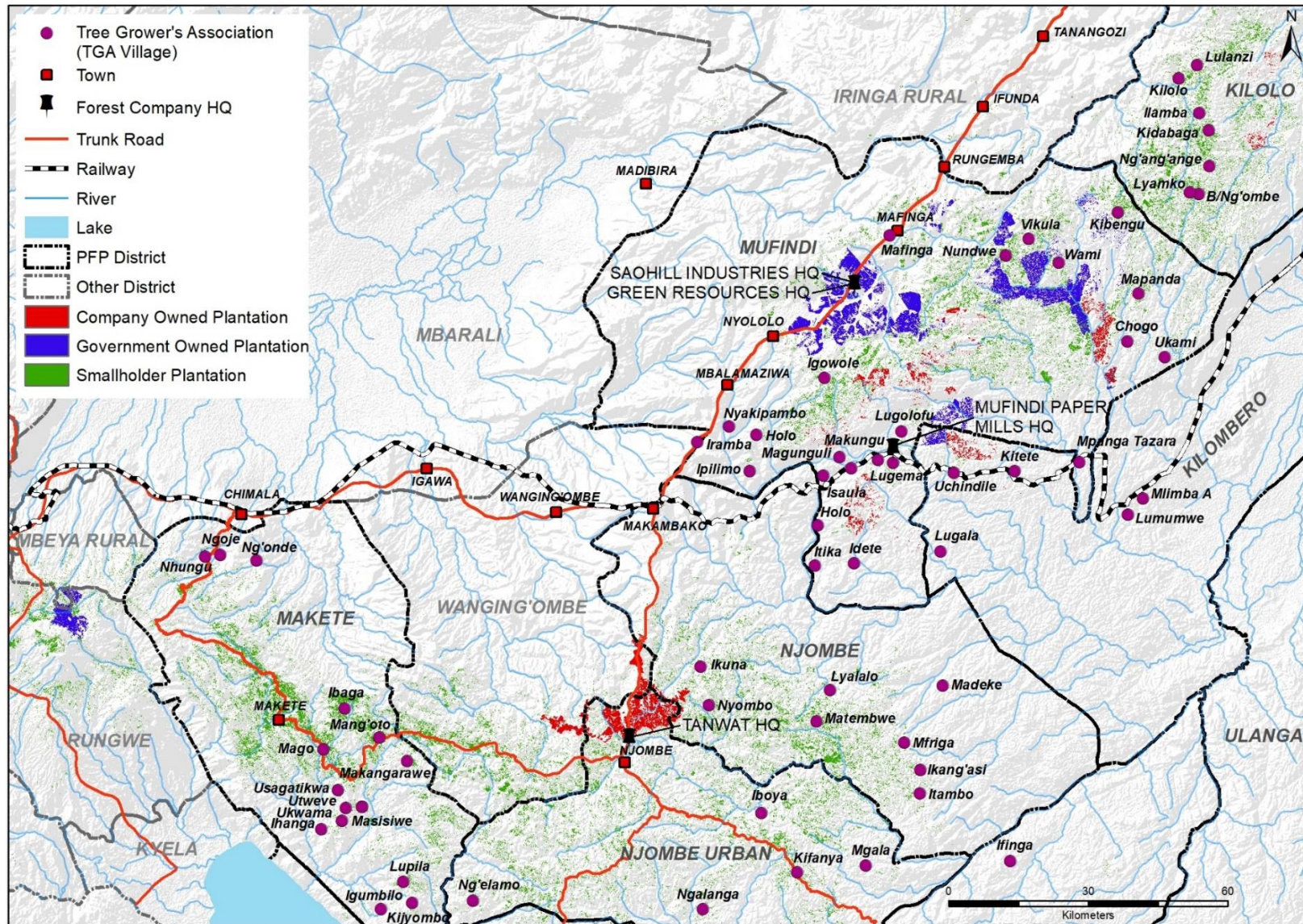




Figure 7 Results of plantation forest mapping of the Southern Highlands disaggregated by ownership





### 3.2.4 Greater capability for much needed in-situ training as well as vocational education and training

The Forestry and Wood Industries Training Centre (FWITC) is now established and well equipped with a concrete road map for the future in form of business and training plans. The curricula for vocational education and training (VET) in forestry and forest industries have been updated and are being piloted with a batch of 40 students, partly at the FWITC. Short courses based on the needs of tree growers and entrepreneurs have been planned and are being carried out. This initiative brings training closer to the needs in Southern Highlands in terms of both content and location. Equity and health and safety in the workplace have been integrated into training courses. In short, the tools for providing the training needed to fill gaps in capacity are now in place. Training delivered in Phase 1 is shown in Table 2.

This achievement is likely to bring about the following changes:

- ⇒ For practitioners along the value chain, a source of both much-needed skills and well-trained workers, both inputs which should improve productivity and the quality of products and services along the value chain, as well as encourage forest sector investment.
- ⇒ Improvements in occupational safety and health.
- ⇒ A major opportunity for uneducated youth to qualify for skilled employment in the formal economy by participating in VET-level training at the FWITC.
- ⇒ Acceleration of innovation in products processes and services.

**Figure 8** The FWITC site and facilities in the town of Mafinga



**Table 2 Cumulative training delivery during Phase 1**

Beneficiary group	Number of participating trainees in individual courses			Total delivery (in trainee days)
	Male	Female	Total	
TGAs, TTGAU and community members	4,975	3,041	8,016	31,186
SMEs and workers	168	219	387	3,581
VET students	53	47	100	1,460
PFP staff	155	83	238	1,089
Female-run enterprises and start-ups	0	72	72	1,080
Service providers and FWITC staff	123	27	150	1,021
Government officials	63	12	75	796
<b>Total</b>	<b>5,537</b>	<b>3,501</b>	<b>9,038</b>	<b>40,213</b>

**Figure 9 Participants in the VETA curricula dissemination seminar held in Dodoma on 3 August, 2017**



**Figure 10 VET-students being trained to treat eucalyptus poles at the FWITC treatment plant**





### 3.2.5 Establishment of seed orchards, providing Tanzania with the opportunity to become self-sufficient in improved tree seeds

A total of 93 ha of seed orchards derived from highly improved parent trees has now been established in eight different locations in the Southern Highlands. They will provide seed for five different species of pine, three different species of eucalyptus, as well as teak (*Tectona grandis*) and white teak (*Gmelina arborea*). If these orchards are properly managed, within eight years, Tanzania will produce enough seeds of these 10 major commercial tree species not only to make the country self-sufficient but also to export. The seed orchards are managed by the newly established Tanzania Tree Growers Associations Union (TTGAU) and its member associations in close cooperation with Tanzania Tree Seed Agency (TTSA).

This achievement is likely to bring about the following changes:

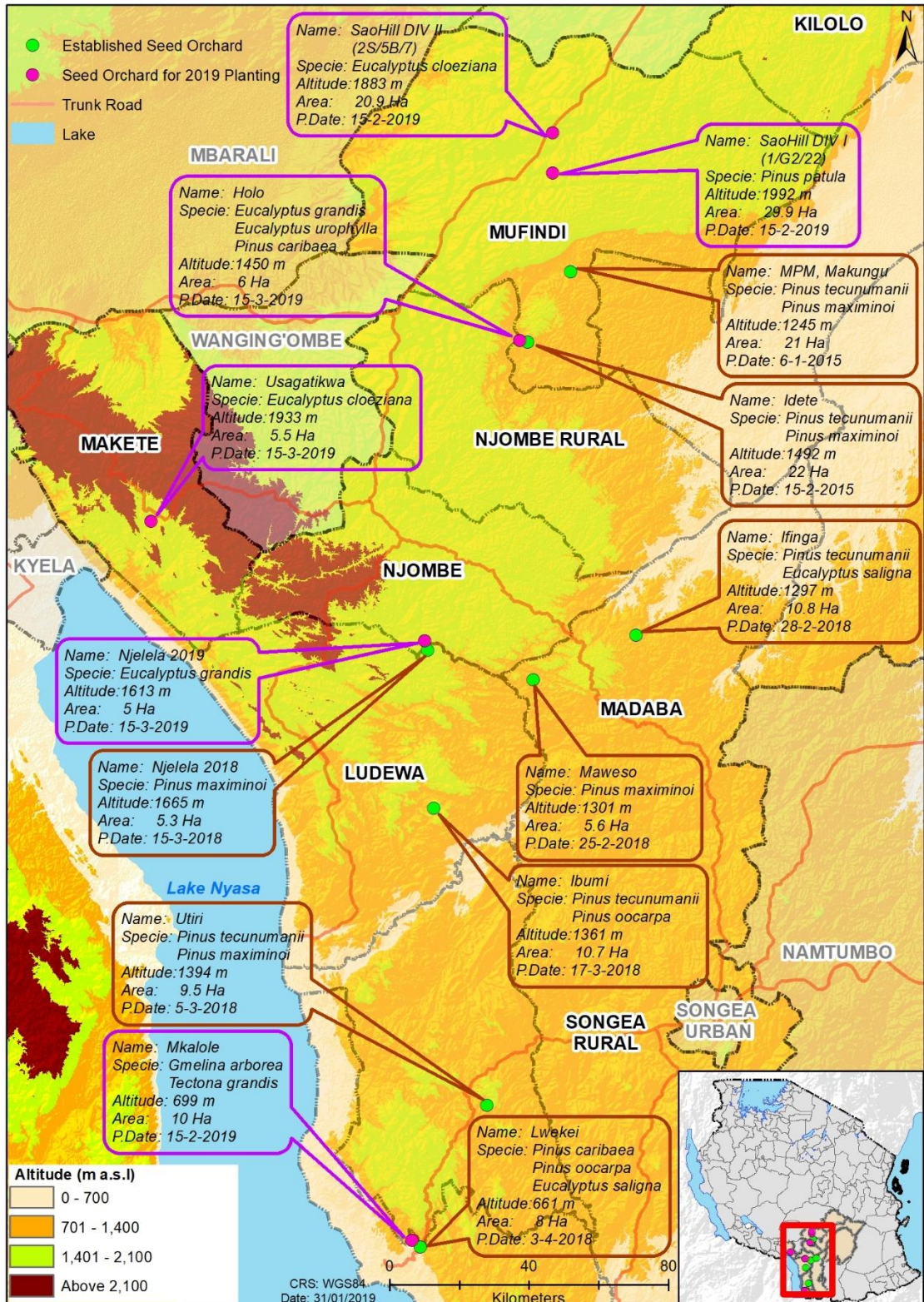
- ⇒ Diversification of plantation species to include more than the current focus on one species alone, *Pinus patula*.
- ⇒ A more secure (disease- and pest-resilient) forest sector due to a better domestic tree seed supply with a broad genetic base and less need to import planting material.
- ⇒ 15–20% increases in plantation productivity and the supply of saw logs to industries during first rotations. These increases will improve returns to growers and extend employment opportunities.
- ⇒ Improvements in inclusivity by allowing 60,000 smallholders to access affordable high-quality tree seed and to compete with large-scale growers.
- ⇒ Eventual potential to breed tree species that are highly adapted to and thrive in local conditions.
- ⇒ Potential total annual seed production valued at EUR 1 million, of which EUR 200,000 will replace imports and the balance will be utilised locally by smallholders or exported.

**Figure 11** *P. maximinoi* starting to bear male flowers in an established seed orchard after three growing seasons





**Figure 12** Established and planned PFP-supported seed orchards





### 3.2.6 Development of standards to guide the sector and promote good-quality management and processing

The programme developed standards for timber logs and for pine sawn wood. Following research and broad consultation with the industry, it prepared a draft report “Specifications for Visually Strength-graded Pine Sawn Wood for Structural Use” and handed it over to the Tanzania Bureau of Standards (TBS) in October 2018. Also through consultation, the PFP prepared log grade specifications and handed them over to the MNRT. Although these standards are still in draft format and further interventions will be needed before they guide the development off the sector, simply initiating this process was an important step toward good-quality management and processing.

This achievement is likely to bring about the following changes:

- ⇒ New high-value markets for wood with known load-bearing characteristics for use in load-bearing situations, such as use in prefabricated roof trusses.
- ⇒ Optimally economical use of sawn wood due to a reduction in the need to over-specify.
- ⇒ Increase in employment through new markets (including export markets) and the implementation of standards.
- ⇒ A movement away from bulk pricing towards new high-value markets for high-quality saw logs.
- ⇒ Optimally economical use of saw logs.
- ⇒ Improvement in employment in plantation silviculture incentivised through new high-value market opportunities for growers.
- ⇒ More open and transparent markets for logs.

**Figure 13** Destructive testing done at the TBS to establish the strength values of sawn wood



**3.2.7 Benefits for the more than 4,000 villagers, almost half women, who participated in a microfinance scheme incorporating small-scale businesses and access to social support**

The programme trained the 4,284 members of 191 Village Savings and Loan Association (VSLA) groups and facilitated them in taking up business ventures like various agricultural activities, retail shop-keeping and forestry processing. About 48% of VSLA members are women and most are also members of TGAs.

One key benefit of the VSLA system is that it gave people access to social support. Many VSLA members have purchased affordable group health insurance from the government through the Community Health Fund. Most of these insurance packages cover both the VSLA member and his or her family. Social loans were taken mostly to pay for education, funerals or medical treatment or to tide the borrowers over after local disasters such as floods and wild fires. VSLAs also helped some members improve their diets: from once being occasionally hungry they now have no difficulties getting proper nutrition. Having access to social funds has reduced the need to sell assets like trees or livestock when health emergencies have arisen, thus making VSLA members and their families more financially stable.

This achievement is likely to bring about the following changes:

- ⇒ The diversification of livelihood options and, as a result, an increase in opportunities for wealth creation.
- ⇒ More opportunities to educate children.
- ⇒ Greater equality by providing opportunities to all segments of the population.
- ⇒ Ability to keep trees growing to maturity and thereby earn more income from forestry.

**Figure 14 VSLA-related activities, clockwise from top left: VSLA group meeting, VSLA group Amkeni in Njombe DC opening a bank account, group members participating in regular financial training, and SME-based group Braves Women in VSLA meeting**





**Figure 15** Businesses supported through VSLAs, clockwise from top left: pottery workshop from group Ushindi, weaving group of Mshikamano, carpentry workshop manufacturing a wooden door, and a beehive producer from group Amkeni



## **4. RESULT 2: MORE HIGH-QUALITY TREE GROWING AND PRIVATE PLANTATION FORESTRY BASED ON THE PRINCIPLES OF SUSTAINABILITY AND INCLUSIVENESS IS DEVELOPED IN THE PROGRAMME AREA**

### **4.1 Introduction to Result 2**

The aim of Result 2 is to, with the participation of all segments of a village society, establish high-quality smallholder plantations in locations that are economically, environmentally and socially sound as well as an institutional framework that can coordinate forestry and provide benefits to villagers. In addition to plantation establishment, other ways to create wealth were to be initiated for poor households. The achievements in Result 2 will increase income and employment in programme villages.

Result 2 is structured into four areas of intervention, or outputs: i) land-use planning, ii) plantation establishment, iii) strengthening the organisational framework of tree growers, and iv) the provision of ways to generate income outside plantation forestry.

### **4.2 Main achievements of Result 2**

#### **4.2.1 Establishment of framework for optimal as well as socially and environmentally sound land use in 59 villages covering almost 850,000 ha of land and benefitting more than 90,000 villagers**

The first step the programme took when working with a community was to develop a VLUP. It did so in 59 villages, all of which use their plans to guide land-use decisions. Because the PFP emphasised inclusion of villagers in the planning, awareness about land tenure issues and the importance of participatory land-use planning has increased. Since VLUPs were prepared and methodology developed simultaneously, improvements were tested and utilised in actual land-use planning. Districts such as Kilolo and Mufindi have already replicated PFP-introduced processes outside the PFP area, and because the PFP developed guidelines and tools together with the NLUPC its methods get adopted at the national level (see Result 1).

This achievement is likely to bring about the following changes:

- ⇒ Better village land use and fewer land conflicts, for example between farmers and livestock keepers.
- ⇒ Plantation forestry directed only to those areas where it is the optimal land use, is viable financially and will not cause social or environmental/hydrologic problems.
- ⇒ Improvements in economic productivity, water source management, and environment protection.



**Figure 16** Members of Ngoje village land-use management committee demarcating the land-use zones on a satellite image in Ngoje, Makete DC



**Figure 17** Participatory land-use planning using a high-resolution satellite image turned into a map with standardised symbols and colour coding

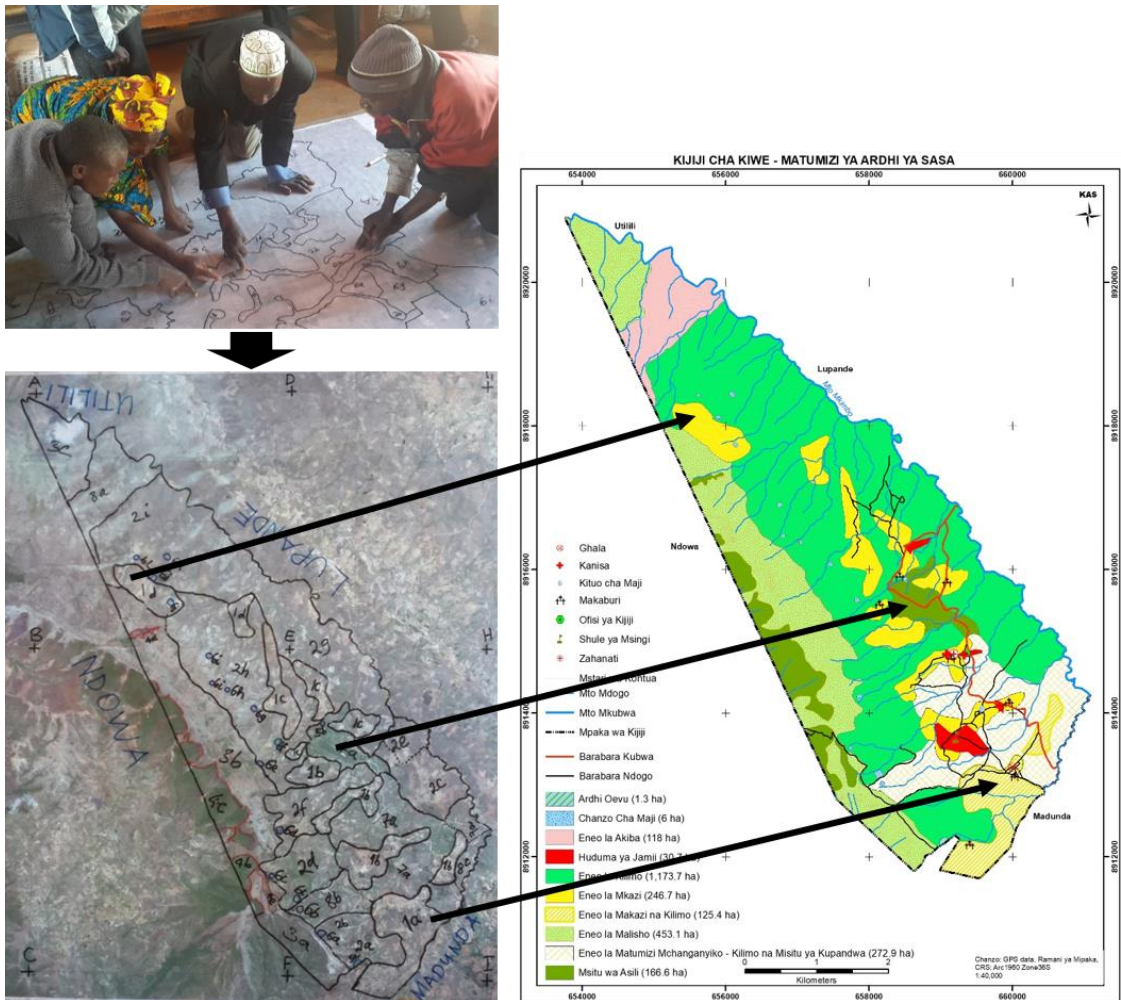


Figure 18 The 59 PFP-supported VLUPs and their geographic coverage





#### 4.2.2 Strengthening of tree growers' organisations and advancing their role in providing services and benefits to members

The programme reached out to over 10,000 members of 97 TGAs, most of which are young institutions with limited capacity. Through programme interventions they have gained strength and, in varying degrees, benefit their members through their efforts in coordination and service provision.

Thanks to the PFP's facilitation, the TTGAU is now up and running, with a national mandate to represent smallholders in forestry. The TTGAU is now taking its first step in implementing its business plan for the timber trade. This is the first time in Tanzania that a tree growers' own organisation has stepped up to back individual tree growers in their most important endeavour, selling their timber. The TTGAU is looking toward adopting into a more comprehensive vision and strategy for moving beyond just the timber trade.

This achievement is likely to bring about the following changes:

- ⇒ Ability of well-functioning TGAs and the TTGAU to provide services, advice and advocacy to their members and thereby increase the profitability of tree growing as an income-generating activity.
- ⇒ Provision of models for learning and motivation for other tree growers to follow in order to get organised into TGAs, thereby developing existing TGAs and providing incentives for new ones to form.
- ⇒ The increase in employment opportunities associated with having more TGAs and more forestry.

**Figure 19** TTGAU members at its annual general meeting on 27 March, 2018



**Figure 20** Masiwe TGA preparing a site for establishing a nursery designed to produce improved seedlings for members and for sale



**Figure 21** Nursery established by the TGA UWAWI in Madaba





### 4.2.3 Establishment of almost 12,000 ha of smallholder plantations involving more than 9,000 tree growers

- ⇒ The fact that almost 12,000 ha of smallholder plantations was established is a major achievement in only four growing seasons, as is the fact that 120 villages were involved (An increase in biomass as more sites are planted and allowed to mature and a corresponding increase in carbon sequestration and mitigation of climate change. During their first rotation, the pine and eucalyptus plantations established on degraded grassland through the TGIS have a potential to sequester an additional 2.3 million tonnes of CO<sub>2</sub> from the atmosphere.

Table 3) and that good-quality procedures were introduced through the Tree-Growing Incentive Scheme (TGIS) and out-grower support programmes (OSPs).

By 30 December, 2018, the plantations established through the TGIS were worth a significant amount of money (Table 4).

This achievement is likely to bring about the following changes:

- ⇒ Diversification of livelihood options through income from tree growing. The emphasis on including all segments of the population give poor and disadvantaged small growers the opportunity to move from a subsistence-level existence to income-based growth.
- ⇒ Through the introduction of good-quality seedlings and more optimised management, an increase in growth from an estimated 10 m<sup>3</sup>/ha/year in a business-as-usual scenario to up to 20 m<sup>3</sup>/ha/year and, as a result, more income.
- ⇒ As the increase in income is realized, the model introduced by the programme with improved seed and plantation management will spread through the “power of example”.
- ⇒ An increase in biomass as more sites are planted and allowed to mature and a corresponding increase in carbon sequestration and mitigation of climate change. During their first rotation, the pine and eucalyptus plantations established on degraded grassland through the TGIS have a potential to sequester an additional 2.3 million tonnes of CO<sub>2</sub> from the atmosphere.

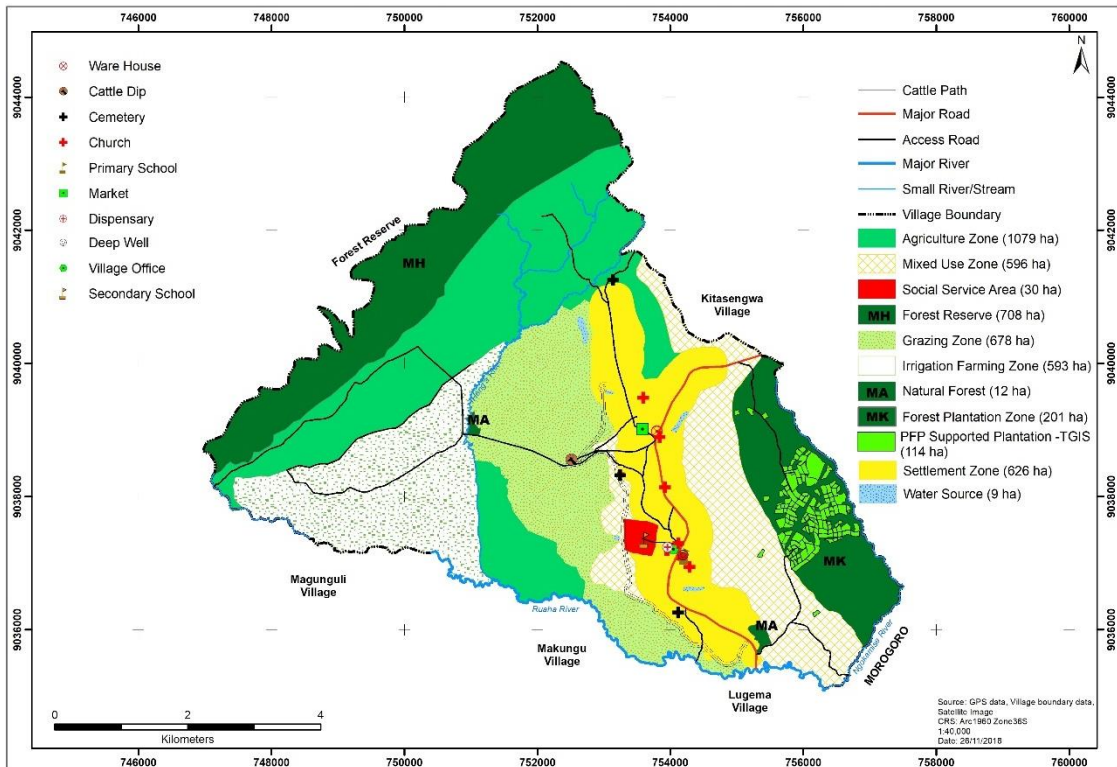
**Table 3 Cumulative number of beneficiaries supported directly in plantation establishment by support schemes implemented during Phase 1**

Support scheme	No. of villages involved	No. of beneficiaries			
		Male	Female	Institution	Total
TGIS planting	65	5,042	2,196	177	7,415
KVTC-OSP	39	478	47	17	542
NFC-OSP	16	720	306	47	1,073
Total	120	6,240	2,549	241	9,030

**Table 4 Value of smallholder plantations of pine and eucalyptus established through TGIS (as at December 2018)**

Discount rate	Net Present Value of plantations (EUR)		Example of a relevant stakeholder group in appliance of the discount rate
	Total value	Average value per beneficiary	
Undiscounted	41,232,996	5,367	-
6%	16,850,764	2,193	Impact investor
12%	7,749,351	1,009	Forest industries
18%	3,990,219	519	Smallholder tree grower

**Figure 22** Lugolofu VLUP overlaid with PFP-supported plantations



**Figure 23** Clockwise, from top left: seedlings in temporary storage in a village, planting after site preparation, PFP field officer providing instructions about site establishment, and circular weeding done with a hoe





**Figure 24** Smallholder-owned *P. maximinoi* planted in 2015 under the TGIS and photographed in October 2018 in the village of Ngalanga, Njombe TC



**Figure 25** Smallholder-owned eucalyptus stand planted in 2015 under the TGIS and photographed in October 2018 in the village of Iboya, Njombe TC





**Figure 26** Smallholder-owned teak stand in Sagamaganga, Kilombero one year after it was established under a PFP-supported OSP



**Figure 27** One-and-a-half-year-old plantations established by TGA members with PFP support in the village of Njelela, Ludewa



#### 4.2.4 A model for PPP in the management of district forest reserves

Through the PFP's facilitation, 10 villages entered into public-private partnerships (PPPs) with the district governments of Mbinga and Nyasa to manage three degraded district forest reserves. The central implementing unit in each village is the TGA established with support from the PFP. Through a memorandum of understanding, each village was granted the right to establish woodlots within the reserves. Under this scheme, the 10 villages afforested about 720 ha of degraded district forest reserves, land comprising the most degraded and erosion-prone sections of the reserves, including most hilltops and ridges within them.

This achievement is likely to bring about the following changes:

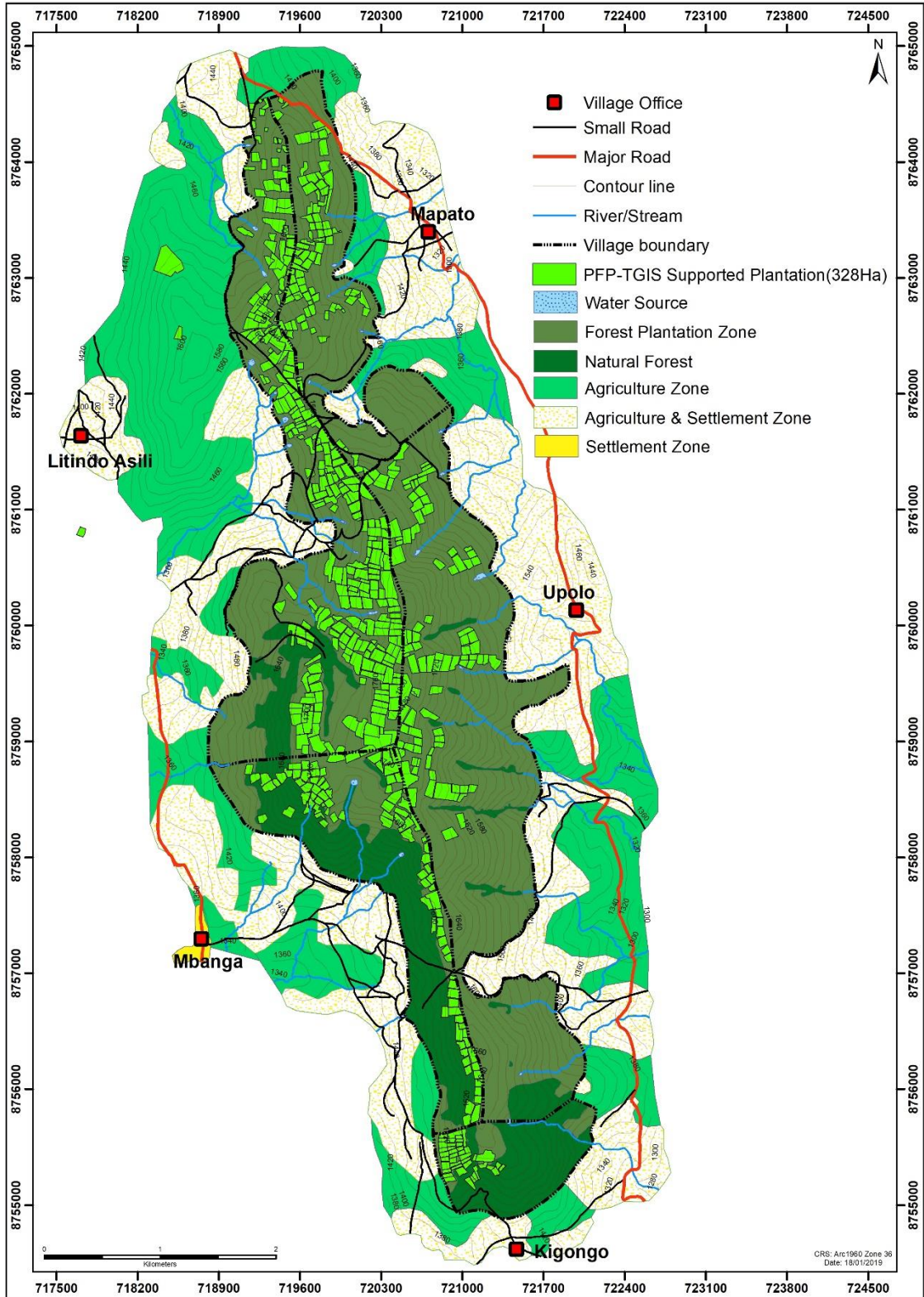
- ⇒ The same changes described above under smallholder plantation establishment (section 4.2.3).
- ⇒ An enhancement of the functioning of the water catchment that will improve the supply of water downstream.

**Figure 28** An eroded hilltop in district forest reserve of Lihumbe Mountain, Mbinga TC, prior to afforestation





**Figure 29** Distribution of new plantations established on the eroded ridge of Upolo Mountain district forest reserve, Nyasa DC



## **5. RESULT 3: PROFITABILITY AND SUSTAINABILITY OF SMES WITHIN THE FORESTRY VALUE CHAIN IMPROVED**

### **5.1 Introduction to Result 3**

Result 3 interventions focused on the processing of the raw material from plantations and the marketing of the resulting products. The aim was to induce a change in the wood-processing industry by encouraging investment in new technology and building capacity for operations. The main mechanisms for achieving this aim were establishing the FWITC and working with a number of SMEs that would develop models for a more profitable and sustainable way of working, thus providing incentives for other SMEs to adapt, too. These changes were expected to grow the industry, increasing income and employment and improving working conditions and safety in the wood industry sector.

### **5.2 Main achievements of Result 3**

#### **5.2.1 More than 30 wood SMEs upgrading their processing technology and doubling the sawn wood they produce**

The programme encouraged investment in new technology through demonstration and capacity-building. Thus far, 34 SMEs that the programme has engaged with have invested in new and improved processing technology. The FWITC is at the centre of this approach. Its facilities and training and business plans provide a good road map for it to continue acting as an incubator of further transformation of the industry and produce a skilled work force with a good understanding of safety and health issues.

In March 2018, the programme also organized a forest industries trade fair at FWITC, the first of its kind in Tanzania. Participating exhibitors came from Finland, China, India and South Africa in addition to Tanzania. The trade fair promoted networking, spread awareness, and raised interest in improved sawing technologies and promoting new products and services among smallholders and SMEs.

This achievement is likely to bring about the following changes:

- ⇒ The TFS estimates that about 150 dingdong mobile saw mills need to be replaced. Most entrepreneurs understand that they need to change. Since models provided by the FWITC and SMEs who have already invested in new technology will demonstrate the alternatives available, they are expected to gradually update their businesses.
- ⇒ Improvements in technology changes and improvements in skills will make SMEs more professional.
- ⇒ A growth in market acceptance and business as product standards implemented and the reputations of products accordingly strengthened.
- ⇒ Improvements in worker health.



**Figure 30** Old “dingdong”-technology, representing the current standard in the Southern Highlands



**Figure 31** Upgraded vertical band saw technology with improved sawing precision, productivity, safety and working conditions





**Figure 32** Slidetec circular mobile sawmill on display at the forest industries trade fair held at the FWITC in March 2018



**Figure 33** Precision-sawn wood, produced here by the multi-rip saw of the FWITC, improves yields and product quality



## 5.2.2 Establishment of a model for integrating tree growers to the value chain through TGAs and development of a permanent SME-processing industry

Encouraging SMEs to invest in improved technology so they can better process raw material from smallholder forestry continues to be a challenge in the Southern Highlands. In fact, it is a fundamental barrier to the transformation of the forest sector. Getting SMEs to invest requires building their trust of tree growers, who must demonstrate they can provide a secure resource base in order to convince SMEs of the feasibility of doing business with them. The PFP established a model for this integration when it initiated the Makete industrial node. At this node, entrepreneurs have invested in a small permanent band saw sawmill and smallholders have organized into a TGA to coordinate the supply and sale of logs to the Makete sawmill. Strengthened by training provided by the programme and guided by a business plan developed with programme support, the Makete model is taking its first steps.

This achievement is likely to bring about the following changes:

- ⇒ Improvement in conversion rates from just 25–30% to over 50% and a resulting increase in the efficiency of the utilisation of the plantations and reduction in wood wastage.
- ⇒ Enabling of the Makete sawmill to operate profitably and tree growers to sell their wood, hence providing income to entrepreneurs and tree growers as well as opportunities for employment at the sawmill and on plantations.
- ⇒ Documentation of experiences and learning that will, assuming that the Makete initiative continues and that awareness-raising is done well, provide opportunities for others to adapt. The more SMEs transform, the more rural employment opportunities will arise, and the more income tree growers and SMEs will earn.

**Figure 34** Opening of the newly established sawmill facilities in Makete industrial node





### 5.2.3 Demonstration of new ways to produce energy from wood other than traditional charcoal and the consequent provision of business opportunities for SMEs

The production of charcoal-briquettes from wood waste is one of the key innovations and entrepreneurial endeavours promoted by the programme. The FWITC was instrumental in promoting this initiative as it boasts demonstration facilities and provides training. Interest in the production of sustainable charcoal from plantation-grown wood is growing rapidly. In fact, through the programme's facilitation four businesses have already diversified into the manufacture of wood energy products. The programme promotes the local fabrication of charcoal manufacturing equipment to ensure that processing equipment will be available on a sustainable basis.

This achievement is likely to bring about the following changes:

- ⇒ Increase in the availability of alternatives to charcoal made in indigenous woodlands, thereby providing consumers with cheaper products and reducing pressure on indigenous woodlands.
- ⇒ The production of pulpwood, chips and sawdust is predicted to increase from 2 million m<sup>3</sup> to 3 million m<sup>3</sup> roundwood equivalent per year in the Southern Highlands and could supply a substantial charcoal and briquette industry. If all the waste were economically utilisable, around 300,000 tonnes of charcoal and briquettes with a Mafinga factory gate value of EUR 60 million per year could eventually be produced every year.
- ⇒ Opportunities for SMEs and increases in employment and wealth creation through the development of sustainable charcoal and briquette production
- ⇒ Improvements in the market for wood from plantation thinning, and a consequent increase in income for tree growers, incentives for adopting forest management, and higher-quality logs (by delaying harvesting). The results of these changes will be greater incomes for tree growers and higher quality sawn timber.

**Figure 35** Sawdust carbonizer being assembled for the FWITC at a workshop in Mafinga





**Figure 36** Charcoal briquettes produced from wood waste as a part of the PFP's promotion of sustainable energy and business opportunities



**Figure 37** Women with SME businesses that produce charcoal benefit from business-incubation support at the FWITC



#### 5.2.4 Introduction of kiln-dried eucalyptus, a sustainable hardwood costing a fraction of the market price of natural hardwood

The fact that hardwood timber from indigenous woodlands is getting increasingly scarce hampers the development of the furniture industry both in terms of the availability and the cost of raw material. Another innovation the programme introduced was the drying of sawn timber using the high-frequency vacuum kiln, the first such machine ever in Tanzania, commissioned at the FWITC. The improvement in wood drying has two key consequences:

- For pine: Reduces the time for drying before dispatch to markets and improves the quality of sawn timber by controlling drying methods.
- For eucalyptus: Allows the use of dried board in the high-quality furniture market and doubles the market value of the product.

This achievement is likely to bring about the following changes:

- ⇒ The introduction of kiln-dried eucalyptus, a sustainable hardwood costing a fraction of the market price of natural hardwood, a change which will lead to a gradual displacement of the natural product in furniture industry. There are already indications of this happening with furniture makers shifting from indigenous hardwoods to eucalyptus.
- ⇒ The diversification of pricing as standards and quality-pricing evolve. Dried and better-quality pine sawn timber commanding a higher price than poorer quality material, a change that will motivate stakeholders to manage the quality of both forests and the processing of raw material.

**Figure 38** High-frequency kiln at the FWITC



## **6. RESOURCE ALLOCATION**

### **6.1 Programme assets**

A list of programme's assets is annexed to the full version of the "Phase I Draft Completion Report." All assets will be handed over to Phase 2 of PFP.

### **6.2 Finances**

Table 5 shows the programme's use of funds between 1 January, 2014, and 31 December, 2018, by financial year and programme budget line. On 31 December, 2018, the programme had used 99% of its total fund, EUR 19.15 million, and the remaining balance of EUR 211,555 was set to be used for bridging the gap between Phase 1 and Phase 2.



**Table 5 Realised programme expenditure by financial year and percentage of total first-phase budget used on 31 December, 2018 (in EUR)**

	Budget, Prog' Doc' phase 1	Expenditure 1/1/2014-30/6/2015	Expenditure 1/7/2015-30/6/2016	Expenditure 1/7/2016-30/6/2017	Expenditure 1/7/2017-30/6/2018	Expenditure 1/7/2018-31/12/2018	Total expenditure 1/1/2014-31/12/2018	Balance, Phase 1 31/12/2018	% of Phase 1 budget used 31/12/2018
<b>Operational</b>	<b>10,400,566</b>	<b>738,637</b>	<b>1,033,235</b>	<b>3,420,297</b>	<b>3,352,683</b>	<b>1,275,838</b>	<b>9,820,690</b>	<b>579,876</b>	<b>94%</b>
Result area 1	2,201,565	300,921	177,017	630,684	886,738	684,467	2,679,827	-478,262	122%
Output 1.1	256,222	94,085	52,277	62,547	159,548	22,924	391,381	-135,159	153%
Output 1.2	125,000	60,879	13	7,338	0	9,358	77,588	47,412	62%
Output 1.3	70,000	0	0	229	-229	0	0	70,000	0%
Output 1.4	171,698	0	4,257	85,945	35,313	137,720	263,235	-91,537	153%
Output 1.5	245,422	32,867	27,190	97,177	50,938	33,122	241,294	4,128	98%
Output 1.6	998,146	111,503	87,386	367,717	417,050	316,017	1,299,673	-301,527	130%
Output 1.7	335,077	1,587	5,894	9,732	0	0	17,213	317,864	5%
Output 1.8	0	0	0	0	224,118	165,326	389,444	-389,444	n/a
Result area 2	7,195,001	437,717	790,815	2,472,685	2,052,012	454,318	6,207,547	987,454	86%
Output 2.1	542,446	51,934	46,673	264,308	133,629	25,068	521,612	20,834	96%
Output 2.2	626,109	17,102	82,319	177,668	156,951	61,546	495,586	130,523	79%
Output 2.3	4,624,869	336,176	561,117	1,711,251	1,709,532	367,704	4,685,780	-60,911	101%
Output 2.4	1,401,577	32,505	100,707	319,457	51,901	0	504,570	897,007	36%
Result area 3	1,004,000	0	65,402	316,928	413,933	137,054	933,317	70,683	93%
Output 3.1	839,000	0	49,489	316,928	411,925	137,054	915,396	-76,396	109%
Output 3.2	165,000	0	15,913	0	2,008	0	17,921	147,079	11%
<b>Reimbursable</b>	<b>3,578,754</b>	<b>1,191,440</b>	<b>1,104,515</b>	<b>1,203,715</b>	<b>984,861</b>	<b>531,622</b>	<b>5,016,153</b>	<b>-1,437,399</b>	<b>140%</b>
Staff	1,390,218	278,368	407,204	196,413	198,318	97,766	1,178,069	212,149	85%
Travel	293,915	88,496	41,951	43,024	66,179	17,374	257,024	36,891	87%
Housing	384,989	115,150	61,765	120,788	71,815	1,877	371,395	13,594	96%
Duty travel	324,954	110,647	144,452	142,030	183,558	43,330	624,017	-299,063	192%
Office	587,629	242,083	182,602	206,790	183,942	93,427	908,844	-321,215	155%
Vehicles	313,009	143,226	86,833	123,883	181,671	70,801	606,414	-293,405	194%
Procurement	284,040	213,470	179,707	370,787	99,377	207,048	1,070,389	-786,349	377%
<b>TA</b>	<b>3,920,000</b>	<b>1,302,623</b>	<b>988,401</b>	<b>856,185</b>	<b>766,373</b>	<b>188,020</b>	<b>4,101,602</b>	<b>-181,602</b>	<b>105%</b>
Internat'l long-term	n/a	624,541	360,761	331,240	228,247	67,900	1,612,689	n/a	n/a
Internat'l short-term	n/a	73,173	189,140	66,216	165,073	0	493,602	n/a	n/a
Nat'l long-term	n/a	480,047	409,920	453,600	373,053	120,120	1,836,740	n/a	n/a
Nat'l short-term	n/a	124,862	28,580	5,129	0	0	158,571	n/a	n/a
<b>Contingencies</b>	<b>1,250,680</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>1,250,680</b>	<b>0%</b>
<b>Grand total</b>	<b>19,150,000</b>	<b>3,232,700</b>	<b>3,126,150</b>	<b>5,480,197</b>	<b>5,103,917</b>	<b>1,995,480</b>	<b>18,938,445</b>	<b>211,555</b>	<b>99%</b>









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