PANDA MITI KIBIASHARA
PRIVATE FORESTRY PROGRAMME

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## FOREST SECTOR FINANCING STUDY

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

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MINISTRY FOR FOREIGN AFFAIRS OF FINLAND


# Forest Sector Financing Study

**30 April 2016**

**Iringa, Tanzania**

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**Recommended citation:**
PFP (2016). *Forest Sector Financing Study*. Private Forestry Programme. Iringa, Tanzania.

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ABBREVIATIONS

| | |
|---|---|
| CCRO | Certificate of customary right of occupancy |
| CRDB | Cooperative Rural Development Bank |
| DANIDA | Danish International Development Agency |
| DFI | Development Finance Institution |
| DFID | Department for International Development |
| ESG | Environmental, social and governance |
| EUR | Euro |
| FAO | Food and Agriculture Organisation of the United Nations |
| FDT | Forestry Development Trust |
| FIP | Forest Investment Program |
| FPCF | Forest Carbon Partnership Facility |
| ha | Hectare |
| IUCN | International Union for Conservation of Nature |
| KVTC | Kilombero Valley Teak Company |
| LMDA | Logging and Miscellaneous Deposit Account |
| MIGA | Multilateral Investment Guarantee Agency |
| NGO | Non-governmental organisation |
| NJOCOBA | Njombe Community Bank |
| NMB | National Microfinance Bank |
| NOFIA | Northern Tanzania Forest Industries Association |
| NPV | Net Present Value |
| OSP | Outgrower Support Programme |
| PASS | Private Agricultural Sector Support |
| PFP | Private Forestry Programme |
| PPP | Public-private partnership |
| REDD | Reducing Deforestation and Forest Degradation |
| SACCO | Savings-and-credit co-operative |
| SAFIA | Sao Hill Forest Industries Association |
| SAGCOT | Southern Agricultural Growth Corridor of Tanzania |
| SIP | Small Investments Programme |
| SME | Small and Medium Enterprise |
| SPGS | Sawlog Production Grant Scheme |
| TADB | Tanzania Agricultural Development Bank |
| TFF | Tanzania Forest Fund |
| TFS | Tanzania Forest Service Agency |
| TGA | Tree growers' association |
| TGIS | Tree-Growing Incentive Scheme |
| TIB | Tanzania Investment Bank |
| TIMO | Timberland Investment Management Organisation |
| TZS | Tanzanian shilling |
| USD | United states dollar |
| VICOBA | Village community bank |
| WWF | Worldwide Fund for Nature |

Exchange rates used if no other explanation:
EUR 1 = TZS 2,400
USD 1 = TZS 2,100

## EXECUTIVE SUMMARY

### Purpose and scope

The purpose of this forest financing study was to assess alternative mechanisms for financing private forestry and the wood industry in the long term and recommend the best practices to be applied in Tanzania. The study was carried out between February and April in 2016 mainly in the Southern Highlands and Dar es Salaam.

The target group of recipients comprised tree growers, small- and medium-size forest and wood-processing entrepreneurs, service providers, and large companies. The sources of financing included microcredit schemes, commercial and development banks, companies, and social-impact investors as well as development finance institutions and financial investors. The types of financing covered were the entrepreneur's own capital, grants, subsidies, different kinds of loans, and equity.

### Rationale for financing private forestry and the wood industry

Tree planting in Tanzania can be profitable if tree growers consider the key underlying conditions, including species and climatic conditions, management, logistics, and markets. Scale is not an issue: even a small tree plantation can be a good investment. Wood processing can be profitable, too, as long as money is invested in new technologies that improve recovery rates and industries are scaled up enough to be able to produce sufficient volumes and qualities of value-added wood products to markets. In addition, wood-processing industries must establish themselves as price-setters rather than, as they currently are, price-takers.

The Tanzanian financing sector is not very aware of the opportunities that private forestry and forest industries offer for long-term economic development in the country. Government, donor, and overall development financing are still needed to improve industrial infrastructures, logistics, and other enabling conditions for viable business development.

### Financing needs

Financing is needed to scale up plantation areas and improve their yield and quality as well as to purchase new wood-processing technologies and scale up and consolidate wood-processing capacities.

Farmers do not ordinarily use outside financing for forestry for two reasons. First, they would rather invest their extra income in activities other than tree planting. In fact, owners of tree plantations often use their plantations as collateral for loans for other purposes, including agriculture or other businesses. Second, the loans currently provided by local community banks and local commercial banks are not a viable option for them because interest rates are high and payback periods short. Since farmers often plant trees without outside financing, what they need is support in accessing the high-quality inputs that will enable them to improve yield and quality.

While sawmillers, like other entrepreneurs, do have access to loans from commercial banks, the terms do not support their goals of investing in new technologies, increasing productivity, or scaling-up businesses. Many sawmills and other wood-processing companies urgently need to establish turnaround operations, consolidate in order to scale up, ensure future raw material from new sources, and secure a premium position in a competitive market. The procurement contracts made with the government-owned Sao Hill plantation also need to be made sustainable. All these changes require investment and financing.

### Sources of financing

Besides the Private Forestry Programme (PFP) only a few donors provide grant financing for private forestry. Several NGOs and social-impact investors also support tree planting, but not with commercial terms. Some donors, like the Private Agricultural Sector Support (PASS) Trust supported by DANIDA, apply interesting financing models in agriculture and rural businesses, but donor and development bank financing in private forestry development has been, all in all, quite modest.

The government of Tanzania does profess to support private forestry, but its efforts so far have been limited. It is unlikely that government plantations will generate enough funds in the government's "logging and miscellaneous deposit account" to support the establishment of private plantation establishments, but the Tanzanian Forest Fund is important even though its activities currently are moderate.

Commercial bank financing is limited and only viable for wood-processing companies in the short term. Development bank financing is in its early stages but nonetheless offers interesting possibilities for future long-term financing. Also encouragingly, the Tanzania Agricultural Development Bank (TADB), which was established in August 2015, includes forestry in its scope.

Development finance institutions (DFIs) can support only well-established companies and other commercial entities that fulfil the eligibility criteria, but their role is important and growing in private forestry. Forestry companies which borrow money from DFIs often involve private tree growers, particularly smallholders, in their supply chains using outgrower schemes. Other potential ways of financing supply chains include financing service providers and sub-contractors.

Financial investors will have a role only when there is a critical mass of well-established plantation companies and an industrial infrastructure for wood processing is in place. The criteria of investors are strict: they include target returns, exit, and environmental, social and governance (ESG) compatibility. Social-impact investors in Tanzania do not yet consider forestry to be an interesting target though there are interesting examples of social-impact investment in forestry in other countries that could be emulated.

Multiple methods and tools exist for developing innovative financial instruments to cater for the needs of the forestry sector. These include developing business skills, connecting tree growers with companies to enable viable outgrower schemes, organising tree growers into groups, and developing instruments that include insurance and/or credit guarantees.

**Financing gaps**

Tree growers have not been able to expand tree plantations significantly for four key reasons: they (i) are unable to keep up with the high interest rates and short payback periods of existing financial instruments; (ii) have poor access to land registration and titling, (iii) have limited knowledge about existing support mechanisms and (iv) do not have access to high-quality genetic material.

At the same time, sawmillers and other wood processors are not able to secure large enough loans to invest in improved technologies because they lack sufficient collateral and/or they are unable to prepare a credible business plan. As a result, they are not able to invest in the new technologies that are needed to improve recovery rates, achieve premium prices in the markets, and scale up production.

Large companies have their own problems securing finance. Since positive cash flows to serve the debt are foreseen only after a relatively long term – from seven to ten years – they find it hard to get finance for greenfield investments for plantation forestry.

Not only does the financing sector not yet consider forestry and forest industries as a key economic sector in Tanzania but that sector also faces many institutional and policy constraints.

**Recommendations**

It is recommended that the competent authorities in the Tanzanian forest sector, donors involved in private forestry development and the lobby organizations of tree growers and wood processors take the following steps:

- Raise awareness about potential financing opportunities among tree growers and small and medium enterprises (SMEs), many of which are ignorant of them.

- Increase the eligibility of tree growers and companies to receive financing by increasing their capacity to provide the business plans, transparent accounting

and reporting, compatibility with ESG criteria, proven management skills, and evidence of a business concept that lenders require.

- Raise awareness among local financing institutions about the forestry business. Local banks in the Southern Highlands are aware that tree planting is a viable investment, but this awareness is still limited and can be broadened. The Tanzanian finance sector needs to treat the forestry and forest industries as important an economic sector as agro-industries, mining, and other growth sectors.

- Shift the focus of donor communities to private forestry as part of the climate change mitigation and adaptation actions they, along with the government, have already embraced. Programmes such as the Forest Investment Program and Forest Carbon Partnership Facility already have significant financing commitments and could be extended to private forestry, especially smallholder plantation development, but advocacy for supporting private forestry and lobbying is required to accomplish this end.

It is highly recommended the Private Forestry Programme take the following actions (or strengthen its on-going efforts if it has already begun to do so):

- Develop the capacities of tree growers' associations and turn them into commercial organisations eligible to receive sustainable financing. The most realistic way to do so is by developing the organised cooperatives, farmers' groups, and social organisations such as TGAs. In practice, this will involve increasing the participation of tree growers in TGAs and providing capacity-building in business planning, management, accounting, and financial reporting.

- Build the capacity of SMEs to receive financing by improving the skills and knowledge of entrepreneurs business planning and financial and ESG reporting.

- Raise awareness about forestry and forest industry sector in the Tanzanian financing sector by establishing a dialogue with key stakeholders, though, for example, workshops, training events, and web-based communication.

- Introduce the Tree Growing Incentive Scheme to the donor community and social-impact investors. The scheme will be more sustainable in the future if partners besides the government of Finland share in financing it. It could even be developed into an effective instrument to promote private tree growing in Tanzania at a large scale.

- Provide critical information to key stakeholders about private forestry and possible investors. Such information includes the extent and nature of plantation resources, the profitability of tree growing, the benchmark costs of wood processing, and the market prices of wood products.

# 1. INTRODUCTION

## 1.1 Background of the Private Forestry Programme

The Private Forestry Programme (PFP) aims to increase rural income in its target area, which consists of nine districts in the Southern Highlands and Kilombero Valley. The PFP reduces poverty and inequality by developing sustainable plantation forestry and adding value to the entire forest product value chain.

In order to achieve its aim, the PFP supports participatory and sustainable land-use planning; facilitates the organising of tree growers into associations; develops the capacities of tree growers; supports plantation establishment; and strengthens plantation management and extension as well as business services. In addition, it improves industrial production, especially that of small and medium enterprises (SMEs) which depend on plantation-grown wood.

The key programme beneficiaries are private tree growers and wood-processing SMEs in the Southern Highlands and Kilombero Valley. In particular, the programme supports tree growers who belong to or will one day belong to tree growers' associations (TGAs).

The rationale for supporting private plantation forestry in Tanzania is as follows:

- Tanzania is one of the few countries in the world that still has areas with the right climate and soils for successful tree plantation development.
- Small-, medium-, and large-size tree growers in the Southern Highlands are keen to expand tree plantations; in fact, a strong movement of tree growers has already emerged.
- Both plantation forestry and plantation wood-based processing are potentially profitable as well as environmentally and socially sustainable.
- Private plantations and value-added production can have positive economic, social and environmental impacts at the local and national levels.
- Private plantation forestry can generate economic growth and employment in rural areas and thereby considerably reduce poverty.

## 1.2 Background of the Tree Growing Incentive Scheme

The Tree Growing Incentive Scheme (TGIS) is the key mechanism by which the PFP channels its support to tree growers. It provides direct in-kind support to tree growers as well as, by promoting outgrower support programmes (OSP) among large companies, indirect support. The TGIS was designed to have the following features:

- Be a performance-based, inclusive scheme for all tree growers.
- Combine in-kind and cash subsidies and tactical technical assistance.
- Be as simple and transparent as possible, eliminating excessive limiting factors and bureaucracy.

The implementation of the PFP has largely adhered to the above design features except for the fact that administrative limitations have prevented the distribution of cash subsidies. That said, cash incentives to support second-year weeding were piloted during the current planting season (2015/16).

During the planting season of 2014/15, the PFP supported the establishment of 834 ha of tree plantations through direct, in-kind TGIS and 125 ha through indirect TGIS-OSP with Kilombero Valley Teak Company (KVTC). There is evidence that the target for the planting season of 2015/16, 2,000 ha, will be exceeded. Thus, in total, PFP-supported private tree growers planted almost 3,000 ha of trees between January 2014 and April 2016.

The PFP's direct in-kind TGIS support to tree growers comprised approximately 40% of the total costs of standard plantation establishment and maintenance. These costs and the share that in-kind support comprises are presented in Table 1.1 (PFP, 2014).

**Table 1.1 Costs of the establishment of standard plantations of various tree types and contribution of in-kind support**

| Input (EUR/ha) | Pine | Eucalyptus | Teak | Wattle |
|---|---|---|---|---|
| Labour | 145 | 232 | 460 | 232 |
| Material | 184 | 564 | 347 | 225 |
| Total cost | 329 | 796 | 807 | 457 |
| In-kind support | 132 | 322 | 347 | 182 |
| In-kind support (percentage) | 40% | 40% | 43% | 40% |

In-kind support is performance-based. This means that tree growers need to reach certain milestones in order to qualify for it. For example, they need to clear and prepare land for planting as well as carry out marking and pitting before they are approved to receive seedlings (PFP, 2014).

## 1.3 Rationale behind the forest financing study

The purpose of this forest financing study was to assess national and international mechanisms for the long-term financing of private forestry and the wood industry and recommend the best practices to apply in Tanzania.

The key tasks of the forest financing consultancy stipulated in the terms of reference were as follows:

a) Assess the needs of private forestry and the wood industry for finance, their knowledge of funding sources, and barriers to their getting finance.
b) Assess the financing mechanisms used in similar sectors, including agriculture and rural SMEs other than sawmills.
c) Identify any policy and institutional factors constraining the private sector from investing in private forestry and the wood industry.
d) Identify gaps in financing opportunities among major stakeholders caused by their lack of skills, technical capacity, knowledge, awareness, or attitudes towards private forestry wood processing
e) Prioritise areas where the PFP and other actors in private forestry and the wood industry can best engage, including policy, legislation, and regulatory lobbying; technology transfer; and business incubation, to enhance investments in private forestry and wood processing.

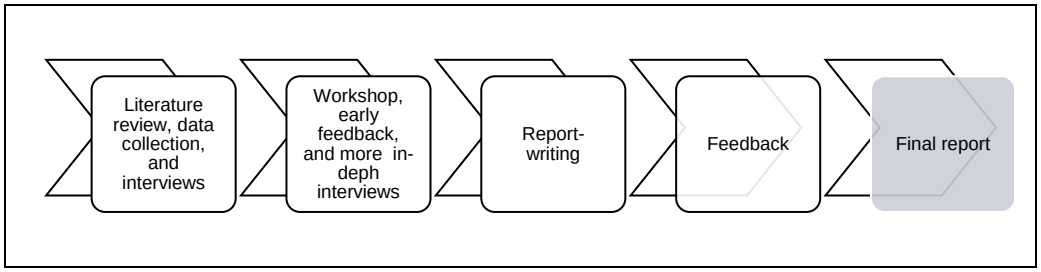
## 2. METHODOLOGY AND WORK PROCESS

### 2.1 Overview

The consultancy was carried out between February 2016 and April 2016. The work (Figure 2.1) started with a review of reports on forest financing in Tanzania, forest financing schemes elsewhere in the world, and financing schemes in other, similar fields like agriculture, as well the PFP's own stock of data. (See Annex 1 for summaries of some of the relevant studies.) Relevant stakeholders in the private forestry and wood processing sector were also identified.

Next, a set of field interviews was conducted with three target groups in the Southern Highlands: tree growers, sawmillers, and local financial institutions. The initial findings were presented and validated with stakeholders in a workshop held in Iringa in March 2016.

**Figure 2.1 Process of the work carried out**




### 2.2 Semi-structured field interviews

#### 2.2.1 Tree growers

Using the data collected by the PFP in its socio-economic baseline study, the consultant was able to efficiently select a sample of households to interview (WEMA Consult, 2016). Of the 335 households originally surveyed, only 16 had accessed any kind of finance or received any kind of support for their tree-planting activities. Six of these 16 tree growers who had accessed finance were included in the sample. The sample itself included 20 respondents in three villages, 14 males and 6 females.

The themes discussed with tree growers in the semi-structured interviews included the following:

- Basic background information
- Vision for the future
- Previously accessed credit for forestry activities
- Failed attempts to access credit
- Other assistance received
- Credit accessed for purposes other than forestry activities
- Challenges

#### 2.2.2 Sawmilling entrepreneurs

The consultants visited the Sao Hill Forest Industries Association (SAFIA) and discussed access to finance with its members. No pre-set sampling intensity was decided upon because it was assumed that most sawmillers face similar issues and that a large sample size would merely result in repetitive interviews. A total of seven sawmilling entrepreneurs were randomly selected to be interviewed.

Themes discussed with sawmilling entrepreneurs in the semi-structured interviews included the following:

- Personal background information
- Company background information
- Vision for the future
- Previous access of credit for forestry activities

- Failed attempts to access credit
- Familiarity with financial institutions
- Challenges

### 2.2.3 Financial institutions and other sources of financing

Following up on the names provided by tree growers and sawmillers who had accessed finance, the consultants also interviewed possible sources of financing,. Discussions with local and national level sources of finance were carried out in order to understand the terms of finance for various activities and views on forest and wood industry financing.

Themes discussed with sources of financing in the semi-structured interviews included the following:

- Extent of businesses
- Target groups for lending
- Financial instruments on offer
- Experiences in lending for agriculture
- Experiences in lending for forestry
- Challenges

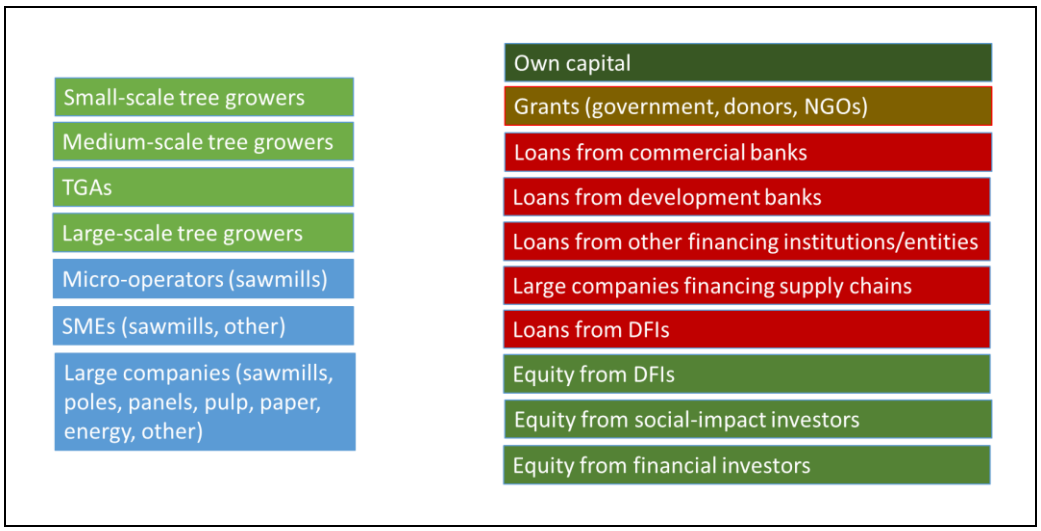
## 2.3 Interviews with large companies, development banks, and donors

In addition to conducting field interviews, the consultants discussed issues related to forest-sector financing with development banks, donors, government representatives and social-impact investors.

## 2.4 Gap analysis

Based on the interviews carried out, the consultants systematically mapped financing experiences, needs, and challenges in order to understand the gaps within the sector.

**Figure 2.2 List of recipients (left) and sources of finance (right)**




## 2.5 Validation with stakeholders

On 10 March, 2016, the initial findings from the field were disseminated at a workshop to which stakeholders from the Southern Highlands, including tree growers, sawmillers and financial institutions, were invited.

## 2.6 Financial models

In order to better understand financing needs and possibilities as well as to help present their business cases, the consultants prepared financial models for both sawmilling and

tree plantation establishment. The calculations included analyses of the cash flow, debt servicing, and sensitivity of these investments.

## 2.7 Recommendations

Finally, the consultants developed recommendations regarding key issues.

The recommendation considered three key questions:

- How could the capacities of lenders and borrowers to provide/access financing be increased?
- Is there a need for new financing instruments and how could such instruments be developed?
- What is the role of the government and donors in creating a more enabling environment for sustainable financing?

The most concrete recommendations are those concerning the PFP and the future actions it needs to take in order to integrate the concept of sustainable financing into tree growing and wood processing in Tanzania.

## 3. CATEGORIZATION OF RECIPIENTS

### 3.1 Typology of investors in forestry and forest enterprises

Investors in forestry and forest enterprises range in size from smallholders and family-run micro-businesses to large-scale international pulp and paper industries. Table 3.1 presents a typology of these investors and their natures. It includes SMEs active in harvesting and transport, various service providers, and joint ventures between different types of investors.

**Smallholders and micro-enterprises**. Micro- and small enterprises and smallholder investments in locally controlled forest and land resources are an important category of rural investors. They typically invest less than USD 1,000 and employ 5-10 workers. This was the key target group of this study.

**Small and medium-sized enterprises (SME).** Small and medium-sized forest enterprises play a crucial role in forest sector investment and development and also, through outsourcing and sub-contracting, in the provision of auxiliary services. The smallest operators serve only very local markets and are often family-run businesses. In some respects, the challenges SMEs face regarding access to financing and regulatory constraints are similar to those of micro-enterprises. However, some medium-sized enterprises are major suppliers both to the national and to the export markets and they operate in a business environment closer to that of large-scale national and international investors than of micro-enterprises. Their small size means they face unique challenges. In many countries, especially small, developing countries, they represent the biggest investor group in the sector.

**Strategic (domestic and international) and financial investors**. In terms of the volume and value, large-scale forestry and forest industry companies dominate investment flows in developing and emerging countries. The typical investment size of such strategic or financial investors ranges from USD 50 to 100 million and the number of workers employed exceeds 100 persons. In Tanzania, as in many other developing countries, international investors are the only ones investing on a large scale.

In the last ten years, an important new forestry investor class has emerged. Timberland investment management organisations (TIMOs) and timberland investment funds are growing increasingly active in Latin America and Asia, and, to some extent, also in Tanzania and other African countries. Their investments in developing and emerging countries may already exceed USD 20 billion but are still tiny in comparison to the total volume of forest industry investment. Their investment frameworks and critical factors influencing investment attractiveness are similar to those of large-scale foreign forest industry companies.

Investor categories are also site- and context-specific. In Tanzania, for example, even medium-sized enterprises are considered large. When making comparisons between categories, relative sizes need to be considered even though there are no specific threshold sizes.

**Table 3.1 Typology of investors**

| Type of operator | Entrepreneurs, communities, smallholders | | Strategic investors | | Financial investors | | Philanthropic investors with social and environmental objectives |
|---|---|---|---|---|---|---|---|
| | Micro-operators | SMEs, organised communities, TGAs, and large farmers | Forest industry companies | Energy, mining, agro-industries | International/ Regional timberland funds and TIMOs | Special cases like family offices & other direct investments, e.g. by banks | |
| Nature of operator | Informal, not able to access finance or to comply with legislation or business reporting | Often family-run; have difficulty expanding operations and complying with national legislation, let alone meet international standards to obtain financing | Source raw material for industrial production; mainly large-scale but also medium-scale operators, both international and local. SMEs could provide a range of service, including wood supply. | Source raw material for industrial production; many new operators, including energy companies looking for feedstock. | For financial profit, portfolio diversifi-cation. | Often keen on direct involvement in a business, like teak. | Long-term, conservation-driven interest, but require a positive bottom line. |

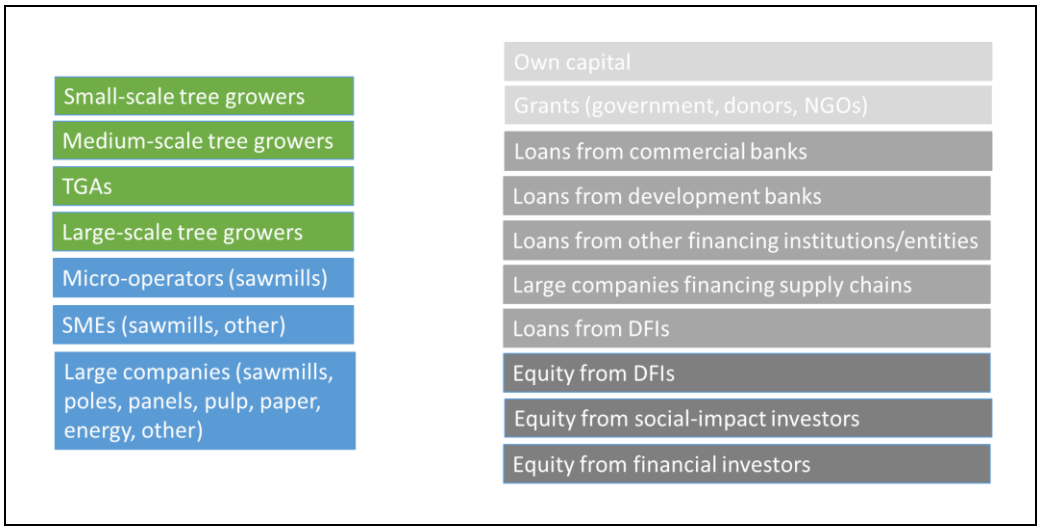
## 3.2 Categories of Tanzanian recipients of forest financing

### 3.2.1 General overview

In order to systematically map and understand the forest financing sector in Tanzania and to feed information to the financial gap analysis framework, the consultant categorised the recipients of financing relevant to the study.

Since the aim of the categorisation was to form groups that had similar experiences, needs, and challenges with regards to financing, working definitions fitting the purpose were used instead of strict official definitions.

**Figure 3.1 Recipients of forest financing**




### 3.2.2 Tree growers and tree growers' associations

Previous studies and existing reports on the fields of agriculture and forestry suggest that there is no common definition for small, medium and large tree growers (or

farmers). A study of East African agriculture conducted with support from the African Development Bank, for example, adopted as its working definition for smallholders farmers with less than two hectares of cultivated land and only a few heads of livestock (Salami, Kamara, & Brixiova, 2010).This study adopted its own working definition fitting the context of the Southern Highlands and private forestry.

Tree growers were grouped into three size categories based on the total area of land informants reported that they held. These categories were as follows:

- Small tree grower: < 10 acres (approximately 4 ha)
- Medium tree grower: 10-50 acres (approximately 4-20 ha)
- Large tree grower: > 50 acres (approximately 20 ha)

The figures included land used for agriculture and forestry as well as that which lay fallow or was barren. The consultants did not verify the landholding reported or demand to see official titles to the land.

In addition to individual tree growers, a fourth category, that of TGAs was identified. This group was included in the analysis throughout the study to highlight how important formal farmer groups are with regard to financing even if the actual recipients are individual tree growers.

Some 90 TGAs were identified in the PFP operating area (the Southern Highlands and Kilombero Valley) and the number seems to be increasing steadily. Early estimations show that 60% are registered associations, 43% operate a bank account, and 20% have their own office. The average annual membership fee of the 42 TGAs that collected such fees was roughly TZS 28,000 (EUR 11). In all except two cases, the fee was a flat rate per member. The total number of TGA members was roughly 4,300, about 1,800 of whom paid membership fees.

The TGA Apex Body, which was established as a national-level lobbying and support body for the 90 TGAs, consists of a committee of elected representatives from member TGAs. From among the members, a chairperson, a secretary, and a treasurer are elected. The PFP supports the TGA Apex Body by sponsoring the salaries of the three officeholders as well as a service manager and a forest information specialist.

### 3.2.3 Sawmilling entrepreneurs, businesses along the value chain, and large companies

Sawmilling entrepreneurs were also categorised using a working definition: the entrepreneurs were categorised based on their existing sawmilling equipment since this directly links them to a specific investment need and dovetails nicely with the definitions of micro and small enterprises adopted by the government of Tanzania (Box 3.1). Medium enterprises in the working definition slot nicely into the category of small enterprises in official use.

Sawmilling enterprises were categorised into micro-, small, and medium-sized enterprises based on the following equipment criteria:

- Micro-enterprise: small circular sawmill or “dingdong”
- Small enterprise: circular sawmill, higher technology than a “dingdong”
- Medium-sized enterprise: modern band saw, higher technology than a circular saw

In addition to sawmilling enterprises, other enterprises and business projects along the forestry value chain, including transportation, logging, by-product processing, and other value-adding projects, may also have special financing needs and challenges. These fall under the official definition of SMEs and can be categorised as micro-, small and medium-sized enterprises using the definition in Box 3.1.

Large companies in the forestry and related sectors are also recipients of forest financing. In the context of Tanzania, there are five such large companies though in many other contexts they would be considered medium-sized. Most of these companies have positive cash flows and access to international development financing.

**Box 3.1 Official definition of micro, small and medium-sized enterprises (SMEs) in Tanzania**

A micro-enterprise is a business with fewer than five employees and a turnover of less than TZS 5,000,000.

A small enterprise is a business with between 5 and 49 staff and a turnover between TZS 5,000,000 and TZS 200,000,000

A medium-sized enterprise is a business with between 50 and 99 employees and a turnover between TZS 200,000,000 and TZS 800,000,000

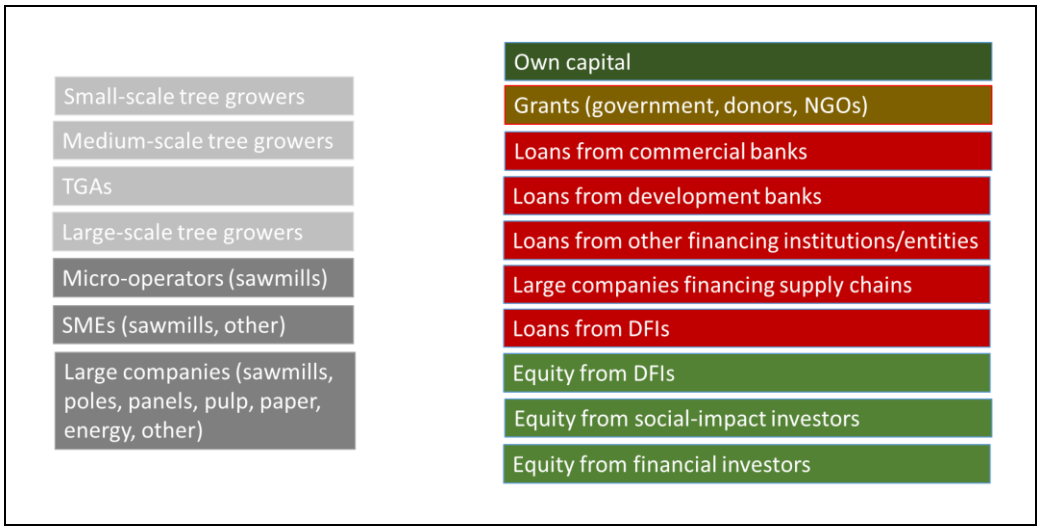
In those cases where a company's staff and turnover sizes place it in different categories, it is the turnover size that prevails.

Source: (FSDT, 2012)

## 4. CATEGORISATION OF SOURCES OF FINANCE

Sources of finance are illustrated in Figure 4.1.

**Figure 4.1 Sources of forest financing**




Having one's own capital is obviously the most important source of financing investments. Besides, without capital or some other form of collateral it is almost impossible to receive any finance other than grants or subsidies. The lack of capital is the main reason that small tree growers and most small enterprises look for other sources of finance.

Grants and a variety of different subsidies are conventionally channelled through donor-financed projects, development bank loans for other, non-forestry financing, and NGOs. With the help of donor support, the role of the government in providing subsidies has been gradually growing.

Loans are provided from a number of sources, including microfinance institutions and commercial and development banks. International DFIs, financial investors and social-impact investors provide loans or capital mainly to companies, NGOs, and large projects that have a commercial structure. In addition, a few companies in Tanzania in the forestry and agro-industries finance farmers as part of their supply chains.

Sources of finance are assessed in detail in Section 6.

## 5. ASSESSMENT OF FINANCING NEEDS

The consultants used semi-structured interviews with tree growers and sawmillers to gather evidence of recipients' experiences, needs, and challenges with regard to financing.

### 5.1 Tree growers

Twenty semi-structured interviews were carried out in Itambo, Kifanya and Madobe villages in order to develop a holistic, qualitative understanding of each of the 20 tree growers' experiences rather than collect hundreds of quantitative questionnaire forms. The main findings of those interviews are presented in Table 5.1 and Table 5.2.

#### 5.1.1 Knowledge about and experience with finance sources

Only a few tree growers had accessed finance from financial institutions for establishing tree plantations, and those who had had other sources of income, like a salary from a steady job or well-managed agricultural crops. Since banks do not generally ask for business plans for small loans, the loans were often used only partially for forestry. The rest was invested in various other activities.

The fact that only a few tree growers had borrowed money for tree planting does not mean that they do not have access to banks or other financial institutions. Most of the tree growers had borrowed money from community banks and similar institutions, including village community banks (VICOBAs) and savings-and-credit co-operatives (SACCOs), or at least knew of them. In some cases, tree growers had borrowed money from relatives and/or friends with favourable terms. These small loans from community banks, relatives, and friends were mostly invested in short-term agricultural crops like maize, beans, and potatoes and, in some cases, used to pay school fees.

While small-scale tree growers had little or no vision for their future tree planting businesses, the large landowners had clear visions of being even better off businesspeople and forest owners. Large landholders typically financed their tree-planting activities with profits from their existing businesses.

None of the tree growers interviewed had ever received any kind of assistance for their tree-planting activities before the PFP was introduced. They stated that they would need support for accessing good-quality inputs and that they would use such support to buy land and seedlings and pay for labour if their plantations were large enough.

**Table 5.1 The financing needs and sources of tree growers**

| | | Financing source | |
|---|---|---|---|
| Tree grower | Business plan / vision | Own capital | Bank loan |
| Small | No real business plans, but some wish to expand their forest plantations. Need financing mainly for agricultural inputs. | No own capital. Input is typically own labor. | Local community banks and SACCOs. |
| Medium | Plans for small business operations. No long-term vision. Need financing for land, seedlings, and labour. | Self-financing from ongoing businesses. | Local community banks and SACCOs. |
| Large | Plans to increase plantation areas. Need financing for land, seedlings and labour. | Self-financing from ongoing businesses | Local community banks, SACCOs, and commercial banks. |

#### 5.1.2 Barriers to getting finance

Tree growers were asked whether they had ever tried to access outside finance for their tree-planting activities and what kind of challenges they had faced in securing it.

Most tree growers were in need of assistance, but many, especially small-scale tree growers, were not willing to try to get a loan for two reasons. First, they knew that with their income was too unstable for them to be able to service the loan and, second, few had sufficient collateral to qualify to get a loan. Overall, tree growers were wary when it

came to borrowing money: only one had tried to access loans for tree planting, and s/he had failed. The loan application was not approved due to an administrative issue: the tree grower did not have valid identification documents.

The tree growers said that the financial products available to them were not suitable for them for several reasons. The most common complaint was that the annual interest rates of loans, about 20-25%, were too high (Section 6.4). The second challenge, which directly affects the applicability of loans for forestry, was the short payback period. Most of the loans on offer for farmers and tree growers are meant to tide farmers over during periods of the year when their income flags. Thus, loans are often issued for just three to six months. Such short-term loans cannot be serviced with income from young tree plantations alone (Section 8.1).

**Table 5.2 Financing gaps and challenges faced by tree growers**

| Tree grower | Financing gaps | Challenges |
|---|---|---|
| Small | No access to financing because not able to meet the criteria. | Reluctant to take loans because no stable income or collateral. |
| Medium | Lack of financing suitable for plantation expansion. | Strict terms of loans: high interest rates and very short payback periods |
| Large | Lack of financing suitable for plantation expansion. | Strict terms of loans: high interest rates and very short payback periods |

## 5.2 Forest industries

A total of seven sawmill entrepreneurs were interviewed in-depth to understand the financing needs and challenges of sawmillers. The interviewed sawmillers were members of SAFIA from the town Mafinga, which lies close to the government's Sao Hill plantations. This town was chosen because it is reported that some two-thirds of Tanzania's sawmills are located there (PFP, 2016). All of the sawmillers interviewed were dependent on the government's supply of raw material.

### 5.2.1 Knowledge and experience of finance sources

The sawmillers had very similar needs and experiences when it came to finance. They also had very similar views on and business plans for their businesses. All but one had planned to invest in a sawmilling machine with a high rate of recovery i.e. a modern bandsaw. They all had accessed loans from commercial banks for their businesses. Some did not see any need for improvements in their situation.

Although most sawmillers envisioned owning a modern sawmill, they had usually used the loans they had accessed to finance working capital rather than invest in long-term assets. Most often the sawmillers reported that they had used their loans to buy logs for their operations.

The sawmillers investment need for their modern sawmills would most often be between TZS 40 and 80 million (approx. EUR 15,000-30,000).

**Table 5.3 Financing needs and sources of forest industries**

| | | Financing source | |
|---|---|---|---|
| Company | Business plan / vision | Own capital | Bank loan |
| Micro | A sawmill with a good recovery rate. A modern bandsaw, TZS 40- 80 million. Loans often used to buy raw material. | Shares of own investment not well known | Loans from commercial banks |
| Small | A sawmill with a good recovery rate. A modern bandsaw, TZS 40- 80 million. Loans often used to buy raw material. | Shares of own investment not well known | Loans from commercial banks. |
| Medium | New value-adding businesses and factories. (> TZS 220 million) | Shares of own investment not well known | Loans from commercial banks. |

### 5.2.2 Barriers to getting finance

The sawmillers all had access to financial institutions but they said that they could not access loans large enough to significantly increase their businesses because they were unable to prepare business plans (a requirement for loans over TZS 15 million), lacked sufficient collateral, and/or lacked sufficient cash to finance their aspirations themselves.

Another hindrance to business development was access to raw material. In the past, SAFIA members have partly or wholly depended on raw materials from Sao Hill government plantations. Currently, to get a government allocation of 400 $m^3$ (for businesses with effective technology) or 200 $m^3$ (for businesses using "dingdongs") of wood, a sawmill needs to register each year (PFP, 2016). Most of the sawmillers have access to private plantations to complement the low government allocation. Some even have their own plantations and intend to be self-sufficient with regard to raw material.

**Table 5.4 Financing gaps and challenges of forest industries**

| Company | Financing gaps | Challenges |
|---|---|---|
| Micro | Not able to access loans large enough to buy a modern bandsaw. | Not enough collateral; can't meet demand for a business plan. Raw material is not guaranteed. |
| Small | Not able to access loans large enough to buy a modern bandsaw. | Not enough collateral. Raw material is not guaranteed. |
| Medium | Not able to access loans large enough to establish new factories. | Not enough cash to fund large business projects on their own. |

## 5.3 Key issues

- Farmers invest their extra income from other activities in trees and do not use outside financing. This fact limits scaling up.
- As planting takes place even if there is no outside financing, farmers need support to access high-quality inputs in order to improve yield and quality.
- Currently, it does not seem viable to use loans from local community or commercial banks to plant trees as current financial instruments offer no suitable finance products.
- Tree plantations are used as collateral for loans used for other purposes.
- Sawmillers have access to commercial bank loans, but the terms do not support investing in new technologies or increasing the productivity of or scaling up a business.
- Supplying sufficient raw material to sawmilling businesses is a challenge. Depending solely on the government's supply of raw material could jeopardise the long-term sustainability of a business for several reasons, including a decline in the amount of raw material the government supplies and the establishment of wood-processing industries by the government.

# 6. ASSESSMENT OF FINANCING SOURCES

One report, “Financing for Sustainable Forest Management in Tanzania,” (Indufor, 2012) discussed the issue of forest financing mainly from the point of view of public financing by the government, development partners, and international development banks. Although this study did not discuss private financing by investors and communities, it did identify a significant emphasis on the private sector in Tanzanian policies. For example, the Tanzania Five-Year Development Plan for 2011-2016 stated that the cost of achieving the country’s forestry-related targets during the plan would total TZS 71.5 billion, TZS 1.6 billion of which was to be provided by the Tanzanian government and TZS 13.1 billion by development partners. Such an allocation leaves a financing gap of TZS 56.8 billion (EUR 23.7 million) (GoT, 2012).

While recognising the importance of public financing in the forestry sector of Tanzania, this study aims to provide sustainable solutions for forest financing by closely investigating private sector sources and possible innovative finance sources.

## 6.1 Donor and international development bank financing

Public financing is crucial for the development of the Tanzanian forest sector; in fact, it is the most important source of financing in Tanzania (Indufor, 2012). Donors and the government are needed to finance infrastructure, services, institutional capacity, and other elements of an enabling environment. Subsidies for private tree planting and wood processing are still limited in Tanzania.

Recently, the World Bank and the donor community have focused mainly on climate change mitigation and adaptation financing with initiatives such as the Forest Investment Programme (FIP) and the Forest Carbon Partnership Facility (FCPF), but there has been no major funding of the private forest sector.

From the donor community the most important financiers in the forest sector are Finland, Norway (Norwegian Agency for Development Cooperation or NORAD), Sweden (Swedish International Development Cooperation or SIDA), UK (Department for International Development or DFID), Denmark (Danish International Development Agency of DANIDA), and Germany (Deutsche Gesellschaft für Internationale Zusammenarbeit or GTZ). Lately, Finnish, British, and Norwegian support has been dominated in the forest sector though Norwegian support is directed only towards projects with climate change mitigation as the main objective, such as REDD (Reducing Deforestation and Forest Degradation) projects.

The government of Finland, through the PFP, is, at the moment, the most important donor financing the private forest sector in Tanzania, and DFID, too, channels financing through the Forestry Development Trust (FDT) (see Section 6.9). Other than these two sources, support to the private forest sector is limited. However, other donors have developed interesting financing mechanisms to support agriculture and rural business that are similar to those of the PFP; DANIDA’s approach, for example, is presented in Section 6.3.3.

## 6.2 Government public financing

There is a strong connection, if not an overlap, between government public financing and financing by donors. Here, government public financing for forestry is considered to be a separate source of financing and the main focus is on the Tanzania Forest Fund (TFF) and the Tanzania Forest Service Agency (TFS).

### 6.2.1 Tanzania Forest Service Agency

The TFS describes itself as “a semi-autonomous government Executive Agency whose establishment is supported by the Executive Agency Act (Cap. 245 Revised Edition 2009), the National Forest and Beekeeping Policies adopted in March 1998 and administered through The Forest Act (No. 14 of 2002) and Beekeeping Act (No. 15 of 2002) which provides legal framework for the management of forests and bee resources” (TFS, 2016). The TFS develops and manages Tanzanian forest and bee

resources in order to produce good-quality goods and services for domestic and international needs (TFS, 2016).

Except for the salaries of its permanent staff, TFS finances its activities through a system called the logging and miscellaneous deposit account (LMDA). The LMDA was first piloted in Northern Tanzania in 1989 and expanded to cover all government plantations in 2000 (Indufor, 2012). The LMDA mechanism is local in that the funds collected in a certain government plantation do not circulate through the government but stay in the plantation they were collected from. As presented in Table 6.1, during the fiscal year of 2014/15 the TFS collected a total of EUR 6.3 million through the LMDA system.

**Table 6.1 LMDA collected by the TFS between 2011 and 2015**

| | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
|---|---|---|---|---|
| LMDA collections (million TZS) | 11,175.0 | 11,732.9 | 12,636.3 | 13,447.1 |
| Period average exchange rate (TZS/EUR) | 0.00047 | 0.00049 | 0.00046 | 0.00047 |
| LMDA collections (million EUR) | 5.3 | 5.7 | 5.8 | 6.3 |
| Period average exchange rate (TZS/USD) | 0.00063 | 0.00063 | 0.00063 | 0.00057 |
| LMDA collections (million USD) | 7.0 | 7.4 | 8.0 | 7.7 |

Source: (MNRT, 2016), exchange rates to EUR and USD are interbank ask rates from www.oanda.com/currency/average

The TFS collects LMDA funds from log sales. The log prices of Sao Hill plantations during the season 2015/16, for example, included LMDA payments of TZS 8,750 per $m^3$ for pine logs and TZS 17,500 per $m^3$ for pine logs. For both species, the associated LMDA payment was added on to the base price twice, once to carry out silviculture and once to carry out road maintenance (PFP, 2016).

At the workshop in Iringa and other times, the consultants raised the question of whether or not LMDA collections could be used to support private tree growers. The responses of government officials suggested that it is unlikely that funds collected for developing and maintaining *government* plantations could be for *private* forestry but a system like LMDA could be developed for the private sector. In order for such a system to be viable, logging and wood sales would need to be conducted through an organisation and the fees collected circulated back to support tree planting.

### 6.2.2 Tanzania Forest Fund

The Tanzania Forest Fund (TFF) is a public fund operating under a board of trustees that was established under the Forest Act Cap. 323 (2002) under Sections 79-83 to provide long-term, reliable, and sustainable financial support for the conservation and management of forest resources in Tanzania. Made operational in July 2011, the TFF had supported 191 projects by December 2013 (TFF, 2014).

The TFF collects funds through levies of 2% and 3% on every prescribed fee and every royalty payable under the Forest Act respectively. These levies are paid by anyone who purchases material from public sources in addition to the royalties paid for logs prescribed by Government Notice 433. (FORCONSULT, 2014) The funds that the TFF has collected through this system are presented in Table 6.2.

**Table 6.2 TFF collections through the TFS between 2011 and 2015**

| | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
|---|---|---|---|---|
| TFF collections (million TZS) | 3,338.9 | 3,188.3 | 2,690.3 | 3,152.9 |
| Period average exchange rate (TZS/EUR) | 0.00047 | 0.00049 | 0.00046 | 0.00047 |
| TFF collections (million EUR) | 1.6 | 1.6 | 1.2 | 1.5 |
| Period average exchange rate (TZS/USD) | 0.00063 | 0.00063 | 0.00063 | 0.00057 |
| TFF collections (million USD) | 2.1 | 2.0 | 1.7 | 1.8 |

Source: (MNRT, 2016), exchange rates to EUR and USD are interbank ask rates from www.oanda.com/currency/average

The priority areas of TFF are as follows:

- Forest protection, conservation and management aimed at ensuring proper forest land management and ecosystem conservation.

- Community-based conservation and sustainable livelihoods with a focus on community conservation initiatives.
- Applied and adaptive research on the management of forest resources and livelihood improvement. (TFF, 2014)

Of the 191 projects that the TFF supported, 56 were priority area 1 projects, while 115 and 20 were priority area 2 and 3 projects respectively. Categorising by size, 98 were small (up to TZS 5 million), 53 were medium (TZS 5-20 million), and 40 were large (TZS 20-50 million).

### 6.2.3 Public-Private Partnerships

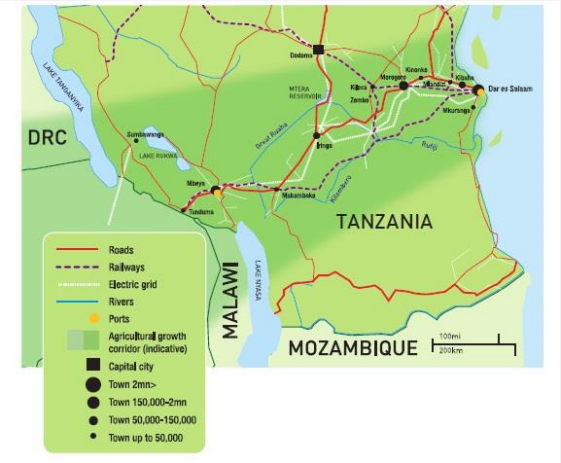
Public-private partnerships (PPPs) have been discussed within the forestry sector in Tanzania for some time, but there is no example as yet of a large-scale PPP. The PPP Policy was issued in 2009, and the PPP Act and Regulations were passed in 2010 and 2011 respectively (TIC, 2016).

The PPP Policy (PMO, 2009) defines a PPP as "an arrangement between public sector and private sector entities whereby the private entities renovate, construct, operate, maintain, and/or manage a facility in whole or in part in accordance with output specifications. The private entity assumes the associated risks for a significant period of time and in return, receives benefits/financial remunerations according to agreed terms; which can be in the form of tariffs or user charges. PPP is therefore a cooperative venture built on the expertise of each partner that best meets clearly defined public needs through the most appropriate allocation of resources, risks and rewards."

PPPs are viable tools for channelling public and private financing to selected sectors. A good example of a functioning PPP from the agricultural sector in Tanzania is the SAGCOT (Box 6.1).

**Box 6.1 The Southern Agricultural Growth Corridor of Tanzania (SAGCOT)**

One successful PPP in Tanzania is the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). The SAGCOT is an inclusive multi-stakeholder partnership for developing agricultural potential in the growth corridor area that extends from Dar es Salaam through Kilombero and Iringa all the way to Mbeya.




SAGCOT's stated objective is "to foster inclusive, commercially successful agribusinesses that will benefit the region's small-scale farmers, and in so doing, improve food security, reduce rural poverty and ensure environmental sustainability."

The founding partners of the SAGCOT include farmers, agri-businesses, the Government of Tanzania, and private companies.

The SAGCOT was recently awarded USD 70 million by the World Bank's International Development Association for a project to improve farm productivity and access to markets in the area. A large variety of donors, companies, and other investors are involved in the SAGCOT. They include the Government of Tanzania, Tanzania Investment Bank, Tanzania Investment Centre, CRDB Bank Ltd., Kilombero Teak Valley Company Ltd., National Microfinance Bank, Mtanga Foods Ltd., Nestle, Monsanto, Syngenta, Unilever, Yara, USAID, UKAID, World Bank, United Nations Development Programme, Confederation of Tanzania Industries, and Tanzania Sugarcane Growers Association.

(SAGCOT, 2016)

## 6.3 Overview of the Tanzanian finance sector

### 6.3.1 The economic outlook in general

To better understand the environment in which the Tanzanian finance sector operates, it is important to be aware of the current economic situation in the country.

The Bank of Tanzania reports that the overall (headline) inflation during the year of 2015 was 6.8%. The overall interbank cash rate (the rate banks use for lending and borrowing between banks) in December 2015 was 7.29% and the overall lending rate (the rate that banks use for lending to clients) was 15.75% (BoT, 2016).

Tanzania's gross domestic product (GDP) grew by 7.0% during 2014 and similar figures are predicted for the medium term (World Bank, 2016; AfDB, 2015). The sector which contributes most to the economy is agriculture, followed by wholesale and retail trade, and, in the service sector, finance, real estate, and businesses. Significant growth was seen in the mining and manufacturing sectors. (AfDB, 2015)

### 6.3.2 Doing Business in Tanzania

Doing Business is a World Bank project that measures business regulations in order to provide information on how easy or difficult running a business is in a total of 189

countries. It is one of the most used information sources among international forestry investors evaluating countries to invest in (Castrén, Katila, & Lehtonen, 2014). It measures indicators in the following 11 areas of doing business: starting a business, securing construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, resolving insolvency, and labour market regulations (World Bank, 2016).

Table 6.3 presents some selected indicators for Tanzania and some neighbouring countries. The table suggests that in East Africa, starting a business in Tanzania is relatively easy but that registering property is slower than elsewhere and that the quality of land administration is poor. In addition, it is difficult to get credit and for lenders to find credit information on potential borrowers.

**Table 6.3 Selected Doing Business 2016 indicators in Tanzania in comparison with other East African countries and the global leader**

| Indicator | Tanzania | Kenya | Mozambique | Uganda | Best globally |
|---|---|---|---|---|---|
| Starting a business | | | | | |
| Rank | 129 | 151 | 124 | 168 | New Zealand (1.0) |
| Procedures (number) | 9.0 | 11.0 | 10.0 | 15.0 | New Zealand (1.0) |
| Time (days) | 26 | 26 | 19 | 27 | New Zealand (0.5) |
| Cost (% of income per capita) | 18.0 | 35.3 | 15.1 | 39.7 | Slovenia (0.0) |
| Registering property | | | | | |
| Rank | 133 | 115 | 105 | 120 | New Zealand (1) |
| Procedures (number) | 8.0 | 9.0 | 6.0 | 10.0 | 4 countries (1.0) |
| Time (days) | 67.0 | 61.0 | 40.0 | 42.0 | 3 countries (1.0) |
| Cost (% of property value) | 4.4 | 4.2 | 5.3 | 2.6 | Saudi Arabia (0.0) |
| Quality of land administration index (0-30) | 7.5 | 15.0 | 9.5 | 10.0 | 3 countries (28.5) |

| Getting credit | | | | | |
|---|---|---|---|---|---|
| Rank | 152 | 28 | 152 | 42 | New Zealand (1) |
| Strength of legal rights index (0-12) | 5.0 | 7.0 | 1.0 | 6.0 | 3 Economies (12.00) |
| Depth of credit information index (0-8) | 0.0 | 7.0 | 4.0 | 7.0 | 26 Economies (8.0) |
| Credit registry coverage (% of adults) | 0.0 | 0.0 | 5.6 | 0.0 | Portugal (100.0) |
| Credit bureau coverage (% of adults) | 4.97 | 14.3 | 0.0 | 5.3 | 22 Economies (100.0) |

Source: (World Bank, 2016)

### 6.3.3 Recent trends and developments in rural financing in Tanzania

The Tanzanian banking sector is emerging, but, still in its early phases, is struggling to do so. Among the total 56 licensed banks and financial institutions, there are a few big players and many small ones, including commercial banks and microfinance institutions.

Tanzania has gone through a privatisation process in which formerly state-owned banks have been privatised and are now commercial banks. Several microfinance institutions have also become commercial banks. The main banks in agriculture and forestry are the National Microfinance Bank (NMB) and the Cooperative Rural Development Bank (CRDB).

Discussions with financial institutions in Tanzania revealed that rural financing is gaining momentum and that interest in it is rising. It is becoming clear to representatives of financial institutions that agriculture in Tanzania can indeed be a successful commercial venture and need not remain at the subsistence level. With the increase in interest in agricultural financing, new products enabling financing for new crops have been developed. For example, some years ago, sugarcane received no finance because the harvest was delayed by 18 months; now, by promoting understanding between the financial and the agricultural sectors, innovative products and modalities have been developed to accommodate the needs of sugarcane farmers who wish to borrow. The key issues that will enable this development to continue in the future and be applied to financing instruments suitable for forestry are discussed in the following sections.

#### The business case

Obviously, the first thing any representative of a financial institution looks for is the business case: is this investment financially sound? The business case for establishing tree plantations might not be easy to develop since forestry does not fit the existing financing products well given its long-term timeframe and low early cash flow projections. Sawmilling and other processing, on the other hand, offer a much more solid business case and are easier for bankers to understand. Whatever the case, a loan seeker must be able to present a viable business case with credible numbers to a financier.

#### Outgrower schemes and farmer groups

Banks often mentioned outgrower schemes run by industrial companies as a mode of operation they prefer to direct lending to farmers. In an outgrower scheme, a company supports farmers with inputs and technical assistance and guarantees them a market for their crops. Participating in an outgrower scheme lowers the various risks lending to farmers poses to banks and makes banks more willing to provide funding with more favourable terms to farmers.

Like involving farmers in outgrower schemes, organising farmers into groups also decreases the risks banks associate with them. In addition, working with groups rather than individuals decreases a bank's transaction costs for issuing loans.

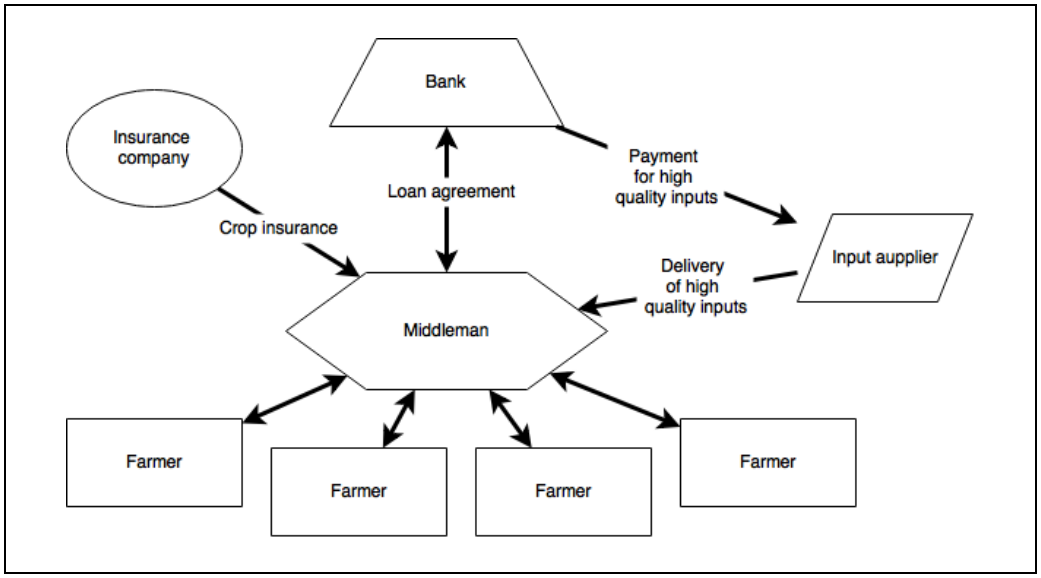
### Agricultural insurance

Agricultural insurance is a rather new concept in Tanzania and interest in it is on the rise. Companies are also interested in providing insurance for forestry, but their understanding of the nature of forestry and its related risks is not yet high enough to convince them to provide services. Typically, insurance companies provide three types of service to the agricultural sector:

- Crop insurance. The company insures a farmer to harvest a fixed amount of crop and will pay out if that yield is not achieved.
- Weather insurance. The company insures a farmer against anomalies in weather and will pay out if there is one, for example a drought or hailstorm.
- Other related insurances. These insurances link other types of insurance, for example life and medical insurances, to agricultural activities. If a person dies or is otherwise unable to take care of a farm, the company pays out to the family or the farmer.

Some insurance companies envision bundling insurance products, credit, and farming inputs into service packages and distributing them through middlemen to farmers. An example of this kind of a scheme is presented in Figure 6.1; it is clear that the middleman plays a central role.

**Figure 6.1 An example of linking agricultural insurance and credit**




The middleman takes a loan supported by an insurance product which provides security if crops fail. The bank channels credit directly to the supplier of inputs to the middleman. The middleman then distributes the inputs to farmers, monitors their progress, and makes sure that they fulfil the terms of their loan agreements.

### Credit guarantee schemes and funds

Credit guarantee schemes and funds are tools for accelerating investments by helping entrepreneurs who otherwise would not be able to access enough credit to fit their investment plans. The guarantees are used in addition to entrepreneur's collateral in order to improve their eligibility for large amounts of credit. Currently active in Tanzania are both national private and public credit guarantee schemes as well as globally operating funds (FAO, 2013).

The government of Tanzania has two credit guarantee schemes, both of which are reported to have had a slow start as well as long processing times, high fees, and low capital (TANEXA, 2010). The Export Credit Guarantee Scheme aims to enhance the

creditworthiness of exporters so that they can secure better and larger facilities from financing institutions (MoF, 2016). The Small and Medium Enterprises Credit Guarantee scheme was established in 2005 to promote and support SMEs by creating an enabling environment in which access to financing is expanded and facilitated. It guarantees loans up to TZS 30 million (BoT, 2002; TANEXA, 2010).

One of the most prominent credit guarantee actors is the Private Agricultural Sector Support (PASS) Trust. DANIDA established the PASS trust in 2005 as part of the Agricultural Sector Programme Support (ASPS). The original capital was USD 12 million and another USD 30 million was added in 2008. The PASS is now said to be self-sufficient; it earns revenues from business development services like selling business plans and preparing feasibility studies as well as financial services like collecting risk-bearing fees from banks offering credit (see Box 6.2 for more). Interestingly, the PASS trust defines agriculture as it is defined in the national agriculture policy, a definition that includes forestry (MoAFSC, 2013). Thus, forestry and forest-processing projects could directly benefit from the PASS trust.

In addition to these Tanzanian schemes are global credit guarantee schemes for agriculture, rural development, and SMEs. For example, AGRA (Alliance for Green Revolution in Africa) has a fund that supports banks which offer loans at reasonable terms to farmers and other groups normally seen as too risky, the French Development Agency's PROPARCO offers financial support and guarantees for renewable energy and agribusiness, and the USAID Development Credit Authority (DCA) offers various guarantee products targeting SME development.

In addition, for foreign investors interested in investing in emerging economies, the World Bank, through the Multilateral Investment Guarantee Agency (MIGA), operates the Small Investments Programme (SIP) to lower the political risks of investments. The SIP helps investors in two ways: 1) directly, by providing political risk insurance to foreign investors and 2) indirectly, by providing political risk insurance to financial institutions that will then lend to SMEs. In practice, an investor looking to invest in the establishment of a SME in Tanzania could apply to the SIP for direct political risk insurance, which provides the following coverage:

- Protection against losses if the investor is not able to convert local currency into foreign currency for transfer outside of the target country.
- Insurance against delays in acquiring foreign exchange due to the action or failure to act of the host government.
- Protection against expropriation, i.e. losses from government action to reduce or eliminate ownership of, control over, or rights to the insured investment.
- Protection against loss from, damage to, or the destruction or disappearance of tangible assets caused by politically motivated acts of war or civil disturbance in the host country, including revolution, insurrection, coups d'état, sabotage, and terrorism. (MIGA, [no date])

**Box 6.2 Private Agricultural Sector Support Trust**

In 2000, the government of Tanzania, supported by DANIDA under the Agricultural Sector Programme Support (ASPS), established the Private Agricultural Sector Support (PASS) Trust as a pilot intervention to improve the access of commercial farmers to finance (OPM, 2009)

The PASS Trust organisation is currently self-sustaining. It finances its operations by offering services in two major categories: business development services and financial services. Business development services include conducting feasibility studies, developing business plans, building capacity, organising famers into groups, and marketing. Financial services include appraisals of loan write-ups and partial credit guarantee covers. The PASS model is depicted in the following figure (PASS, 2016).

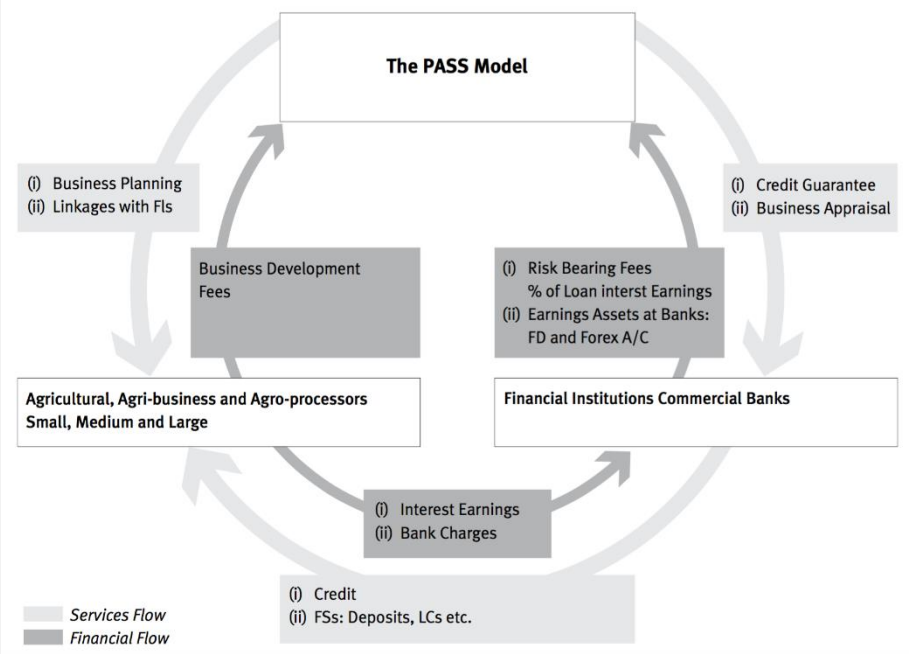



Figure source: Credit Guarantee and Business Development Services for Small and Medium Agro-Enterprises: A Case of the Private Agricultural Sector Support (PASS) Trust-Tanzania, Andrew E. Temu.

Any individual, association, or company linked to the agricultural / livestock sector can apply for PASS's services. Since forestry and wood processing care included in the definition of agriculture in Tanzania (MoAFSC, 2013), tree growers and sawmillers are also eligible.

An applicant can enter the PASS system through any of the eight collaborating banks and six PASS offices. It is recommended that a PASS applicant present his or her business idea to his or he bank, which will then forward it for further processing.

## 6.4 Local financial institutions

### 6.4.1 Commercial banks

Tanzanian commercial banks made it clear that they are interested in doing business as long as it makes financial sense, or, in other words, that their expected return of credit covers the expected risks. Preparing a business case for tree planting alone is challenging, but commercial banks have ready solutions for sawmilling operators at least.

Banks offer loans of various lengths, typically short (< 1 year), medium (2-3 years) and long (about 10 years). The interest rates reported were above 15% per annum, most commonly, 16-19%. The basic rule is that the shorter the payback period for a loan is, the higher is its annual interest rate. The collateral most often used for loans was the

house the borrower resided in. Banks also said that they accepted tree plantations as collateral in view of the fact that their value was higher than that of bare land.

### 6.4.2 Microfinance institutions

A plethora of microfinance institutions operate in Tanzania and in the Southern Highlands. There are many democratic, member-driven, self-help savings-and-credit cooperatives (SACCOs) as well as village community banks (VICOBAs) that offer grassroots lending schemes that foster the ability of participants to innovate and manage viable income-generating activities by providing entrepreneurship training and other capacity-building initiatives (SACCOL, 2016; SEDIT, 2008). International microfinance banks such as FINCA are also present.

The SACCO the consultant visited offered three types of services to its members: savings, loans, and safekeeping. They offered individuals three-month loans up to TZS 15 million at a monthly interest rate of 2%. In addition, they offer loans of TSZ 500,000 to groups of five entrepreneurs for one month at 1% monthly interest. The collateral for the loans was most commonly a house or a piece of land and ownership of the assets was verified by the village leader. No certificates of customary right of occupancy were asked for. In fact, people with CCROs tend to go to commercial banks because they provide better terms. The SACCO had given credit for forestry, but the loan was the standard type in terms of both interest rate and payback period. The recovery rate of the SACCO's loans was some 90%.

The consultant visited the Njombe Community Bank (NJOCOBA), a VICOBA based in Njombe town. The bank offered its customers three types of loans: small business loans up to TZS 5 million for one year with annual interest of 20%, medium loans up to TZS 75 million for one year with annual interest of 20% and agricultural input loans where no cash is given, but the NJOCOBA pays the input supplier to provide the farmer with farming inputs with a 3-12-month payback period.

The consultant also visited FINCA, a global microfinance institution that has offices around the Southern Highlands. The FINCA model differs from other two in that it supports farmers to form groups of between 5 and 15 people, organises a three-day training programme for them, and gives them loans typically up to TZS 1 million each. The loans need to be paid back within 6 to 48 months with monthly interest rates varying from 5.8% for group management and 6.3% for other members. The loans are guaranteed collectively by the group members.

## 6.5 Local development banks

The main development banks in Tanzania are the Tanzania Investment Bank Group (TIB) and the Tanzania Agricultural Development Bank (TADB)

The TIB has three distinct institutions: TIB Development Bank Limited, a DFI; TIB Corporate Finance Limited, a short-term financing institution serving large corporate clients, both public and private, to support TIB Development Bank Limited; and TIB Rasilimali Limited, a registered brokerage company, wholly owned by the Government of Tanzania, that purchases and sells corporate bonds on the Dar es Salaam Stock Exchange. Rasilimali also offers investment advice to the Tanzanian government to support TIB Development Bank Limited.

Established by the government of Tanzania in August 2015, the TADB is the newest development bank in Tanzania. It is dedicated to financing rural development, particularly among Tanzanian smallholder farmers. The TADB has thus far received capital funds totalling TZS 60 billion and the government has promised to inject more funds annually.

TADB offers farmers loans in three categories:

1. Short-term
    - Payback period: up to 24 months
    - Purpose: requirements in the agriculture value chain
    - Interest rates: 7- 8% per annum
2. Medium-term:
    - Payback period: 2-5 years
    - Interest rates: 9-10% per annum
3. Long term:
    - Payback period: 5-15 years
    - Interest rates: 11-12% per annum

The above categories are for various parts of the agricultural value chain, including pre- and post-harvest, asset-financing, and infrastructure loans.

One of the existing focus areas of the TADB is forestry, and the bank is looking into financing forestry-related value chains in the long-term. The bank has started financing beekeeping projects but currently put tree planting and wood processing to the side. The TADB believes that financing tree planting on bare land could be feasible but that appropriate insurance products would have to be developed in order to reduce the risks of such long-term ventures.

In April 2016, the TADB joined the PASS programme (Box 6.2) as one of PASS's partner banks.

### 6.6 Development Finance Institutions

A number of DFIs aim at financing the private sector in developing countries. For instance, the World Bank Group's International Finance Corporation offers investment, advisory, and asset management services to encourage private sector development in developing countries. The African Development Bank, too, has a division that focuses on the private sector. The European Investment Bank operates mainly in Europe but has also a significant stake in the African private sector.

In addition to international development banks, there are number of national development finance institutions, such as British CDC, Dutch FMO, German DEG, French PROPARCO, Finnish Finnfund, and Norwegian Norfund.

In Tanzania so far it is mainly the major forest plantation and processing companies that have benefitted from DFI private equity and loans. The details of the conditions are confidential and thus cannot be fully revealed in this study.

Companies have to be well established in order to receive DFI support. They also have to comply with international standards when it comes to financial as well as environmental, social, and governance (ESG) reporting.

Investments are large, USD 5-50 million or even more. DFIs require a company to contribute a significant amount of its own capital and often prefer to have other financing partners, like other DFIs.

Senior loans, or loans that takes priority over other unsecured or otherwise more "junior" debt owed by the borrower, are typically long-term loans with payback periods of 20 or more years, low interest rates ranging from 2% to 6%, and grace periods of 5 to 7 years. DFIs demand that companies have sufficient cash flows generated from their business operations to serve the debt.

Finnish Fund for Industrial Cooperation Ltd. (Finnfund) is a small DFI, but is unique in that forestry and forest industries are important in its portfolio. For other DFIs, forestry and forest industries represent quite a small share of their overall portfolios.

Finnfund and its financing instruments are presented in Box 6.3.

**Box 6.3 Finnfund's financing**

Finnfund is a Finnish development finance company that provides long-term risk capital for private projects in developing countries. Apart from co-investing with Finnish companies, Finnfund finances ventures that use Finnish technology, cooperate with Finnish partners on a long-term basis, or generate major environmental or social benefits.

Finnfund is very well informed about financing forestry sector projects in emerging markets and developing countries. It finances plantations, sawmills, plywood mills, and other processing facilities.

Finnfund's terms of financing are market-related. Finnfund does not extend soft loans but is ready to share risks by providing long-term financing for promising projects.

Funding can be in the form of equity capital, mezzanine financing, or long-term investment loans. Regardless of the form of financing, Finnfund's stake is always a a minority stake.

Other characteristics of its loan financing are as follows:

- Financing directly to companies in emerging markets and developing countries
- Minority financier; provides EUR 1-10 million
- Finances in euros and US dollars
- Maturity periods of up to 8-10 years with a grace period of 2-3 years
- Market-based interest rates; compensation for the risk-taking

DFI financing works well with well-established forest companies that have assets and plans for scaling up with processing investments. It does not, however, easily reach greenfield investments that aim to expand and establish new plantation areas, whose expected cash flows from business operations are typically generated only after 5-10 years and are not sufficient to serve the debt before that. Private tree growers or small and medium size enterprises lie outside the scope of DFIs due to their company-oriented eligibility requirements.

That said, it might be possible for TGAs or the TGA Apex Body to build up enough capacity to fulfil the eligibility criteria of DFIs.

Private tree growers benefit indirectly from DFI loans through outgrower schemes launched by plantation companies with those loans (Section 6.7).

## 6.7 Companies

Already a few Tanzanian companies in forestry and Tanzanian agro-industries do finance farmers as part of their supply chains. These include the outgrower schemes supported by the PFP as well as the schemes of tea and tobacco companies. Large machinery and equipment suppliers might also be persuaded to offer financing to their clients.

One example of a well-established forestry outgrower support programme (OSP) in Tanzania is that of Kilombero Valley Teak Company (KVTC). KVTC is developing teak resources through an OSP it operates in Kilombero and Ulanga districts. Through its OSP, the company has created a sustainable source of income for communities as well as a secondary source of raw material to complement its own sources.

According to KVTC's OSP brochure, the programme is inclusive, as long as a tree grower meets the following criteria:

- The planting site needs to be in Kilombero or Ulanga and within 100 km radius of the sawmill
- The area needs to be at least one hectare and not more than 50 hectares.
- Institutions (private or public) as well as individuals can apply for the program.
- If a school participates in the programme, it cannot use children to establish the plantation.

- Applicant's need to be able to contribute to the financing of the establishment of the teak plantation.
- Applicants need to demonstrate legal ownership of the site they plan to plant under the programme.

Accepted applicants enter into an agreement with KVTC giving the company first right of refusal at the time of thinning or felling. The agreement also prohibits the tree grower from clear-felling trees before the age of 15 years.

KVTC selects sites scientifically to ensure that they are viable for teak plantations. It does not support land conversion. KVTC pays 50% of the standard cost per unit of labour calculated according to predetermined activities and supplies all planting material, fertilizers, and chemicals. Payments are made only upon the completion of an activity and after inspection verifies that all KVTC standards have been met. If the work is below standard, the participant tree grower has to rectify the situation before receiving payment.

KVTC has the right to 25% of the interim and final harvests as well as first right of refusal at both harvests.

### 6.8 Financial investors

The most important difference between international TIMOs, timberland funds, and forest industry companies and national investors, is the fact that international operators have the freedom to choose where to invest. The quality of the business environment is one of the key factors they use to screen investment targets (countries). In addition, a domestic investor, unlike a foreign investor, whose investment is 100% exposed at the time of exit is not exposed to the risk of fluctuating foreign exchange rates and does not have to meet some of the regulatory requirements specific to a foreign investor, such as getting a license to operate in the country or dealing with risks related to expatriation of profits and taxation issues.

### 6.9 NGOs, social-impact investors, and other sources

A large variety of NGOs have several forestry projects. They range from well-established, prestigious international organisations such as World Wide Fund for Nature, International Union for Conservation of Nature, and Oxfam to numerous religious and other ideological organisations.

In addition, a growing number of impact investors target specific social and environmental objectives while seeking a financial return on their investments. So far, social-impact investors have come mainly from the US and focused principally on social and environmental investments such as education, health care, and conservation. Recently such investors have widened their scopes in both geographic and thematic terms.

The forest and agro-forestry landscape offers also opportunities to generate returns, advance development, and safeguard the environment. Adding impact to the risk/return calculation, impact investors chose to support businesses that strengthen the environment and the society. In previous generations, philanthropy funded charities to fill gaps that the market failed to reach. That is changing. Today, impact investors are shifting the focus from the act of giving to using the market to generate impact. A similar trend exists in the official development aid arena, where international donors focus on promoting trade rather than aid and performance-based grants.

In Tanzania, such impact investors include the Gatsby Foundation and the Bill and Melinda Gates Foundation.

The most significant NGO or social-impact investor supporting private forestry in Tanzania is the Forestry Development Trust (FDT), which is funded by the Gatsby Foundation with the support of the DFID. The FDT is an independent institution set up to work with the public and private sectors to drive a long-term programme which aims to transform the sector. The FDT has four key functions: (i) increase the supply of high-value wood products and energy from sustainable sources; (ii) increase smallholder planting and employment in sustainable private forestry; (iii) raise the net incomes of

the sector's smallholders; and (iv) ensure good-quality services and industry functions are provided sustainably.

To promote the sustainable growth of Tanzania's forestry sector and ensure that both large- and small-scale growers can exploit lucrative opportunities in the commercial timber and energy markets, the FDT is running a programme comprising three components: (i) improving tree planting material (genetic resources); (ii) increasing forestry skills and knowledge; and (iii) building insight in the forestry sector.

## 6.10 Experiences from other countries

Selected experiences in forest financing from neighbouring countries are discussed in this section. Two, the well-regarded Sawlog Production Scheme of Uganda and a micro-forestry company in Kenya called Komaza are discussed in detail.

### 6.10.1 Ugandan Sawlog Production Grant Scheme

The Ugandan Sawlog Production Grant Scheme (SPGS) is regarded as a successful example of a forestry incentive scheme. The European Union and the government of Norway supported the establishment of the SPGS in 2004. Its first phase ran until 2009. (Indufor, 2011a)

In its first phase, the SPGS supported the establishment of 10,000 ha of tree plantations. The area was planted by 106 tree growers and 43% of the total area planted was in plantations with areas of 200-500 ha. Table 6.4 below presents a more detailed breakdown of the size of these SPGS plantations (Jacoveli, 2009).

**Table 6.4 Breakdown of SPGS planter during the first phase**

| Plantation size (ha) | No. of planters contracted | % of total (10,000 ha) |
|---|---|---|
| 25-99 | 70 | 29 |
| 100-199 | 24 | 28 |
| 200-500 | 12 | 43 |

Source: (Jacoveli, 2009)

The SPGS supported private-sector individuals, associations, and companies that planted a minimum of 25 ha. The grant was fixed at approximately USD 350/ha, a price that equalled 50% of the cost of establishing the plantation. The payment was made in three tranches spread across the two years after certain criteria were met. No upfront payments were accepted: farmers had to invest in plantation themselves and only upon successful fulfilment of the criteria did they receive the grant. In practice, this policy meant that the supported tree growers had to be wealthy to participate. All had at least 25 ha to plant and could finance its planting, at a cost of USD 700/ha, by themselves.

The second phase of the SPGS, which ran from 2009 to 2013, continued supporting tree planting in Uganda. Another 30,000 hectares were planted through the grant scheme and some 30,000 additional hectares were planted independently of it (TRANSTEC, 2014).

It is currently difficult to access information about the SPGS because its website (www.sawlog.ug) is unavailable, but personal communication with SPGS staff revealed that they are preparing for a third phase. The funding is to come from the European Union, but this time it will be channelled through the Food and Agriculture Organisation of the United Nations. Donor funding has ended for now, and the SPGS is currently not awarding grants to tree growers. The third phase of the SPGS is to support value addition, increase support to community forestry, and possibly develop commercial forestry for native species (EU, 2014).

The SPGS aims to achieve sustainability by, for example, decreasing the grant from 50% to 20% during the third phase, emphasising capacity-building, and supporting TGAs to take over its role (EU, 2014).

### 6.10.2 Komaza

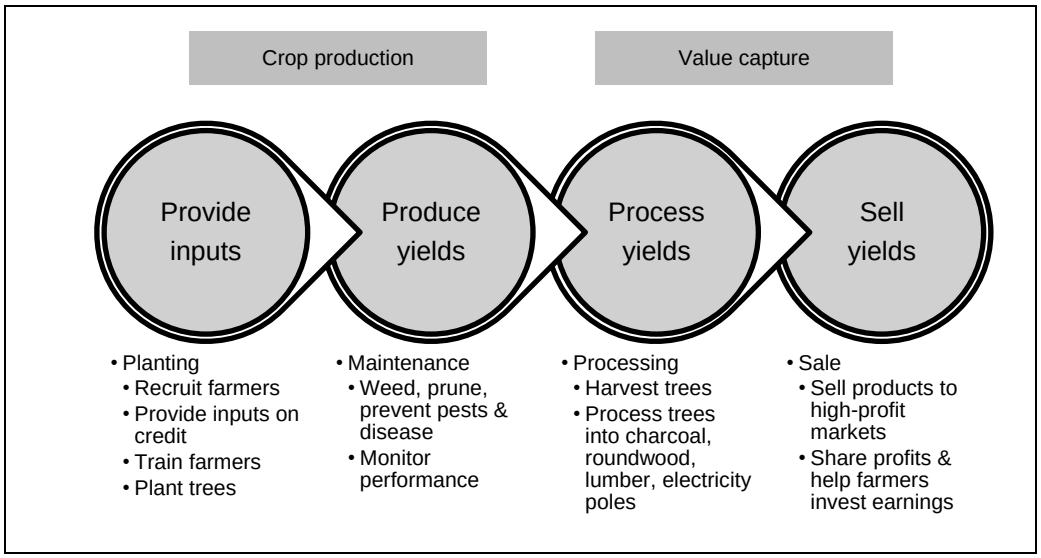
Another example of a support mechanism for forestry is the US-based social enterprise Komaza. Established in 2008, Komaza is currently operating in the poorest area of Kenya, that in the southeast. It calls its approach "microforestry," or a combination of microfinance and sustainable forestry.

Komaza provides farmers with support throughout the forestry value chain. The farmer package with Komaza consists of 1) training in the best forest management practices, 2) the best possible planting inputs, including *Eucalyptus grandis x camaldulensis* seedlings, seeds for short-term crops, water-retaining polymers, and fertilisers, 3) maintenance support throughout the rotation, 4) harvest and sales support, and 5) after-harvest support, including advise on spending strategies for the new income generated from harvested trees. Komaza's operating model is presented in Figure 6.2.

Besides producing end-products such as lumber and charcoal from fast-growing tree species, Komaza aims to tackle the multiple environmental challenges in semi-arid areas caused by deforestation, such as desertification.

Komaza provides a practical and scalable model for channelling funds from various social-impact investors to tree growers and simultaneously helping to find solutions to many economic, social and environmental challenges.

**Figure 6.2 Komaza's operating model**




Redrawn from (Komaza, 2016c)

Komaza organises itself into "rural cells" that have central offices as well as wood-processing facilities to improve efficiency and to ensure the profitability of the entire value chain. These geographically distinct cells are headed by field directors. Below the directors, field managers coordinate field officers, who in turn manage 5-15 village-based facilitators who themselves support 30-40 farmers in villages. (Komaza, 2016a)

## 6.11 Experiences from other sectors

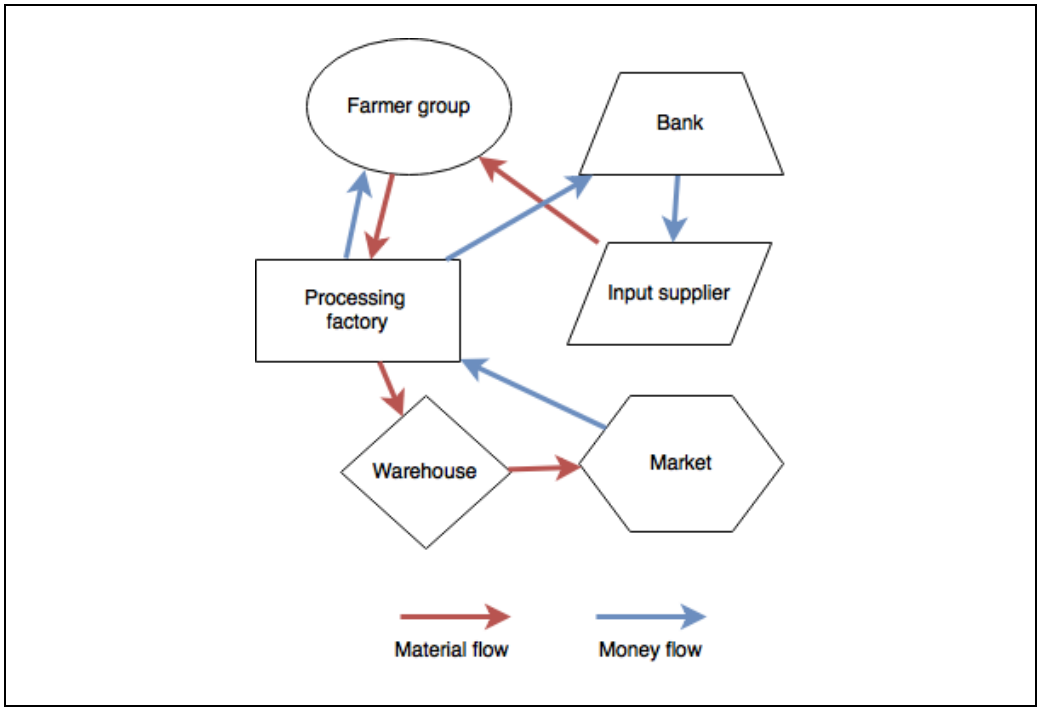
Most of the comparable financing examples from other sectors in Tanzania come from the agricultural sector. These examples have been already discussed in length in previous sections like 6.3.3. It is often simpler and more straightforward to finance agriculture than forestry. In addition, agriculture is also closer to being perceived as a business than forestry, which is still often regarded as something done to, for example, claim land.

The government of Tanzania has placed a strong emphasis on commercialising agriculture for the last 10 years. Most notably, the "kilimo kwanza," or "agriculture first" initiative was launched in 2009 to modernise and commercialise the agriculture sector. This initiative resulted in the creation of large-scale PPPs, such as the SAGCOT

(Section 6.2.3), as well as the establishment of the TABD (Section 6.5). It also includes significant inputs to the development of infrastructure, including improvements to railway, road, and air connections. (Massao, 2009)

Experiences in other sectors usually include the following elements: 1) grouping farmers, 2) securing high-quality inputs by channelling funds directly to suppliers, and 3) securing markets for crops through outgrower systems. Figure 6.3 below presents a common mode of operation, adopted, for example, by the TADB, for financing the cultivation of agricultural crops. First, a bank approves a loan to a farmer group to purchase high-quality inputs. It then transfers funds to the selected supplier, which in turn delivers inputs to farmers. Farmers then deliver their crops to a pre-selected processing factory and get paid their share. The processing factory then pays off the original loan used for the inputs on behalf of the farmer group. Since he TADB organises the network on behalf of farmers, its system is very easy for a farmer to operate in. In some cases, the TADB also connects processing factories with final markets. In these cases, it facilitates transactions between the final customer and the processing factory, often using a warehouse as a point of delivery.

**Figure 6.3 An example of a common network organised by a financing bank**




## 6.12 Key issues

- Only a few donors and social-impact investors provide support for private forestry besides the government of Finland, which does so through the PFP and DFID/Gatsby Foundation, which operates through the Forest Development Trust
- Interesting financing models such as Private Agricultural Sector Support (PASS) Trust are applied by other donors in agriculture and rural businesses.
- Donor and development bank financing is still needed to develop private forestry.
- It is unlikely that LMDA funds from government plantations can be used to support the establishment of private plantations.
- The existence of the TFF is important even though its activities are currently moderate.
- Commercial bank financing is limited and only viable for wood processing companies for short-term purposes.
- Development bank financing is in an early stage but nonetheless offers interesting possibilities for long-term financing

- DFIs can support only well-established companies or other commercial entities that fulfil their eligibility criteria.
- Financial investors will have a role only when there is a critical mass of well-established plantation companies and industrial infrastructure for wood processing.
- Social-impact investors have not so far considered forestry to be an interesting target.
- Multiple methods and tools exist for developing innovative financial instruments to cater to the needs of the forestry sector. These include developing business skills, connecting tree growers with companies to enable viable outgrower schemes, organising tree growers into groups, and developing instruments that include insurance and/or credit guarantees.

# 7. IDENTIFICATION OF FINANCING GAPS

## 7.1 Tree growers

Access to finance has been identified as one of the main barriers for plantation forestry development in Tanzania (Indufor, 2011a). Six underlying issues for this barrier have been analysed in previous reports and they include:

- Long-term nature of forestry
- Lack of collateral
- Capacity in the banking industry
- Size of loans
- Lack of access to information
- Efficacy of public sector credit guarantee programs. (Indufor, 2011a)

The above mentioned reasons for not accessing finance still prevail although some improvements have been made and initiatives such as the PFP include many of the above issues on their agendas.

During interviews, tree growers claimed that poor access to finance currently limited their ability to establish new tree plantations. They did not claim that limited access to finance limited their ability to tend their existing plantations or access markets though it is very likely that plantations would be tended more often and with better results if finance and/or external support were provided.

In trying to access finance from financial institutions, tree growers struggle with most of the issues listed above. First of all, the long-term nature of forestry means that a tree grower will not be able to service a loan with cash flow from his or her tree planting business unless he or she has another income source. If the tree grower is able to persuade a financing institution to finance his or her tree planting business, the second issue, that of sufficient collateral, arises. If the tree grower is negotiating with a commercial bank, he needs collateral worth 125% of the loan (GoT, 2008). Even microfinance institutions often demand 100% collateral. The collateral issue is complicated if land is used as collateral: commercial banks require official titles as proof of ownership though microfinance institutions may verify land ownership by, for example, communicating with village leaders.

At least in the Southern Highlands, capacity in the banking industry regarding forestry seems to be improving. All the interviewed representatives of financial institutions in the Southern Highlands were knowledgeable about and showed increasing interest in forestry. Most even had their own tree plantations and small sawmills. Forestry is starting to be considered as a viable business compared to agriculture and other businesses though suitable financial products with favourable conditions for private tree planting on bare land, like low interest rates and long payback periods, do not exist.

Information on credit guarantee schemes and other supporting programmes continues to be difficult to obtain. Few within the forestry sector know about the government's credit guarantee schemes. In general, access to public credit guarantee schemes has been very low for various reasons, including low capital in the scheme, slow processes, and high fees (TANEXA, 2010).

Tree growers would, in many cases, establish tree plantations regardless of whether or not they received external support or improved financial services. However, to accelerate the process of establishing tree plantations and guarantee the high-quality raw material needed for the sort of credible investment that can boost the economy in the area requires support to fill the gaps this study identified.

## 7.2 Forest industries

The scope of the study limits the forest industry as a borrower to micro, small, and medium enterprises. It is more or less expected that large companies are capable of looking for finance for themselves. In contrast, small industries desperately need external support to develop business plans, acquire information on new technologies, and connect with various financing sources.

All of the sawmillers reported that they had accessed local commercial banks for their activities. Credit was usually accessed to provide working capital to buy logs rather than investing in improved machinery. However, all of the sawmillers had visions of buying better machinery and thereby improving their recovery rates.

Most often the barrier preventing a sawmiller from accessing the finance he or she desired was that a business could not access a large enough loan. The two key reasons for not accessing a loan were 1) the person did not have collateral worth enough or 2) the person was unable to provide a credible business plan to support the loan application.

In addition, sawmillers often had unrealistic visions of the machinery they needed and inflated the costs to purchase it.

Naturally, forest industries include other actors along the value chain than sawmillers. However, there are no clear groups of businesspeople like sawmillers that have similar investment needs and barriers. Whether or not to support other businesses along the value chain, including those that utilise waste material produced by sawmillers, need to be determined case by case since no pre-formulated businesses were identified.

### 7.3 Financial sector

The consultant's original assumption that tree growers and the financial sector do not understand each other when it comes to financing activities does not hold. The financial sector in the Southern Highlands area is very well informed about developments in the forestry sector and most of them think forestry and forest industries are good business. However, banks do not currently offer suitable products for supporting the establishment of new tree plantations. In particular, the current high interest rates and short payback periods do not allow for the viable financing of slow-to-profit plantations through loans from commercial banks.

That said, practically all banks and other lending institutions accept tree plantations as collateral for loans, a fact which is positive signal for improving tree planters access to credit.

The study revealed that the main gaps in the financial sector are as follows:

- Long-term loans for tree planting or wood processing are not available to small-scale tree growers or SME processing companies.
- Large companies have difficulty getting financing for greenfield plantation establishment from any source whatsoever because the positive cash flows that can be used to service the debt are predicted only after a relatively long time – from 7 to 10 years.
- The financing sector does not consider forestry and forest industries to be a key economic sector in Tanzania.

### 7.4 Policy and institutional constraints

The forest policies and registration currently in force were formulated without the participation of the private sector, which is not well developed and has no legal organ to represent its interests. Although an association for key players has been discussed many times, action to develop a constitution for and register such an organisation has been very slow.

When issues affecting this sector arise, companies seek hearings with the government on an individual basis or through stakeholder forums organised by the government. This strategy has not proved effective.

Several associations representing small-scale sawmillers have been formed. They include the Northern Forest Industries Association (NOFIA) and the Sao Hill Forest Industries Association (SAFIA). These associations, along with an umbrella body, Tanzania Forest Industries Federation (SHIVIMITA), concentrate mainly on licensing and on the allocation of raw material to members. Large industries are not welcome to join as, in light of serious competition for a scarce resource, they are considered a threat to the wellbeing of small-scale sawmills.

Government policies are changing all the time, and these changes often have adverse implications for businesses. The policy regarding land ownership by foreign investors, for example, is being reformed to include a new requirement that the government hold 25% equity in foreign companies which own land. This new policy, which has not been well explained to stakeholders, is viewed as an attempt by the government to nationalise the assets of foreign investors and as contrary to the Tanzania Investment Council Act. The annual rent for land held on a leasehold basis has been reviewed and increased by 200% without any discussion with stakeholders. The private sector needs to be involved in shaping new policies and laws which affect their operations. The only way to do ensure their engagement is to form a strong forest industries association capable of voicing the interests of its members.

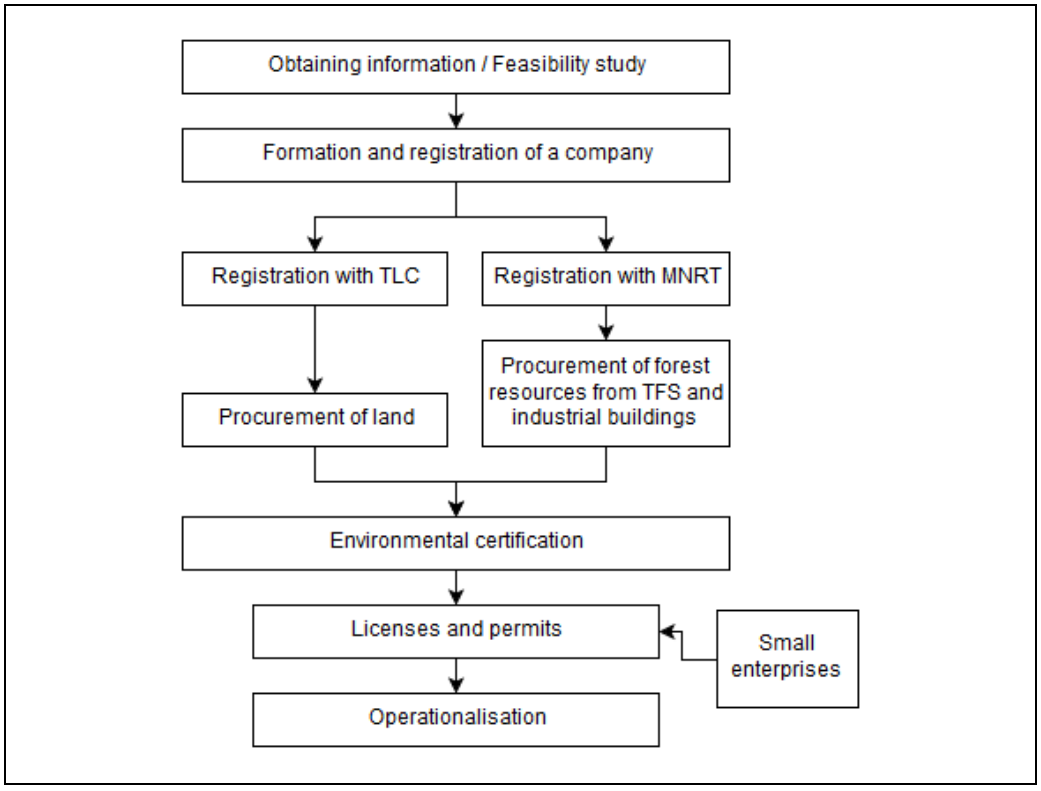
The Forestry Act of 2009 and the Forestry Policy identify the need to create a suitable environment for private sector investments in forestry. The Tanzania Investment Council offers incentives such as tax holidays and exemption from duties and value-added taxes for imported machinery and equipment. Despite the good intentions of this council, interviews with various actors indicated that the business climate for forestry sector investors was not satisfactory and needed improvement.

The key elements required to execute a business venture are listed below:

- Collecting information from the TIC and other government departments, banks, NGOs, and other sources and preparing a feasibility study.
- Forming and registering a company
- Registering a company with the relevant government bodies, including the TIC and the Ministry of Natural Resources and Tourism (MNRT)
- Procuring land and forestry concessions
- Obtaining business licences and permits
- Obtaining environmental certificates
- Operationalising the company

The Figure 7.1 illustrates the steps in operationalising a business.

**Figure 7.1 Depiction of a typical investment process in Tanzania**




The procedure for starting a new business in Tanzania is common to all sectors, including the forestry sector. Companies in the forestry sector face the same issues

related to the process of business registration as other businesses do. Some considerations and concerns are highlighted below.

- The process for registering property is common to all businesses.
- The process of getting electricity supplied to business premises is the same, as are the issues connected to the procedures for doing so.
- The process of acquiring land for forestry purposes is quite lengthy as no single tool adequately covers the procedure for acquiring land for the purpose of forestry.
- All afforestation projects, including the building of wood-processing facilities must undergo an environmental impact assessment, a process which takes about two months but can take longer if a project is large and/or complex.
- Wood-processing companies and individuals require licences to operate in governmental forest plantations. Applying for a forest licence can take up to five months.
- Because of the shortage of experienced professionals in forestry and especially wood processing, expatriates need to be employed to fill the gap and they require work permits.
- There is a shortage of extension services in forestry in Tanzania, so investors have to rely on consultancy services sourced from abroad. These are so expensive that only large investors can afford them.
- Government extension services have collapsed due to the lack of resources, leaving the small investors in forestry that depended heavily on this service bereft.

Tanzania, like many other African countries, faces major problems in forestry governance. Although laws and regulations are in place, their enforcement is inadequate due to the lack of resources and corruption. In fact, leakages in the system mean that the revenue collected from state forests is perhaps only 30% of the expected amount (Indufor, 2012). Forests also suffer from encroachment, theft of forest produce, and fires. The government's capacity to cope with these problems is lacking.

Proposals to allow more private sector participation in the management of state forests through long-term concessional arrangements have not been successful so far in Tanzania. Privatization of government assets is always politically sensitive topic. The arguments for privatization are government's management failure of the assets in sustainable and profitable terms as well as market efficiency. The arguments against privatization are related to potential loss of direct government revenues and reduction of employment among government employees.

### 7.5 Key issues

1. Tree growers are not able to increase their tree plantation areas as fast and as significantly as they want to for four main reasons:
    a. Financial products are unsuitable for tree growing due to their high interest rates and short payback periods.
    b. Access to land registration and titling is poor.
    c. Knowledge of existing support mechanisms is very limited.
    d. Access to high-quality forestry inputs is poor because they are either too expensive or not available.
2. Sawmillers are not able to secure large enough loans to invest in improved technology because they lack sufficient collateral and/or they are unable to prepare a credible business plan.
3. The investment needs estimated by sawmillers are higher than the actual cost of the technology they need to increase recovery rates.
4. Large companies have difficulty getting financing from any source to establish greenfield plantations because the positive cash flows that could be used to serve the debt are foreseen only after a relatively long term – from 7 to 10 years.
5. The financing sector does not consider forestry and forest industries to be a key economic sector in Tanzania.
6. The forestry and forest industry sector still face many institutional and policy constraints.

## 8. EXAMPLES OF FINANCIAL MODELS

The following financial models for tree plantations and sawmills are not real cases. The results provided should be considered as examples based on various assumptions made that may or may not hold in reality.

### 8.1 Tree plantation investment

#### 8.1.1 Yield models

The yield models for the financial calculations were obtained from the *South African Forestry Handbook* (Kassier & Kotze, 2000). The management regimes and assumptions included in the models used are presented below. More detailed information on the calculations done can be found from Annex 6.

a) *Pinus patula*
   - 1,111 trees per hectare planted
   - 85% survival at age 7
   - First thinning at age 8 to 500 trees per hectare
   - Second thinning at age 13 to 300 trees per hectare
   - Site index: height of trees at age 20 is 25 metres

b) *Eucalyptus grandis*
   - 1,111 trees per hectare planted
   - 85% survival at age 1
   - First thinning at age 1.5 to 650 tree per hectare
   - Second thinning at age 3 to 400 trees per hectare
   - Third thinning at age 4.5 to 250 trees per hectare
   - Site index: height of trees at age 20 is 40 metres

#### 8.1.2 Underlying assumptions

The financial models presented for tree growing include multiple underlying assumptions that should be considered. Some of these assumptions, such as the discounting rate and stumpage prices for logs and pulpwood are discussed below in Section 8.1.5, but the following point should also be already kept in mind:

- The models are for small-scale tree growers who, it is assumed, do not need to purchase any land.
- The tree grower takes care of the tree plantation by himself or herself. No costs normally incurred in industrial forestry (like company overheads and maintenance) are included. A daily wage rate of TZS 10,000 is included to compensate for the tree grower's loss of income from other activities or for him or her to hire his or her own daily labourers.
- The tree grower has access to high-quality inputs and pays only unit prices for inputs and transportation as he or she would if he or she was a member of an organised group of farmers. This assumption was adopted to simulate a situation in which a well-functioning TGA is present in a village.

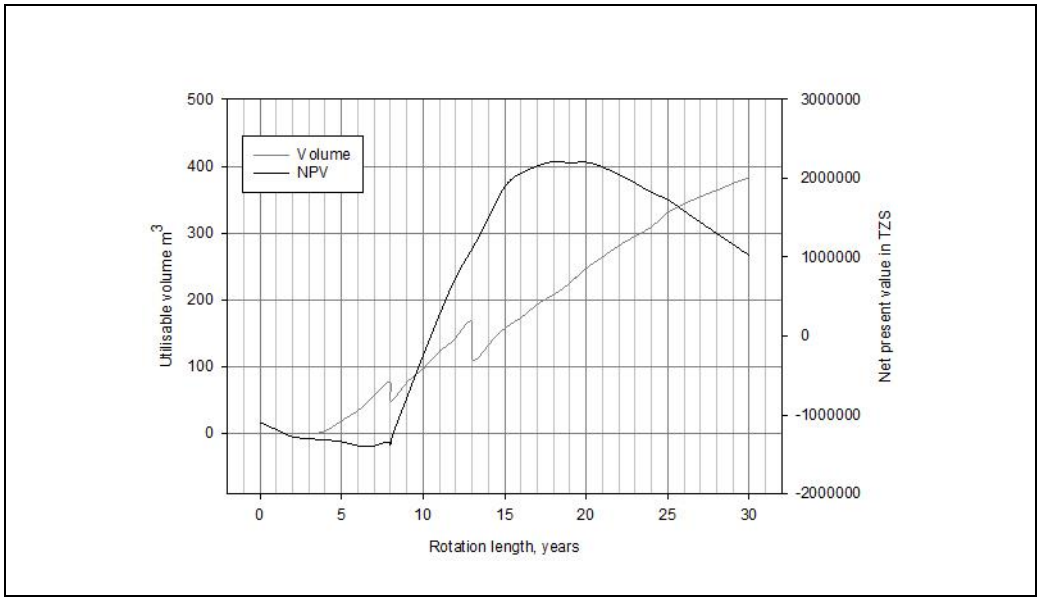
#### 8.1.3 Financial model for *Pinus patula*

The above growth model and the expert-estimated cost of establishing small-scale tree plantations in Tanzania suggest that the rotation period which maximises the net present value (NPV) during the growth of a tree plantation is 18 years. This rotation length results in an internal rate of return of 16.5% for *Pinus Patula*. Figure 8.1 presents the development of the volume and NPV per hectare of a Pinus patula plantation.

Other attributes of the financial model for pine were as follows

- A 10% real rate of return was used for discounting.
- The stumpage price used for saw logs was TZS 92,857 per $m^3$ (PFP, 2016).
- It was assumed that there was no market for pulpwood, or the price was TZS 0 per $m^3$.

**Figure 8.1 Net present value and volume of *Pinus patula* per hectare**



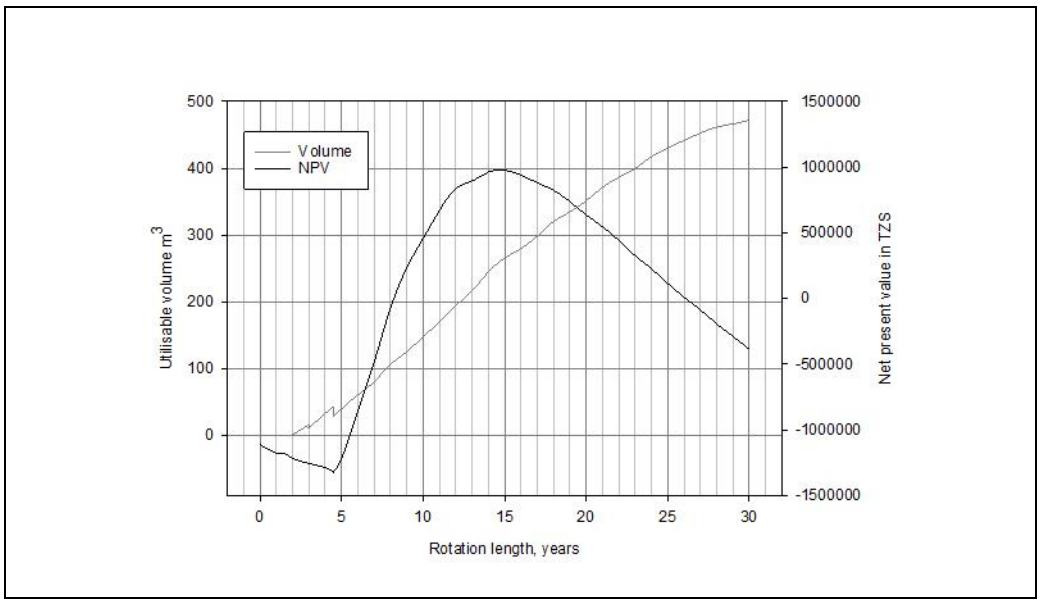

### 8.1.4 Financial model for *Eucalyptus grandis*

As was done for *Pinus Patula*, a financial model was developed for *Eucalyptus grandis* using the South African growth models described in Section 8.1.1. Expert estimates of the cost of establishing small-scale tree plantations in Tanzania suggest that the rotation length that maximises the NPV of the plantation is 15 years. This rotation length results in an internal rate of return of 14.1%. Figure 8.2 presents the development of the volume and NPV of one hectare of *Eucalyptus grandis* plantation.

Other attributes of the financial model for eucalyptus were as follows

- A 10% real rate of return was used for discounting.
- The stumpage price used for saw logs was TZS 45,000 per $m^3$ (PFP, 2016).
- It was assumed that there was no market for pulpwood, or the price was TZS 0 per $m^3$.

**Figure 8.2 Net present value and volume of *Eucalyptus grandis* per hectare**



### 8.1.5 Sensitivities of the plantation economic models

The above models are, of course, indicative in nature and based on various assumptions. Table 8.1,

Table 8.2 and Table 8.3 respectively show sensitivities with regard to discounting rate and log and pulpwood stumpage prices on the NPV-maximising rotation length and the NPV itself. The analysis holds all other things the same. With regards to the cost of plantation establishment, the calculations assume that there are no company overheads or fixed costs since the case is based on small-scale tree growers.

**Table 8.1 Sensitivity analysis of changing real discounting rate on optimum rotation length and NPV**

| *Pinus patula* | | | |
|---|---|---|---|
| Scenario | Real discounting rate | Rotation length (years) | NPV (in EUR) |
| -5% | 5% | 25 | 3,250.65 |
| Baseline | 10% | 18 | 921.34 |
| +5% | 15% | 16 | 156.28 |
| +10% | 20% | 15 | -174.03 |
| *Eucalyptus grandis* | | | |
| Scenario | Real discounting rate | Rotation length (years) | NPV (in EUR) |
| -5% | 5% | 21 | 1,575.65 |
| Baseline | 10% | 15 | 406.94 |
| +5% | 15% | 12 | -18.35 |
| +10% | 20% | 11 | -220.02 |

**Table 8.2 Sensitivity analysis of changing log stumpage price on optimum rotation length and NPV**

| *Pinus patula* | | | |
|---|---|---|---|
| Scenario | Sawlog price (EUR/m$^3$) | Rotation length (years) | NPV (in EUR) |
| -20% | 30.95 | 18 | 606.60 |
| -10% | 34.82 | 18 | 763.97 |
| Baseline | 38.69 | 18 | 921.34 |
| +10% | 42.56 | 18 | 1,078.71 |
| +20% | 46.43 | 18 | 1,236.09 |
| +30% | 50.30 | 18 | 1,393.46 |
| *Eucalyptus grandis* | | | |
| Scenario | Sawlog price (EUR/m$^3$) | Rotation length (years) | NPV (in EUR) |
| -20% | 15.00 | 15 | 203.24 |
| -10% | 16.88 | 15 | 305.09 |
| Baseline | 18.75 | 15 | 406.94 |
| +10% | 20.63 | 15 | 508.78 |
| +20% | 22.50 | 15 | 610.63 |
| +30% | 24.38 | 15 | 712.48 |

**Table 8.3 Sensitivity analysis of changing pulpwood stumpage price on optimum rotation length and NPV**

| *Pinus patula* | | | |
|---|---|---|---|
| Scenario | Pulpwood price (in EUR/m$^3$) | Rotation length (years) | NPV (in EUR) |
| Baseline | 0.00 | 18 | 921.34 |
| + | 4.17 | 18 | 1,029.83 |
| ++ | 12.50 | 18 | 1,246.80 |
| +++ | 20.83 | 17 | 1,471.94 |
| *Eucalyptus grandis* | | | |
| Scenario | Pulpwood price (in EUR/m$^3$) | Rotation length (years) | NPV (in EUR) |
| Baseline | 0.00 | 15 | 406.94 |
| + | 4.17 | 15 | 491.10 |
| ++ | 12.50 | 14 | 670.86 |
| +++ | 20.83 | 14 | 850.66 |

The above sensitivity analysis basically shows that changes in log prices have no effect on the NPV-maximising rotation length. However, introducing a price for pulpwood does shorten rotation length and improve the profitability of a plantation.

The above models assume that yields are high, like those of plantations managed by commercial companies and that all plantation management is done according to best practices. The costs the model uses are those that would be incurred by a small-scale tree grower with access to high-quality inputs purchased in bulk without company overheads. Such costs would be available if TGAs were able to procure high-quality inputs in bulk and distribute them to members sharing transport costs. The calculations do not include a purchase price for land as it is assumed that tree growers are local small-scale tree growers with enough land at their disposal to expand.

## 8.2 Sawmill investment

An existing sawmill's investing in a modern band saw unit as currently advocated by the PFP was used as the basis for the study's financial model. Table 8.4 below presents the characteristics of such an investment. The interest rates used are nominal and an inflation rate of 6.8% was assumed.

**Table 8.4 Characteristics of a representative sawmill investment**

| | | EUR | TZS |
|---|---|---|---|
| Initial investment | | | |
| | Machinery | 11,500 | 27,600,000 |
| | Buildings | 3,500 | 8,400,000 |
| | Other | 2,000 | 4,800,000 |
| Financing | | | |
| | Bank (70%), 18% p.a. for 3 years | 11,900 | 28,560,000 |
| | Own (30%) | 5,100 | 12,240,000 |
| | Capital for first logs, 5% per 3 months for 6 months | 38,047.50 | 91,314,000 |
| Costs | | | |
| | Log price / $m^3$ (year 0) at the mill gate | 61 | 146,357 |
| | Labour / year (year 0) | 12,600 | 30,240,000 |
| | Others / year (year 0) | 18,000 | 43,200,000 |
| Revenues | | | |
| | Sawn timber price / $m^3$ (year 0) ex works* | 208.33 | 500,000 |

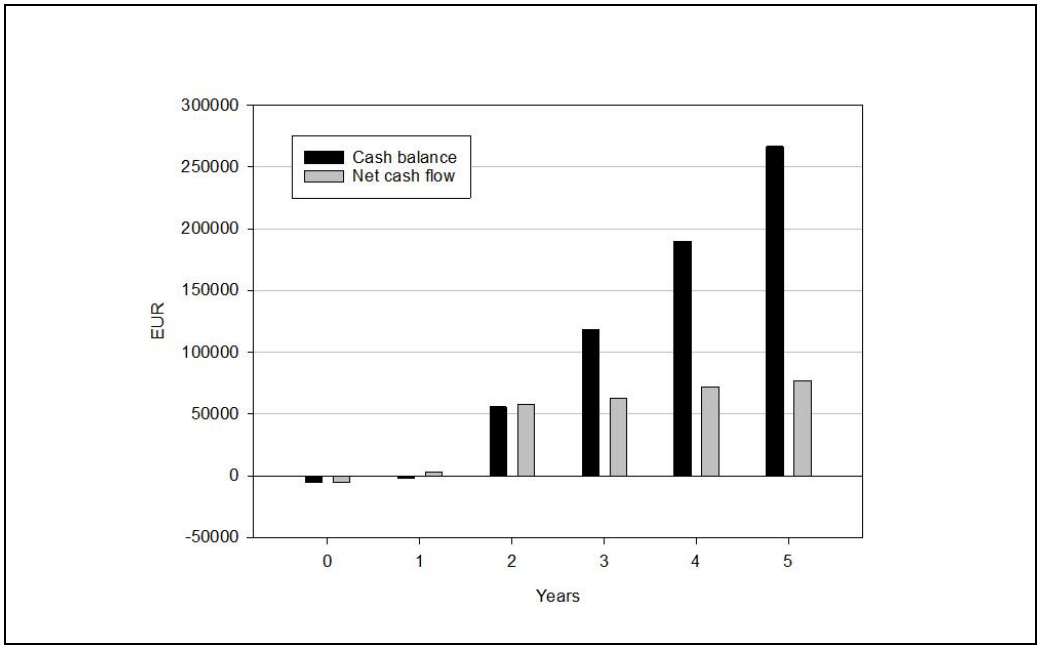
*Ex works – goods ready for pickup at sawmiller's place of business. Transportation costs and risks are assumed by the buyer.

The rate of recovery was assumed to be 55% and the input volume per year was set at 1,500 $m^3$. The investment was set at 10 years and it was assumed that the machinery had no residual value.

### 8.2.1 Cash flow projection

The cash flow projection of the investment shows how fast a project will be able to produce a positive cash flow and how well it will be able to service the loans it takes to start up. Considering the assumptions presented above, the following cash flow projection can be made (see Figure 8.3).

**Figure 8.3 Cash balance and net cash flow of the example sawmill during the first five years**




### 8.2.2 Profitability of a representative sawmill

As was done in the timber market study (Indufor, 2011b), the profitability of the sawmill was estimated per cubic meter of sawn timber produced. Table 8.5 below presents a calculation of the profitability of a representative sawmill.

**Table 8.5 Profitability of a representative sawmill**

| | EUR / $m^3$ of sawn timber | TZS / $m^3$ of sawn timber |
|---|---|---|
| Costs | | |
| Investment cost / $m^3$ of sawn timber | 2.06 | 4,945.45 |
| Log price / $m^3$ of sawn timber at the mill gate | 110.88 | 266,103.64 |
| Labour / $m^3$ of sawn timber | 15.27 | 36,654.55 |
| Others / $m^3$ of sawn timber | 21.82 | 52,363.64 |
| Production cost / $m^3$ of sawn timber | 150.03 | 360,067.27 |
| Revenues | | |
| Sales price (ex works) | 208.33 | 500,000.00 |
| Profit | 58.31 | 139,932.73 |
| Profit (%) | 28.0% | |

### 8.2.3 Net present value of the example sawmill

The sawmill investment is profitable indicated by a NPV of EUR 0.23 million at 15% discount rate during its 10 years of operation. These values are, of course, very sensitive with respect to, for example, the price of sawn timber and the recovery rate. These sensitivities are discussed briefly below.

### 8.2.4 Sensitivities of the sawmill model

At least two significant sources of sensitivities are assumed to be both likely and significant from the point of view of the profitability of an investment: the sale price of sawn timber and the recovery rate of the sawmill. For example, a significant 30% drop in the price of sawn timber would make an operation unprofitable. Similarly, dropping the recovery rate from 55% to 35% would result in a negative NPV.

**Table 8.6 Sawn timber price effect on NPV and profit %**

| | Sawn timber price, ex works*, (in EUR) | NPV (in EUR) | Profit (%) |
|---|---|---|---|
| +10% | 229.17 | 308,711.75 | 34.5% |
| +5% | 218.75 | 267,436.71 | 31.4% |
| Baseline | 208.33 | 226,174.88 | 28.0% |
| -10% | 187.50 | 143,651.20 | 20.0% |
| -20% | 166.67 | 61,140.73 | 10.0% |
| -30% | 145.83 | -21,409.35 | -2.9% |

**Table 8.7 Recovery rate effect on NPV and profit %**

| | Recovery rate (%) | NPV (in EUR) | Profit (%) |
|---|---|---|---|
| +5% | 60% | 301,181.99 | 34.0% |
| Baseline | 55% | 226,161.67 | 28.0% |
| -5% | 50% | 151,141.35 | 20.8% |
| -10% | 45% | 76,121.03 | 12.0% |
| -15% | 40% | 1,100.71 | 1.0% |
| -20% | 35% | -73,919.61 | -13.2% |

## 8.3 Key issues

- Tree planting is profitable when the investment considers various underlying conditions, including species suitable to climatic conditions, management, logistics, and markets. Operating at a small scale does not reduce profitability since private individual tree growers do not, it is assumed, have company overheads or other fixed costs.
- Wood processing is profitable when investments are made in new technologies that improve recovery rates. Scaling up is needed if wood-processing units are to be able to produce sufficient volumes and qualities to meet the demands of the market. Wood-processing industries should seek to be price setters rather than price takers.

# 9. POTENTIAL SOLUTIONS FOR FUTURE FINANCING

## 9.1 Companies

Well-established large companies can play a fundamental role in financing their supply chains. The most realistic way to expand sources of wood and fibre is either to establish long-term contractual relations with third-party tree growers or initiate outgrower schemes like those of KVTC and New Forests Company.

Companies can be involved in financing in other ways, too, for example, financing the purchase of machinery and equipment.

## 9.2 Tanzanian finance sector

The Tanzanian finance sector as a whole needs to be made more aware of the possibilities in the forestry sector. Commercial banks probably have limited capacity to develop more favourable instruments for tree growers and wood processors, but they should consider those business plans of the wood processing companies that aim to scale up the business and improve technologies and recovery rates. Financing should be shifted from the financing of operations to the financing of investments in new technologies and expansion.

Tanzanian development bank should consider forestry to be a viable economic sector to develop by providing long-term favourable loan, but currently, at least in the TADB's portfolio, this sector is marginalised.

Credit guarantee schemes such as the PASS are viable options for complementing collateral for SME investments. Increasing knowledge about this option among wood value-chain entrepreneurs would likely see an increase in the use of the PASS trust within the forestry sector.

## 9.3 DFIs

DFI's are already looking into options for financing the forest and forest industry sector. The key obstacle is to identify companies and commercial organisations with interesting investment projects that fulfil DFIs' criteria.

DFIs might be able to finance TGAs as well as companies if TGAs develop the required capacities (see Section 9.6).

## 9.4 Social impact investors

The universe of social-impact investors is expanding and soon there will be more opportunities to involve them in the forestry sector.

Innovative models to develop private tree planting such as the TGIS of the PFP, the Forestry Development Trust, and Komaza path the way for social impact investors that are looking for opportunities in Tanzania to enter the sector.

TGAs are also an interesting channel for channelling finance to tree growers (see Section 9.6).

## 9.5 Government and donor community

The government and donor community will still have a fundamental role in developing infrastructure, providing information services, facilitating business processes, and providing extension services.

If the TGIS is well developed and results are well documented and reliable, the TGIS, which is currently fully financed by the PFP, could eventually be transformed into a vehicle through which by the donor community could finance private forestry.

Climate financing could ultimately be channelled through initiatives such as the FIP and the FCPF if they were to increase their focus on the private sector. Climate financing in Tanzania is supported by the government of Norway, but the latest findings point out that Tanzania is not REDD+ ready.

The government and donors could facilitate the involvement of DFIs in greenfield forestry investments.

### 9.6 TGAs and the TGA Apex Body

TGAs and their national-level apex body, all of which are supported by the PFP, are opportunities for organising sustainable financing for forestry in Tanzania.

Currently, the TGA Apex Body consists of a committee comprising members elected from member TGAs as well as a committee-elected chairperson, secretary, and treasurer. None of these positions is salaried but the PFP pays the salaries of a service manager and a forest information specialist. All of these positions are meant to be permanent and sustainable by the time the PFP phases out at the end of 2017). Unless the TGA Apex Body has an additional viable income stream, all of the membership fees it currently collects would have to be used to pay the moderate salaries of the two paid staff.

TGAs need to be able to provide their members with meaningful services and value for their membership fees. Eventually, the most significant source of income source is expected to come from log sales, and TGAs should show their value by being able to negotiate higher prices than an individual grower could. Other sources of income may include organising bulk purchases of inputs and delivering them to members, running nurseries, and providing advisory services. Since banks and other financiers prefer to work with groups than with individual growers, TGAs could play a central role in facilitating loans and insurance for their members if appropriate products are developed.

Even if just one moderately paid professional staff member were retained after the PFP came to an end, the total running costs of the TGA Apex Body would be approximately EUR 31,800[1] per year and procurements would total EUR 800[2] every three years. For comparison, the TGA membership fees estimated within the TGA network currently total some EUR 20,000. If no changes are made, the TGA Apex Body will not be ready to meet these expenses.

Individual TGAs currently finance their operations on their own, without continuous direct support from donors. However, they do get support from the TGA Apex Body, which is itself propped up by the PFP. This mechanism could lead, in the worst case scenario, to individual TGAs becoming dependent on a body which could itself collapse with the end of the PFP.

From the point of view of financial sustainability, the consultant recommends that the TGA Apex Body be a lobbying institution run elected representatives without the help of paid staff. The TGA Apex Body will grow stronger as individual TGAs become stronger. This sort of organic growth of the TGA network is more likely to lead to the establishment of sustainable institutions within the network than is hiring professionals. Instead of intensifying support for the TGA Apex Body, the PFP should identify and support strong TGAs that were not established just to channel PFP support to tree growers and that have future prospects. Such an approach through organic growth would develop strong tree grower groups that DFIs and other financial institutions would be willing to work with.

### 9.7 Tree Growing Incentive Scheme

The TGIS is the main tool through which the PFP channels support to its beneficiaries. As discussed in Section 1.2, the PFP currently supports tree growers by giving in-kind support totalling to some 40% of the total cost of establishing a tree plantation. The direct cost of support per hectare is about EUR 132 for pine and EUR 322 for eucalyptus trees. These costs are incurred only in the year of plantation; no support is provided for later maintenance and no extension or supervision is included. Table 9.1 presents

[1] Office rent: EUR 300/month, professional staff – EUR 2,000/month, travel – EUR 200/month, overheads (incl. airtime, internet) – EUR 150/month.

[2] Computer – EUR 700/staff member and phone – EUR 100/staff member

estimates of the costs of running the TGIS both with 40% and 20% subsidisation after the PFP has phased out.

**Table 9.1 Estimates of the cost of running costs TGIS after the PFP has phased out with the current subsidy of 40% and a reduced subsidy of 20%**

| | | | TGIS 40% | | TGIS 20% | |
|---|---|---|---|---|---|---|
| Grant disbursements | | | | | | |
| | Share | Hectares* | EUR/ha | Total (in EUR) | EUR/ha | Total (in EUR) |
| Pine | 60% | 1,800 | 132 | 236,880 | 66 | 118,440 |
| Eucalyptus | 40% | 1,200 | 318 | 382,080 | 159 | 191,040 |
| Overheads | | | | | | |
| Extension** | | | | 120,000 | | 120,000 |
| Management | | | | 60,000 | | 60,000 |
| Overheads*** | | | | 50,000 | | 50,000 |
| Total cost | | | | 848,960 | | 539,480 |
| Total cost per hectare | | | | 282.99 | | 179.83 |

*A total of 3,000 ha was planted annually with 60% pine and 40% eucalyptus.
**Extension costs EUR 40 per ha given that an extension worker works for 12 months, earns EUR 1,000 per month, and oversees 300 ha of plantations
***Overheads include office costs, motorbikes for 10 extension workers, and one car with five-year depreciation.

The TGIS currently relies on close monitoring and the field presence of the PFP to run. With a subsidy of 40%, some 30% of the total cost comprises staff and overheads; decreasing support to 20% increase that percentage to 40% mainly because the decrease in support does not correspondingly decrease the need for technical assistance, supervision, and checking of plantation-establishment milestones.

In order for another donor, a DFI, or a social-impact investor to be able to channel tree planting support through the TGIS system, the TGIS system needs to be modified and streamlined. It currently relies on unsustainable levels of international technical assistance and needs a large, and therefore costly, team of extension workers.

Since the current TGIS system is similar to the sustainable model of Komaza (see Section 6.10.2), it ought to draw upon lessons learned from that model when establishing its own sustainable modifications. It must, in particular, design operations so that ad hoc implementation is minimised, standard practises are clear and available, and extension work is organised as efficiently as possible.

## 10. RECOMMENDATIONS

This section presents the consultant's evidence-based recommendations, both general recommendations and those that are specific to the PFP.

### 10.1 General

**1. Raise awareness about potential financing opportunities among tree growers and SMEs**

Tree growers and SMEs need to be made more aware about potential financing opportunities, particularly about those less known, like various credit guarantee and outgrower schemes.

**2. Improve the capacities of tree growers and companies related to their eligibility to receive financing**

Tree growers and companies need to build up their capacity to receive financing by learning to develop business plans, carry out transparent accounting and reporting, ensure compatibility with ESG criteria, and demonstrate management skills and a business concept.

**3. Raise awareness among local financing institutions about the forestry business**

Local banks in the Southern Highlands are aware of that tree planting is a viable investment but this awareness needs to be broadened. The Tanzanian finance sector as a whole should recognise that forestry and forest industries are, like agro industries and mining, a key economic growth sectors.

**4. Shift the focus of donor communities to private forestry as part of climate change mitigation and adaptation actions**

The donor community, together with the government, focuses heavily on climate change mitigation and adaptation-related financing. Already programmes such as the FIP and the FPCF have significant financing commitments. There is a need for lobbying and evidence-based advocacy to include private forestry, especially smallholder plantation development, in such financing.

### 10.2 Targeted to the PFP

**1. Build the capacity of tree growers to receive financing**

The participation of individual tree growers in TGAs should be increased and they should improve their capacities in business planning, management skills, accounting, and reporting. They also need to be made more aware about potential financing opportunities

**2. Build the capacity of SMEs to receive financing**

SMEs' capacity to receive financing should be increased by improving their entrepreneurial skills and knowledge about business planning and financial and ESG reporting.

**3. Build the capacity of TGA and the apex body to receive financing**

The capacities of TGAs need to be increased so they can serve as commercial organisations capable of receiving financing. The most realistic way to improve farmers' eligibility to receive sustainable financing is getting them to join organised cooperatives, farmers' groups or social organisations like TGAs and developing the knowledge and

skills of these groups in business planning, management, accounting, and financial reporting.

**4. Raise awareness about the forestry and forest industry sector in the Tanzanian financing sector**

Members of the Tanzanian financing sector need to be made more aware of the forestry and forest industry sector among by establishing a dialogue with the stakeholders through workshops, training events, and web-based communication.

**5. Introduce the TGIS to the donor community and social-impact investors**

The TGIS must be introduced to the donor community and social-impact investors. This scheme can have a more sustainable future and can be developed into an effective instrument to promote private tree growing in Tanzania at a large scale if partners other than the government of Finland share financing The TGIS

**6. Provide information to key stakeholders**

Key stakeholders in private forestry and possible investors need more information about the extent and nature of plantation resources, the profitability of tree growing, benchmark costs of wood processing, and market prices of wood products.

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## Annex 1 Brief of selected relevant studies

### Private financing for sustainable forest management and forest products in developing countries—Trends and drivers (2014)

Tuukka Castrén, Marko Katila, Karoliina Lindroos and Jyrki Salmi, Program on Forests (PROFOR)

The study looks into private forest financing flows in tropical and other developing countries. The objectives are to improve understanding of the flows, provide a snapshot of the flows, understand the challenges related to forest financing, and finally, provide a way forward. The study found that there is no systematically collected data in global or regional databases on direct investment on forests. The barriers identified were: 1) high real and perceived risks in developing countries, 2) weak availability of loans and equity, 3) unfavourable terms for forestry and 4) high up-front costs of forestry projects due to lack of information. In relation to African countries, the study also notes that "Inadequate infrastructure and bureaucracy, corruption, and weak access to financing are the main barriers to private sector investment in many African countries". The study also includes an appendix with a case example of Tanzania: Enabling Policies and Incentives Accelerate Tree Growing in Tanzania.

### Business climate for forest investments: A survey (2014)

Tuukka Castrén, Marko Katila and Petri Lehtonen

The study discusses various tools available for evaluating investment and business climate in relation to forest investments and assesses the need for developing a new tool for this purpose. The tools discussed include Doing Business Indicators, Global Competitiveness Index, and Worldwide Governance Indicators. Doing Business Indicators were reported of being the best known of the discussed tools. The study concludes that there in fact is demand for a tool for evaluating investment and business climate for forestry, but the cost of properly developing such a tool with hosting would be high. A feasible option, however, consists of awareness raising and improved access to existing tools available.

### Financing for sustainable forest management in Tanzania: Country case study (2012)

Amina Akida, Isaya Mnangwone and Leonard Lyimo. Indufor Oy

The study discusses the issue of financing for sustainable forest management with an emphasis on public financing including government and donors. It highlights the need for private financing in the forest sector, but provides little solutions from that point of view. The study finds establishment of TFS and TFF as significant developments while it also sees donor support to them important. The study recommends 1) improving of revenue generation from forestry, 2) increasing stakeholder participation in forest development, 3) improving institutional and legal frameworks, 4) making use of global forest-related initiatives such as REDD+, and 5) acknowledging and addressing cross-sectoral collaboration with stakeholders and ministries, departments and agencies.

### Timber market dynamics in Tanzania and in key export markets (2011)

Private Forestry and Carbon Trading Project, Indufor Oy

One of the main findings of the study is the forecasted collapse of government plantation wood supply and continuing increase in domestic demand. Furthermore, the study forecasts the rise wood supply from private plantations in the country. The study also includes a brief value chain analysis of sawn timber as well as profitability calculations for a "dingdong" and Kara/Laimet –type sawmills in Tanzania. The study recommends for example to implement a grant scheme for planting as soon as possible, to gradually move away from the government allocation system for logs, to develop a market information system and introduce a grading system, and move away from using logs in pulp mills.

**A Feasibility Study on Establishing a Subsidy Scheme for Commercial Plantation Forestry in Tanzania (2011)**

Private Forestry and Carbon Trading Project, Indufor Oy

The study is behind the current incentive scheme (TGIS) implemented by PFP. The study discusses cost estimations of subsidy schemes, effects of the proposed subsidy scheme on tree planting profitability and barrier of entry with regards to development of tree plantations in Tanzania. The study identified nine barriers: 1) Access to finance, 2) Fire hazard, 3) Machinery, equipment and tools, 4) Availability of quality seed, 5) Long-term nature of forestry, 6) Availability/Access to market information, 7) Lack of technical expertise, 8) Inadequate infrastructure and 9) Land tenure laws. Finally, the study recommends that a semi-autonomous, performance-based, inclusive subsidy scheme following international best practises would be established.

## Annex 2 List of stakeholders identified

| | |
|---|---|
| Small-scale tree growers | |
| | Tree growers who have accessed loans |
| | Tree growers who have not accessed loans |
| Large-scale tree growers | |
| | Private individuals |
| | Large companies |
| Small and medium forest industries | |
| | Sawmills and other companies around Mafinga area |
| Large forest industries | |
| | Mufindi Paper Mills |
| | New Forests Company |
| | Green Resources Limited |
| | Kilombero Valley Teak Company |
| | Tanganyika Wattle Company |
| Commercial banks | |
| | CRDB Bank Ltd |
| | National Microfinance Bank (NMB) |
| | Tanzania Postal Bank (TPB) |
| | National Bank of Commerce (1997) Ltd (NBC-1997) |
| | Tanzania Investment Bank (TIB) |
| | AKIBA |
| Microfinance institutions | |
| | FINCA |
| | PRIDE |
| | SACCO |
| | NJOCOBA (Njombe Community Bank) |
| | MUCOBA (Mufindi Community Bank) |
| Associations | |
| | Tree Growers' Associations |
| | Tree Growers' Associations Apex Body |
| | SHIVIMITA |
| | SAFIA |
| | NOFIA |
| | Small Industries Development Organisation (SIDO) |
| | Tanzania Private Sector Foundation (TPSF) |
| Donors and other possible funding sources | |
| | Embassy of Finland |
| | Royal Norwegian Embassy |
| | African Development Bank |
| | Embassy of Germany |
| | Swiss Agency for Development and Cooperation (SDC) |
| | Forestry Development Trust (Gatsby/DFID) |
| | World Bank |
| | Gatsby |
| | DFID |
| | Tanzania Forest Fund (TaFF) |
| | Clinton Foundation |
| | Mufindi Environmental Trust |
| | One Acre Farms |
| | Cheetah Development |
| | Iringa Rural Development Initiative |

## Annex 3 List of stakeholders consulted

| Name | Title | Organisation | Individually interviewed | Workshop participant |
|---|---|---|---|---|
| Abdalla Said Shah | Climate Change Advisor | DFID Tanzania | x | |
| Amadeus A Tango | Chief underwriter | Outassurance brokers (T) Ltd | x | |
| Amdrea Joeph Mwufote, | Tree grower | Madope village | x | |
| Andries Smith | Senior Invetment Offices | International Finance Corporation (IFC) | x | |
| Antery Kiwale | | Tanganyika Wattle Company | | x |
| Badwin Thonya | Tree grower | Madope village | x | |
| Beatrice Daudi Mkongwa | Tree grower | Kifanya village | x | |
| Ben Sulus | President | SHIVIMITA | x | x |
| Berit k. Tvete | Counsellor Environment & Climate | Royal Norwegian Embassy | x | |
| Bosco Simon Kahwili | Tree grower | Kifanya village | x | |
| Carol I. Nyangaro | Research Analyst | NMB Bank – Head office | x | |
| Chris Pienaar | Chief Executive Officer | New Forests Company | x | |
| Christopher J. Mazali | Senior Associate | ACRE Africa | x | |
| Danford E. Mfikwa | Operations manager | NJOCOBA | x | x |
| Daniel Mira Salama | Senior Environmental specialist | World Bank | x | |
| Davis Osborne | Director | CDC Group | x | |
| Deusdedit Bwoyo | | MNRT | x | |
| Doris Titus Lukinja | Tree grower | Kifanya village | x | |
| Edgar Masunga | Forest Plantation officer | Tanzania Forest Services Agency | x | |
| Faida Mgallawa Haule | Sawmiller | Mafinga village - SAFIA | x | |
| Faustine Kisinza | Sawmiller | Mafinga village - SAFIA | x | |
| Flaviana Mtega | Tree grower | Madope village | x | |
| Flora Mtwewe | Tree grower | Madope village | x | |
| Frank Karonge | Chairman | NOFIA | | x |
| Freddy Kisinini | Manager | FINCA Iringa | x | |
| Gaudence Mpete | Tree grower | Itambo village | x | |
| Geofrey Mtawa | | Tanzania Agricultural Development Bank | x | |
| George Kahwili | Tree grower | Kifanya village | x | |
| Gerhard Engel | Senior Investment Offices | FMO | x | |
| Godfrey Mtwewe | Tree grower | Madope village | x | |
| Godifrey Mosha | Director | Mufindi Wood Plantation & Industry Ltd | | x |
| Gregory Chogo | | Mufindi Paper Mills | | x |
| Hanna Skelly | Director | Finnfund | x | |
| Henry J. Lukaminga | Sawmiller | Mafinga village - SAFIA | x | x |
| Ilkka Norjamaki | Senior Invetment Officer | Finnfund | x | |
| Isaack L. Kamizora, | Sawmiller | Mafinga village - SAFIA | x | |
| John Power | Managing Director | Clinton Foundation | x | |

| Name | Title | Organisation | Individually interviewed | Workshop participant |
|---|---|---|---|---|
| Jordan Paul Mchami | Tree grower | Kifanya village | x | |
| Josephat Kingililwe | Sawmiller | Mafinga village - SAFIA | x | |
| Kastor Mgaya | Tree grower | Madope village | x | |
| Kyösti Pietola | Senior Adviser | EIB | x | |
| Laban S. Mgimba | Secretary | TGA Apex body | x | x |
| Laurent Mfugale | Chairman | TGA Apex body | x | x |
| Mads Asprem | Managing Director | Green Resources | x | |
| Magreth Alfonce Nyadzi | Tree grower | Kifanya village | x | |
| Makupa | | | | x |
| Malika Kisakali | Tree grower | Itambo village | x | |
| Mikko Leppänen | Counsellor | Finnish Embassy, Dar es Salaam | x | |
| Moses Mwankenja | | NJOCOBA | x | x |
| Msafiri Mhina | Manager Business | CRDB Bank | x | x |
| Nicomed Bohay | Managing Director | PASS | x | |
| Nike Njoro Mremi | Sawmiller | Mafinga village - SAFIA | x | |
| Ole Sand | | GEF | | |
| Oliper Kinyamarutha | Accountant | SACCO Lupembe | x | |
| Ovin Innocent Mng'ong'o | Tree grower | Kifanya village | x | |
| Patricia Manonga | | Tanzania Forest Fund | | x |
| Philip Mabena | Tree grower | Itambo village | x | |
| Pricilla Karobia | Managing Director | Outassurance brokers (T) Ltd | x | |
| Prosper Wilbright | | Green Resources Limited | | x |
| Renatus D. Mushi | Head - Agribusiness | NMB Bank – Head office | x | |
| Richard Fusi/Seliatou | | African Development Bank (AfDB) | x | |
| Richard Nguhula | Tree grower | Itambo village | x | |
| Rogers Sabugo | | Clinton Foundation | | x |
| Samson Mabene | Tree grower | Itambo village | x | |
| Samweli Kilua | Programme officer | DANIDA | x | |
| Seliatou Kayode-Anglade | | African Development Bank (AfDB) | x | |
| Soren Dalsgaard | Consultant | Royal Norwegian Embassy | x | |
| Sumka A Mbuba | Branch Manager | NMB Bank Iringa | x | |
| Tevis Howard | | Komaza | | |
| Valentina Aloyce Msigwa | Tree grower | Kifanya village | x | |
| Vitalis Najhina Kitomo | Accountant | SACCO Lupembe | x | |
| Wilbert Mbilinyi | Tree grower | Madope village | x | |
| William Mgowole | Sawmiller | Mafinga village - SAFIA | x | x |
| Yohana Mwamkili | | MUCOBA | x | x |
| Yuda Mkollo | | Forestry Development Trust | | x |
| Zacharia Lupala | Manager | TGA Apex body | x | x |

## Annex 4 Terms of Reference

### Background

Private Forestry Programme (PFP) increases rural income in nine districts in the southern highlands and Kilombero Valley of Tanzania. Tanzanian plantation forestry, which encompasses company owned industrial plantations, government plantations and a rapidly expanding network of smallholder woodlots, is a major but inadequately understood contributor to the economy. The programme reduces poverty by developing science-based plantation forestry and adding value to the entire forest product value chain, from quality tree seeds to quality wood products sold to end-users. The programme supports participatory land use planning; organises tree growers into networked tree growers' associations (TGAs); develops the capacities of tree growers and wood processors; supports quality timber plantation establishment; strengthens plantation management; strengthens extension and business services; establishes an accessible forest information system and plantation market information system, and improves the performance of wood processing industries. Recognising the significance of its policy, legal, regulatory, and governance environment, the programme elucidates and analyses these issues, and where strictly necessary, it prepares evidence-based recommendations for consideration by specially convened multi stakeholder forums.

PFP, which is a sixteen-year programme, is currently approaching the halfway mark in the first of its four-year phases. The programme is well established in the southern highlands facilitating village land use planning, and supporting quality smallholder plantation establishment; both directly through its tree grower incentive scheme, and indirectly through supporting companies to expand their outgrower schemes. The programme is strengthening tree grower associations, and developing vocational courses in plantation forestry and wood processing.

In compliance with its approved annual work plan, PFP is seeking specialist short-term consultancy support to assess the present forest and wood industry financing, and to provide well-researched, costed, actionable, and justified recommendations for improving sector financing.

### Summary of the Proposed Consultancy Work and Outputs

PFP seeks to recruit a short-term consultant to evaluate both national and international mechanisms for long term private forestry and wood industry financing in the context of what would work best in the southern highlands of Tanzania. The consultants are required to recommend and justify long term private forestry and wood industry financing mechanisms that would be sufficient to meet the prerequisites of large scale investors, whilst also motivating thousands of small scale investors.

### Specific Requirements of the Proposed Consultant Work

### Reporting

The consultant will agree on a final documented mission work plan with the PFP Team Leader prior to the first field mission. PFP will then support the consultant to the maximum extent possible

The consultant will prepare a comprehensive draft report, have it cleared by the PFP and then present it at a specially convened validation workshop within ten weeks of commencement. The consultant will then prepare the final report and present it to a specially convened multi stakeholder forum composed of key actors and authorities in the sector, within twelve weeks from arrival.

### Research

The consultant will:

a) Assess private forestry and wood industry need for finance, knowledge of funding sources, and barriers in getting finance.
b) Assess experiences from financing mechanisms for similar sectors such as agriculture and other rural small-and-medium size businesses.

c) Identify any policy and institutional constraints causing poor participation of the private sector in sectoral investment.
d) Identify gaps in financing opportunities by major stakeholders due to lack of skills, technical capacity, knowledge, awareness or attitudes towards private forestry wood processing
e) Prioritise areas where PFP and other actors in the sectors can best engage; through policy, legislation, and regulatory lobbying; technology transfer; and business incubation, amongst others, to enhance investments in private forestry and wood processing.

**Timeframe**

The consultancy is to be completed within a three month period between 1 March and 30 June 2016.

**Consultant requirements**

The consultancy requires high-level commercial forestry sector expertise with proven knowledge of forest and wood industry financing in emerging economies (2 consultant months). In addition the senior expert will be supported by a junior expert for field work as shown below, and both consultants will be supported and guided by the Private Forestry Programme.

| | Field | Desk | Total |
|---|---|---|---|
| Senior expert | 10 | 20 | 30 |
| Junior expert | 33 | | 33 |
| Total, days | 43 | 20 | 63 |

**Preliminary work plan**

Prior to the field mission the senior expert will do preliminary work and draft a report on similar experiences elsewhere as well as list potential investors and lenders. With senior expert instructions the junior expert will identify the key local stakeholders and carry on with preliminary meetings. After the preparatory work the senior expert will carry out the field mission in April with relevant meetings. Before departing from Tanzania the senior expert will present the report for validation to a national policy maker level workshop that will be specially convened for this purpose.

## Annex 5 Preliminary work plan

| | February | | | | March | | | | April | | | | Responsibility |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| Work Plan / Mobilization | | | | | | | | | | | | | PL/MH/AS |
| Skype call | | | | | | | | | | | | | PL/AS |
| Compilation of background documents in Tanzania on forestry financing | | | | | | | | | | | | | AS |
| Compilation of experiences elsewhere / other sectors | | | | | | | | | | | | | PL |
| Categorization of recipients: farmers, wood processing companies and other market participants | | | | | | | | | | | | | AS |
| Identification of sources of finance | | | | | | | | | | | | | AS |
| Listing contacts for interviews in Tanzania | | | | | | | | | | | | | AS |
| Skype calls | | | | | | | | | | | | | PL/AS |
| Meeting with Embassy & Ministries in DAR | | | | | | | | | | | | | PL |
| Interviews in DAR | | | | | | | | | | | | | PL |
| Interviews in field (Iringa) | | | | | | | | | | | | | PL/AS |
| Interview / contacts else where (Companies, Funds, DFIs, others) | | | | | | | | | | | | | PL/AS |
| Analysis | | | | | | | | | | | | | PL/AS |
| Wrap-up meeting on findings | | | | | | | | | | | | | MH/PL/AS |
| Assessment/analysis/report writing | | | | | | | | | | | | | PL/AS |
| Skype calls | | | | | | | | | | | | | PL/AS |
| Draft reporting | | | | | | | | | | | | | PL/AS |
| Feedback | | | | | | | | | | | | | MH |
| Final report | | | | | | | | | | | | | PL |

| | |
|---|---|
| Petri Lehtonen | PL |
| Asko Siintola | AS |
| Michael Hawkes | MH |

| | |
|---|---|
| Desk work in Helsinki | |
| Desk work in Tanzania | |
| Tanzania – field/DAR | |
| Milestones | |

## Annex 6 Plantation establishment investment calculation tables

Net present value calculation tables for *Pinus patula* with 10% real discounting rate and TZS 92,957 stumpage price for logs with no market price for pulpwood.

| | Utilisable volume, $m^3$ | | Thinning volume, $m^3$ | | | | |
|---|---|---|---|---|---|---|---|
| Year | More than 8 cm | More than 18 cm | More than 8 cm | More than 18 cm | Revenues, TZS | Costs, TZS | NPV if harvest at time T, TZS (cumulative) |
| 0 | 0 | 0 | | | 0.00 | 1,096,200.00 | -1,096,200.00 |
| 1 | 0.0 | 0.0 | | | 0.00 | 100,000.00 | -1,187,109.09 |
| 2 | 0.0 | 0.0 | | | 0.00 | 110,000.00 | -1,278,018.18 |
| 3 | 0.1 | 0.0 | | | 0.00 | 30,000.00 | -1,300,557.63 |
| 4 | 3.8 | 0.0 | | | 0.00 | 30,000.00 | -1,321,048.03 |
| 5 | 19.3 | 0.0 | | | 0.00 | 30,000.00 | -1,339,675.67 |
| 6 | 34.4 | 0.0 | | | 0.00 | 90,000.00 | -1,390,478.32 |
| 7 | 57.2 | 0.3 | | | 0.00 | 30,000.00 | -1,391,577.97 |
| 8 | 76.9 | 2.4 | 28.1 | 0.8 | 74,285.60 | 90,000.00 | -1,343,894.39 |
| 8 | 48.6 | 1.7 | | | 0.00 | 0.00 | -1,339,562.54 |
| 9 | 76.4 | 16.3 | | | 0.00 | 30,000.00 | -784,025.83 |
| 10 | 96.8 | 33.3 | | | 0.00 | 30,000.00 | -245,340.08 |
| 11 | 123.2 | 52.7 | | | 0.00 | 30,000.00 | 267,156.30 |
| 12 | 143.5 | 74.4 | | | 0.00 | 30,000.00 | 743,713.46 |
| 13 | 167.5 | 96.7 | 55.9 | 26 | 2,414,282.00 | 140,000.00 | 1,102,855.29 |
| 13 | 111.6 | 70.7 | | | 0.00 | 0.00 | 1,102,855.29 |
| 14 | 132.4 | 94.0 | | | 0.00 | 30,000.00 | 1,491,813.75 |
| 15 | 157.4 | 121.8 | | | 0.00 | 30,000.00 | 1,893,649.78 |
| 16 | 173.5 | 142.9 | | | 0.00 | 30,000.00 | 2,067,379.73 |
| 17 | 193.3 | 162.4 | | | 0.00 | 30,000.00 | 2,157,158.67 |
| 18 | 208.0 | 182.2 | | | 0.00 | 30,000.00 | 2,211,218.99 |
| 19 | 225.5 | 200.0 | | | 0.00 | 30,000.00 | 2,199,936.95 |
| 20 | 247.3 | 220.7 | | | 0.00 | 30,000.00 | 2,205,139.46 |
| 21 | 264.6 | 238.2 | | | 0.00 | 30,000.00 | 2,143,742.01 |
| 22 | 281.3 | 254.2 | | | 0.00 | 30,000.00 | 2,050,853.04 |
| 23 | 295.5 | 269.4 | | | 0.00 | 30,000.00 | 1,941,520.29 |
| 24 | 309.6 | 284.1 | | | 0.00 | 30,000.00 | 1,823,083.60 |
| 25 | 330.7 | 301.7 | | | 0.00 | 30,000.00 | 1,727,669.46 |
| 26 | 343.6 | 314.3 | | | 0.00 | 30,000.00 | 1,588,260.76 |
| 27 | 354.8 | 325.6 | | | 0.00 | 30,000.00 | 1,443,393.31 |
| 28 | 364.1 | 336.7 | | | 0.00 | 30,000.00 | 1,303,131.74 |
| 29 | 374.5 | 346.5 | | | 0.00 | 30,000.00 | 1,161,513.93 |
| 30 | 383.1 | 355.4 | | | 0.00 | 30,000.00 | 1,022,766.04 |

Net present value calculation tables for *Eucalyptus grandis* with 10% real discounting rate and TZS 45,000 stumpage price for logs with no market price for pulpwood.

| | Utilisable volume, $m^3$ | | Thinning volume, $m^3$ | | | | |
|---|---|---|---|---|---|---|---|
| Year | More than 8 cm | More than 18 cm | More than 8 cm | More than 18 cm | Revenues | Costs | NPV if harvest at time T, TZS (cumulative) |
| 0 | 0 | 0 | | | 0.00 | 1,110,859.20 | -1,110,859.20 |
| 1 | 0 | 0 | | | 0.00 | 70,000.00 | -1,174,495.56 |
| 2 | 1.5 | 0 | | | 0.00 | 0.00 | -1,174,495.56 |
| 3 | 15.9 | 0 | 3.6 | 0 | 0.00 | 50,000.00 | -1,215,817.88 |
| 3 | 12.3 | 0 | | | 0.00 | 50,000.00 | -1,253,383.62 |
| 4 | 32.9 | 0 | | | 0.00 | 0.00 | -1,253,383.62 |
| 4.5 | 42.2 | 0 | 12.6 | 0 | 0.00 | 50,000.00 | -1,287,534.29 |
| 4.5 | 29.7 | 0 | | | 0.00 | 50,000.00 | -1,320,095.68 |
| 5 | 40.2 | 4.4 | | | 0.00 | 0.00 | -1,320,095.68 |
| 6 | 60.6 | 19.8 | | | 0.00 | 30,000.00 | -1,215,780.90 |
| 7 | 80.6 | 38.4 | | | 0.00 | 30,000.00 | -852,711.27 |
| 8 | 106.4 | 62.6 | | | 0.00 | 30,000.00 | -484,315.05 |
| 9 | 125.4 | 85.6 | | | 0.00 | 30,000.00 | -70,896.21 |
| 10 | 148.1 | 107.8 | | | 0.00 | 30,000.00 | 235,853.60 |
| 11 | 169.6 | 132.6 | | | 0.00 | 30,000.00 | 460,933.77 |
| 12 | 194.5 | 158.2 | | | 0.00 | 30,000.00 | 671,545.55 |
| 13 | 216.5 | 180.2 | | | 0.00 | 30,000.00 | 838,922.32 |
| 14 | 245 | 204.5 | | | 0.00 | 80,000.00 | 896,304.83 |
| 15 | 265.7 | 226.9 | | | 0.00 | 30,000.00 | 962,822.31 |
| 16 | 280.1 | 246.7 | | | 0.00 | 30,000.00 | 976,647.20 |
| 17 | 298.5 | 265.3 | | | 0.00 | 30,000.00 | 941,815.66 |
| 18 | 320.4 | 285.4 | | | 0.00 | 30,000.00 | 881,839.05 |
| 19 | 334.8 | 302.9 | | | 0.00 | 30,000.00 | 824,401.14 |
| 20 | 351.5 | 318.9 | | | 0.00 | 30,000.00 | 738,265.13 |
| 21 | 371.4 | 336.4 | | | 0.00 | 30,000.00 | 638,220.54 |
| 22 | 386.5 | 351.9 | | | 0.00 | 30,000.00 | 546,662.82 |
| 23 | 400 | 364.7 | | | 0.00 | 30,000.00 | 442,698.27 |
| 24 | 417.4 | 380.1 | | | 0.00 | 30,000.00 | 326,826.60 |
| 25 | 430.4 | 391.8 | | | 0.00 | 30,000.00 | 227,519.34 |
| 26 | 441.9 | 404 | | | 0.00 | 30,000.00 | 115,476.61 |
| 27 | 452.8 | 416.8 | | | 0.00 | 30,000.00 | 11,089.83 |
| 28 | 461.7 | 425.5 | | | 0.00 | 30,000.00 | -85,935.38 |
| 29 | 466.4 | 434.4 | | | 0.00 | 30,000.00 | -190,928.15 |
| 30 | 472.2 | 441.1 | | | 0.00 | 30,000.00 | -288,276.75 |

Costs used in *Pinus patula* calculations, TZS/ha

| Year | Seedlings | Seedling transport | Weeding | Land preparation | Road maintenance | Pruning | Administration | Fire management | Total cost |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 240,000 | 133,200 | | 523,000 | 50,000 | | 100,000 | 50,000 | 1,096,200 |
| 1 | | | 70,000 | | | | 10,000 | 20,000 | 100,000 |
| 2 | | | 20,000 | | | 60,000 | 10,000 | 20,000 | 110,000 |
| 3 | | | | | | | 10,000 | 20,000 | 30,000 |
| 4 | | | | | | | 10,000 | 20,000 | 30,000 |
| 5 | | | | | | | 10,000 | 20,000 | 30,000 |
| 6 | | | | | | 60,000 | 10,000 | 20,000 | 90,000 |
| 7 | | | | | | | 10,000 | 20,000 | 30,000 |
| 8 | | | | | | 60,000 | 10,000 | 20,000 | 90,000 |
| 8 | | | | | | | | | - |
| 9 | | | | | | | 10,000 | 20,000 | 30,000 |
| 10 | | | | | | | 10,000 | 20,000 | 30,000 |
| 11 | | | | | | | 10,000 | 20,000 | 30,000 |
| 12 | | | | | | | 10,000 | 20,000 | 30,000 |
| 13 | | | | | 50,000 | 60,000 | 10,000 | 20,000 | 140,000 |
| 13 | | | | | | | | | - |
| 14 | | | | | | | 10,000 | 20,000 | 30,000 |
| 15 | | | | | | | 10,000 | 20,000 | 30,000 |
| 16 | | | | | | | 10,000 | 20,000 | 30,000 |
| 17 | | | | | | | 10,000 | 20,000 | 30,000 |
| 18 | | | | | | | 10,000 | 20,000 | 30,000 |
| 19 | | | | | | | 10,000 | 20,000 | 30,000 |
| 20 | | | | | | | 10,000 | 20,000 | 30,000 |
| 21 | | | | | | | 10,000 | 20,000 | 30,000 |
| 22 | | | | | | | 10,000 | 20,000 | 30,000 |
| 23 | | | | | | | 10,000 | 20,000 | 30,000 |
| 24 | | | | | | | 10,000 | 20,000 | 30,000 |
| 25 | | | | | | | 10,000 | 20,000 | 30,000 |
| 26 | | | | | | | 10,000 | 20,000 | 30,000 |
| 27 | | | | | | | 10,000 | 20,000 | 30,000 |
| 28 | | | | | | | 10,000 | 20,000 | 30,000 |
| 29 | | | | | | | 10,000 | 20,000 | 30,000 |
| 30 | | | | | | | 10,000 | 20,000 | 30,000 |

Costs used in *Eucalyptus grandis* calculations, TZS/ha

| Year | Seedlings | Seedling transport | Weeding | Land preparation | Road maintenance | Fertiliser | Administration | Fire management | Total cost |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180,000 | 133,200 | | 523,000 | 50,000 | 74,659 | 100,000 | 50,000 | 1,110,859 |
| 1 | | | 40,000 | | | | 10,000 | 20,000 | 70,000 |
| 2 | | | 20,000 | | | | 10,000 | 20,000 | 50,000 |
| 3 | | | 20,000 | | | | 10,000 | 20,000 | 50,000 |
| 4 | | | 20,000 | | | | 10,000 | 20,000 | 50,000 |
| 4.5 | | | 20,000 | | | | 10,000 | 20,000 | 50,000 |
| 5 | | | | | | | 10,000 | 20,000 | 30,000 |
| 6 | | | | | | | 10,000 | 20,000 | 30,000 |
| 7 | | | | | | | 10,000 | 20,000 | 30,000 |
| 8 | | | | | | | 10,000 | 20,000 | 30,000 |
| 9 | | | | | | | 10,000 | 20,000 | 30,000 |
| 10 | | | | | | | 10,000 | 20,000 | 30,000 |
| 11 | | | | | | | 10,000 | 20,000 | 30,000 |
| 12 | | | | | | | 10,000 | 20,000 | 30,000 |
| 13 | | | | | 50,000 | | 10,000 | 20,000 | 80,000 |
| 14 | | | | | | | 10,000 | 20,000 | 30,000 |
| 15 | | | | | | | 10,000 | 20,000 | 30,000 |
| 16 | | | | | | | 10,000 | 20,000 | 30,000 |
| 17 | | | | | | | 10,000 | 20,000 | 30,000 |
| 18 | | | | | | | 10,000 | 20,000 | 30,000 |
| 19 | | | | | | | 10,000 | 20,000 | 30,000 |
| 20 | | | | | | | 10,000 | 20,000 | 30,000 |
| 21 | | | | | | | 10,000 | 20,000 | 30,000 |
| 22 | | | | | | | 10,000 | 20,000 | 30,000 |
| 23 | | | | | | | 10,000 | 20,000 | 30,000 |
| 24 | | | | | | | 10,000 | 20,000 | 30,000 |
| 25 | | | | | | | 10,000 | 20,000 | 30,000 |
| 26 | | | | | | | 10,000 | 20,000 | 30,000 |
| 27 | | | | | | | 10,000 | 20,000 | 30,000 |
| 28 | | | | | | | 10,000 | 20,000 | 30,000 |
| 29 | | | | | | | 10,000 | 20,000 | 30,000 |
| 30 | | | | | | | 10,000 | 20,000 | 30,000 |

Indufor ...forest intelligence

NIRAS