



PANDA MITI
KIBIASHARA
PRIVATE FORESTRY PROGRAMME

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BUSINESS PLAN

FORESTRY AND WOOD INDUSTRIES TRAINING CENTRE (FWITC)
MAFINGA

June 2018



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



MINISTRY FOR FOREIGN
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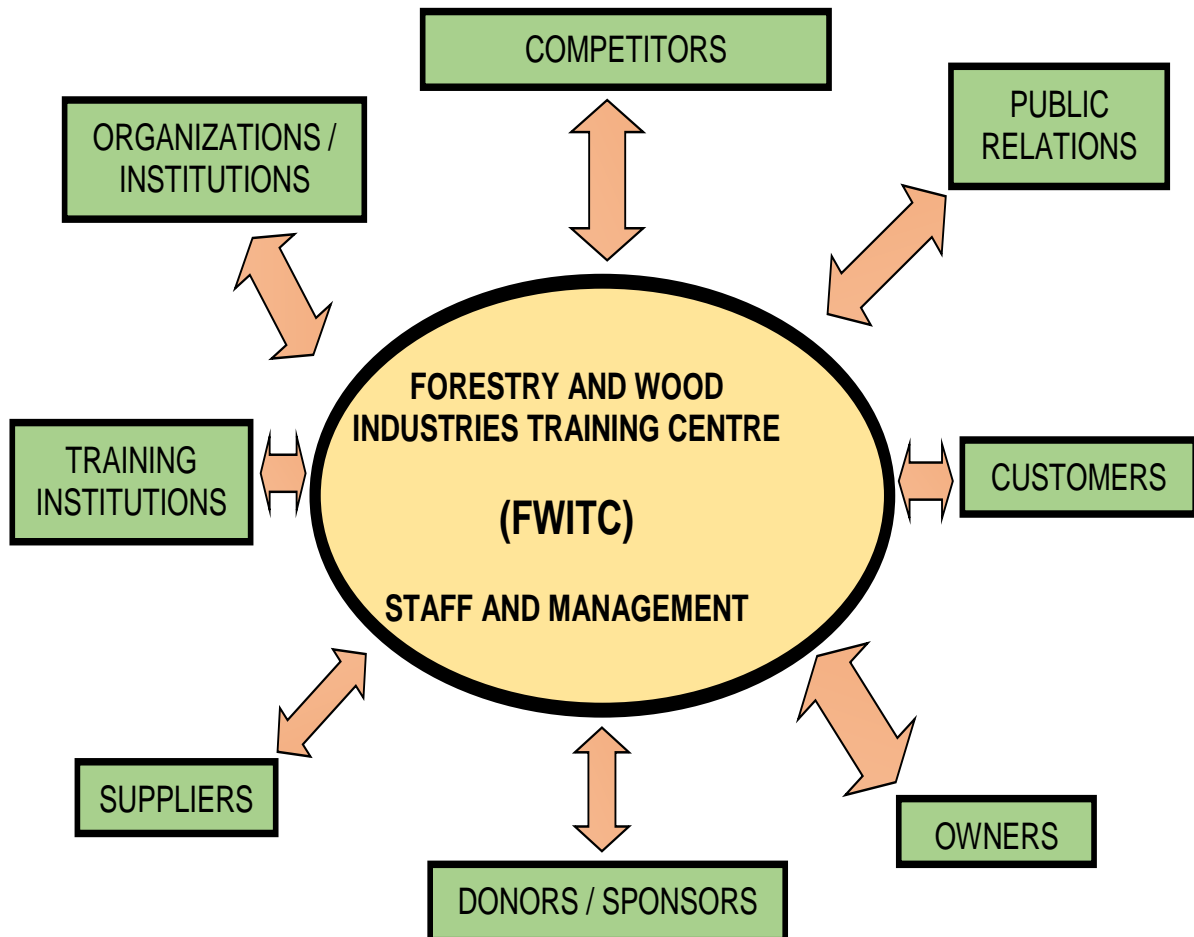


Private Forestry Programme – Panda Miti Kibiashara

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15 June 2018, Iringa, Tanzania



FWITC's business partners and stakeholders (Source: Juha Kiuru/PFP)



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



EMBASSY OF FINLAND
DAR ES SALAAM

**BUSINESS PLAN - FORESTRY AND WOOD INDUSTRIES TRAINING CENTRE (FWITC),
MAFINGA**

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PREFACE

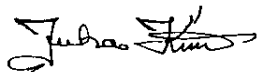
Private Forestry Programme (PFP) Phase I is being implemented in Iringa Tanzania by the Finnish Ministry for Foreign Affairs (MFA) and the Tanzanian Ministry of Natural Resources and Tourism (MNRT). The aim of the Programme is to increase rural income in the Southern Highlands through industrial forest plantation establishment, development of new business opportunities, supporting in value chain development and in providing capacity building and training services for the stakeholders and beneficiaries of the Programme. Indufor Ltd from Finland is the implementing agency for the programme.

During the PFP programme the Forestry and Wood Industries Training Centre (FWITC) was established to offer training and technical advisory services for forestry and wood industries with wood processing and forestry facilities to support development and the sustainability of the centre. FWITC's sawmill and the forest tree nursery have key functions in supporting the centre in its sustainable training activities. By producing forest products and tree seedlings the centre will generate income that will be used for maintaining and developing the centre, especially the infrastructure, machinery and equipment used in training. The upcoming centre will provide employment directly to local people close to the facilities and indirectly to farmers, forest owners and SME sawmillers within the Southern Highlands of Tanzania. Through the training provision the centre facilitates sustainable use and management of forest resources in Tanzania.

FWITC has operated since the 1st of December 2017 when it was launched for its operations. Until today, the centre has partly achieved its purpose in providing training services and in generating income for its development. The Steering Committee of the PFP recognized that there is a need to prepare a comprehensive business plan for the centre. The purpose of preparing the business plan is to assist FWITC's management to maximise the benefits of the investment made. The business plan will also be a guideline for the management to manage the centre more effectively.

The author of this document carried out a technical advisor mission for five months in October-December 2017, and in February, March and April 2018. The aim was to support PFP and the management of FWITC in preparation of a business plan for the centre. During the three missions to Tanzania participatory discussions, consultations and planning events were held with the staff of FWITC. These formed a base for the work to prepare a Training Plan and a Business Plan for the centre. The role of the author was to provide an approach, methodology and tools for putting ideas and information together to come up with the training and business plans.

15th of May 2018



Juha Kiuru

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ABBREVIATIONS

| | |
|-----------|---|
| AAO | Accountant and Administrative Officer |
| BP | Business Plan |
| CBA | Capacity Building Advisor |
| DBH | Diameter at Breast Height |
| ERP | Enterprise Resources Planning |
| FBD | Forest and Beekeeping Division |
| FITI | Forest Industries Training Institute |
| FTI | Forestry Training Institute |
| FWITC | Forestry and Wood Industries Training Centre |
| GoF | Government of Finland |
| GoT | Government of Tanzania |
| GMP | General Manager / Principal |
| FA | Ministry for Foreign Affairs of Finland |
| MNRT | Ministry of Natural Resources and Tourism |
| MSME | Micro, Small and Medium Enterprise |
| NACTE | National Council for Technical Education |
| NOFIA | Northern Forest Industry Association |
| O/M | Owner and Manager |
| O/W | Operator and Worker |
| OUS | Occupational Unit Standard |
| PFP | Private Forestry Programme |
| PPP | Public-Private Partnership |
| SAFIA | Southern Forest Industry Association |
| SC | Steering Committee |
| SDL | Skills and Development Levy |
| SHIVIMITA | Tanzanian Forest Industries Federation |
| SHR | Southern Highland Region |
| SME | Small and Medium Enterprise |
| SMS | Small and Medium Scale |
| SO | Sales Officer |
| SP | Service Provider |
| SUA | Sokoine University of Agriculture and Forestry |
| SWOT | Strength Weaknesses Opportunities and Treats |
| TANESCO | Tanzania Electric Supply Company Limited |
| TA | Technical Assistance |
| TC | Training Coordinator |
| TE | Training Expert |
| TF | Teacher Forestry |
| TFS | Tanzania Forest Service |
| TGA | Tree Growers Association |
| TL | Team Leader |
| TP | Training Plan |
| T&P | Training and Production |
| TNA | Training Needs Assessment |
| ToT | Training of Trainers |
| ToR | Terms of References |
| TRA | Tanzanian Revenue Authority |
| TVET | Technical and Vocational Education and Training |
| TWICO | Tanzanian Wood Industry Corporation |
| TWT | Teacher Wood Technology |
| TZS | Tanzanian Shilling |
| UWASA | Umoja wa Wawunaji Saohill |
| VAT | Value Added Tax |
| VETA | Vocational Education Training Authority |
| VET | Vocational Education and Training |
| WIBA | Wood Industry Business Advisor |
| WITA | Wood Industry Technical Advisor |

EXECUTIVE SUMMARY

Tanzanian forestry sector has changed a lot since nineties when Tanzanian Wood Industry Corporation (TWICO) was the main operator in forestry sector. Since then TWICO has pulled out and closed down its production units that affected also forest industries in Tanzania. Especially, sawmilling sector where capacity has been reduced significantly from late 80's. To fulfil the born gap small and medium scale (SME) sawmills were established to Southern Highlands where the main forest plantations in Tanzania are. Recession in forestry and forest industries caused a technological degradation that has also reduced capabilities of the operators and workers. Because of the forestry sector recession forestry education suffered with a consequence that intakes to forestry and wood technology studies dropped considerably. Student intakes declined in both Forestry Training Institute (FTI) and Forest Industries Training Institute (FITI), where the institute was almost closed in the middle of nineties.

Because of the above Governments of Tanzania (GoT) and Finland (GoF) initiated a new five-year Private Forestry Programme (PFP). PFP was started with phase I in January 2014 to be ended in the of 2018. The programme is implemented in the Southern Highlands of Tanzania.

Apart from many PFP activities the programme has also carried out capacity building and training activities. For example, Training Need Assessments (TNA) were implemented to identify skill gaps and training needs for planning of forestry training courses. Also, a pre-feasibility study was carried out to study whether PFP should establish a training centre to Southern Highlands. In early 2016 the establishment of the centre was started. A site with reasonable infrastructure and buildings was found and leased from Mafinga. The Forestry and Wood Industries Training Centre (FWITC) with facilities for training and production was launched on 1st December 2017.

From the start-up it was found and agreed that the centre should be operated as a business unit paying for its own expenditures from the revenue collected. As a result, many business options were identified, but never analysed. Therefore, in February 2018 a Business Plan (BP) preparation was started to develop a Training Plan (TP) and a Business Plan for the centre. Aim of it was to analyse various business alternatives for their viability and profitability.

Procedure for Business Plan preparation

Information and data for production and manufacturing cost calculations were first gathered, screened and analysed. Secondly, one-year production plan and budget with a cash flow plan was developed for the sawmill operations. Thirdly investment, variable and fixed costs were calculated for economic analysis to find out profitability of the businesses. Finally, operating margins and profit after the tax and depreciations were computed for four-year projections.

The procedure included also preparation of instructions for accounting and bookkeeping procedures with an annex of a chart of accounts developed. Eventually, recommendations for administrative arrangements with organizational chart and management structure were developed.

Markets

There are lots of markets for forestry and wood technology training and technical advisory services in Tanzania. In case of wood processing the markets are tight and there are lots of competitors, however there is a gap for high quality forest and wood products, especially for innovations. In wood processing operations there is a need for extra efforts for marketing.

Business idea

FWITC's core businesses will be forestry and wood technology training supported with technical advisory services that will be offered both with the training and production facilities established at the centre and at the real field and sawmill environments. Training will be offered through hands-on-skills and learning-by-doing training approaches by prioritizing practical exercises.

Training and TA services will be supported by the production operations on wood and tree seedling productions that are planned also for securing the sustainability of the centre.

While the trainees gain theory knowledge and practical work experiences they also produce valuable forestry and products. When these are sold revenue will be collected with a profit that is planned to be used for FWITC's development and sustainability. Profit made as FWITC's development fund will be used for constructions and renovations, and for procurement of new machines for training and production, and for purchasing of spares and materials for maintaining the machines and facilities of the centre.

Vision & Mission

VISION is to be a centre for capacity building and training in forestry and wood technologies in Tanzania to train people working along the forestry value chain from the seedlings production to sawn timber production and sales of forestry and wood products. FWITC's vision is to be a

***“Centre of Excellency” for knowledge, information and training
in forestry, forest industries and wood technologies***

MISSION is to provide short courses, workshops, seminars and technical advisory services with demonstrations in forestry, forest industries and business development. FWITC's mission is to

***provide training, technical advisor services and skills development
for forestry and wood industry workers
with emphases on farmers, TGA members and workers of the MSMEs***

Through its mission FWITC trains people and provides technical advisory services with practical examples and demonstrations on how to organize small-scale forestry and wood processing operations in Tanzania. To succeed in the mission this BP provides answers and guidelines for organizing and implementing the training services and business operations. Also, the BP recommends organization and management structures to be established for successful operations.

The selected **two (1-2) key business operations** and **three (3-5) supporting production operations** of the centre are:

1. **Training services** in form of short courses in forestry and wood technology.
2. **Technical advisor services** to support the training services prior and after the courses.
3. **Wood processing** at the FWITC's sawmill including sawn timber production, charcoal production and briquetted charcoal production.
4. **Forest tree seedlings production.**
5. **Contract sawing services** to cut sawn timber from clients' raw material.

The above operations are described in section 6 where the profitability calculations are also shown. Also, recommendations and guidelines for the operations can be found from section 6.

Implementation of business operations

The projected training volume for the first calendar year was planned for 1480 trainees. This is supposed to be reached with 47 different type of courses under four main subject areas. Total number of courses per annum will be 98. If the set targets are reached FWITC produces 6455 trainee days per annum. It is expected that all trainees will pay or are sponsored for a course fee that contributes to the costs of the training organized. The minimum requirement for organizing of any short course should be that break-even point will be broken.

TA services are planned to be linked to training services so that they will be offered prior and after the courses to support planning of training as well as after-sales follow-ups in the field and at the sawmills. It is recommended that WIBA and WITA will provide these services for about 66 days per year so that services are offered in average of 6 days per month.

The business plan proposes that FWITC's sawmill produces annually about 4,000m³ of sawn timber. From this volume 2,550 m³ of pine and 1,450 m³ of eucalyptus. Contract sawing option is highly recommended, because of its many advantages e.g. from logistical and management point of views. If full capacity is expected new investments must be made. It is planned that during the 1st year FWITC's forest tree nursery produces about 500,000 tree seedlings, which target will gradually be increased to 1,000,000 seedlings after the 4th year.

Profitability of Business

The profitability calculations and economic analysis of this business plan deals with the period of four years starting from 7/2018. The summary of profitability calculations shows that revenues collected from the four business lines increases from the 1st operational year of TZS 970,740,438 to TZS 2,103,154,147 for the fourth year, with an increase of 117%. To reach this the productions should be increased annually as proposed in this BP. With this projection for four years the operating margin will raise from 6% to 18%, which is reasonably good for this type, scale and combination of operations.

Profitability of the training services and sawmill production will be negative at the beginning but will turn to positive during the 2nd and 3rd year of operations. The negative result is caused by the high depreciation costs that brings the profit down when the sawmill is not operating in full capacity as it is during the 1st year of operations. After the 3rd and 4th year operations the sawmill can already make a good profit if operated as proposed here. The forest tree nursery operations seem to be good business in terms of profitability vs. investments and labour requirements. It can be concluded that with a firm and gradual production increase a good business result can be achieved already after the 3rd year of operations. It seems that sustainability of the centre can be secured in few year time if all the operations are implemented as recommended.

To begin the operations FWITC needs external financing for working capital. This should be arranged on loan basis because to be paid it back within the 1st year of operations. For example, the cash flow of the sawmill will be positive after few months operations, therefore getting an external working capital to begin the operations is critical. The critical period will be the few first months of operations. It is recommended that PFP provides assistance in this respect.

Administrative Arrangements and Organization

FWITC's organization will be divided into four business and financial departments that are 1) Training services, 2) Technical advisory services, 3) Business operations and 4) Supporting services. FWITC will be directed by the General Manger / Principal (GMP) who will be responsible for all departments and operations and who will report to the Board of FWITC.

The most important department will be the Training department which will and must be supported by the other 3 departments. Training department is divided into Forestry, Wood Technology, Business Development, and Short Courses, Workshops and Seminars departments. Each department is led by the Manager / Teacher who reports to the Training Coordinator that is responsible for all training issues of the centre and who reports to GMP.

The sawmill and the forest tree nursery will be independent business units of the centre. These will be managed by the Sawmill and Nursery Managers who report to GMP. Supporting services department will provide administrative and financial services for other departments. This department will be directed by the GMP.

Management

Management options for FWITC's were studied and it was recommended that both training and production operations should be carried concurrently with a percentage of operations to be defined at the beginning. Main point of the management is that it is done in collaboration with FWITC, FTI and FITI under one management using the administrative arrangements and organization proposed in this BP and supervised by the Ministry of Natural Resources of Tourism (MNRT).

The recommended management option and structure has a challenge which is the shares of operational times between the production and training. Too often business overrides the training because of the financial targets and aims of operations causing limitations or even death of the training operations. This option and approach requires a special efforts and supervision from the management team to maintain the agreed model of operations with allocation of times.

Critical Success Factors

FWITC will be independent business unit responsible for its sustainability and business viability. Therefore, the centre must demonstrate a high level of responsibility, accountability and integrity as well as willingness to listen others and share its experiences and challenges with the stakeholders, beneficiaries and donor organizations.

Good governance and transparency are the key issues to be followed and therefore the critical success factors for FWITC's victory as well as successful implementation of this Business Plan.

Recommendations

To develop FWITC further for its viability and sustainability the following should be done:

1. FWITC's financing for the next five (5) years should be secured. This can be facilitated 1st from the FWITC's production operations that should be the main source of financing or 2) from the MNRT of Tanzania or 3) VETA Tanzania who should provide funding from the Skills Development Levy (SDL) that is collected from the industry to be recycled for skills development at the VET centre or 4) temporarily from the donor financing that should only be short term solution.
2. FWITC should be registered as a legal company to legalise its operations to facilitate and establish its invoicing, financial arrangements and accounting procedures.
3. FWITC should be organized as an independent budget unit under the MNRT in case there are no other solutions.
4. Detailed operational plans, records keeping system and accounting procedures should be designed and established for FWITC to facilitate appropriate management of operations with regular monitoring and auditing of operations.
5. FWITC's management should be further trained and mentored for more efficient management of the centre.

Conclusions

1. Currently financing of training and finding of paying clients are the biggest challenges of FWITC training operations. Therefore, it is important that FWITC starts its business operations, especially production of sawn timber and tree seedling production to support the training operations.
2. To minimize defined risks strengthening and capacity building of workers and teachers is essential.
3. Detailed operational plans for all business operations are inevitable and must be developed immediately with appropriate accounting and records keeping systems.
4. Prerequisite for operations is transparent management and well-organized organization.

Finally, it can be concluded that to ensure that the mission of FWITC is achieved careful planning and effective on-time execution of operations are called for.

Based on the foregoing FWITC's establishment and full commencement of its training and production operations in conjunction with FTI, FITI, the MNRT and PFP is justified.

1. INTRODUCTION

The Private Forestry Programme (PFP) is a bilateral developing aid programme between the Governments of Tanzania (GoT) and Finland (GoF). PFP is financed by the Finnish Ministry for Foreign Affairs (MFA) and the Tanzanian Ministry of Natural Resources and Tourism (MNRT). The main beneficiaries of PFP are local private farmers, tree growers and micro, small and medium scale (MSME) sawmillers that are organized into Tree Growers Associations (TGAs), and into Sawmillers Associations such as Southern Forest Industry Association (SAFIA) and Northern Forest Industry Association (NOFIA). Currently PFP is implementing the final year of the five-year programme.

The aim of the Programme is to increase rural income in the Southern Highlands through industrial forest plantation establishment, development of new business opportunities, supporting in value chain development and in providing capacity building and training services for the stakeholders and beneficiaries of the Programme. PFP aims at supporting members of TGAs, MSMEs and various associations in developing their forestry and wood processing operations, technologies and value addition of forestry and wood products. The aim of training activities is to improve knowledge and develop skills needed by the farmers, tree growers, forest owners and workers of MSMEs. Short courses training in forestry and wood technologies will be offered to managerial, operational and workers levels.

MSME industries, especially sawmills, provide large number of jobs in Tanzania with a concentration in Southern Highlands. The sector has high potential to improve livelihoods in rural areas, where new job opportunities are needed and where jobs are known to be less than in the urban areas. The sawmilling sector only in Southern Highlands employs about 5000-6000 workers per annum. The total employment of entire forestry sector is about 20000-30000 workers respectively. (PFP 2016a, 55.) Critical factor for development of forestry and wood industry sectors is lack of skilled and trained manpower. Currently well-trained and qualified workers are not much available.

At present, manpower in forestry and wood industry sectors is largely trained on the job, often done by the workers that are not trained. To improve the situation PFP found that there is a need to establish a training centre for training of forestry and wood industry workers. Way forward was taken in 2016-2017 when PFP started establishing Forestry and Wood Industries Training Centre (FWITC) to Mafinga. FWITC was launched on the 1st of December 2017. By March 2018 the facilities were established, and ready for short courses training and production of sawn timber and tree seedlings. The aim of production facilities was to generate revenue for the centre, especially for its development and sustainability.

Part of FWITC's establishment has been assessments of training needs to identify skill gaps, training needs and preferences for training. Two TNAs were carried out in 2015-2016 to gather this information. Recommendations from these were that PFP should immediately start preparation of FWITC's training plans where details of short courses, training administration and financing issues should be dealt with.

In 2017-2018 PFP's staff prepared a Training Plan (TP) for the FWITC. This plan comprises details for short courses, seminars and workshops on forestry and wood technologies. Emphases of the events are on knowledge and skills development for entrepreneurship, business development, maintenance and efficient forest and sawmill operations. Most of the planned short courses will be implemented at the Mafinga centre. However, it is also planned that some courses will be taken to the field conditions at the villages close to the trainees. For these courses PFP will develop mobile training units that can be easily transported and moved to the field training locations.

During the founding of the FWITC PFP's Steering Committee (SC) and the MNRT found that FWITC is not a real business unit unless it has an appropriate Business Plan. Therefore, the SC suggested that PFP should prepare a BP for the centre. Purpose of the BP is primarily to be a supporting instrument on decision making for both the MNRT and the PFP and secondly as a tool for PFP and FWITC to manage FWITC on viable and sustainability way.

To succeed on FWITC's mission right models and procedures should be developed for its operations and management. Through well-organized and successfully executed BP the mission of FWITC can be achieved with a profitable business. This paper comprises a Business Plan for FWITC. The plan deals with all FWITC's business issues that are training, and production offered to FWITC's clients.

1.1 Purpose for Preparing FWITC's Business Plan

FWITC's Business Plan (BP) is applicable for two purposes. First purpose is that the management of FWITC will know and understands the potential of training and production operations of the centre to distinguish FWITC's financial standing and viability. Second purpose is that PFP, as the implementing agency of the Private Forestry Programme, and the MNRT of Tanzania will be facilitated with information for their decision making.

Focus of the BP is to clarify and describe options and projections for FWITC's business. Attention is given to revenue collection opportunities as the core business of FWITC. The BP gives options and recommendations for improvement of FWITC's business, management procedures and organization to better manage the centre. It will provide information with profit and loss statements, cash flow projections and eventually shows the profitability of training and production as businesses of the centre.

It is anticipated that through the BP the management of FWITC will better understand its role and responsibilities on financial management, accountability and overall management of the centre. The key factors on this will be openness, co-operation and 100% transparency on management, reporting and auditing of operations, accounts and viability of the centre.

The emphasis throughout of developing this BP is on identifying opportunities for FWITC's effectiveness, financial autonomy and sustainability. The key issue, in developing and maintaining FWITC's business towards its sustainability and success, will be the skills and capacities of its manpower.

It is well-known that a successful company must have a well-functioning organization with a clearly defined mission and distinctly set objectives which are well-defined in the business plan. With these the company can reach its goals for business. This BP sets a mission and objectives for FWITC's business. The BP further shows and analyses business options for FWITC's profitable business operations.

From the recommendations given the management of FWITC can develop its operational plans for day-to day operations. A Training Plan as one of the operational plan has already been developed. It is already under implementation.

It is expected that this business plan supports PFP and FWITC's to initiate preparation of the following documentations for FWITC's operations:

- (a) Revision of Training Plan for short courses, seminars and conferences.
- (b) Preparation of operational plan for technical advisor services.
- (c) Preparation of operational plan for sawn timber production
- (d) Preparation of operational plan for forest tree seedling production.
- (e) Preparation of records keeping and reporting system for the sawmill and the forest tree nursery.
- (f) Preparation of accounting and bookkeeping system to monitor and audit FWITC's economic performance, viability and sustainability.
- (g) Preparation of quality assurance system to follow-up and improve products and services quality as well as business performance in a whole.
- (h) Preparation of human resources development plan to train workers of FWITC and to improve their skills and capacities.
- (i) Preparation of a plan to develop training and production facilities of FWITC.

1.2 Structure of the Business Plan

This Business Plan is divided into eleven main sections. Before these the plan starts with preface, abbreviations and executive summary tum sum up the BP. These are followed by the section one that is introduction to the PFP and this BP preparation. Section one also describes reasons and purpose for the business plan preparation with its structure.

The section two is the background to FWITC. It describes the current situation of the centre with clarifications to its ownership arrangements. It also describes the facilities, machinery and tools available for training and production purposes. The section three focuses on marketing plan, approach and the marketing strategy for the services and products. It lists the products and services to be produced and offered. It also describes the potential clients and the competitive advantage of the centre.

The section four defines FWITC's business idea with the vision & mission statements with the business strategy for the centre. The section five describes the classification of investments made with summary of investment calculations and depreciation considered.

The section six defines the training and production operations proposed for the FWITC business operations. The section explains how the raw materials are supplied to the centre. It also shows the profitability calculations and economic analysis prepared for the business operations.

The section seven describes the financing arrangements with an annual cash flow plan for sawmills first year production operations. In also describes the accounting and bookkeeping system proposed for the centre.

The section eight proposes the organization chart for FWITC. It looks at the management options possible for FWITC's management with a recommendation for the most potential one. The section explains the management structures for the business departments with the manpower requirements for training and production. It also has the list of key staff required for the centre.

The section nine assesses the business risks whereas the section ten highlights the main four recommendations given for operationalization and implementation of the Business Plan. Finally, the section 11 concludes the business plan preparation and the work done with the final recommendations given.

The Business Plan quantifies expected outcomes in business activities based on financial model for the period of 7/2018 to 6/2019. The BP shows scenarios based on the analysis and assumptions made from the estimates and calculations.

Supporting documents, investment estimates and calculations, financial calculations, profitability analysis and cash flow projections are attached to this plan for clarifications. Terms of references for the key personnel of FWITC were developed and attached to this plan. Chart of accounts for accounting and bookkeeping of FWITC's finance were developed to keep accounts and to monitor FWITC's financial performance and viability.

2. BACKGROUND

In the background of existing forestry education in Tanzania and in deficiency of appropriate forestry and wood technology short courses in Tanzania PFP started establishing of FWITC in January 2016. In December 2017 the centre was launched for training and production. At the time of launch the key personnel was in place and machines assembled for sawing operations, kiln drying, timber preservation and maintenance of saw blades. By then a forest nursery had been established and ready for production.

FWITC is located at Mafinga town in Mufindi district at Southern Highlands of Tanzania, which is about 75 km from Iringa. Locality of the centre was selected because of the extent of forest plantations and forest industries in the area. The centre being placed in Mafinga makes access to it easier, especially to companies who operate in the Southern Highlands.

Main reason for establishing FWITC was to provide training on forest and wood technologies for clients that come from Southern Highlands of Tanzania. Training of FWITC was to consist mainly short courses with emphasis on workers' skills development and hands-on training. This primary objective has always been kept as the focus area of the centre. Even now when a business plan for the centre will be planned and prepared.

Alongside with the above focus area of FWITC it has been discussed that training should be supported by production operations to facilitate a development of the centre which can be done through extra revenue collection from the products and services sold. Other reasons for starting the production operations are that investments can be better utilized and benefits from these maximised. Therefore, to support all these initiatives it was found important that a business plan will be developed for the centre.

2.1 Ownership

When FWITC's establishment was started in August 2016 PFP's Steering Committee (SC) decided that to begin the establishment a site with reasonable infrastructure and buildings should be found and leased. Later same year reasonable premises were found from Mafinga town. A three-year lease agreement, until the end of June 2019, was signed with PFP. This means that PFP, as a developing aid programme under the Governments of Tanzania and Finland, rented the land and its premises for a three-year period. Currently FWITC operates with this lease agreement with no certainty of its operations after June 2019. In April 2018 there was no information on longer lease agreement nor for full ownership of the land and premises.

A challenge of FWITC's business operation currently is that it does not have a legal status or registration as a business unit. PFP has introduced the issue to MNRT, who is working on the options for ownership and registration of the centre.

The uncertain issues have caused difficulties for FWITC's operations, which currently are running, but in a slow and uncertain mode. To get them more efficient the ownership issue should first be settled. After that the official registration and legality of the centre could be established with a legal accounting and bookkeeping system.

When establishment of FWITC was started and when the ownership arrangements were discussed one option was to establish a Public-Private Partnership (PPP). The idea of this was to engage and commit PFP's stakeholders to both ownership and management of the centre. A plan for PPP arrangement was finalized in May 2016 when it was introduced to PFP's stakeholders. Responses and feedback from the stakeholders were not as expected. Therefore, PFP and MNRT decided to work on their own with a long-term vision to return the land ownership for FWITC. During this time the MNRT and the PFP tentatively agreed on the vision that FWITC should be merged to FTI and FITI who should take over the management, operations and business of the centre. Currently the MNRT is working on this option as well as on the legal registration of the centre.

Currently PFP manages and maintains the premises in accordance with the lease agreement they have signed. Since May 2016 PFP has invested for renovations of the buildings and development of the infrastructure to change the place as a training centre for forestry and wood technology training. Buildings have been changed to offices, classrooms and training facilities. Training facilities for sawmilling, sawdoctoring and forest nursery establishment have been established. The investments are high and therefore PFP and the MNRT decided that FWITC should operate as a business unit with an aim that operating expenditures should be covered from the operations. For this purpose, this BP is developed.

2.2 Facilities

FWITC's establishment was started in the beginning of 2016 by infrastructure development and renovation of buildings at the leased land and premises. Part of this development work has also been a purchase of machinery, equipment and tools which was started at the same time. The

plan has been that machinery and equipment will be purchased mainly for training purposes with a possibility for production operations for revenue collection.

Purchased and development of training facilities was made so that most of the machinery follows a structure of a typical sawmill or a manufacturing plant in Southern Highlands of Tanzania. The decision was purposely made so that workers' skills development can best serve the existing industry.

2.2.1 Training Facilities

Regarding training, the important milestone has been the development of FWITC's TP and a short courses training calendar for 2018. The TP is ready for implementation which has been started slowly. Extra efforts should be made to improve progress and speed of implementation.

After investing in 2016-2018 the FWITC is now equipped with a basic forestry and wood processing facilities for demonstrations and training. The centre has classrooms that can accommodate 10 to 30 trainees. These are equipped with teaching aid facilities, whiteboards, flipcharts and multimedia projectors for lecturing and presentations. It is planned that in the future FWITC will also be furnished with adequate library facilities and with a computer laboratory for training and demonstrations.

2.2.2 Plantation Forest Nursery Facility

The centre has a full-scale forest nursery for tree seedling production. This facility will be used for commercial seedling production and training on nursery establishment and management as well as seedling production. Seedlings produced will be sold for the tree farmers around FWITC. Priority on sales will be given to PFP's beneficiaries, TGA members and tree farmers.

2.2.3 Sawmill and Wood Processing Facilities

FWITC has a sawmill and wood processing facility for Training and Production (T&P) purposes with the following machinery:

1. Horizontal and vertical band saws for breakdown and re-saw operations. Used for T&P.
2. Two multi-blade circular saws for sawing of small diameter logs. Used for T&P.
3. A high-pressure kiln for sawn timber drying that is used for demonstrations, testing and training, especially drying of eucalyptus sawn timber for furniture making.
4. A timber treatment plant for wood preservations. Unit is used only for demonstrations, testing and training purposes.
5. A mobile horizontal band saw unit with a grinding and saw set-up device. Unit is used for demonstrations and training purposes. It can be used for mobile training in the field at the villages.
6. Sawdoctoring machines, tools and equipment to maintain:
 - 1) Tungsten tipped circular saw blades.
 - 2) Narrow band saw blades.
7. A briquetting making machine to produce wood briquettes from saw dust and wood waste. Unit will mainly be used for demonstrations and training purposes.
8. Charcoal kiln to produce charcoal from wood waste and bio mass. Unit will be used for demonstrations and training purposes, with an option for production.

All the above-mentioned machines will be used for demonstration, testing and training purposes. Machines that are mentioned in the bullet points 1, 2 and 6 are also used for FWITC's sawn timber production operations.

2.2.4 Other Facilities

FWITC has also invested for some supporting facilities that can be used for both training and production. There is a standby generator for power supply whenever there is a power shortage

from the national Tanzania Electric Supply Company Limited (TANESCO) grid. Capacity of the generator is planned so that it can easily back-up FWITC's training and production operations.

PFP has further planned that it will still invest for more training and production machines, equipment and tools. These will be purchased especially, to improve and develop FWITC's production operations for revenue collection and pure business. New machines and accessories include forklift, tractor and truck for raw material and products handling at FWITC.

3. MARKETING PLAN AND THE STRATEGY

PFP and its post-project Private Forestry and Carbon Trading in Tanzania (2010-2011) have carried out several market studies and research exercises where markets for training, technical advisory services and forestry and wood products production were asked and analysed. Results of these show that there is a huge need for training in forestry and wood technologies in Tanzania. Especially, in the lowest level workers, farmers and forest owners who do not have any professional or vocational training.

A report on Timber Market Dynamics in Tanzania and in Key Export Markets in Tanzania prepared by the Carbon Trading project and the Value Chain report of PFP in 2016 show that there is a lot of markets and demand for forestry and wood products in Tanzania (MNRT & Indufor 2011). These reports clarify that the major challenge wood products market will be the availability of raw materials not the production capacities or markets for products. (PFP 2016a).

Because of the above the PFP started establishment of FWITC in 2014 with an objective to form a training centre to Southern Highlands. To supplement training services PFP decided also to start production operations. Therefore, joint facilities for were built to be used for both training and some wood products processing for sales and revenue collection. This section three analysis briefly the markets and products for training services and production of wood products.

Key to FWITC's success in training and production will depend on marketing and advertisement of products and services with a high standard of quality and adequacy of services to be provided.

Clients and trainees to FWITC will be invited from all forestry and forest industry companies operating in Tanzania. Main clients will be members of the TGAs and workers of the MSME sawmills operating in Southern Highlands. Mostly the clients are individual workers interested in developing of their knowledge, skills and competences. All worker groups from the managers to owners and to lowest level industry workers will be targeted.

FWITC will be responsible for its own marketing operations. Sales Officer will be responsible for marketing, preparation of marketing materials and for organizing of marketing operations and campaigns. The Sales Officer of FWITC should design and develop marketing materials and brochures for marketing of FWITC's products and services.

3.1 Market Assessment

Starting point for FWITC's establishment was made in late 2015 and early 2016 when the results and recommendations from the two TNAs, PFP carried out, were received. TNAs identified the desired and required trainings in Southern Highlands of Tanzania with a feedback that there is a high demand for various type training in forestry and wood technologies.

The TNAs indicated also that short courses training is mostly preferred by the companies and workers because of its fast impact to workers' skills and performance of the company. Because of the results PFP developed a TP in 2018 by which FWITC can now offer training for the members of Tree Growers Associations and workers of the SME sawmills. (PFP 2015 & PFP 2016b).

3.1.1 Training Services

The studies indicated clearly that there is a huge market for forestry and wood technology training in Southern Highlands if there is an institution which can really offer practically oriented skills

development training for workers. With this background and considerations FWITC established its first short courses training programmes and started implementing them and in early 2018.

According to the market studies and TNA done there are almost unlimited markets for short courses training in forestry and wood technology. Another fact is that there are no forestry training institutions in Tanzania that is specializing only for short courses training in forestry and wood technologies. Therefore, FWITC has a good business opportunity in organizing short courses training, extension services and specialized technical adviser services that are offered in the field and at the MSME sawmills. The only FWITC's challenge is that how it can mobilize people for training and are they ready to pay for training, extension and technical services?

Based on the market scenarios and training forecasts prepared it seems that there are good business opportunities for all types of forestry and wood technology training and technical services within the next 10 years. Markets in short courses training and technical advisory services at the field of forestry and the MSME sawmills looks very promising business for FWITC.

3.1.2 Wood Products and Other Services

When FWITC was established PFP's management planned that invested machines and equipment will also be used for minor production operations to collect revenue for FWITC's maintenance and development. It is obvious that the sawmill facility and the tree nursery establishment can provide opportunities for production of sawn timber and tree seedlings for the high sawn timber markets in Tanzania.

Recently under preparation being market studies have indicated that sawn timber consumption in Tanzania will increase. Therefore, there is a good prospectus that any sawn timber produced at FWITC will have markets. From the marketing point of view, it is expected that FWITC sells all sawn timber it can produce. Especially there are good market scenarios for well dried sawn timber and treated wood products such as poles and rough sawn timber for construction purposes.

It is also expected that FWITC has good markets for its tree seedlings. Demand for tree seedlings is high because of an increase on establishment of new forest plantations within the Southern Highlands of Tanzania. There is a good market potential in the next 5 years when looking at FWITC's nursery production and the diversity of seedlings FWITC can produce in the future.

One important service that FWITC can offer is technical advisory services to local forestry and wood industry companies. In this respect markets are boundless. Forest industries in Tanzania, especially MSME sawmills are still undeveloped with basic, labour intensive and primitive production methods and obsolete machines. There is a big need for all types of technical support and services to improve productivity and production processes. Also mentoring of managers and owners on these aspects is required.

3.2 Products and Services

The vision and mission of FWITC shows that the main operation of the centre is training, implemented through short courses programme and extension services. However, it is additional planned that some production operations and other services will be offered and carried out as part of the business. The following are the services and products that will be marketed, produced and sold from FWITC:

The potential sawmill products can be regarded as one of the main product groups. The selected product strategy can be based on the market demand and profitability of production operations. The strategy can include one product group only or be a combination of many groups. FWITC's business plan was developed with a consideration that there will be several product groups of wood products and training services to be offered.

3.2.1 Training Services – the Main Product of FWITC

FWITC's business focus is on workers' skills development through short courses training. Courses that are competence-based, practically oriented and with lots of hands-on-skills training. Training services include the following type of trainings:

1. Regular short courses for workers' skills development.
2. Tailor-made short courses for craftsmen, sawdoctors and maintenance specialists.
3. Special thematical workshops for owners and managers.
4. Special seminars and congresses on current forestry and wood technology issues for decision makers, entrepreneurs and owners of the companies.

To market and advertise FWITC's short courses, workshops and seminars directed mass advertisement campaigns should be planned and implemented. Advertisement should include at least the following outlets and approaches:

1. Local and regional newspapers to publish annual FWITC course calendars and advertise individual short courses,
2. Local and regional radios to publish clips and advertisements,
3. FWITC's Facebook and Twitter to publish FWITC's annual course calendar and to advertise individual and special courses for special target groups,
4. PFP webpage for continuous advertisement and presentation of FWITC's annual training, course and seminar calendars,
5. Direct communication with forest industries, sawmills and forest owners should be done whenever known effective and training is directed to specific target groups,
6. PFP's resource people such as extension officers, leaders of villages, forest wards, and district and regional forest officers should be used for direct communication.

Regular advertisements should be done at PFP's and FWITC's web page, Facebook and Twitter to keep clients informed in continuous and regular basis. FWITC's marketing plan for training, short courses, workshops and seminars should be published immediately. FWITC's advertisement and marketing campaign should be planned and carried out immediately. FWITC's General Manager and Training Coordinator should plan and organize these in collaboration with PFP's Communication Expert.

When designing and developing FWITC's marketing and advertisement materials, brochures and course leaflets a Logo as a trade mark for FWITC should be designed and published to distinguish the centre from other training institutions and training products. When advertising training and short courses a direct advertisement to members of foresters' and sawmillers' association should also be used. Text messages and emails should be sent directly to members and offices of the associations who should be advised to further distribute all FWITC's advertisement materials to their members. More effective networks and partnerships with various associations should also be developed to attract more trainees.

3.2.2 Technical Advisory Services

Technical advisory services will be a special type of service that FWITC will offer for forestry and wood industry sectors. It can be technical assistance that will be provided to the companies to improve their production operations, sawing methods, productivity, mill lay-outs and general mill arrangements for higher performance.

Technical advisory services will be linked very closely to FWITC's training services, because by doing this the centre can support training and especially the industry and companies more effectively. This service can be provided either prior or after the training courses offered to the clients. Description of the business concept and the exact products with cost estimations and revenue collection are explained under the section 6.4.

3.2.3 Wood Products

FWITC's sawmill will produce sawn wood products for local markets. processes, capacity calculations and profitability are explained under the section 6.2. The products can be divided into following product groups:

- 1) Sawn timber for local markets. (Main product produced during T&P.)
- 2) Kiln dried sawn timber. (Small volumes produced for furniture makers.)
- 3) Treated sawn timber. (Small volumes from special request through training services.)

FWITC's Sawmill should prepare its marketing material to inform the potential customers on the products and prices. A leaflet to present information about the sawmill, its products and pricelists should be developed, printed and distributed to all potential customers. After distribution of the advertisement materials, customers should be visited by the Sales Manager for identification of the best and the most potential customers. Also, information on the most promising products should be identified.

Products from the sawmill would mostly be sawn timber for construction industry and scantlings for the furniture manufacturing industries. It is expected that the bulk of the product will be pine and eucalyptus species. 2,000m³ of pine and 2,000m³ of eucalyptus sawn timber is planned to be produced annually at the FWITC sawmill. Therefore, the planned total output capacity of the sawmill is 4,000m³ of rough sawn timber per annum. Dimensions of sawn timber to be produced will be the normal Tanzanian selection, which are:

- 25 mm Thickness (T) x 100mm, 150mm, 200 mm and 250mm (Width (W)) x 3,0 - 6,0 m (Length (L)).
- 50 mm (T) x 50 mm, 75mm, 100mm, and 150mm (W) x 3-6 m (L).

It is planned that sawn timber requirements of the local wood manufacturing industries would be satisfied first. However, export markets will be considered for finding better markets and higher prices for products produced. Pine and eucalyptus sawn timber will form the bulk of the products produced. The Value Chain Analysis of the PFP observed that until today eucalyptus sawn timber and final products are not very familiar within the construction industry or even for most of the furniture industries in Tanzania. Sawmilling industry in Tanzania does not value eucalyptus as a raw material for sawn timber production. (PFP 2016a, 48.) Eucalyptus, being valuable and good raw material for first-class furniture manufacturing FWITC should start introducing and marketing of eucalyptus sawn timber for local furniture manufactures to start selling eucalyptus sawn timber as a product of FWITC.

Contract Sawing Services

It is planned that FWITC's sawmill could also provide sawing services for its customers who bring their own raw materials for cutting. Concept of contract sawing with its benefits and cost structures are explained under the section 6.2.5.

3.2.4 Forest Tree Seedlings

Tree seedlings will be produced, marketed and sold to tree growers, farmers and plantation owners who are willing to establish forest plantations. Sale of seedlings to client game obviously to the product selection of FWIOTC because the centre established its own tree nursery where relatively big number of seedlings can be produced. Tree seedling production with capacity, expenditure and profitability calculations are explained under the section 6.3.

3.3 Clients

FWITC has many client groups that it approaches by marketing and selling of the products and services. For the BP purposes four different business substance groups were established. Established groups are 1) training and technical advisory services, 2) wood products 3) sawing services and 4) tree seedling provision under which the potential customers are listed as follows:

1. Training and Technical Advisory Services

1. Tree farmers,
2. Small and medium scale forest plantation owners,
3. Members of Timber Growers Association (TGA),
4. Large scale forest plantation and forest concession owners,
5. Logging and forest harvesting operators,
6. Haulage, transport and logistic operators operating in forestry and wood industries,
7. Micro, small and medium entrepreneurs in forestry and wood industries,
8. Micro, small and medium scale sawmills,
9. Large scale sawmills and forest industries,
10. Machine and tool manufacturers selling products for forest operators and industries,
11. Maintenance and service companies providing machine maintenance and services for forest and wood industry machines,
12. Service providers for training,
13. Individuals interested running business in forestry value chain.

2. Wood Products

1. Carpentry and joinery manufacturers,
2. Medium-size furniture and door manufacturers,
3. Tongue & Groove manufacturers,
4. Small-scale joinery manufacturers (using offcuts as raw material for their products),
5. Firewood users,
6. Middle men and sales agents selling sawn timber for local markets,
7. Individuals around the centre in Mafinga.

3. Sawing Services

1. Tree farmers,
2. Small and medium scale forest plantation owners,
3. Members of TGAs,
4. Large scale forest plantation owners
5. Forest concession owners,
6. Micro, small and medium scale enterprises operating in wood industries,
7. Individuals that own or buy their own logs for cutting.

4. Tree Seedlings

1. Tree farmers,
2. Small and medium scale forest plantation owners,
3. Members of TGAs
4. Owners of large scale forest plantation
5. Owners of forest concession,
6. Service providers in forest plantation establishment,
7. Entrepreneurs starting forest plantation establishment,
8. Investors investing for forest plantation establishment,
9. Individuals interested in forest plantation establishment.

3.4 Competitors and Competitive Advantage

FWITC's situation in terms of competition and competitive advantage is twofold. In forestry and wood technology training and technical advisory services there is not much competition and there are no competitors whereas in sawn timber and tree seedling productions there are many competitors and competition of markets and customers is tough.

In forestry and wood technology training there are only two training institutions that can compete with FWITC. These are FTI and FITI who are considered more about partners rather than competitors. PFP is rather co-operating and collaborating with FTI and FITI rather than competing.

PFPP's plan is that FTI and FITI should be engaged in FWITC's management, operations and training provision. PFPP and the MNRT assume that with this approach FWITC will operate more effectively to serve all customers from school leavers to experienced older untrained workers.

Currently the MNRT and the two institutions are deciding for a mutual solution to find a modality and institutional arrangements for registering FWITC as a legal entity under the MNRT and the two institutions. Management structure of FWITC and the organization chart of it are recommended in section 8.

Training services where FWITC will face competition is training directed to managers and owners of MSMEs. The fact is that management, business development and entrepreneurship topics are taught in many other training institutions. Also, short courses on Information Technologies and Occupational Safety and Health Administration (OSHA) are offered in several institutions. Therefore, FWITC should carefully analyse and consider whether it should offer these trainings or leave them for specialized institutions already offering them.

In production and wood processing operations FWITC will not have competitive advantages because there are many wood processors, sawmills and forestry operators that operate in these markets. Competition on sawn timber sales and wood products processing will be tough. Probably the only business opportunity for FWITC will be product development and innovations to create new products for new markets.

The competitive advantage of FWITC's sawmill can be based on the following:

- Easy access to raw material resources because it works under the supervision of the Forest and Beekeeping Division (FBD) and the MNRT who are closely co-operating with the TFS who allocates forest compartments for sawmillers and wood processors.
- Productive and easily maintainable machinery to produce high quality wood products. This can be advantage only if the lay-out of the sawmill and production flow of materials are developed. Logs and timber handling systems with conveyors and storage tables should be constructed to make material handling easier, faster and more productive.
- FWITC's sawmill personnel, including teachers and trainers, is trained well.

To succeed in the business and the competition FWITC must plan its strategy well by considering the market environment and products to be processed. The strategy should focus and concentrate on high standard training and technical advisory services which should then be supported with well-planned production operations and processing of innovative new forestry and wood products. The following section will describe FWITC's strategy for both training and processing of forestry and wood products.

3.5 Training Calendar and Advertising

An annual training prospectus and training calendar for different years of FWITC's short courses should be designed immediately. These should be distributed to all potential client companies, organizations and institutions operating in forestry and forest industries in Tanzania. Each short course and workshop that will be implemented should be introduced in this prospectus with minimum of the following information:

1. Name of the course, workshop or training event
2. Target group/s
3. Course or workshop objective/s
4. Participant's learning objective/s
5. Main topics and contents of the course / workshop
6. Venue of the course, workshop or training event
7. Duration of the course or workshop
8. Course or workshop fee per trainee or participant
9. Procedures and instruction for applying to the training events

4. THE BUSINESS IDEA

This section will introduce FWITC's vision & mission statements for FWITC's business in a long and short-term. The section will list products and services that will be produced as part of FWITC's training and business operations. The section outlines also potential customers for the business and describes the competitive advantages of the centre. Eventually the strategy for FWITC's business is defined.

While operating independently from the Tanzanian public service system the FWITC remains as a private company entity with a public body arrangement under the MNRT supervised by FBD and managed jointly by the FTI and the FITI. FWITC is responsible to a government's ministry (MNRT). FWITC is delivering a range of products and services for the national well-being. Therefore, it is important to remember that FWITC is not meant for a real profit-making unit but more about for provision of high quality products and services with a reasonable price.

4.1 Vision

FWITC's long term aim is to be a centre for all sorts of capacity building issues on forestry, forest industries and wood technologies in Tanzania. The main purpose of the centre is to train and educate people working along the forestry value chain from seedling production and forest plantation establishment to processing and sales of forestry and wood products to domestic customers. FWITC's vision is

***To be a "Centre of Excellency" for knowledge, information and training
on forestry, forest industries and wood technologies in Tanzania***

The vision in this context means capacity building of institutions, companies and people on forestry and wood technology issues, technology developments and on machines for forestry and wood processing. The vision means also gathering, organizing and sharing of knowledge and information on forest and wood raw materials and products as well as on standardization, quality requirements, grading and pricing of forestry and wood products. It also means development and creation of innovations for forestry and forest industry operations and wood processing with new marketable forest and wood products.

4.2 Mission

FWITC provides short courses training for workers on forestry, wood technology, entrepreneurship and business development topics. Also, it organizes workshops, seminars and discussion forums to owners and managers of MSME sawmills and enterprises operating in forestry and wood industries to familiarize them with the latest machine information and production technologies. FWITC's mission is

***To provide training and extension services with skills development
for forestry and wood industry workers
with emphases on farmers, TGA members and workers of MSMEs***

To accomplish its mission FWITC organizes demonstrations and trade fairs to provide the latest information on forestry and wood industry technologies. The centre facilitates also show rooms for companies to introduce new products and services for them. To achieve the mission FWITC also creates pilots and demonstrations for introducing business models in forestry and forest industries. These are used for training purposes to train people working in the sector.

To achieve its mission FWITC has also planned that various production operations will be started in the sawmill and plantation forest nursery to generate revenue for FWITC's development and maintenance of established facilities. When these operations are properly managed they can provide a practical evidence and examples on how small-scale forestry and wood processing businesses can be run profitably.

4.3 Business Strategy

The products and services that were introduced in the section 3.2 will be the base for FWITC's operations and strategy to produce them. The strategy focuses and responds to the defined markets on forestry training and workers' skills development in the Southern Highlands of Tanzania. The essential matter of the strategy is that FWITC only concentrates on one or two core products or services.

Regarding the above, forestry and wood technology training, skills development and technical advisory services is chosen as the core product and service of the centre. Training is the key business to be started either at the centre in Mafinga or in the field conditions. Technical advisory services should only come after the training has already taken place. By taking this approach continuous skills development and capacity building of companies and their operations can be best achieved.

Sawn timber production and tree seedlings growing are only the supporting operations for both better training operations and development of the centre. The strategy is deliberately chosen because there is a high demand and huge need for FWITC's type of training in forestry and wood technologies. Especially for workers level skills development through short courses and apprenticeship type of training. Sawn timber processing and selling of tree seedlings will support FWITC's training and development to be sustainable, because training only alone cannot fully sustain the centre and its development. In a long run the main determinants to monitor FWITC's success and the chosen strategy are the viability and sustainability of the centre.

Because training is the main product of the centre the supporting operations should be limited and carried out only when there are no ongoing training activities. Production operations, even on part time basis, are important from the capacity building and FWITC's own workers' experience point of view. During the production operations FWITC's operators, trainers and teachers can gain a lot of work experiences and operations of the machines, which skills and abilities can then be used when organizing training of workers from the industry. In a long run their well-developed work experiences will obviously improve the standard of FWITC's training, quality of products produced and eventually sustainability of the centre. The aim of production operations is also to create a real working environment and example for training purposes where a realistic production example with success and challenges can be shown.

The scale and scope of FWITC's production operations will finally be approved by the Board of FWITC that will be done from the proposal given by the management team of the centre. The outputs and recommendations of this BP will provide tools for the proposals and decision-making.

This BP will be a guideline and a tool for the management of FWITC. It helps the management to plan, define and allocate resources and facilities for both training and production. It will also assist the management to begin preparation of operational plans for the agreed operations which that should be put into practice immediately after planning and implementing the training activities. Weight on operational planning should be given for planning and implementation of training and technical advisory services.

5. INVESTMENT COST CALCULATIONS

Investment cost calculations are based on the PFP's and Indufor's accounting and bookkeeping systems from where the costs of machines and investments were collected. Some of the investments are still being continued and procurement of more machines, tools and material handling equipment such as tractors, front-end loaders and conveyers are still to be made. These items were estimated for the calculations.

The investment costs were allocated between training and production with a share of 70% for sawmill operations and 30% for training activities. The sawdoctoring facility is part of the sawmill investment. All the machines procured to the sawmill were included to calculations because they either are used for production or training, in many cases for both. For example, the high-

pressure kiln dryer is not much used for production, but it will be used for training, demonstrations and technical advisor services.

Investment costs and therefore annual depreciation is higher in the sawmill operations. This is because the use of the sawmill machinery in training was considered as internal lease from the sawmill cost centre to training business department. Time and use of the machinery and FWITC's facilities for training in forestry and sawmilling were estimated in costing of the short courses and training. These are shown under the individual short course expenditure breakdown and expenditure summary of the FWITC's Training Plan. Costs for the training department and revenue to the sawmill cost centre were considered in the sawmill annual budget prepared and profitability calculations made for the sawmill. Total revenue per annum calculated from the training department and accounted to the sawmill is TZS 28,405,000

Forest tree nursery investment and the its depreciation cost were calculated independently under the tree seedlings production. Otherwise, common investments as shown in the investment accounts and investment centres were divided between the training and sawmill operations based on the percentages given above.

The need for working capital was not evaluated and was not included in the calculations. The annual budget of the sawmill for the period of 7/2018-6/2019 shows the cash balance in the beginning and at the end of the month from which the required financing could be estimated. A separate cash flow plan for the same period was also produced for the sawmill operations.

5.1 Classification of Investment Costs

The mill has been classified into cost centres /departments according to its process department to make sure that accuracy of the investment estimate is in harmony with the aims of the FWITC project. The main cost centres or departments of the centre can be listed as follows:

1. Wood handling
2. Sawmill
3. Power and water
4. Utilities
5. Mill site
6. Forest nursery
7. Forest tools
8. Other sawmill investments
9. Temporary facilities
10. Temporary services
11. Indirect costs

The cost centres or departments were broken down into accounts that were used to classify and verify expenditures of the investment. The seven accounts under each investment cost centre are as follows:

- 1.1. Common costs
- 1.2. Civil works
- 1.3. Machinery
- 1.4. Piping
- 1.5. Electricity / power
- 1.6. Spare parts
- 1.7. Personnel / training

5.2 Investment Accounts

This section describes what investment expenditures and costs were included to each of the seven accounts created for the investment calculations. The section also describes any other common accounting features related to investments and accounting of the expenditures.

Common costs

Common costs account includes costs related to temporary facilities, temporary services and indirect costs that occurred during the renovations, establishment and construction of the centre. As a rule of thumb any “common costs” of the cost centres or departments that could not have been directly designated to any other investment account were accounted to common costs account.

Temporary facilities and services cover services and facilities during the renovations, constructions and establishment such as electricity, water, transport, storage, site cleaning, guards and temporary roads. Indirect costs include also costs of engineering. Mill contingencies cover minor technical alterations done during the construction works but does not include the cost of inflation.

Civil works

Civil works account covers costs of earthworks, buildings, equipment and tools for civil works, foundations, and the construction works for ventilations and water supply to the buildings.

Machinery

Machinery account includes the CIF price of the machinery, as well as the costs of internal freight and handling in Tanzania to the sawmill site at FWITC in Mafinga. Import tax (27%) and Value Added Tax (VAT) (18%) on the machinery were included to this account. Also, machinery assembling, and installations works were included to machinery account.

Piping

Piping costs to cover costs of water pipes and their installation for the process and auxiliary systems were included to this account.

Electricity / Power

Electricity / Power account covers costs of electrical and process control equipment installations and costs for installation of machinery and equipment.

Spare parts

Spare parts account covers costs of spare parts for machinery, piping, electrical equipment and process control. However, at this stage of the investment spares have not yet been procured and therefore not accounted.

Personnel Training

Costs of personnel training covers the external training offered for FWITC’s staff and costs of external experts that have been hired for training to be carried out at FWITC.

Table 5.1 Depreciation periods used in investment calculations

| Investment | Years |
|---|--------------|
| 1. Wood handling | 20 |
| 2. Sawmill including machinery and vehicles | 15 |
| 3. Power and water | 5 |
| 4. Utilities | 3 |
| 5. Mill site | 10 |
| 6. Forest nursery | 5 |
| 7. Forest tools | 10 |
| 8. Other sawmill investments | 10 |
| 9. Temporary facilities | 10 |

Table 5.2 Investment and depreciation calculations for FWITC establishment

| INVESTMENT AND DEPRECIATION CALCULATIONS FOR FWITC ESTABLISHMENT | | | | | | | | | | | |
|---|----------------|----------------------|------------------------------|-----------------------------------|------------------------------------|-----------------------------------|---|--|--|--|--|
| INVESTMENTS | EURO | TZS | YEARS OF DEPRECIATION | Depreciation TOTAL (TZS)/a | Depreciation TOTAL (TZS)/m3 | SHARE from full production | Depreciation TOTAL sawmill (TZS)/a (70%) | Depreciation TOTAL sawmill (TZS)/m3 (70%) | Depreciation TOTAL training (TZS)/a (30%) | Depreciation TOTAL sawmill (TZS)/m3 (30%) | |
| Woodhandling | 0 | 0 | 20 | 0 | 0 | 0,0 % | 0 | 0 | 0 | 0 | |
| Sawmill | 493 723 | 1 278 742 394 | 15 | 85 249 493 | 21 312 | 66,4 % | 59 674 645 | 14 919 | 25 574 848 | 6 394 | |
| Power and water | 36 618 | 94 840 484 | 5 | 18 968 097 | 4 742 | 14,8 % | 13 277 668 | 3 319 | 5 690 429 | 1 423 | |
| Utilities | 0 | 0 | 3 | 0 | 0 | 0,0 % | 0 | 0 | 0 | 0 | |
| Mill site | 2 882 | 7 464 380 | 10 | 746 438 | 187 | 0,6 % | 522 507 | 131 | 223 931 | 56 | |
| Forest tools | 24 545,45 | 63 572 716 | 5 | 12 714 543 | 3 179 | 9,9 % | 8 900 180 | 2 225 | 3 814 363 | 954 | |
| Other sawmill investments | 17 581 | 45 533 557 | 10 | 4 553 356 | 1 138 | 3,5 % | 3 187 349 | 797 | 1 366 007 | 342 | |
| Temporary facilities | 0 | 0 | 10 | 0 | 0 | 0,0 % | 0 | 0 | 0 | 0 | |
| Temporary services | 0 | 0 | 10 | 0 | 0 | 0,0 % | 0 | 0 | 0 | 0 | |
| Indirect costs | 0 | 0 | 1 | 0 | 0 | 0,0 % | 0 | 0 | 0 | 0 | |
| Interest (5% from total depreciation) | 0 | 0 | | 6 111 596 | 1 528 | 4,8 % | 4 278 117 | 1 070 | 1 833 479 | 458 | |
| INVESTMENTS TOTAL | 575 349 | 1 490 153 530 | | 128 343 523 | | 100 % | 89 840 466 | | 38 503 057 | | |

| | | 1 EURO | 2 590 TZS | INVESTMENT ACCOUNTS | | | | | | | TOTAL |
|--|-------------------------|------------------------|----------------------|----------------------------|-------------------------------|------------------------|---------------------------------|------------------------|----------|----------------|--------------|
| INVESTMENT COSTS OF FWITC BY COST CENTRES / DEPARTMENTS | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY/ POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | WORKING CAPITAL | | | |
| 1 Woodhandling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2 Sawmill | 0 | 27 628 | 466 095 | 0 | 0 | 0 | 0 | 0 | 0 | 493 723 | |
| 3 Power and water | 0 | 0 | 1 629 | 34 019 | 970 | 0 | 0 | 0 | 0 | 36 618 | |
| 4 Utilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 5 Mill site | 0 | 0 | 0 | 2 882 | 0 | 0 | 0 | 0 | 0 | 2 882 | |
| 6 Forest nursery | 40 500 | 5 594 | 5 195 | 0 | 0 | 0 | 1 375 | 0 | 0 | 52 664 | |
| 7 Forest tools | 0 | 0 | 24 545 | 0 | 0 | 0 | 0 | 0 | 0 | 24 545 | |
| 8 Other sawmill investments | 0 | 0 | 17 581 | 0 | 0 | 0 | 0 | 0 | 0 | 17 581 | |
| 9 Temporary facilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 10 Temporary services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 11 Indirect costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| TOTAL INVESTMENT COSTS | 40 500 | 33 222 | 515 045 | 36 901 | 970 | 0 | 1 375 | 0 | 0 | 628 013 | |

NOTE: Investment cost / cost centre "6 Forest nursery" was deducted from the "main depreciation calculation" above because the depreciation of the nursery was handled under the Forest Nursery

5.3 Summary of Investment Costs and Depreciation Charges

Investment costs for the sawmill, forest nursery and training facilities are based on the real expenditures obtained from the PFP's project accounts and information received from Ministry for Foreign Affairs of Finland (MFA) and Indufor Ltd. Some of the investments that were not procured but are needed for the operations are estimated from the quotations obtained for PFP to procure machines, tools and equipment for FWITC. The depreciation periods used for various items and investments in the investment calculations are shown in Table 5.1.

The total investment of the FWITC is EURO 628,013 and TZS 1,626,553,451 from which EURO 575,349 equalling to TZS 1,490,153,530 is the investment for the training, technical advisory services and sawmill operations. The remaining EURO 52,664 and TZS 136,399,921 is the investment for the forest tree nursery operations. The investment for the FWITC project does not include working capital estimations nor their calculations.

Summary and breakdown of the sawmill and training investment costs and depreciation calculations are shown in Table 5.2. Forest tree nursery investment costs and depreciation charges are shown in table 7.11. Details of all cost accounts and cost centres are shown in the annex 2.

The depreciation charges are presented in detail in Table 5.2. Annual depreciation is divided between training and sawmill production so that 70% of the depreciation was charged for the sawmill operations and 30% for the training activities. Depreciation of forest nursery operations was calculated separately and was charged 100% from the nursery operations. Annual depreciation from the sawmill machines through the sawn timber production operations is TZS 89,840,466 and through the training activities TZS 38,503,057. Depreciation for the forest tree nursery operations is TZS 17,841,163 respectively.

The share of depreciations was estimated in line with the operations planned and estimated. These figures can be changed whenever required and if the estimation of operations or plans of the operations will change.

6. OPERATIONS AND PROFITABILITY CALCULATIONS

FWITC's business strategy defines that the core business of the centre is training and technical advisory services. These are supported with business operations that are production of wood products and forest tree seedlings. All operations are described under this section.

FWITC's business units and their operations are explained in this section. The descriptions are followed by the profitability calculations immediately under the same section. Targets, production outputs and capacities for each department are shown as they were planned for this business plan. The profit calculations are analysed and explained to show revenues collected, expenditures occurring, and operating margins obtained for each business line separately. After the 30% tax deduction the net profit was calculated and explained for four years of operations.

In the expenditure calculations both variable and fixed costs were calculated. The investment costs were calculated to find out the depreciation costs for the profitability calculations. Basis for investment calculations are shown in Table 5.1 whereas the investment costs and depreciations are summarized and shown in Table 5.2. All the sub-sections of different business departments follow the structure that will be introduced in the section 6.1 of the Training Services.

6.1 Training Services

FWITC's training services are explained and described deeply in the Training Plan of FWITC that was prepared in 2017 and 2018. This paper highlights only the main training activities and outputs of training to form a base for expenditure and profitability calculations.

Short courses training

Normally the duration of FWITC's short courses will be from 1 to 10 days depending on topics,

objectives and contents of the course. Workers' short courses are planned for 3 to 10 days while courses for owners, managers and supervisors will last only for 2 to 5 days. Daily programme of a course consists normally 7 x 45-minute sessions. Some short courses will be implemented more than once a year. Table 6.1 shows FWITC's Training Plan and number of trainees for year 2018 with description of type of courses to be implemented.

Projected number of trainees for 2018 is 1480 trainees. If this is reached FWITC will reach 6455 trainee days in 2018. Details of the short courses with individual training outputs can be found from the annex 2, 4, 6 and 8 of the FWITC's Training Plan for 2018.

Table 6.1 Training Plan proposed for 2018

| TRAINING PLAN 2018 (Proposed for 2018) | | |
|---|---|-------------------------------|
| In total 47 different type of short courses is planned for training year 2018 | | |
| TYPE OF SHORT COURSES / WORKSHOPS | Number of different type short courses | Short courses in total |
| General courses | 5 | 15 |
| Entrepreneurship and business development | 7 | 14 |
| Forestry workers' skills development | 14 | 34 |
| Wood technology | 21 | 35 |
| SHORT COURSES TOTAL | 47 | 98 |
| Number of trainees with 100% implementation | 1 480 | |
| Trainee days planned for 2018 | 6 455 | |

Workshops and seminars

In 2018 FWITC has also planned to organize 4 special thematic seminars which will be organized for about 30-50 participants. Durations of the seminars will be 1-3 days. Details of them can be found from the FWITC Training Plan for 2018.

Seminars are special events that are planned and organized apart from the regular short courses. When this business plan was prepared there was no confirmation about organizing these seminars and therefore they were not included to any expenditure and profit calculations. Below is the recommendation given for organizing and financing of these type of events.

Recommendation 1 Seminars and workshops of FWITC

It is recommended that for time being the special workshops and seminars should be financed and organized by the PFP programme through the donor financing. This is because most of the thematic seminars and workshops focus on wider scope of forestry and policy issues and therefore their planning and scheduling for regular training programmes is rather difficult. If these become regular annual events they can be added to FWITC's business plan when revisions and updates are being made.

6.1.1 Course Fees and Costing of Training

It is planned that FWITC's training courses are offered on fee-bases so that costs are covered from the course fees paid by the trainees or their parent companies. However, there are already cases that donor organizations or external financiers will pay costs for their workers or project beneficiaries. For example, PFP will subsidize forestry courses that are directed to members of the TGAs, farmers and their family members with low incomes.

When FWITC's Training Plan was prepared it was planned that all short courses will be offered to everyone with a modest fee. Short courses were designed so that there are different fee levels depending on target groups and financial capacity of the trainee. Course fees and costs summaries of the courses can be found from the annex 1, 3, 5, 7 and 9 of the FWITC's Training

Plan for 2018. Annex 10 of the training plan shows the unit costs used for calculating the course costs for various short courses.

Table 6.2 shows an example for a calculation of FWITC's short course costs and fee per trainee. It shows the structure and flow of the Excel worksheet called "Costs summary FWITC courses".

When costing the courses, the expenditures were distributed to seven different cost centres that were lecturing, lodging, meals & refreshments, use of classrooms / workshops / training facilities, training materials and consumables, transport and administration. Each cost centre had several cost items.

Table 6.2 Calculation of costs for short courses and a fee for a trainee

| ITEM | | SPECIFICATION OF COST / ITEM | Costs (Tshs) |
|--|---|---|------------------|
| COST PER COST CENTER / COURSE (cost calculated for 1 course) | | LECTURING COSTS | 1 047 917 |
| | | LODGING | 0 |
| | | MEALS & REFRESHMENT | 0 |
| | | USE OF CLASSROOM / WORKSHOP / TRAINING FACILITIES | 375 000 |
| | | TRAINING MATERAILS AND CONSUMABLES | 297 500 |
| | | TRANSPORT COSTS | 80 000 |
| | | ADMINISTRATION | 1 023 395 |
| TOTAL COSTS OF COURSE (calculated only for 1 course) | A | TOTAL COST (total from cost centers above) | 2 823 812 |
| | B | OVERHEADS (15% from A) | 423 572 |
| | C | TOTAL COST WITH OVERHEADS (A + B) | 3 247 383 |
| | D | DEVELOPMENT FUND FWITC (20% from C) | 649 477 |
| | E | TOTAL COST WITH OVERHEAD AND PROFIT (C + D) | 3 896 860 |
| | | NUMBER OF COURSES PER YEAR | 1 |
| | | TOTAL COSTS OF ALL COURSES / TOPIC (2018) | 3 896 860 |
| | | FWITC PROFIT FROM ALL COURSES / TOPIC (2018) | 649 477 |
| F | | NUMBER OF TRAINEES / COURSE | 15 |
| G | | COURSE FEE PER TRAINEE | 259 791 |
| H | | DURATION OF THE COURSE | 3 |
| I | | TRAINING COST PER DAY / TRAINEE | 86 597 |
| Subsides received | J | PFP SUBSIDY (% OF TOTAL COURSE FEE PER TRAINEE WITH FWITC DEV FUND (D)) | 0 |
| | K | OTHER SUBSIDIES FOR TRAINING | 0 |
| L | | FINAL COURSE FEE TO BE PAID BY PARTICIPANT | 259 791 |
| | | FINAL COURSE FEE TO BE PAID BY PARTICIPANT (rounded) | 260 000 |

Example is from the short course on Quality Requirements, Value and Utilization of Raw Material

6.1.2 Profit Calculations

FWITC's Training department is planned to be one business unit and a cost centre of FWITC. The department prepares its own annual budgets as part of FWITC's annual budgeting procedure. To follow up training expenditures and revenues collected the department maintains its own expenditure and income accounts, which is part of FWITC's bookkeeping.

Table 6.3 shows the profit calculation of FWITC's training services. The base for the calculation is FWITC's Training Plan that was prepared in November 2017 and February 2018.

In the profitability calculation a projection for year 2, 3 and 4 were made with an assumption that sales of training services would be increased by 15% for 2nd year of operations, 30% for 3rd year and 40% for 4th year of operations respectively. It was assumed that expenditures and tax will grow linearly with the revenue increase. In this case already the 2nd year would change the net profit to positive and the 4th year of 40% increment would keep the training services positive, although the profit would not be big.

In 2018 the total expenditures of FWITC's training services amounts to TZS 187,876,476 from which the variable costs are TZS 44,755,800 amounting to 23,8% of total the expenditures and the fixed costs TZS 143,120,676 amounting to 76,2% of the total expenditures respectively. If it is considered that all courses are implemented the total revenue collected would amount to TZS 225,451,771 making a profit margin of TZS of 37,575,295, which can be considered reasonable.

When the depreciation deduction shown in Table 5.2 amounting to TZS 38,503,057 (23,7% of FWITC's total depreciation cost/annum and about 30% of sawmill's annual depreciation), is considered with a tax deduction of 30% the profit of the 1st operational year will be negative with

an amount of TZS 649,433. From this it can be concluded that profitability of FWITC's training services is not very promising because this shows that most of the courses should be implemented with full number of students to make profit.

Remark 1 Improvement of profit in training services

If the net profit of the training services would like to be improved something should be done to decrease the fixed costs of training. High expenditures in the fixed costs are the costs of administration and use of FWITC's training facilities. Use of facilities was estimated in terms of time spent at the classrooms and other training facilities so if this cost could be reduced it may reduce the fix costs of training resulting also reduce of course fees to be paid by the trainees, which indeed would bring more trainees to the courses.

Table 6.3 Profit calculation for training activities

| | YEAR 1 | YEAR 2 15% increase for year 1 | YEAR 3 30% increase for year 1 | YEAR 4 40% increase for year 1 | |
|--------------------------------|--------------------|--------------------------------------|--------------------------------------|--------------------------------------|----------------|
| SALES / REVENUE | | | | | |
| Training | 225 451 771 | 259 269 537 | 293 087 303 | 315 632 480 | |
| SALES TOTAL | 225 451 771 | 259 269 537 | 293 087 303 | 315 632 480 | |
| EXPENDITURES | | | | | |
| VARIABLE COSTS (%) | | | | | |
| Training | 44 755 800 | 51 469 170 | 58 182 540 | 62 658 120 | |
| VARIABLE COSTS TOTAL | 44 755 800 | 51 469 170 | 58 182 540 | 62 658 120 | 23,8 % |
| FIXED COSTS | | | | | |
| Training | 143 120 676 | 164 588 778 | 186 056 879 | 200 368 947 | |
| FIXED COSTS TOTAL | 143 120 676 | 164 588 778 | 186 056 879 | 200 368 947 | 76,2 % |
| EXPENDITURES TOTAL | 187 876 476 | 216 057 948 | 244 239 419 | 263 027 067 | 100,0 % |
| OPERATING MARGIN | 37 575 295 | 43 211 590 | 48 847 884 | 52 605 413 | |
| Share of operating marging (%) | 16,7 % | 16,7 % | 16,7 % | 16,7 % | |
| DEPRECIATION | | | | | |
| Training | 38 503 057 | 38 503 057 | 38 503 057 | 38 503 057 | |
| DEPRECIATION TOTAL | 38 503 057 | 38 503 057 | 38 503 057 | 38 503 057 | |
| PROFIT BEFORE TAX | -927 762 | 4 708 533 | 10 344 827 | 14 102 356 | |
| TAX (30%) | -278 328 | 1 412 560 | 3 103 448 | 4 230 707 | |
| PROFIT AFTER TAX | -649 433 | 3 295 973 | 7 241 379 | 9 871 650 | |
| DIVIDEND | 0 | 0 | 0 | 0 | |
| NET PROFIT | -649 433 | 3 295 973 | 7 241 379 | 9 871 650 | |

The breakeven analysis for the courses was carried out. In these calculations the depreciation deductions and the tax payments (30%) were not considered at all. The analysis indicated that, if depreciation costs and taxes are not considered, the courses can be implemented with 20-30% smaller groups and number of trainees and still the breakeven point would be reached. It seems that the depreciation and tax deductions will destroy the profitability of the training services. If a solution could be found for this, it would help profitability of the training services and sustainability of the centre in a long-term perspective.

Currently short courses at FWITC are planned so that trainees pay their training unless having other arrangements with external financiers. Course fees per course are varying from TZS 50,000 up to TZS 490,000 depending from the length, number of participants, and contents of the course. The average course fee of the different type of short courses is about TZS 190,000, which gives an average cost of TZS 45,000 per day. This are rather reasonable costs for a course that lasts for an average of 4,2 days.

Already now, when only few courses have been arranged there is a feedback that course fees are too high, and many trainees cannot afford paying the high fees. The fact is that PFP's phase I is ending in the end of 2018. Therefore, not much can be done to find good sources of funding. The only solution to fill up the courses would be PFP's support and financing.

Recommendation 2 Cutting down the depreciation and tax payments

Because of poor profitability of training services when depreciations and taxes are calculated it is recommended that this issue is raised up in the PFP's Supervisory Board and Steering Committee to discuss whether these expenditures could be covered from donor or Tanzanian government sources. Often in donor funded projects these costs are not counted but are considered and accounted as in kind.

6.2 Sawmill and Wood Processing Operations

The mission of FWITC is to provide forestry and wood technology training, skills development and technical advisory services for its clients in Tanzania. However, if FWITC facilities are well managed the centre can also offer other valuable services and products to its clients. For example, wood processing operations. In that case the sawmill would be a practical evidence and good demonstration on viable small-scale sawmill operations and business. It can be a pilot and an example on how to utilise plantation forest raw materials efficiently and how to make sawmilling business profitable and productive in Tanzania. This is the best future scenario of FWITC's sawmill because at the same time it can also assist in developing the centre for better performance and it can sustain its operations and existence.

For sawmilling and wood processing operations two options are proposed. First option is that operations are organized through normal Tanzanian sawmilling system where all the operations from forest harvesting to sale of final products are done by the centre. Second option is that only production operations are organized through a contract sawing arrangement in which only cutting of logs are done by the centre whereas all other operations are bought from the service providers. In this option raw material for sawing operations is brought by the clients who collect sawn timber and the by-products produced. The centre charges only the sawing services and if the client does not want to take the by-products the centre will arrange further processing of these for value-added wood products such as charcoal and briquetted charcoal.

When considering FWITC's mission the sawmill should not only offer training services, but it should be deployed for production operations for generating extra income for FWITC's development and for the sustainability of the centre. To do these the sawmill should start cutting sawn timber in line with this business plan and proposed production plan and budget prepared for the financial year 7/2018-6/2019. The management of FWITC should consider the two production options proposed. If the 1st option is selected the raw material could be procured from the Tanzanian Forest Service's (TFS) forest plantations in Sao Hill.

6.2.1 Production Plan and Basis for Calculations

Breakdown of 1 m³ of raw material into products and recovery rates in percentage (%) were studied and agreed with the management of FWITC. As a result of this, the business plan proposes that the FWITC's sawmill will produce annually about 4,000m³ of sawn timber (output). About 2,550 m³ of this will be pine and 1,450 m³ eucalyptus. Table 6.4 shows the targeted production volumes with projected recovery rates for a 1m³ of raw material / saw logs. Table 6.4 specifies also volumes of logs needed for the planned production output. It also shows the volumes and m³ of by-products produced from a 1m³ of raw material and the planned input volumes in total.

The capacity of 4,000m³ of sawn timber can only be reached if the production facilities, sawmill machinery lay-out and handling of materials at the sawmill are properly set. Currently the sawmill does not meet all these requirements and therefore cannot produce the expected output capacity. More investments are required, which will be elaborated later in this section when operations are described.

Besides the core business of producing sawn timber, the sawmill, and especially FWITC as the demonstration centre, will innovate and create new products that are charcoal and briquettes. These will be manufactured from the by-products of the sawmilling process such as slabs, off cuts and sawdust, which will be used for compressing briquettes after carbonizing the sawdust. All the products will be sold to local markets in Tanzania.

Table 6.4 Recovery rates and product distributions for 1m3 of raw material

| Expected distribution of wood products and by-products from FWITC's sawmill | | | | | | | |
|---|--|-------------------------|--|---------------------------------------|----------------------------------|---|---|
| Product | Spieces /recovery / total volume / annum | | | | | | |
| | Recovery % (1 m3 of pine) | Recovery Pine (1 m3) | Volume of pine logs total / annum (m3) | Recovery % (1 m3 of eucalyptus) | Recovery Eucalyptus (1 m3) | Volume of eucalyptus logs total / annum (m3) | Total volume produced /annum (m3) |
| Logs (m3) | | 1,0 | 5313 | | 1,0 | 3021 | 8333 |
| Recovery rate (%) | 48 % | | | 48 % | | | 0 |
| Sawn timber (m3) | | 0,48 | 2550 | | 0,48 | 1450 | 4000 |
| Slabs (m3) | 19 % | 0,19 | 1009 | 19 % | 0,19 | 574 | 1583 |
| Sawdust (m3) | 13 % | 0,13 | 691 | 13 % | 0,13 | 393 | 1083 |
| Off cuts (m3) | 11 % | 0,11 | 584 | 11 % | 0,11 | 332 | 917 |
| Bark | 3 % | 0,03 | 159 | 3 % | 0,03 | 91 | 250 |
| Shrinkage | 6 % | 0,06 | 319 | 6 % | 0,06 | 181 | 500 |
| Total products (m3) | 100 % | 1,0 | 5313 | 100 % | 1,0 | 3021 | 8333 |

The production plan and budget for the year 2018-2019 was developed as part of this business plan development. This document is shown in annex 3 where the projected monthly and annual raw material requirements, sawn timber volumes, by-product volumes, and logging and harvesting volume requirements are indicated. The same document presents also an annual sales budget, and manufacturing and capital costs. Depreciations, and variable and fixed costs were calculated when the manufacturing costs were computed to find out operating margins for the operations. Finally, monthly net profits and annual net profit were computed with a cash balance for monthly and annual basis.

A separate cash flow plan was also developed for the sawmill operations showing revenue collected and expenditures occurring in monthly and annual bases. This document can be found from the annex

Capacities of FWITC's main sawmill machines were studied with the staff of the centre. Power consumption estimation for each machine were listed and total power consumption of the sawmill calculated. Sawmill's power consumption calculations are shown in annex 6.

Already at this stage of the business plan development it was discussed with the FWITC management that in normal production circumstances the machines are often the bottle-necks in the production processes. If not, the production processes and flow of materials at the mill or layout of the factory and set-up of the machines, or lack of proper conveyors and tables could be the causes for bottle-necks, inefficiency and low outputs of production. Very often the bottle-neck in the sawing line is one of the main sawing machines. The bottle-neck could also be cross cutting and green sorting of sawn timber as well as handling of final products and raw materials.

Table 6.5 Working time calculations for sawmill production

| Specification | (%) | hours |
|--|-------------|------------|
| Theoretical working hours / day | | 9 |
| Breaks hours / day (tea times) | | 0,5 |
| Theoretical working hours / day | | 8,5 |
| Theoretical working hours / annum (220 days/a) | 100 % | 1870 |
| Planned working hours for 1st operational year/ annum | 40 % | 748 |
| Working hours for 2nd operational year/ annum | 60 % | 1122 |
| Working hours for 3rd operational year/ annum | 80 % | 1496 |
| Training time during the 1st operational year (60% from maximum working hours / annum) | 60 % | 1122 |

The daily and annual working times in table 6.5 are proposed for the sawmill production operations. It is proposed that sawmill production operations will be started with 40% production from the full 4,000m3 output capacity. If higher than 40% capacity would like to be achieved it will obviously require more than 748 hours / annum, and that will apparently facilitate also higher annual output for the 1st operational year than planned and proposed in this business plan.

Working time calculation is shown in table 6.5. It was calculated that 748 working hours per annum will be the effective working time of the sawmill. This is said because normally the sawmills operating time factor is 60% from the total working hours due to machine breakdowns and maintenance and service of the machines. This gives a working time of 306 minutes/day, if 8,5h/day are worked.

Capacity of the sawmill is based on the following circular sawmill machine capacity calculation: In-feed speed of the circular saw line for small logs was estimated to be 4,0m/min. Average volume of the log is expected to be 0,100m³ with an average length of 4,6m and sawing distance between the logs 0.2 m when sawing machines are running. This is based on the fact that the theoretical maximum feeding speed of the circular breakdown saw is 10,0m/min.

$$= \frac{306\text{min} \times 4.0\text{m}/\text{min} \times 220\text{d} \times 0.100\text{m}^3 \times 0.40\%}{4.6\text{m} + 0.2\text{m}}$$

Theoretical output (capacity) of the circular sawmill line in one shift operation will be about 2,224m³/annum, when the recovery rate of the sawmill is estimated for 40%. If the recovery rate is raised up to 48% the capacity could be about 2,692m³/annum. With these considerations it was agreed that FWITC's sawmill capacity for an annum will be set to 2,000m³ to begin the operation. The output of the band saw line is set also to 2,000 m³ giving an input of 4,166m³/annum when sawing pine.

Daily, monthly and annual production targets for both harvesting and sawmill are shown in the production plan and budget prepared for 7/2018-6/2019, which is shown in annex 3. Also, number of estimated working days for a month and year are specified in the production plan.

Before starting the sawmill, operations there is a need to examine FWITC's internal log and timber yard transportation systems to make sure that moving logs to the sawmill and handling of all produced materials will be efficient and well organized. If the planned volume of logs and products will be handled there is a need to invest for a fork lift or front-end loader with forks and shovel. Extra investments are proposed in Recommendation 17.

6.2.2 Operations of the Sawmill

Sawmill production operations are planned so that sawn timber is produced with both the small log circular saw line and with the band saw line. Most of the sawn timber produced will be air dried in the timber yard. Only from special request and with special price some sawn timber can be kiln dried. This service will be provided specifically for furniture makers buying timber from the centre.

Recommendation 3 Sawn timber dimensions to be produced

It is highly recommended that FWITC starts marketing and selling of wide variety of sawn timber dimensions meaning that normal distribution of sawn timber dimensions normally produced in Tanzanian sawmills should be increased a lot. This means also that new markets for new dimensions, that are not normally produced in Tanzania, should be found. By doing this FWITC could improve recovery rate of the sawmill as an example and it could create another an example for proper sawmill operations.

Chemicals

The sawmill will work with pine and eucalyptus sawn timber. Treatment is required for certain pine wood products to protect wood from fungi and insects' attacks. Therefore, preservative chemicals will be used for treatment of the pine sawn timber. In this case safety precautions must be taken care, and appropriate treatment facilities established with provision of personal safety gears for all workers possibly under the influenced.

Energy Consumption

The installed power of the sawmill will be 175 kW, the largest motors being the 62 kW and 57kW motor of the small log line circular saw machines. Energy consumption per cubic metre of sawn timber produced will be about 32,7 kWh. When the sawmill is operating at 40% capacity during the 1st year operations, the annual energy consumption will be about 130,7 MWh.

It has been noted that only the two circular saw machines for small logs will consume about 68% of the sawmill's total power consumption when machines are used. Therefore, it is recommended that serious monitoring and follow-up will be made on efficiency and productivity of these two machines in order to find out their cost effectiveness and profitability, and whether these machines should be used for production or only for training and demonstration purposes.

Fresh water

The sawmill will be connected to the internal water supply that comes from the centre's own bore hole. To the sawmill area reserve tanks of 2 x 5000 litres should be procured to secure appropriate water supply. It is estimated that about 10m³ of clean water per 24 hrs /day and 2,100 m³/a will be used.

Water treatment

A septic tank system should be built for waste water coming from the sawmill, especially from the treatment tank and area.

Transport

Internal transport and handling system and means for transport of raw materials (logs), sawn timber and by-products (slabs, offcuts and sawdust) should be established to facilitate fluent material flow. An extra investment is required to establish efficient internal transport means. This investment was already estimated in the investment calculations in the form of a heavy-duty farm tractor for harvesting and logging operations and a front-end-loader with forks and shovel for raw material and products handling at the sawmill.

Logs will be hauled from the forest plantations to the sawmill probably with a 7-tonne truck, which has not been considered in any of the investment calculations. It is expected that transport of finished products will be done by the clients purchasing sawn timber.

Recommendation 4 Log and raw material transport

Considering the investments, workforce involved, volume of work involved and expenditures occurring in forest harvesting operations and transportation of saw logs it is recommended that FWITC considers an option of buying these services from the service providers, who should have a full responsibility of operations until the gate of the sawmill, including costs of the operations. This decision would save a lot of money and would make business easier in terms of supervision and implementation. A simple rule of thumb in business is that **"CONCENTRATE ONLY ON YOUR KEY BUSINESS"** to be efficient and profitable.

6.2.3 Raw Material Supply

Volumes of raw material to be procured, harvested and transported are shown in the annual production plan and budget for 7/2018-6/2019. Figures are shown in annex 3. Volumes are given for monthly and annual basis to prepare a procurement plan. To secure a steady raw material supply a procurement plan should be prepared for the sawmill.

The raw material to be procured and produced includes both pine and eucalyptus that will be purchased and procured mainly from the TFS's Sao Hill forest plantations. An annual and monthly procurement plans and requests should be developed and directed to TFS.

It is recommended that FWITC, as subordinate of the MNRT, FBD and TFS, requests directly a five-year allocation to secure stable raw material supply for the expected Phase II period of the PFP. Compartment should be requested close to FWITC in Mafinga to minimize transport expenses and time spent for raw material procurement.

Stumpage prices for raw materials and costs for logging and transport of raw material are indicated in the annual production plan and budget shown in annex 3. Stumpage price for pine and eucalyptus includes also other fees for payable on services related to forest products, which is calculated for total volume of raw material procured. These fees include item 2) Application for Harvesting trees in plantations, and item 3) Transit pass application fees, item 5) fees for registration of produce dealers and traders for each site per year which include a) trees, c) timber yard, d) logs, h) sawmill capacity of up to 5,001-10,000m³ per year, item 6) Forest road service fee in terms of capacity of the vehicle, and item 7) c) Silviculture fee per m³ of softwood logs and d) Road fee per m³ of softwood logs. (United Republic of Tanzania, 2017, 17-20).

Procured tree stems should be cross cut to log lengths that vary between 3,1 meters to 6,1 meters with interval of 0,3 meters to obtain the best possible recovery of raw material and trees to be recovered. This practice is not common and almost not used at all in Tanzania. Therefore, FWITC being a high-quality training centre should introduce this system not only for its production operations but also to its training courses in forestry and wood technologies.

Forest compartments and raw material to be purchased, procured and processed should be requested with special characteristics as shown in table 6.6 for pine and in table 6.7 for eucalyptus. Comparison calculations were made to obtain the most suitable Diameter at Breast Height (DBH) tree classes for FWITC's sawmilling operations and therefore for raw material procurement. The most economical options were chosen for both pine and eucalyptus raw materials. Calculation are shown in annex 9. The following criteria and reasons were used for recommending the given options for the raw material procurement and DBH class selection:

1. Lower raw material prices and savings in raw material procurement, but still getting appropriate and high quality raw material.
2. Optimum log size to produce regular sawn timber dimensions for Tanzanian markets.
3. Easier and faster harvesting and handling of logs both in the forest and the sawmill.
4. Probably lower harvesting costs as usually.

Table 6.6 Plan and cost structure for procurement of pine saw log

| Option 3. PINE with weight on thinnings DBH class 1 & 2 + clearfelling DBH class 3 | | | | |
|---|--------------------|----------------------------|-----------------------|------------------------------|
| 1 DBH class | TZS/m ³ | % of class | m ³ /class | price total |
| 2 11-20 | 6 900 | 30 % | 1 594 | 10 996 875 |
| 3 21-25 | 13 700 | 20 % | 1 063 | 14 556 250 |
| 4 26-30 | 34 200 | 50 % | 2 656 | 90 843 750 |
| 5 31-35 | 59 200 | 0 % | 0 | 0 |
| 35 above | 65 600 | 0 % | 0 | 0 |
| TOTAL | | 100 % | 5 313 | 116 396 875 |
| | | total m³ | 5 313 | AVG TZS/m³ |
| | | | | 21 910 |

Three different options were computed for pine raw material. The 1st option had even distribution of all five DBH classes, 2nd option was developed so that weight was given for the two biggest DBH classes with a little share of 1st and 2nd classes and the 3rd option was developed so that only the three smallest DBH classes were considered for calculation. The average price for the 1st option was TZS 35,920, for the 2nd option TZS 45,270 and the 3rd option TZS 21,910 respectively as shown in table 6.6. The 3rd option was selected for budget and profit calculations purposes with an average raw material price of TZS 21,910 for a m³.

Three different options were also computed for eucalyptus raw material with only difference that eucalyptus DBH classes are three instead of five as they were for pine. Weight of the DBH classes for various three options were the same as used for pine. The average price of the 1st

option was TZS 19,067, the 2nd option TZS 16,280 and the 3rd option TZS 26,560 respectively. The 2nd option was selected for budget and profit calculations purposes with an average raw material price of TZS 16,280 for a m3.

Recommendation 5 Selection of raw material for production operations

After analysing the DBH classes and their suitability for sawmilling, and by considering the economic benefits the option 3 for pine and the option 2 for eucalyptus were selected. With this statement it is recommended that FWITC procures only raw material as indicated in the selected option 2 for pine and option 3 for eucalyptus. Percentages of the DBH classes and volumes indicated should also be followed.

Table 6.7 Plan and cost structure for procurement of eucalyptus saw logs

| 2. EUCALYPTUS weight on DBH classes 1 & 2 | | | | |
|--|--------|--------------|--------------|--------------------------|
| DBH class | TZS/m3 | % of class | m3/class | price total |
| 1 11-20 | 7 300 | 30 % | 906 | 6 615 625 |
| 2 21-30 | 18 200 | 60 % | 1 813 | 32 987 500 |
| 3 30 above | 31 700 | 10 % | 302 | 9 576 042 |
| TOTAL | | 100 % | 3 021 | 49 179 167 |
| total m3 | | | 3 021 | AVG TZS/m3 16 280 |

Remark 2 Base for manufacturing costs calculations

Calculation of manufacturing costs, expenditures and profitability of the operations were based on the raw material options shown in table 6.6 and table 6.7.

6.2.4 Profit Calculations

The sawmill is the second business unit of FWITC with emphases on production operations. The sawmill prepares its annual budgets as part of FWITC's annual budgeting procedure. To monitor its finance, expenditures and revenues the sawmill should also maintain its own expenditure and income accounts, which are part of FWITC's bookkeeping system.

As a start of the profit calculations the sawmill's sales were listed, calculated and summarised as shown in table 6.8 and in annex 3 where the annual production plan and budget for 7/2018-6/2019 are shown. After calculating the sales, the manufacturing costs were calculated by dividing them into variable and fixed costs as usually done in the profit calculations. These were deducted from the sales to obtain the operating margin. The depreciation was then converted from the investment and depreciation calculations to be deducted after which the 30% tax was deducted to obtain the net profit for the business.

The depreciation, that was calculated for sawmill consists of buildings, machinery and equipment with costs for infrastructure, renovations and mobile equipment to be used. Total investment and the annual depreciation were calculated as shown in table 5.1 and 5.2. Interest expenditures were not considered in the calculation.

The cost level used in all calculations follows the price level of the first quarter of 2018. The variable costs in sawmilling consist of raw material and harvesting prices, costs of electricity, chemicals and water, and costs of maintenance, sawdoctoring as well as costs of vehicles and fuels. Also, costs for communication, workers safety and office supplies for example are included in the calculations.

The fixed costs mainly consist of salaries of the payroll, insurances and overheads. The payroll was planned for various worker groups under which the unit costs were calculated and indicated in TZS/m3/month for each group. The base for the unit price was a m3 of sawn timber. Insurances were not included to profit calculations because these were not known at the time of preparing the budget. Overheads and marketing costs were 5% from the sales value.

Table 6.8 Manufacturing costs calculation for sawmill operations

| MANUFACTURING COSTS | | | | | | | |
|---|----------------|------------------|------------------------------|----------------------|----------------------|------------------------------|--|
| VARIABLE COSTS | UNIT PRICE | CONSUMPTION | UNIT COST | ANNUAL COST | Variable costs | Manufacturing costs | |
| | TZS / UNIT | UNITS / m3 | TZS / m3 | TZS | % | % | |
| Stumpage price, (Pine) / m3 | 21 910,00 | 2,08 | 45 646 | 116 396 875 | 10,6 % | 9,0 % | |
| Stumpage price, (eucalyptus) / m3 | 16 280,00 | 2,08 | 33 917 | 49 179 167 | 4,5 % | 3,8 % | |
| Stumpage price, (other costs) / m3 | 20 303,02 | 2,08 | 42 298 | 169 191 833 | 15,4 % | 13,1 % | |
| Logging costs (forest) incl. capital cost | 25 500,00 | 2,08 | 53 125 | 212 500 000 | 19,3 % | 16,4 % | |
| Transport (long distance on the road) cost incl. capital cost | 24 250,00 | 2,08 | 50 521 | 202 083 333 | | | |
| Chemicals (Anti-blue chemicals) | 18 089,00 | 1,00 | 18 089 | 72 356 000 | 6,6 % | 5,6 % | |
| Direct labour (not in the payrolls) | 1 090,00 | 1,00 | 1 090 | 4 360 000 | 0,4 % | 0,3 % | |
| Consumables | 590,00 | 1,00 | 590 | 2 360 000 | 0,2 % | 0,2 % | |
| Electricity, TZS/m3 | 7 774,16 | 1,00 | 7 774 | 31 096 623 | 2,8 % | 2,4 % | |
| Water, m3 | 510,00 | 1,00 | 510 | 2 040 000 | 0,2 % | 0,2 % | |
| Fuel, oil, lubricants (l) | 13 700,00 | 1,00 | 13 700 | 54 800 000 | 5,0 % | 4,2 % | |
| Maintenance materials and spares | 6 473,00 | 1,00 | 6 473 | 25 892 000 | 2,3 % | 2,0 % | |
| Sawdoctoring materials and spares | 1 350,00 | 1,00 | 1 350 | 5 400 000 | 0,5 % | 0,4 % | |
| Saw blades, tools for sawdoctoring | 3 880,00 | 1,00 | 3 880 | 15 520 000 | 1,4 % | 1,2 % | |
| Maintenance | 2 974,00 | 1,00 | 2 974 | 11 896 000 | 1,1 % | 0,9 % | |
| Vehicles and Equipment | 17 600,00 | 1,00 | 17 600 | 70 400 000 | 6,4 % | 5,4 % | |
| Working clothes | 2 960,00 | 1,00 | 2 960 | 11 840 000 | 1,1 % | 0,9 % | |
| Safety gears | 1 740,00 | 1,00 | 1 740 | 6 960 000 | 0,6 % | 0,5 % | |
| Communication | 1 140,00 | 1,00 | 1 140 | 4 560 000 | 0,4 % | 0,4 % | |
| Office supplies | 1 740,00 | 1,00 | 1 740 | 6 960 000 | 0,6 % | 0,5 % | |
| Food for staff working on sawmill production | 3 560,00 | 1,00 | 3 560 | 14 240 000 | 1,3 % | 1,1 % | |
| Rent of the buildings and land | 1 193,33 | 1,00 | 1 193 | 4 773 320 | 0,4 % | 0,4 % | |
| Other variable costs (TZS / m3 sawn timber)- workers treatment/hospital bills | 1 820 | 1,00 | 1 820 | 7 280 000 | 0,7 % | 0,6 % | |
| TOTAL VARIABLE COSTS | 275 521 | | | 1 102 085 151 | 100,0 % | 85,1 % | |
| FIXED COSTS | | | | | | | |
| Personnel salaries incl. social security costs | | Personnel | Cost / month / person | | Fixed costs % | Manufacturing costs % | |
| Management | | 3 | 655 556 | 23 600 004 | 12,2 % | 1,8 % | |
| Supervision and planning | | 2 | 335 833 | 8 059 992 | 4,2 % | 0,6 % | |
| Operations | | 22 | 186 457 | 49 224 576 | 25,4 % | 3,8 % | |
| Maintenance | | 2 | 260 000 | 6 240 000 | 3,2 % | 0,5 % | |
| Materials handling | | 12 | 211 488 | 30 454 296 | 15,7 % | 2,4 % | |
| Personnel Total | | | | 117 578 868 | 60,8 % | 9,1 % | |
| Other fixed costs | | | | | | | |
| Insurances | | | | | | | |
| General overhead and marketing 5% of sales | | | | 75 886 083 | 39,2 % | 5,9 % | |
| TOTAL FIXED COSTS | | 41 | | 193 464 951 | 100,0 % | 14,9 % | |
| TOTAL MANUFACTURING COSTS | | | | 1 295 550 102 | | 100,0 % | |

Table 6.9 shows the profit calculation for FWITC's sawmill. The base for the calculation is the annual production plan and the sales budget prepared for the period of 7/2018-6/2019.

The projections in the profit calculations are made for 1st, 2nd, 3rd and 4th year of sawmill operations with an assumption that production and sales of the sawmill for the first year will only be 40 % from the full capacity, 60% for the 2nd year, 80% for the 3rd year and full 100% capacity for the 4th year of operations. This means that after the fourth-year operations the sawmill will reach the full capacity of 4,000m3 of sawn timber per annum.

The expenditures of the sawmill for the first operational year amounts to TZS 634,088,667 from which the variable costs are TZS 440,834,060 amounting to 85,1% of the total sawmill expenditures and the fixed costs are TZS 193,464,951 amounting to 14,9% of the total expenditures respectively. If all the sawmill products are sold the total revenue collected would amount to TZS 607,088,667 making a negative profit margin of TZS -27,210,345. This can be considered somehow reasonable when starting the operations with a 40% capacity.

When making the calculations it was assumed that sales, expenditures and tax will grow linearly with the increase of the production. When all the given facts are considered the 1st and 2nd year operations will give a negative profit whereas the 3rd year will be a bit positive and the fourth year will already give a net profit of TZS 92,631,769.

The financial projection is encouraging because after the third year of operations the sawmill makes already a little profit and after the fourth year the result seems to be reasonable. The

breakeven analysis was also carried out for the sawmill operations. The calculation indicates that the breakeven point for the sawmill operations is about 2,922m³/annum, which volume is not impossible. However, it requires trained and skilled sawmill operators and workers.

In the calculations all the depreciation deductions and the tax payments (30%) were considered and calculated, which obviously reduced the net profit of the sawmill. If the depreciation is not considered at all the net profit, when cutting with a full capacity, will increase from TZS 92,631,769 to TZS 155,520,095 which is about 67,9% increment. This makes the sawmill result much better. It looks good but is not advisable. This is because the sustainability of the centre is in danger and replacement of the investment is not secured.

Table 6.9 Profit calculation for sawmill operations

| PROFIT CALCULATION | | | | | | |
|---|------------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|----------------|
| | UNIT PRICE TZS / m ³ | YEAR 1 (40% production) | YEAR 2 (60% production) | YEAR 3 (80% production) | YEAR 4 (100% production) | % |
| SALES | | | | | | |
| Sawn timber (pine) (TZS) | 372 000 | 379 440 000 | 569 160 000 | 758 880 000 | 948 600 000 | 62,5 % |
| Sawn timber (eucalyptus) (TZS) | 307 000 | 178 060 000 | 267 090 000 | 356 120 000 | 445 150 000 | 29,3 % |
| Slabs (TZS) | 24 600 | 15 580 000 | 23 370 000 | 31 160 000 | 38 950 000 | 2,6 % |
| Off cuts (TZS) | 20 400 | 7 480 000 | 11 220 000 | 14 960 000 | 18 700 000 | 1,2 % |
| Sawdust (TZS) | 35 000 | 15 166 667 | 22 750 000 | 30 333 333 | 37 916 667 | 2,5 % |
| Income from renting facilities for FWITC training | 7 101 | 11 362 000 | 17 043 000 | 22 724 000 | 28 405 000 | 1,9 % |
| SALES TOTAL | | 607 088 667 | 910 633 000 | 1 214 177 333 | 1 517 721 667 | 100,0 % |
| MANUFACTURING | | | | | | |
| VARIABLE COSTS | | 440 834 060 | 661 251 091 | 881 668 121 | 1 102 085 151 | 85,1 % |
| FIXED COSTS | | 193 464 951 | 193 464 951 | 193 464 951 | 193 464 951 | 14,9 % |
| MANUFACTURING TOTAL | | 634 299 012 | 854 716 042 | 1 075 133 072 | 1 295 550 102 | 100,0 % |
| OPERATING MARGIN | | -27 210 345 | 55 916 958 | 139 044 261 | 222 171 564 | |
| Share of operating margining (%) | | -4,5 % | 6,1 % | 11,5 % | 14,6 % | |
| DEPRECIATION | | | | | | |
| Woodhandling | | 0 | 0 | 0 | 0 | 0,0 % |
| Sawmill | | 59 674 645 | 59 674 645 | 59 674 645 | 59 674 645 | 66,4 % |
| Power and water | | 13 277 668 | 13 277 668 | 13 277 668 | 13 277 668 | 14,8 % |
| Utilities | | 0 | 0 | 0 | 0 | 0,0 % |
| Mill site | | 522 507 | 522 507 | 522 507 | 522 507 | 0,6 % |
| Forest tools | | 8 900 180 | 8 900 180 | 8 900 180 | 8 900 180 | 9,9 % |
| Other sawmill investments | | 3 187 349 | 3 187 349 | 3 187 349 | 3 187 349 | 3,5 % |
| Temporary facilities | | 0 | 0 | 0 | 0 | 0,0 % |
| Temporary services | | 0 | 0 | 0 | 0 | 0,0 % |
| Indirect costs | | 0 | 0 | 0 | 0 | 0,0 % |
| Interest (5% from total depreciation) | | 4 278 117 | 4 278 117 | 4 278 117 | 4 278 117 | 4,8 % |
| DEPRECIATION TOTAL | | 89 840 466 | 89 840 466 | 89 840 466 | 89 840 466 | 100,0 % |
| PROFIT BEFORE TAX | | -117 050 811 | -33 923 508 | 49 203 795 | 132 331 098 | |
| TAX (30%) | | -35 115 243 | -10 177 052 | 14 761 139 | 39 699 330 | |
| PROFIT AFTER TAX | | -81 935 568 | -23 746 456 | 34 442 657 | 92 631 769 | |
| DIVIDEND | | 0 | 0 | 0 | 0 | |
| NET PROFIT | | -81 935 568 | -23 746 456 | 34 442 657 | 92 631 769 | |

Remark 3 How to Improve profit of the sawmill

The sawmill profit does not look good but there are choices to improve it because there are few factors that can be changed, and profitability improved. First, the variable costs should be looked at to reduce the expenditures. Raw material expenditures are major costs in the variable costs. These can be reduced by buying logging and transport services from the service providers. Another factor that can improve the profit margin is to improve the recovery rates, which will increase also sawn timber volume produced.

The remark 4 shows that the recovery rate has a big effect to the net profit of the sawmill production both decreasing and increasing of it. The point is that there are several issues that can affect the recovery to any directions and there are many issues that can be done to improve the recovery rate. These are for example better cutting of stems into logs in the logging operations, cutting of logs to more sawn timber dimensions in the sawmill and

especially value adding of sawn timber to get better prices by grading it for different markets and final uses, from which sources increment of sawn timber price can be obtained.

Remark 4 Effect of recovery rate to sawmill's net profit

If the recovery rate of the sawmill will change it will have an effect to the net profit of the sawmill as follows.

- 1) Decreasing of the recovery from 48% to 40% will reduce the profit from TZS 92,631,769 to TZS 13,520,166.
- 2) Decreasing of the recovery from 48% to 44% will reduce the profit from TZS 92,631,769 to TZS 56,671,950.
- 3) Increasing of the recovery from 48% to 52% will increase the profit from TZS 92,631,769 to TZS 127,028,847.

6.2.5 Contract Sawing Option

Contract sawing is a special term in sawing operations. Simply it means that a sawmill cuts logs of the customer to sawn timber dimensions that are specified by the customer who also supplies the raw material to the sawmill. In other words, the sawmill offers its services to cut sawn timber from the client's raw material. After cutting of the logs the client collects all sawn timber and by-products produced and the sawmill charges the sawing services. Another option would be that client only collects the sawn timber and leaves the by-products for the sawmill to either further process these for value-added products or direct sales to local clients.

Table 6.10 Advantages and disadvantages of contract sawing

| ADVANTAGES | DISADVANTGES |
|--|--|
| <ol style="list-style-type: none"> 1) No raw material purchases required 2) No costs of raw material 3) No raw material transport required 4) Savings in variable and manufacturing costs 5) Less funds engaged for variable costs 6) Lower risk of business 7) Easier management of production operations because only sawing is done 8) Sawn timber drying is not necessary unless asked by the client when a service charge would be charged 9) Less challenges and problems when logging and transportation of logs is done by the client 10) With contract sawing operations FWITC can still organize its training activities on wood technology as planned | <ol style="list-style-type: none"> 1) Sawmill cannot decide cutting of stems in the forest which might affect recovery rate achieved from the logs 2) Sometimes raw material might not be available as planned and requested |

The fact is that raw material costs in planned 4,000m³ sawmilling operations are about 68,0% from the variable costs, which is a major manufacturing expenditure. If the contract sawing operations would be done at FWITC the raw material procurement costs would be zero because the client should meet these costs. With this consideration and the same 4,000m³ output capacity the sawmill would make a net profit of TZS 158,782,031 instead of TZS 92,631,769.

Remark 5 Benefits of contract sawing option

With pure contract sawing operations FWITC could make 71,4% better net profit, if the sawing service price is set for TZS 200,000 per m³. This is about 56,3% more than the manufacturing costs per m³ in normal sawing operation, which is TZS 127,933. If the contract sawing service charge is set only for TZS 141,000 the sawmill can still, make a zero result.

Another option would be that the sawmill cuts only about 2000m³ of sawn timber per year with the same TZS 200,000 service charge in which case the sawmill can still cover the variable and fixed costs.

With all the considerations explained, and advantages and facts given the contract sawing option would be the best operational arrangements for FWITC. With this arrangement the core

business operation – TRAINING AND TECHNICAL ADVISORY SERVICES - of FWITC could still be organized efficiently. Therefore, the following recommendation is given.

Recommendation 6 Contract sawing the best option for FWITC

It is highly recommended that FWITC operates the sawmill with only pure contract sawing arrangements. This is because the contract sawing has many advantages against the normal sawing operations where everything is done by the centre and where much more challenges would be met, especially when organizing procurement, logging and transportation of logs from the forest plantation to the sawmill site at Mafinga.

6.3 Forest Tree Nursery Operations

FWITC's forest tree nursery has been established for two main reasons that are forest workers' skill training and provision of demonstrations for tree growers, forest owners, and stakeholders and beneficiaries of PFP. During the PFP implementation it has been observed that most of the nursery enterprises are seriously out of date and are not providing quality tree planting materials to tree growers. Therefore, the following actions have been made by the PFP programme:

- 1) Construction of a Seed Tray Nursery to demonstrate a more advanced and improved method of producing tree seedlings with lower costs.
- 2) Establishment of a demonstration forest tree nursery to show operations and their advantages on a seed tray forest tree nursery operation i.e. hygiene, root development, vigour, labour savings and production of lower cost seedling transportation.
- 3) Establishment of a demonstration for ease of seedling dispatch from a Seed Tray Nursery.

The above actions have been taken to:

- 4) Raise seedlings for Tree Seed Orchards that have been established. This will be done only in short term projection.
- 5) Raise high quality forest tree seedlings for the distribution to TGA's and their members as PFP's support to programme's direct and final beneficiaries.
- 6) Provide short courses training on practical hands-on-skills in forest tree nursery techniques and operations.
- 7) Assist FWITC on establishing new business ventures for improving FWITC's sustainability and viability in short and long-term projections.
- 8) Assist FWITC on its revenue collection for running and development of the centre.
- 9) Demonstrate that a forest tree nursery can make profit if well established and managed.

It is planned that during the first operational year FWITC's nursery produces about 500,000 tree seedlings. During the business plan preparation, it was decided that FWITC's nursery operations will be increased annually so that target for the 2nd year will be 50% more, for the 3rd year 75% more and for the 4th year 100% more than it the plan for the 1st year.

The operations will be run annually so that from April to June the nursery will be maintained and prepared for the next patch of seedlings, trays will be cleaned for the next growing season, growing mediums would be refilled and seeds will be procured. To begin the process markets for seedling demand will be assessed to prepare an annual production plan with an annual budget, which will be the responsibility of the Nursery Manager and Forest Nursery cost centre.

From July to October sowing of seeds will be done depending on the species used. Also, laying out of seed trays will be done during this period. From November to December the seedlings will be taken care by daily irrigations and fertigation of them. From December to March the seedlings will eventually be dispatch to the clients in the districts and villages.

Due to low temperatures and high altitude at Mafinga, it is planned that Pine species will be planted. The main species will of *Pinus Patula*, *Pinus Tecunumaani* and *Pinus Maximinoi*.

6.3.1 Investment Calculations

The investment calculations for the forest tree nursery establishment were done separately from the training activities and sawmill operations. Table 6.11 shows the total invest costs, years of depreciations used and the total depreciation per annum used in the profit calculations.

Table 6.11 shows also the extra depreciation calculated for the 3rd and 4th operational year. This depreciation comes imperative because there is a need to invest and enlarge the nursery for the 3rd and 4th year seedling production since the capacity of the established nursery is only for 750,000 seedlings per annum.

Table 6.11 Investment cost calculation for forest tree nursery

| INVESTMENT COSTS | | | | |
|-------------------------------|------------------------|-------------------------|-------------------------|--------------------|
| | Number of units | Cost /unit (EUR) | Cost /unit (TZS) | Total (TZS) |
| Nursery trays | 4 000 | 7,26 | 19 790 | 79 160 974 |
| Bore hole | 1 | 1 375,00 | 3 749 185 | 3 749 185 |
| Wire/Tensioners | 1 | 1 435,00 | 3 912 786 | 3 912 786 |
| Poles/planks | 1 | 3 140,00 | 8 561 775 | 16 469 147 |
| Shade net | 1 | 3 993,00 | 10 887 633 | 10 887 633 |
| Tanks and piping | 1 | 5 594,00 | 15 253 048 | 15 253 048 |
| Pressure pump | 1 | 3 308,00 | 9 019 857 | 9 019 857 |
| Irrigation system | 1 | 1 887 | 5 145 245 | 5 145 245 |
| INVESTMENT COSTS TOTAL | | | | 143 597 876 |

| INVESTMENTS | TZS | YEARS OF DEPRECIATION | Depreciation/a (TZS) | Extra depreciation/a (TZS) (for 3rd year) |
|------------------------------|--------------------|------------------------------|-----------------------------|--|
| Bore hole | 3 749 185 | 10 | 374 919 | |
| Irrigation and water systems | 29 418 151 | 10 | 2 941 815 | 2 039 829 |
| Nursery structure | 31 269 566 | 10 | 3 126 957 | 3 126 957 |
| Nursery trays | 79 160 974 | 7 | 11 308 711 | 11 308 711 |
| Interest (5%) | | 7 | 88 762 | 82 377 |
| INVESTMENTS TOTAL | 143 597 876 | | 17 841 163 | 16 557 873,95 |

6.3.2 Profit Calculations

The forest tree nursery is the third business unit of FWITC. It is planned that this department also prepares its own production and operational plans with the annual budget as part of the FWITC's budgeting. For monitoring its expenditures and sales the forest tree nursery maintains its own expenditure and income accounts that are part of FWITC's bookkeeping system.

Table 6.12 shows the profit calculation of FWITC's forest tree nursery. The base for this calculation is the annual production plan for 7/2018-6/2019 and the sales budget prepared for the period the same period.

In the calculation the projection for 1st, 2nd, 3rd and 4th year was made with an assumption that production and sales of the nursery will increase by 50 % for the 2nd, by 75% for the 3rd, and by 100% for the 4th year of operations. It is assumed that sales and expenditures as well as the tax will grow linearly with the increase of the seedling production. The profit calculation shows that FWITC's nursery will make a profit of TZS 14,979,967 already during the 1st year of operations, which will be increased to TZS 38,038,010 after the 2nd year.

After the 3rd year of operations the profit will drop down to TZS 26,652,867, which is caused by the extra investment and therefore increased depreciation that are to be made for the 3rd and 4th year production increment. After this the profit will again raise up to the level of TZS 40,181,889, which will be reached after the 4th year operations.

The total expenditures of FWITC's nursery operations in 2018 to 2019 will be about TZS 85,758,885. From this the variable costs are TZS 59,119,878 amounting to 68,9% of the production costs and the fixed costs TZS 26,639,009 amounting to 31,1% of the total production costs respectively.

If the amount of investment is considered it can be concluded that this business of FWITC has a good profitability. The nursery maintains a good revenue collection for FWITC's development and sustainability of the centre in a long projection

The forest nursery requires two separate investments which also increases the depreciation deductions as shown in table 6.11. The positive aspect of the investment is that this does not destroy the profitability of nursery operations, but it increases the profit after the third-year operations. The forest nursery operation is a good business for FWITC. One example is that it develops a realistic and good demonstration for the trainees and potential new entrepreneurs.

Table 6.12 Profit calculation of forest tree nursery

| | Unit price (TZS) | | YEAR 1 | YEAR 2 (50% higher variable costs and 0% higher fixed costs) | YEAR 3 (75% higher variable costs and 50% higher variable costs) | YEAR 4 (100% higher variable costs and 50% higher variable costs) |
|----------------------------------|---------------------|------------------|--------------------|--|--|---|
| SALES | | | | | | |
| Seedlings | 250 | Seedlings / year | 500 000 | 750 000 | 875 000 | 1 000 000 |
| SALES TOTAL | | | 125 000 000 | 187 500 000 | 218 750 000 | 250 000 000 |
| VARIABLE COSTS | | | 59 119 876 | 88 679 814 | 103 459 783 | 118 239 752 |
| FIXED COSTS | | | 26 639 009 | 26 639 009 | 39 958 514 | 39 958 514 |
| PRODUCTION COSTS TOTAL | | | 85 758 885 | 115 318 823 | 143 418 296 | 158 198 265 |
| OPERATING MARGIN | | | 39 241 115 | 72 181 177 | 75 331 704 | 91 801 735 |
| Share of operating margining (%) | | | 31,4 % | 38,5 % | 34,4 % | 36,7 % |
| DEPRECIATION | | | 17 841 163 | 17 841 163 | 34 399 037 | 34 399 037 |
| PROFIT BEFORE TAX | | | 21 399 952 | 54 340 014 | 40 932 667 | 57 402 698 |
| TAX (30%) | | | 6 419 986 | 16 302 004 | 12 279 800 | 17 220 809 |
| PROFIT AFTER TAX | | | 14 979 967 | 38 038 010 | 28 652 867 | 40 181 889 |
| DIVIDEND | | | 0 | 0 | 0 | 0 |
| NET PROFIT | | | 14 979 967 | 38 038 010 | 28 652 867 | 40 181 889 |

6.4 Technical Advisory Services

Technical Advisory (TA) services will be one FWITC's business operations. TA services include all types of technical assistance to forest harvesting operators and MSME sawmills operating in Southern Highlands of Tanzania. The following TA services can be offered:

1. Support for business plan preparation for forest operators and MSME sawmills.
2. Designing and developing of mill lay-outs and flow of materials at the sawmill
3. Development of production operations at the sawmills.
4. Improvement of sawmill's productivity and efficiency by improving sawing methods and techniques. Two (2) technical advisors will offer their services for 3 days / month and 11 months / annum.
5. Total TA service provision will be 6 days X 11 months
6. Improvement of products quality in sawmilling, logging and wood processing
7. Development of quality assurance systems for sawmills and logging operations
8. Establishment of sawmill's production record keeping systems to record and follow up production volumes and stocks of materials in the sawmill.
9. Development of bookkeeping and accounting systems for the sawmill.
10. Assisting in saw blade and sawmill machine maintenance and service.

To begin the TA services FWITC plans to start with the following operations for the budget year 7/2018-6/2019:

1. Two (2) technical advisors offering TA services for 3 days/month and 11 months/annum making a total of 66 days/annum. This amount has been budgeted for profit calculations.
2. For profit calculations the daily charge was set to 200,000TZS / day.

Recommendation 7 Strategy for TA service provision

It is recommended that FWITC offers its TA services either prior to short courses or immediately after the course to support learning of the trainees and to offer specifically designed and tailor-made TA services for the needs of the companies.

Prior the course arrangement is recommended because the advisor/s can see and find the training needs of the client. Prior to the course the advisors can also advise the client to participate the training courses to deepen their workers skills and competences through appropriate training.

After the course TA services could be offered to deepen the knowledge and skills learnt during the course. This would be a special type of TA service specifically designed to client and the needs of the company. This service could be offered and planned during the FWITC courses.

6.4.1 Expenditure Calculations

Table 6.13 shows the plan and expenditure calculations prepared for the TA services. Expenditures include both the variable and fixed costs. Variable costs include direct labour costs, DSAs, travel, communication, advertisement and office expenditures.

Table 6.13 Expenditure calculation for technical advisor services

| VARIABLE COSTS (TZS) | UNIT COSTS (TZS) | UNITS / ANNUM | COSTS TOTAL / ANNUM |
|---|------------------|-----------------------|---------------------|
| Direct labour TA services (TZS/day) | 50 000 | 66 | 3 300 000 |
| Km charges for TA services to be offered / annum | 1 100 | 1 100 | 1 210 000 |
| DSA for TA personnel | 60 000 | 20 | 1 200 000 |
| Communication telephone + Internet (2 persons x 3 months) | 50 000 | 6 | 300 000 |
| Advertisement | 100 000 | 1 | 100 000 |
| Office supplies | 100 000 | 1 | 100 000 |
| Office maintenance | 0 | | 0 |
| TOTAL VARIABLE COSTS, TZS | | | 6 210 000 |
| FIXED COSTS | | | |
| Personnel salaries incl. ocial security costs | | Number of days | |
| Management (TZS/day) | 50 000 | 10 | 500 000 |
| Planning | 50 000 | 11 | 550 000 |
| Office rent (1% from total of FWITC rents * 5 months) | 4 772 000 | | 238 600 |
| General overheads 5% of sales | 1 | | 660 000 |
| TOTAL FIXED COSTS, TZS | | | 1 948 600 |
| EXPENDITURES TOTAL | | | 8 158 600 |

In 7/2018 to 6/2019 the total expenditures for TA services will be TZS 8,168,600 from which the variable costs are TZS 1,848,000, 22,5% of the expenditures and the fixed costs TZS 6,210,000, 77,5% of the expenditures respectively. Income that can be collected from these services will be about TZS 13,200,000 during the first operational year. The profit margin to be achieved is 38,2%, which is good for the small services to be provided. However, the key question is that are the MSME sawmills and the clients ready to pay TZS 200,000 for a day.

6.4.2 Profit Calculations

The TA services is the fourth business line of FWITC. TA services should be supervised directly by the General Manager of the centre, however in close coordination with the Training Department. Collaboration is very important to link TA services to short courses training either before or after the short course. Annual budget for the TA services should be prepared under the budget for the Training Department where also expenditure and income accounts should be maintained to match with a general bookkeeping of the centre.

Table 6.14. shows the profit calculation for the TA services. The base for this calculation is an annual plan and projected sales for the period of 7/2018-6/2019. The depreciation costs were not considered in the calculation because these were deducted in profit calculation prepared for training and sawmill production.

The profit calculation was prepared for the 1st operational year. It was then assumed that TA services could be increased annually so that sales for the 2nd year of operations would increase by 15%, for the 3rd year by 30% and for the 4th year by 50% respectively. It was assumed that sales, expenditures and tax will grow linearly with the increase of the sales. The profit calculation shows that TA service is not a big business, but it is very important for supporting the training activities of the centre and it very much needed by the forestry and wood industry sectors.

Recommendation 8 PFP support for FWITC's TA services

FWITC's TA service provision will not be very profitable business, although it is very important. This is because of its high costs and low-income. Therefore, it is recommended that PFP supports funding of this business for the period PFP operates with FWITC.

Table 6.14 Profit calculation for technical advisor services

| | YEAR 1 | YEAR 2 15% increase from year 1 | YEAR 3 30% increase from year 1 | YEAR 4 50% increase from year 1 | |
|----------------------------------|-------------------|---------------------------------------|---------------------------------------|---------------------------------------|----------------|
| SALES / REVENUE | | | | | |
| Technical advisory services | 13 200 000 | 15 180 000 | 17 160 000 | 19 800 000 | |
| SALES TOTAL | 13 200 000 | 15 180 000 | 17 160 000 | 19 800 000 | |
| EXPENDITURES | | | | | |
| VARIABLE COSTS | | | | | |
| Technical advisory services | 6 210 000 | 7 141 500 | 8 073 000 | 9 315 000 | (%) |
| VARIABLE COSTS TOTAL | 6 210 000 | 7 141 500 | 8 073 000 | 9 315 000 | 76,1 % |
| FIXED COSTS | | | | | |
| Technical advisory services | 1 948 600 | 2 240 890 | 2 533 180 | 2 922 900 | |
| FIXED COSTS TOTAL | 1 948 600 | 2 240 890 | 2 533 180 | 2 922 900 | 23,9 % |
| EXPENDITURES TOTAL | 8 158 600 | 9 382 390 | 10 606 180 | 12 237 900 | |
| OPERATING MARGIN | 5 041 400 | 5 797 610 | 6 553 820 | 7 562 100 | 100,0 % |
| Share of operating margining (%) | 38,2 % | 38,2 % | 38,2 % | 38,2 % | |
| DEPRECIATION | | | | | |
| Technical advisory services | 0 | 0 | 0 | 0 | |
| DEPRECIATION TOTAL | 0 | 0 | 0 | 0 | |
| PROFIT BEFORE TAX | 5 041 400 | 5 797 610 | 6 553 820 | 7 562 100 | |
| TAX (30%) | 1 512 420 | 1 739 283 | 1 966 146 | 2 268 630 | |
| PROFIT AFTER TAX | 3 528 980 | 4 058 327 | 4 587 674 | 5 293 470 | |
| DIVIDEND | 0 | 0 | 0 | 0 | |
| NET PROFIT | 3 528 980 | 4 058 327 | 4 587 674 | 5 293 470 | |

6.5 Summary of Profitability Analysis

The profitability calculations and economic analysis of this business plan deals with the period of four years starting from 7/2018. Annual budgets were only prepared for the main business lines that are training and sawmill production. The annual budget and the cost breakdowns for training can be found from the Training Plan whereas the detailed annual production plan and budget for the sawmill is shown in the annex 3 of this BP.

When the BP plan was prepared no donor funding, private funding or local ministry funding were considered as an income for the centre. When the Training Plan for FWITC was prepared some of courses were planned to be subsidised by the PFP. These subsidises were not considered in these calculations.

As explained earlier the business plan has four (4) core business lines that were identified and analysed. These are training, TA services, sawn wood production and forest tree seedlings production. Table 6.15 summarizes revenues collected, expenditures occurring, depreciations costed, and taxes paid from the income earned. The summaries of the operating margins and net profits obtained are also shown in the table.

The summary sheet in table 6.15 is prepared and projected for the 1st, 2nd, 3rd and 4th operational year of the centre. Figures to the summary sheet have been linked directly from the four

business area profitability calculations. Annual increments of the business operations have been considered under each business unit calculation.

The summary table shows that revenues collected from the four business lines increases from the first operational year of TZS 970,740,438 to TZS 2,103,154,147 for the fourth year of operations. The increase is about 117% if the operations are increased as proposed in the business plan. The expenditures for the same period increase from the first year of TZS 916,092,973 to TZS 1,729,013,334 for the end of the fourth year of operations. This gives the operating margin of 6% for the 1st year operations and 18% for the 4th year operations. It can be concluded that with the proposed growth of operations the operating margin can be raised to good level.

Table 6.15 Summary of FWITC's profit calculations

| SUMMARY OF PROFIT CALCULATIONS | | | | | | |
|--------------------------------------|---------------------|----------------------|----------------------|----------------------|--------------------|------------------|
| REVENUES | | | | | | |
| | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | REVENUE (%) | |
| Sawmill | 607 088 667 | 910 633 000 | 1 214 177 333 | 1 517 721 667 | 72,2 % | |
| Training | 225 451 771 | 259 269 537 | 293 087 303 | 315 632 480 | 15,0 % | |
| Forest nursery | 125 000 000 | 187 500 000 | 218 750 000 | 250 000 000 | 11,9 % | |
| Technical advisory services | 13 200 000 | 15 180 000 | 17 160 000 | 19 800 000 | 0,9 % | |
| REVENUES TOTAL (TZS) | 970 740 438 | 1 372 582 537 | 1 743 174 636 | 2 103 154 147 | 100,0 % | |
| EXPENDITURES | | | | | | |
| VARIABLE COSTS | | | | | | |
| | | | | | VARIABLE COSTS (%) | EXPENDITURES (%) |
| Sawmill | 440 834 060 | 661 251 091 | 881 668 121 | 1 102 085 151 | 85,3 % | 63,7 % |
| Training | 44 755 800 | 51 469 170 | 58 182 540 | 62 658 120 | 4,8 % | 3,6 % |
| Forest nursery | 59 119 876 | 88 679 814 | 103 459 783 | 118 239 752 | 9,1 % | 6,8 % |
| Technical advisory services | 6 210 000 | 7 141 500 | 8 073 000 | 9 315 000 | 0,7 % | 0,5 % |
| VARIABLE COSTS TOTAL (TZS) | 550 919 736 | 808 541 574 | 1 051 383 443 | 1 292 298 023 | 100,0 % | 74,7 % |
| FIXED COSTS | | | | | | |
| | | | | | FIXED COSTS (%) | |
| Sawmill | 193 464 951 | 193 464 951 | 193 464 951 | 193 464 951 | 44,3 % | 11,2 % |
| Training | 143 120 676 | 164 588 778 | 186 056 879 | 200 368 947 | 45,9 % | 11,6 % |
| Forest nursery | 26 639 009 | 26 639 009 | 39 958 514 | 39 958 514 | 9,1 % | 2,3 % |
| Technical advisory services | 1 948 600 | 2 240 890 | 2 533 180 | 2 922 900 | 0,7 % | 0,2 % |
| FIXED COSTS TOTAL (TZS) | 365 173 237 | 386 933 628 | 422 013 524 | 436 715 312 | 100,0 % | 25,3 % |
| EXPENDITURES TOTAL (TZS) | 916 092 973 | 1 195 475 202 | 1 473 396 968 | 1 729 013 334 | | 100,0 % |
| OPERATING MARGIN | | | | | | |
| Sawmill | -27 210 345 | 55 916 958 | 139 044 261 | 222 171 564 | | |
| Training | 37 575 295 | 43 211 590 | 48 847 884 | 52 605 413 | | |
| Forest nursery | 39 241 115 | 72 181 177 | 75 331 704 | 91 801 735 | | |
| Technical advisory services | 5 041 400 | 5 797 610 | 6 553 820 | 7 562 100 | | |
| OPERATING MARGIN TOTAL (TZS) | 54 647 465 | 177 107 335 | 269 777 669 | 374 140 812 | | |
| Share of operating margin (%) | 6 % | 13 % | 15 % | 18 % | | |
| DEPRECIATION | | | | | | |
| | | | | | DEPRECIATION (%) | |
| Sawmill | 89 840 466 | 89 840 466 | 89 840 466 | 89 840 466 | 55,2 % | |
| Training | 38 503 057 | 38 503 057 | 38 503 057 | 38 503 057 | 23,7 % | |
| Forest nursery | 17 841 163 | 17 841 163 | 34 399 037 | 34 399 037 | 21,1 % | |
| Technical advisory services | 0 | 0 | 0 | 0 | 0,0 % | |
| DEPRECIATION TOTAL (TZS) | 146 184 685 | 146 184 685 | 162 742 559 | 162 742 559 | 100,0 % | |
| PROFIT BEFORE TAX (TZS) | -91 537 220 | 30 922 649 | 107 035 109 | 211 398 253 | | |
| TAX (30 %) | | | | | | |
| Sawmill | -35 115 243 | -10 177 052 | 14 761 139 | 39 699 330 | | |
| Training | -278 328 | 1 412 560 | 3 103 448 | 4 230 707 | | |
| Forest nursery | 6 419 986 | 16 302 004 | 12 279 800 | 17 220 809 | | |
| Technical advisory services | 1 512 420 | 1 739 283 | 1 966 146 | 2 268 630 | | |
| TAX TOTAL (30%) | -27 461 166 | 9 276 795 | 32 110 533 | 63 419 476 | | |
| PROFIT AFTER TAX | -118 998 386 | 21 645 854 | 74 924 576 | 147 978 777 | | |
| DIVIDEND | 0 | 0 | 0 | 0 | | |
| NET PROFIT (TZS) | -118 998 386 | 21 645 854 | 74 924 576 | 147 978 777 | | |

After calculating the operating margin, a full depreciation and the 30% tax were deducted to get finally the net profit for all four years. The net profit of the 1st operational year is negative TZS -118,998,386. This is because of starting the operations with a lower scale than can be reached during the second, third and fourth year of operations when the full training and production capacity can be reached. When the operations are accelerated to full in the end of the 4th year the net profit will be positive with TZS 147,978,777 per annum.

The result can be even better if the depreciation is not deducted but considered as in-kind donor support. In this case the net profit after the 4th year operations would be 110% bigger than the 1st year net profit, making the net profit for TZS 310,721,336. Another factor that has an influence on profit is the 30% tax that is deducted from the gross profit. In case the Tanzanian Revenue Authority (TRA) would grant a tax exemption for the centre, because of donor funded project, the net profit would even be much higher and the sustainability obviously much better.

Recommendation 9 Tax exemption for FWITC operations

It is recommended that PFP and FWITC will study the option and possibility of getting tax exemption from the TRA because the centre has been established with the donor funds and is run by the donor organization that normally has the right for the tax exemption.

Sawn timber production to local market seems to be profitable business. The business looks good even when buying the raw material which is the biggest variable cost being almost 80% of the expenditures. Sawing business would be even more profitable if the contract sawing approach is introduced and used as proposed and explained in this business plan. Currently the raw material prices have increased and the local market prices for sawn timber decreased lowering the operating margin and profit of the sawmilling business. To make the business more profitable, there are options that FWITC could do to improve its business. These are for example:

1. Innovating and introducing new wood products to the market.
2. Developing the production systems and cutting methods to improve recovery rate.
3. Capacity building of companies and training of their workers.
4. Increasing TA services to be offered to MSMEs and TGAs.

Training and technical advisory services is a core business of FWITC which must be kept in the product and services range. The profitability and sustainability of training and TA services are heavily influenced by the companies' willingness to buy and pay for the services FWITC offers. Therefore, marketing and advertising of the services must be well planned and carried out. Markets for these products and services exist but how to attract and commit the clients to buy them are the keys for the success.

Recommendation 10 Improvement of Profit in Training Services

If the net profit of the training services would like to be improved something must be done to decrease the fixed costs. High administration and training facility costs should be reduced.

Tree seedling production seem to be a good business with low investment, but good profit. Viability of the business depends much about the general development of the forestry and wood industry sectors in Tanzania. The forecast seems to be good. With a simple product and simple production process this business line could easily be developed to be successful for FWITC.

7. FINANCING

A financial position of FWITC presented is based on the existing and analysed demand for training in Southern Highlands of Tanzania and on the demand of products and markets defined for forest and wood products to be processed. The market and the business position of FWITC looks promising, especially in training and TA services. There is a lot of market for workers' skills development and training. However, the beginning of the business is critical, especially the two first years. It seems that external donor financing will be required at least to support training activities, which have been defined as the core product and service of FWITC.

Financial position of the proposed production operations is different because these operations must be planned so that self-financing and viability is the only option for operations. The only challenge at the beginning is that FWITC must borrow the starting working capital to begin the operations. To begin the production operations PFP and the MNRT should assist to get the initial working capital, which should be given in a loan basis with a reasonable interest to be paid.

The main sources for revenue collection at FWITC will be the sawn timber and forest tree seedlings productions. These two operations can pay the costs of operations and they can even generate funds for FWITC's development. Revenues collected from these operations will increase to satisfactory level if operations are run as planned for the 3rd and 4th years.

The possibility to finance training through the course fees does not look very promising. This is because the courses currently are not full and they do not even meet the break-even points to cover the variable costs. The future and the profitability of the training operations depends very much from the clients and their willingness to pay for training courses and technical advisor services FWITC offers. In the case of training FWITC must start looking for extra financing from any possible sources such as government and ministries.

At its lowest the proposed year two operations should be targeted to make FWITC's operations viable and to cover the total annual expenditures of the centre lines. The annual planned revenue collection for the 2nd year would bring an income of TZS 1,372,587,537 billion. This would provide in minimum the basis for running the operations and to gain a little income for development of the centre. In most cases the outside financing would be required especially if international and regional teachers and technical advisors would be recruited.

7.1 Cash Flow Plan

For proper financial management of a business unit a cash flow plan is must. Normally, it is prepared at the same time with the production and operational plan, and preparation of the annual budget as it has been done in this business plan preparation for the FWITC's sawmilling business. The purpose of the cash flow plan is to identify temporary cash shortages or surpluses in monthly and annual basis. In the case of the sawmill the plan was prepared for the 1st operational year to show cash requirements in monthly basis.

Cash flow plan and calculations were prepared for the sawmill business operation to begin the sawn timber production operations. This plan was developed as an example to prepare other cash flow plans for example for forest tree nursery operations. The plan is shown in annex 5. For other business operations the similar cash flow plan should be prepared as soon as the Steering Committee of the PFP has approved the proposed Business Plan.

The cash flow plan should be prepared for each production and business line separately. The planning period should either be one year or three months with monthly or weekly intervals respectively. The cash flow presents all cash out- and inflows for each interval and shows how much money is available in the end of each interval. A tentative cash flow plan for FWITC's sawmill production for the 1st budget year 7/2018-6/2019 is presented in annex 5. According to the plan of July 2018, the working capital of TZS 25 000 000 is needed for the start-up of the production at the sawmill.

7.2 Financing of Training and Production

When this FWITC's training plan was developed also cost estimations for individual short courses were calculated to find out total training costs in 2018. Calculation was prepared by considering that costs will be covered from the course fees collected from trainees and clients. In this option subsidies or outside financing were not considered so if there is outside financing available the share of training fees and the costs of the course should be re-calculated.

When the business plan was developed the profit calculations and financial analysis for the four-year period were developed. Table 7.3 indicates if training operations are run as planned the 1st year will be challenging in terms of financing the operations especially if the full depreciation is considered. Therefore, FWITC should carefully plan right from the beginning how to carry out the training activities to cover the costs of training. An option to support FWITC's training operations, financing and viability is to find institutions or companies that can subsidize their trainees.

For the sustainability of FWITC it is important that a systematic financing mechanism will be worked out found for the centre. Options in this respect are that trainees will pay their training

100%, companies of trainees will meet the costs of training or government of Tanzania together with donor organizations will support and subsidise FWITC and its training activities.

Options for financing FWITC's training activities were already studied when opportunities and procedures for establishing a PPP for FWITC and the PFP were studied in 2016 and a Concept Note for PPP for FWITC was developed. The paper recommended that the PPP should be established between the PFP, its stakeholders and the private forestry and wood industry companies in Tanzania. (PFP 2016). The following are the main points of the Concept Note that should also be considered when planning financing for FWITC:

1. Companies employing more than four (4) employees are liable to pay Skills and Development Levy (SDL) to the TRA. The levy is collected by the TRA under the Vocational Education Training Act and Income Tax Act that is meant for financing of VET education and training in Tanzania. In 2018 the SDL is 4,5% of the total emoluments paid to all employees during the month.

Recommendation 11 SDL levy for financing of FWITC's training

FWITC should study how it could have access to the SDL funding meant for workers' skills development and how much that could contribute for FWITC's annual budget, especially for paying and subsidising training activities and skills development.

If the process for accessing the SDL is going to be long the following actions are proposed.

2. To get training started at FWITC, PFP and its partners should sponsor FWITC in line with this business plan. Stakeholders and partners should be familiarized to various options and costs of training and with amounts required from them. Recommendation is that partners support something between 30-50% of the costs and PFP covers the rest.
3. FWITC's Development Fund should be established as soon as possible to generate extra funds for the centre. This proposal was already considered when FWITC's training plan was prepared in 2017. In a long-term perspective FWITC's Development Fund is planned to be 20% from the course fees.
4. One option would be that membership fee of the TGAs and the SAFIA and SHIVIMITA etc. should include a training levy that would be returned directly to FWITC to cover its training costs.

Recommendation 12 Outside funding for FWITC's financing

To improve FWITC's financing situation the management of the centre should follow-up that proposals made in the PPP Concept Note of 2016 will be taken into use or they will be adjusted so that financing of the centre can be improved.

When this business plan and earlier the training plan for FWITC's short courses were prepared PFP promised to subsidise eight (8) forestry short courses. The promised financing from PFP for 2018 is TZS 78,258,039. This about 28% of the total training costs of FWITC short courses training in 2018.

Profit that will be generated from FWITC's production operations should be re-cycled to FWITC. This money could be used for development of the centre and possibly partly for paying the training costs.

7.3 Accounting

For monitoring of revenues and expenditures as well as for auditing of revenues and expenditures it is important that an institution or a company has an appropriate accounting system. The most important tool of this is a chart of accounts. This was designed and proposed for FWITC's accounting as part of the business plan development. The chart of accounts can be found from the annex 10. Instructions and a guideline for accounting and use of the chart of accounts can also be found from annex 10.

The chart of accounts was created for all the four business lines of FWITC. It presents various codes and numbers used in recording different payments for necessary purchases and movements of finances from one account to another. It includes the project groups for short courses training, seminars and workshops as well as for FWITC's business operations like sawmill and forest nursery production, technical advisory services. In addition, the chart of account has other potential business services that FWITC could offer for its clients. These are for example maintenance of machinery and saw blades. The chart of accounts includes components and accounts for accounting and bookkeeping of FWITC's revenues collected and expenditures accounted. For more details see annex 10.

Accounts show where the money comes from and purchases accounts show how the money is used. For recording a voucher is needed. An example of a voucher is shown in annex 11. Basic rule of accounting and transparency for each voucher a receipt must be attached.

FWITC's sawmill and other business units must maintain the financial records to monitor its financial performance. Financial recording (bookkeeping and accounting) must be maintained in a day-to-day basis. Financial reporting will be done in monthly, quarterly and annual basis with regular auditing done by the external auditing company or institution.

The purpose of accounting is to see whether the business is proceeding as planned. The information can be used for modification of the figures in the annual production and operational plans, budgets, profitability calculations and cash-flow plans, and for considering measures to improve profitability and performance of the centre.

The following presents a model, which can be used in accounting in FWITC business units.

Step 1. (daily)

- Record all the expenses by using the chart of accounts and voucher.
- Record all the revenues (sales income) by using the chart of accounts and voucher.
- Keep the vouchers in a folder in chronological order.

Step 2. (monthly)

- Arrange all the vouchers of an accounting period by component and purchase account.
- Sum up the totals of each account and component.
- Compare the results to the cash flow plan and make the required adjustments.
- Make calculations and computing by Excel. The results can then be presented in a work sheet form for the management of FWITC, MNRT and PFP if required.

Step 3. (monthly)

- Prepare the income statement of the accounting period (month). On the right column add all the expenses and on the left column add all the revenues. The balance is then the net income of the month.
- Prepare the balance sheet presenting the financial status of FWITC's business. This should always be done in the end of the accounting period (month).
- Examples of an income statement and a balance sheet are presented in annex 12.

8. ADMINISTRATIVE ARRANGEMENTS

The core operations of FWITC will be education and training which will be supported with the TA services in forestry and wood processing. TA services will be directed to companies and individuals prior and after the training courses. The purpose of this is to confirm the training needs in advance and to support trainers and companies after the training. These core operations will be supported with FWITC's production operations that are wood processing operations and forest tree seedling production. The idea of the supporting operations is to generate revenue for the centre to facilitate its further development and sustainability.

Training has been identified as the priority area, which will be emphasised in all business circumstances. Because of this, the production operations are to be planned and implemented under the conditions of education, training and TA services. The organization structure and the management options recommended in this BP are planned with this background. The management structure is explained in the section 8.2 and the organization chart is shown in Figure 8.1.

8.1 FWITC's Organization

FWITC's organization will be divided into four business department that are 1) training services, 2) technical advisory services, 3) business operations and 4) supporting services. The organization chart shows the core job titles for each department and their sub-sections, if shown in the organization chart. Arrows between the departments show the relation and the linkages between the departments and the sub-sections within the department.

The main thought about the organization is that training department organizes training services that will be supported by the business operations that are tangible examples of sawmilling and tree seedling productions. Because of this strategy, most of the workers will have a dual role being a worker and a trainer at the same time, depending on the operations carried out. Therefore, most of the workers will be trained to be production operators and trainers. Long-term aim is that all FWITC workers will be able to work in both production and training.

To clarify the organization set-up more, it must be distinguished that training and the TA services are independent business departments as introduced and explained in section 6. However, they work in close co-operation because of the TA services that will be provided either before or after the training courses, depending on the needs and willingness of the client. The idea situation is that TA services are used and offered both prior and after the courses to provide a comprehensive package of technical assistance and training. For example, prior to training, development needs of the sawmills and skills of the workers could be identified to be developed during the training courses and after the training by the TA services. This type of tailor-made training supported with technical assistance can improve both the performance workers, and the sawmills.

Figure 8.1 shows how the Business departments, Training Services and TA services are linked to FWITC's supporting services that will assist other departments in marketing, office administration, and accounting and bookkeeping. Supporting services works under the supervision of the General Manager. The Training Coordinator, Managers of the business departments and Officers of the supporting services report directly to the General Manager. Managers / Leading Teachers of the training departments report to the Training Coordinator.

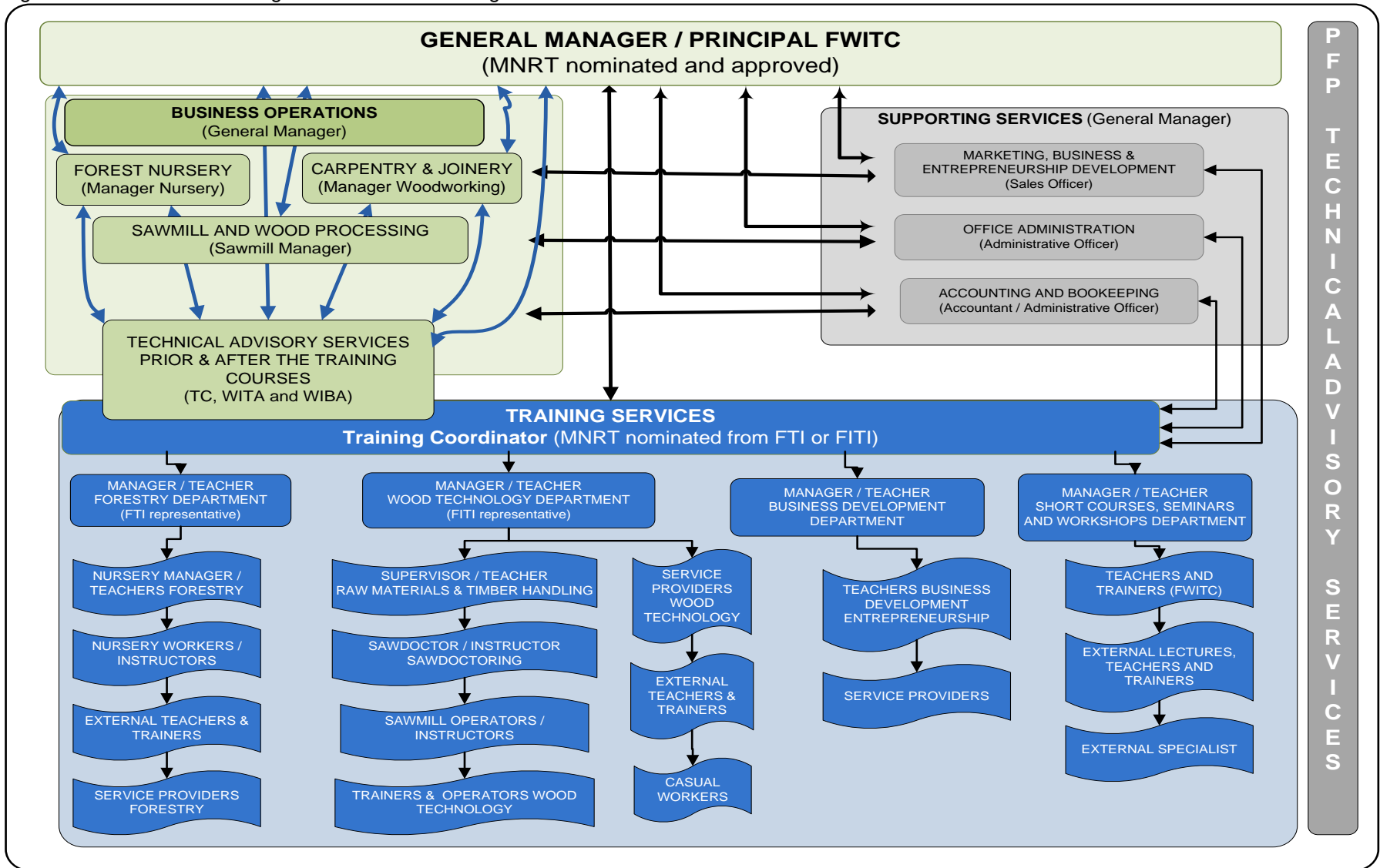
The most important link between the departments is the position of the Technical Advisory Services that is expected to work between the Training Services and the Business operations to link training and technical issues that are both offered to the clients of the centre. Important function of training, TA services and the business departments is collaboration when planning the training and TA activities to synchronise production, training and TA services. In this respect the operational planning and scheduling of all operations together is a precondition.

The training department, where most of the workers and teachers are, is divided into Forestry, Wood Technology, Business Development, and Short Courses, Workshops and Seminars departments. Each department has its own Manager / Teacher who is responsible for training activities under the Training Coordinator. The Manager of each department acts also as a leading teacher of the department being responsible for planning and implementation of training courses as well as supervision of the training personnel linked to their training.

The organization chart also indicates that PFP continues as technical assistance and supporting organisation. PFP provides TA service for all training and business departments and operations.

It is assumed that carpentry & joinery operations for manufacturing of value added wood products will be added to FWITC's business and organization in the future. This will be done to provide an inclusive training package with the TA services for the entire forestry value chain.

Figure 8.1 FWITC Management structure and organization chart



The General Manager / Principal (GMP) of the FWITC will have an overall management responsibility. He/she will act as a GM where the business operations are concerned and as a Principal where the training activities are concerned. The GMP reports to the Board of FWITC, which is the highest decision-making body of the centre. A chairman for the Board will be nominated annually by the MNRT who the supervising institution of the centre is.

The Board of FWITC will have members from the most important stakeholder groups having interest and role in FWITC's operations. The recommended composition is shown in Table 8.1.

Table 8.1 Composition of FWITC's Board

| Organization | Representing | Role | No. |
|-----------------------------|-----------------------------------|----------------------|----------|
| SAFIA | MSME sawmillers and SAFIA members | Member | 1 |
| TGA APEX | Tree growers and TGA members | Member | 1 |
| FTI and FITI | Co-operating training institutes | Member | 1 |
| FBD | MNRT | Member | 1 |
| FWITC (GM) | FWITC | Secretary | 1 |
| PFP (TL) | PFP | Technical Assistance | 1 |
| TOTAL No. of MEMBERS | | | 6 |

8.2 Management Option for the Centre

Tentatively it has been discussed that FWITC would be merged and managed jointly with the FTI and the FITI under the supervision of the MNRT. Merging of FWITC, FTI and FITI would establish a comprehensive nationwide forestry education institution to Tanzania. The merge would strengthen the existing two institutions because the new set-up would offer a full range of forestry education from the short courses for workers' skills development to formal VETA and NACTE level forestry education. This type of institution under one management would be beneficial for all, the forestry educators, education authorities, industry, trainees and the beneficiaries of education and training.

An advantage of the merge and the new set-up would be that forestry and wood technology education and training (short courses) would be planned, managed and implemented only by one institution that knows the needs and requirements for training and who has the required experience and knowledge to do the work. With this arrangement operational, management and financial advantages could be achieved with scale of economies for improved viability and sustainability of all the three institutions.

The following three management options were developed for FWITC's operations. These options were analysed with a SWOT analysis to find out the most appropriate one.

Option 1:

FWITC will be established only to plan, organize and implement short courses training in forestry and wood processing. No production and business operations are included. FWITC will be directed by the Board and managed by the GM as recommended in the organization chart. Training will be planned and organized by the newly established FWITC management that includes FTI and FITI.

Option 2:

FWITC's operations will be done so that it includes both production and training operations as proposed in this BP. Management structure and the organization chart is used as it is recommended in Figure 8.1.

Managers / Leader Teachers of the training department and business units will be independently responsible and accountable for the training activities and the production operations. Specific times will be allocated for training and production so that they do not interrupted each other. Priority is always given for training.

Operations in this option will be intensified to maximize both in production and training with the aim of full capacity of the facilities. It is anticipated that training will take about 30% of FWITC's operating time and the production about 70% respectively. This model is aiming at the greatest efficiency of the centre to generate as much revenue as possible for development and sustainability of the centre.

Option 3:

FWITC will be established by merging the management and operations of the FWITC, FTI and FITI to plan, organize and implement the training and production operations of the centre. Specific times for production and training will be allocated with a priority on training. It is recommended that training will occupy fully about 30% of FWITC's operating time and the production about 70% respectively. Both training and production operations should be accelerated to full capacity as soon as possible.

This option empowers the full capacity of the centre and the best impact of the investment for the future. It provides good training services provision with real practical working and business environment. Long-term impact for term sustainability of the centre can be secured.

FWITC will be established with independent business units and training departments as profit making centres as recommended in this BP. Management will be organized under one management structure as recommended in this BP. All business units and training departments will be accountable for the GM and Board of the FWITC.

Comparison of the options

To compare the management and operational options a SWOT analyses was carried out to find out the most appropriate option. The analysis is shown in annex 13. The most feasible and recommended management option for FWITC is to have its own autonomous decision-making which has the authority to manage and operate both training and production operations on its own as recommended and planned in this BP.

Whatever management option will be chosen the balance between training and production must be well planned and maintained to secure training provision that is identified to be the core business of the centre. Any management option chosen training must have the priority. In any interventions FTI and FITI should be involved in both management and operational activities, especially where training is concerned. FTI and FITI should also be represented in FWITC's management team and Board of the centre to participate in planning and decision-making of the future operations and investments required for improved performance.

From the SWOT analysis it can be concluded that option 3 will be the most appropriate option for FWITC's management. The centre should operate under the supervision of the MNRT. It should be merged to FTI and FITI operations so that it will be part of them at least in terms of training services provision.

Recommendation 13 Management option for FWITC

It is recommended that option three (3) will be selected as the management option for FWITC. The following facts support the recommendation given:

- 1) Combination of production and training operations will provide many advantages e.g. real practical training environments, good income generation and revenue earnings for the centre, good ground to improve teachers and trainers practical working skills for improved training and establishment of real demonstrations for running wood processing business profitably by well-planned production operations.
- 2) Financial viability of the centre will be satisfactory if all proposed plans are executed.
- 3) This option will support development of the centre, if FWITC development fund is collected and net profit used for the development.
- 4) Sustainability of the centre can be secured with 2-4 years operations, if carried out as planned and recommended in this BP.

- 5) Experienced teachers can be occupied from FTI and FITI to train new teaching and training staff for the centre.
- 6) Production operations create a good test ground and laboratory for industry development as well as a show room for business management and enterprise development, of course if well-developed and maintained at FWITC's own operations.
- 7) This option would ensure the best possible financial support for training and development of the centre.

The option three is challenging one especially in setting up the priorities, time frames and allocations for production and training activities, which must be well planned and maintained. The option will become even more challenging if the production targets are raised up too high and there is pressure to produce more products and to generate more income for the centre on the cost of training provision. In this circumstances training is too often neglected and money making takes over the business, which cannot be accepted in this case.

To override all the challenges, it is important that a constitution will be developed for the centre, which will spell out all the conditions for FWITC's operations, management and development. The constitution must clearly state the time allocations and conditions all the operations. It must also provide declarations for roles and responsibilities of the personnel. Only by developing and following the constitution the primary purpose of FWITC – training and technical advisory services - can be achieved.

The constitution should clarify the status of the centre, its Board and responsibilities of the Board and the General Manager. The constitution should include at least the following issues: ¹

1. Priorities and time allocations for production and training.
2. Staff arrangements, allocations and qualification criteria.
3. Staff roles and responsibilities for both production and training of the FWITC.
4. Roles and responsibilities of the Board.
5. Legal and registration requirements for the centre.
6. Establishment procedure for the Board.

Roles and responsibilities of the staff should clearly be written down and explained to all staff members to minimize confusions and misunderstanding of responsibilities. Capacity building programmes should be drafted to train the staff to become qualified and skilled workers as well as teachers and trainers for forestry and wood technology training. For the potential teachers and trainers, a special training programme is required to qualify them as VETA level qualified teachers to teach and train people on competence-based short courses.

It must be noted that sawmill operators and forest workers are not qualified teachers or trainers unless having an adequate professional education (certificate/degree) and teacher training from the authorised teacher education institute such as VETA Tanzania. If trainers or teacher do not fulfil the qualification criteria they do not have authority to give accredited certificates.

When really starting FWITC's operations the following should be clarified and agreed:

1. Organization of training and production in terms of times and occupation of the facilities?
2. People involved and their roles and responsible for training and production operations.
3. Staff arrangements for production and training operations?

The most important precondition for successful FWITC business is the registration of FWITC as a legal company or enterprise. The registration will facilitate sale of FWITC's products and services for its clients to maximise the income generation and revenue collection as presented in the profitability calculations of this BP. For the registration of FWITC, the ownership and the constitution of the business must be defined and accepted by the Board of FWITC, the TRA and the MNRT.

¹ Legal lawyer services should be hired to register FWITC as register company and to establish its legal status by preparing a constitution for the centre and the company.

Recommendation 14 Registering of FWITC as a legal company

The following issues are recommended to register FWITC as a legal company:

- 1) FWITC company or enterprise to be established and registered as a business unit.
- 2) Machinery, equipment and transport fleet of the centre to be property of FWITC.
- 3) The shares of FWITC company to owned by the MNRT and the FWITC in collaboration with FTI and FITI.
- 4) The FWITC registered company to operate like any other business enterprise in Tanzania to follow the government of Tanzania and the TRA rules and regulations concerning the business operations of the enterprises.
- 5) The Board of FWITC to be the highest decision-making body in all business.
- 6) The business operations to be managed as defined in FWITC Business Plan.
- 7) The salaries paid to the management and manpower to be competitive to those paid in the other similar forestry and wood processing enterprises.
- 8) The profits of the FWITC business, if generated, must be used for supporting of centre's training activities, development of FWITC facilities and for establishment and management of new forest plantation areas that have been allocated for the ownership of FWITC under the TFS and the MNRT of Tanzania.

8.3 Management of Training and TA Services

Training Department (TD) will be an independent business unit and cost centre of FWITC. TD will be responsible for planning, scheduling, organizing and implementing of the short courses and thematic forestry and wood technology seminars and workshops as business of the department. TD's responsibility is also identification and recruitment of teachers and tutors for the courses, workshops and seminars to be organized. The department will be led and supervised by the Training Coordinator (TC) who will be nominated by the MNRT.

TC is responsible also for the personal management of the TD. He/she will be responsible for recruitment of service providers, tutors, lectures and trainers needed in short courses and special training events of the centre. TC recruits and supervises also external Service Providers for training. He/she will act as a Leading Teachers of the centre supervising the external and internal tutors, teachers and trainers working for short courses. TD's manpower requirement and lines of commands are shown in Figure 8.1.

Technical Advisory Services will also be an independent business unit of the centre. However, it works very close to training department. This is because the business idea is that operations of the TA services will be offered before and after the training, if requested by the clients. The fact is that manpower requirement for this department is the most demanding one of the centre because the advisors must have excellent technical knowledge of forestry and wood processing operations with a long-term practical work experience from the field they are going to provide services. Only with this type of workers the department can offer services to the industry to have their full respect and appreciation of assistance. If the advisors do not have the respect and required expertise to advise the industry, companies and their personnel the business will collapse sooner or later. This will also affect the reputation of FWITC as a qualified training centre.

TA services department should be manpowered with highly experienced and correctly qualified personnel that have experiences from, forestry, forest industry and wood processing operations. It is planned that this section begins its services with the ex-posts of PFP that are TC, Wood Industry Technical Advisor (WITA) and Wood Industry Business Advisor (WIBA). The department and its workers will be working directly under the supervision of the General Manager. However, the workers must collaborate and plan their works and working schedules with the FWITC's Training Services department and other Business Operations departments of FWITC. This is because of the linkage between the TA services and the training.

8.4 Management of Forest Nursery and Sawmill Operations

If the option three (3) is selected it means that FWITC will start its sawn timber and tree seedling production operations. This means that each business unit / department must be manpowered with qualified managers, operators and workers to run the operations effectively as planned.

The nursery operations and the tree seedling production will be the easiest business department in terms of manpower and the supervision because of rather modest production techniques and labour-intensive working methods. The department will employ one Manager supervisor to organize and supervise the operations. He/she will report to the General Manager.

The Forest Nursery department will employ from 3 to 6 nursery workers depending on the production volume and the time of the year. Mostly the workers will be casual workers that will be employed with a fixed-term contract for a period of seasonal operations. An option that these workers could be the permanent workers of FWITC's other departments should be studied. There might be a possibility that FWITC needs general workers that work seasonally or on part time basis in different departments depending on the needs and works available. For example, sawn timber drying, if carried out through air seasoning system, can share some of the workers, because the work in the timber might not be full time work.

For the 1st operational year it is planned and budgeted that FWITC's sawmill will employ 41 workers. 24 of them will work on the sawmill operations and maintenance, 3 in management, 2 in supervision and 12 in material handling. Forest operations such as harvesting, logging and transportation of logs and raw materials are not included to this manpower. The sawmill operations will be directed by the Sawmill Manager assisted by two Supervisors one for the sawmill operations and another one for the raw material and products handling. The sawmill will also have a secretary working for records keeping, sales and administration issues.

The Sawmill Manager will prepare monthly and annual production and operational plans as well as financial reports. These reports must be submitted to the Board of FWITC in monthly and annual basis for monitoring of the business and to secure the transparency of the operations.

Organization of sawmill operations and job descriptions for workers

The following manpower is proposed for the sawmill operations. Main responsibilities of the Sawmill Manager and the Supervisors are presented under each heading. Number of workers needed for the position is shown in the brackets after the position. The labour budget and profitability calculations of the sawmill were prepared in line with this plan and number of workers.

Sawmill Manager (1) will be responsible for:

- Coordination of all production activities both in the forest (if applicable) and the sawmill.
- Production planning of sawing operations.
- Planning of manpower use.
- Budgeting the production targets for logging and production operations
- Supervising the supervisors and manpower of the sawmill.
- Monitoring the operational and financial performance to meet the production and financial targets of the sawmill.
- Preparing the operational and financial reporting to the Board of FWITC.

The sawmill manager will be the highest authority at the sawmill. The sawmill manager will solely control inputs, outputs and performance of the sawmill. The manager will maintain the records keeping system of the sawmill to report production performance. Manager will ensure that targets are reached and profitability of the sawmill obtained as planned and budgeted annually.

Sawmill Supervisor (1) will be responsible for:

- Achievement of the daily production targets.
- Maintaining of daily records for input and output volumes.
- Cross-checking of logs supplied with the invoices at the mill gate.
- General maintenance of the sawmill machinery.
- Sawdoctoring and saw blade maintenance to secure smooth production operations.
- Workers safety and discipline at the mill.

The sawmill supervisor will ensure that the output target of the sawmill is achieved as planned. The supervisor will also be responsible for maintenance of the machinery and saw blades as well as acquisition of spare parts required. The supervisor will also oversee controlling the workers of the sawmill. The supervisor will report directly to the sawmill manager. The following personnel will be employed to work under the sawmill supervisor:

- Secretary (1)
- Sawmill operator (4)
- Assistant operator (4)
- Cross cut saw operator (2)
- Assistant cross cut saw operator (2)
- Sawdoctor (1)
- Assistant sawdoctor (1)
- Sawn timber graders (2)
- Sawmill workers (8)
- Log and timber yard workers (8)
- Tally clerks (2)
- Drivers (2)
- Sales clerk (1)

Log and Timber Yard Supervisor (1) will be responsible for:

- Receiving logs to the sawmill and log yard.
- Operational planning of log and timber yard operations.
- Seasoning and drying of sawn timber for high quality.
- Daily, monthly and annual maintenance of the database on felling, skidding and transporting of logs to the sawmill, if applicable for the operations.
- Ensuring that felling, log-marking, bucking and long-distance transport conform the provisions made under the TFS Rules and regulations for forest harvesting operations, if applicable for FWITC sawmill operations.
- Ensure workers safety at the yard and the field conditions, if applicable.

The log and timber yard supervisor will be responsible for log storing and raw material handling at the sawmill as well as for products handling at the sawmill, including drying of sawn timber. The supervisor is responsible for preparing raw material procurement and transportation plans with the TFS and Sao Hill forest plantations. The supervisor will be in charge for raw material procurement, transport operations and supervision of the field operations in the forest, if applicable for the sawmill. The following forest workers will be employed to work under the supervisor, if logging and harvesting operations are to be carried out by the sawmill instead of buying the services from the service providers as planned and recommended in this BP:

- Chain saw operator (2)
- Assistant operator (2)
- Tractor driver (2)
- Assistant tractor driver (2)

Management by Operational Planning

In a management system based on the operational plan, the necessary development steps are always required to attain the set objectives and the mission of the business. In the next few years FWITC should pay special attention to the following aspects:

- 1) Marketing and sales of its products and services.
- 2) Cost control and structure of manufacturing expenditures vs. variable costs.
- 3) Capacity building, training and staff development.

If the business and production operations are started in full scale at FWITC the centre should concentrate on the following special development areas to reach the targets:

- 1) Mastering of production processes for a full capacity and utilization of the facilities.
- 2) Service and maintenance of machines and facilities to increase the capacity gradually.
- 3) Quality control and records keeping maintaining quality of products and services as well as controlling the volumes produced and sold.
- 4) Cost monitoring and productivity improvement.

8.5 Key Staff of the Centre

A professionally qualified staff is the key to the success of FWITC's services and training. Some manpower has already been recruited to FWITC and the rest can easily be recruited from Mafinga area. However, there is always a need for capacity building and training of workers. Training of the existing workers should be started immediately and when new manpower is recruited there must be immediate arrangements for internal training and skills development.

Without competent management, and teachers and trainers FWITC cannot provide its training that satisfy its clients and trainees. Therefore, it is recommended that all potential workers and teachers will be trained to be qualified VET teachers. Minimum training is Training of Trainers (ToT) that can be organized internally with qualified teacher trainers.

To enable FWITC to offer high quality training it is recommended that its staff will be trained on how to conduct short courses, how to teach practical hands-on-skills for workers and how to plan and prepare training sessions and materials for workers' skills development. These trainings can also be organized in-house by recruiting qualified trainer with experiences on further training, and planning and organizing of short courses in forestry and wood technology.

Currently, the permanent staff of FWITC consist of the GM, TC, WITA, WIBA and the Office Assistant. The supporting staff comprises of drivers, technicians, operators and general workers for production operations. It is planned that the GM works hand in hand with the TC when planning and implementing the training and production operations. The GM controls the monthly operating budgets and the resources available and provided for the centre. He/she is also responsible for searching funding for the centre. The following are the key staff positions of FWITC with a brief job description: (detailed ToRs are shown in annex 14).

1) **General Manager / Principal (GMP)**, will be responsible for:

- Planning, managing and supervising FWITC's business operations and human resources.
- Overseeing planning and implementation of training and short courses programme.
- Planning, managing and organizing the thematic seminars and workshops.
- Planning and organizing special forestry and wood technology exhibitions.
- Budgeting, accounting and bookkeeping.
- Marketing and communication.

GMP will work hand in hand with the TC, especially when planning training, short courses and annual training calendars for the centre. GMP controls FWITC's budgets and expenditures for training and production as well as use of resources and facilities.

2) **Training Coordinator (TC)**, will be responsible for:

- Planning, organizing and supervising FWITC's short courses training programme.
- Recruiting and supervising teachers and trainers for short courses, seminars and workshops.
- Monitoring & Evaluation (M&E) of the training implementation and its performance.
- Training material preparation and planning of the materials.
- Maintaining of students' rosters and performance records.

- Planning and preparation of FWITC's annual short courses training calendars.
- Development and maintenance of the training facilities.

TC will work in close co-operation with the GMP and the external service providers, lectures, teachers and trainers when planning, organizing and implementing the short courses.

3) **Accountant and Administrative Officer (AAO)**, will be responsible for:

- Accounting and bookkeeping.
- Day-to-day office administration.
- Organizing advertisement of the short courses, seminars and workshops.
- Enrolment of trainees and informing of selected course participants.

4) **Sales Officer (SO)**, will be responsible for:

- Coordination of marketing of training and production operations.
- Marketing of products and services produced.
- Maintaining of sales records and stocks of products at FWITC.
- Supervision and coordination of sales to meet the sales and profitability targets.

5) **Teacher Forestry (TF)**, will be responsible for:

- Overall implementation of short courses and on-site-training events in forestry.
- Acting as a teacher during the forestry short courses.
- Planning, preparation and producing of training materials for the short courses in forestry.
- Securing safety in training and appropriate training environment for the forestry course being responsible.
- Developing and purchasing of tools, equipment and materials for training.

6) **Teacher Wood Technology (TWT)**, will be responsible for:

- Overall implementation of short courses and on-site-training in wood processing, sawmilling and maintenance of machinery and tools.
- Teaching during the wood technology short courses.
- Planning, preparation and production of training materials for wood technology short courses.
- Securing safety and appropriate training environment for training in wood technology short courses.
- Developing and purchasing of tools, machines, equipment and materials for training.

7) **Instructors, Trainers and Supporting Staff**, will be responsible for:

- Supporting training activities when courses are implemented in their working areas.
- Carrying out the practical training sessions of short courses in their working areas.

For teaching the short courses FWITC lacks the necessary expertise. Therefore, there might be a need that FWITC recruits external professionals with relevant theory and practical experiences until the centre has its own trained staff to teach. Mostly these trainers are needed when management topics, and special advanced technical subject matters are taught.

It is anticipated that external professionals are also needed when management level short courses, and special thematic seminars and workshops are implemented. To inspire these specialist and highly qualified people FWITC must offer and pay competitive fee for their services.

9. RISK ASSESSMENT

As FWITC develops, there are substantial risks involved in the process. The greatest risks are related to the national economic climate, that might affect negatively the demand for FWITC training services and products produced. The merging process of FWITC to FTI and FITI will obviously affect the financial sustainability of the centre, if not well handled. However, currently FWITC has many strengths and opportunities that could be turned to success of the centre if the developed plans are well executed and even further developed to be more effective. Uncertainty of sustainability, ownership, governance and transparency are the highest risks of the centre.

Potential risks, which may affect the success of FWITC's training services and business operations are listed in Table 9.1. Table 9.1 has also the mitigation measures to be taken for reducing or eliminating the risk and improving the sustainability of the centre. Also, persons responsible for following the risks and measures to be taken are listed in the table 9.1.

Risks and Challenges

The biggest challenge of FWITC's operations is a risk of adequate financing for training services and production operations, unless PFP continues supporting the centre during the phase II. The financing challenges and lack of operating funds will particularly be during the first and probably the second year of operations. It is foreseen that funds and support from the external sources, such as PFP phase II and the MNRT, are needed for marketing of the centre and capacity building of the staff.

Another risk with regard to start up and continuity of the centre might be poor interest of industry and companies to send their workers for training causing low course attendance and therefore low income to keep the centre surviving and sustainable. Enrolment fees, unless subsidised by the external financiers like PFP or the government of Tanzania, might be too high to make courses attractive and to fill up them. The key issues for the success and the sustainability will also be marketing of services and offering of high quality training right from the beginning. If these are well-done they may initially improve the image of the centre and in a long run enhance the clients' appreciation towards the services of the centre and training as a whole.

Sustainability Issues

Bookkeeping and accounting, if not timely and transparently execution, will become an enormous risk for the business, profitability and sustainability of the centre. As far as the production operations are concerned service and maintenance of the machines and execution of products' and services' quality control are required.

In developing forestry and forest industry sectors in Tanzania the FWITC in Mafinga can be a future pillar for sustainable forestry and wood technology training and education. FWITC's role and contribution to support workers' skills development and capacity building is important because it is the only forestry training institution in Southern Highlands. Therefore, it is important that sustainability risks listed here will be considered and taken seriously. When considering them, correct actions can be taken, right directions maintained and sustainability secured.

Collaboration with the existing forestry education institutions, such as FTI and FITI, will be the key for securing the long-term sustainability of the centre and the forestry education in Tanzania. The best impact of training and sustainability of the centre can be achieved, if FWITC, FTI and FITI are linked for collaboration.

Table 9.1 Risk Assessment and Mitigation Plan

| Risk No. | Risk statement | Impact | Likelihood | Mitigation action. | Action owner |
|---------------------------------------|---|--------|------------|--|----------------------------------|
| RISKS IN TRAINING SERVICES | | | | | |
| 1 | No financing or subsidises for offering full annual training calendar and all short courses planned. | H | MH | FWITC's management should find and work out reliable financing sources or built up a subsidy system. | GM, TC and PFP |
| 2 | Downturn in economy reducing a lot of demand for training, capacity building and workers' skills development. | MH | L | FWITC to control investments for establishing capacity and facilities of the centre. Keeping the organizational structure as small as possible. Merging FWITC to FTI and FITI facilitates flexible movement of staff in accordance with the needs. | GM, TC, FTI, FITI and Principals |
| 3 | Willingness of clients to pay for training and short courses because of FWITC's poor reputation, lack of experiences and low level of teachers' and trainers' knowledge and skills. | H | MH | FWITC to improve and show its profile, status and capabilities. FWITC to improve its image by developing and improving of its reputation through open-days and demonstrations. | GM, WITA, WIBA and TC |
| 4 | Quality of training is low poor depressing clients' willingness bring enough trainees and pay applicable fees for the training and short courses. | H | H | Improving course contents, training and training material qualities. Updating of courses and training materials in regular basis after receiving M&E results. | GM, TC, Teachers and Trainers |
| 5 | Need for training and skills development underestimated by the clients and workers of the industry causing low attendance of courses and poor profitability of training activities. | MH | ML | Constant follow-up of number of trainees. During the planning process proper projections for training needs must be developed to update annual plans. | GM, WITA and WIBA |
| 6 | Delays in organizing training, short courses, and many cancellations of courses because of poor marketing, planning and implementation FWITC. | L | L | Processes for planning and implementation of FWITC's training should be developed and must be followed to be effective. | GM and TC |
| 7 | Demand for training and short courses is overestimated leading to overproduction of training and short course hence causing financial loss and poor profitability. | L | ML | Constant follow-up of number of trainees. Preparation of TNA and analysis to know the demand and needs. Updated and revising the annual training calendars in relation to the demand and needs. | GM, WITA, WIBA and TC |
| 8 | People do not understand and appreciate the need for training, knowledge and skills development of workers. | L | MH | More communications to be done and demonstrations and shows to be implemented with more attractive marketing to be done. | GM, WITA, WIBA and TC |
| RISKS IN PRODUCTION OPERATIONS | | | | | |
| 1 | No working capital to start production operations and to run operations as planned. | H | MH | FWITC management to start negotiations with potential financiers for getting the initial working capital. | GM, and Production Managers |
| 2 | Availability of raw materials for full production capacity. | H | ML | Sawmill to plan for raw material needs and procurement. | GM and Sawmill Manager |

| Risk No. | Risk statement | Impact | Likelihood | Mitigation action. | Action owner |
|---|--|--------|------------|---|---|
| 3 | Increasing competition of raw materials from the forest plantation to reach set production targets. | H | H | Sawmill to plan for raw material needs and procurement. | GM and Sawmill Manager |
| 4 | Quality of sawn timber, wood products and other products sold is low to get reasonable prices for the products. | MH | H | Product qualities to be improved by developing proper quality standards and operating procedures as well as developing quality control systems for controlling products and production operations. | GM, WITA, WIBA and Sawmill Manager |
| 5 | Low demand and sales for forest tree seedlings because of lack of funds by the farmers, forest owners and people establishing new forest plantations. | MH | ML | FWITC to add information and training about forest plantation establishment. More marketing and advertisement required by FWITC. | GM and Nursery Manager |
| 6 | Clients of the nursery are not willing to pay market prices for the seedlings due to their financial limitations and expectations for subsidised services and free seedlings from the donor funded projects. | ML | MH | FWITC and MNRT should work appropriate financial mechanisms to subsidise and facilitate people and groups with less ability to pay for the seedlings | GM and MNRT |
| 7 | Water supply to the forest nursery might not be sufficient due to the depth of the bore hole causing loss of seedlings and reduction of production volume of the nursery. | L | Low | FWITC to secure that water supply at the centre is constant and sufficient to all its production operations | GM, Nursery Manager |
| 8 | Loss of seedling production due to poor nursery management causing plant diseases, poor-quality seedlings and death of seedlings. | ML | Low | Management of FWITC's nursery operations should be strengthened and staff trained to meet the qualification criteria | GM, Nursery Manager |
| RISKS IN TECHNICAL ADVISORY SERVICES | | | | | |
| 1 | Quality of TA services low causing challenges to support FWITC's training prior and after the courses | MH | MH | FWITC's TA team knowledge and skills on forestry, forest industries and wood technology should be strengthened through training and capacity building. | GM and TC |
| 2 | Clients are not happy for FWITC's TA services because it does not provide appropriate knowledge and assistance affecting sales and reputation of the centre as well as training provision. | H | H | FWITC's TA team knowledge and skills on forestry, forest industries and wood technology should be strengthened through training and capacity building. | GM and TC |
| 3 | Willingness of customers to pay for TA services due to poor reputation, lack of experience and lack of knowledge and skills to offer TA services. | MH | H | Reputation of FWITC should be improved by organizing demonstration days and strengthening of the TA team's capacities. TA team should be supported with experienced technical advisor to assist the team and to build knowledge and skills of FWITC's technical advisors. | GM, TC and external forest industry technical advisor |

Impact (rate to occur) High (H),
Medium High (MH),
Medium Low (ML)
Low (L)

Likelihood H
MH
ML
Low

10. FOUR MAIN RECOMMENDATIONS

The success of FWITC will greatly depend on the cost-effective training services and sales of profitable forestry and wood products as well as on innovative new products. To reach the targets and the mission of FWITC the success will depend also on the marketing strategy and delivery of comprehensive training packages and services to clients' satisfaction.

It is found that FWITC's sawmill and forest tree nursery can be operated viably, if well managed. These operations can well support development and sustainability of the centre. However, new machine investments for both sawmill and forest nursery operations are still required to reach the full production capacities. In this regard good planning for procurement is required.

Technology wise FWITC's sawmill and tree nursery as well as training facilities can be developed so that they meet the requirements for an appropriate training institution as well as a simple demonstration SME production sawmill. Technological developments might be necessary also if FWITC's business is to be increased and profitability improved from the projected profits of this Business Plan

This Business Plan provides information that can be used for development of documentations and internal FWITC plans that are required for running of the business. Development of management structures and administrative procedures of an enterprise like FWITC is a long-term and progressively built process which combines business, marketing and operational plans and procedures as well as financial management procedures. All these must be linked to each other to make it centralized and functional system. The system can be computerized with a software such as Enterprise Resources Planning (ERP) system, which manages and controls procurements, productions, sales and deliveries of the company.

Recommendation 15 Enterprise Resources Planning (ERP) system for FWITC

To establish FWITC's management system functional, controllable and transparent it is recommended that all-inclusive ERP system will be established and set-up to FWITC. Only with the computerized type of system the performance can be followed and analysed for the developments and improvements. It is almost obligation that ERP system will be set-up to FWITC operations right from the beginning of operations. This could be a relevant example and a tool for training as well as a demonstration model for local industries.

In the operationalization of the business plan and before considering investing for the ERP system, the following should be considered:

- 1) FWITC's business departments and their operations must be linked together so that the benefits for both training and production operations can be achieved.
- 2) Development of correct business operations and their processes must be started to improve the business performance and profitability of the departments.

When sensitizing the Business Plan, it is recommended that in-house technical assistance, mentoring and internal capacity building will be provided. This approach can guarantee the best knowledge transaction with guidance, practical on-site works and supervision for these.

The key players associated to FWITC's business and operations are the MNRT, FBD, FTI and FITI. These institutions should be linked to FWITC from the beginning to sensitize them for the operations and to include them for the management of the centre. The following recommendations are given to enable sensitization and operationalization of this business plan.

RECOMMENDATIONS 1: OPERATIONALIZATION OF THE BUSINESS PLAN

To begin the process FWITC's management should first be sensitized after which the real operations could be started gradually as explained and described in recommendation 16.

Recommendation 16 Operationalization of the Business Plan

To begin the **organizational arrangements the ownership arrangements** should first be clarified. MNRT should do this because it is planned that ministry will be the owner and supervisor of the centre. This arrangement will legalize the status of the centre and would facilitate registration of it as a training institution. After the ownership arrangements **the following management arrangements should be done:**

- I. Management and administration arrangements with office procedures should be established to start business and training operations.
- II. FTI and FITI should be linked to FWITC to accelerate training as planned in the training plan of the centre.
- III. FWITC should recruit the needed manpower for the training and production operations as recommended in this BP.
- IV. FWITC should take over the management responsibility of the centre from PFP to be fully responsible for training and business operations. This should be done under the technical assistance support from the PFP and its phase II operations.

After making the management and administration arrangements **the following operational arrangements should be done:**

- 1) Operational plans for all business departments and operations should be developed.
- 2) Accounting, bookkeeping and auditing systems to monitor payments and financial performance of the centre should be established.
- 3) Procurement, purchase and store keeping systems should be established.
- 4) Marketing and advertising of products and training services should be started.
- 5) A plan for further investments should be developed to facilitate full production operations and training provision.
- 6) A plan for time-based machine maintenance and service should be designed.
- 7) Records keeping and quality control systems for production operations should be designed and initiated together with starting of the production operations.
- 8) Coordination and collaboration between the training department and the TA services should be established to offer comprehensive services with the best performance.
- 9) After-sales services should be established to monitor training impacts and to follow-up quality of products produced and sold.

After finalizing the management and operational arrangements **training and production operations should be started** as recommended in the section 6.

When the operations are started special emphases should be given for:

- Mastering and supervising the production processes and working methods.
- Following that established maintenance and service schedules are implemented.
- Maintaining the records keeping and quality control systems in regular daily basis for controlling the volumes and qualities of products and services produced.
- Initiating a system for product innovations to create new saleable products and to increase value for the existing products and services.

To empower the recommendations above and to succeed on the business strategy the management and supervisory personnel should be trained at least on operational and production planning, accounting and bookkeeping, and on maintenance of machines. First plans could already be developed during the training to be piloted when operations begin.

In the effective management, based on the annual budgets and operational plans, clearly defined procedures must be followed to achieve the goals. **With this context FWITC should pay extra attention for:**

- 1) Marketing and sales of products and services.
- 2) Pricing and costing of products and services.
- 3) Developing of human resources through skills development and special training.

RECOMMENDATIONS 2: IMPLEMENTATION OF THE BUSINESS PLAN

To begin operations all machine operators, teachers and trainers should be trained on practical sawmill and forest tree nursery operations and on the use of FWITC's machinery. They should be trained also for a short time on pedagogics and teaching methodology used in skills development and training of workers.

The starting point for succeeding on the management is to satisfy clients now and in the future. Only by focusing on serving the clients, can an organization ensure its success and competitiveness. Primary activities of FWITC is to prepare the above-mentioned plans and procedures to accomplish the mission based on the strategy of this BP. To do this effectively the following aspects must be emphasized:

- Managing the strategic planning processes for the improved performance.
- Managing the data and information for the best planning processes and implementation.
- Managing the quality of products and services for clients' satisfaction and the success of the centre.
- Managing and developing the human resources for the best performance of the centre.
- Managing finances for the viability and sustainability of the centre.
- Managing accounting and bookkeeping for the transparent operations and successful business.

When managing the operations, the following marketing principles should be followed:

- Prices of products and services should be at the realistic and right level.
- Quality of products and services must be of the highest standard.
- On time service provision is key for the success of the business.
- Communication with and feedback from the clients should be part of the business.

To implement the business plan effectively an efficient management system is the first prerequisite. The second one is communication with the external business associates to get feedback from them. When linking the clients' feedback back to the business development the company can improve its services and products' to better serve its clients for improved business performance and profitability of the operations.

RECOMMENDATIONS 3: INVESTMENTS REQUIRED TO UPGRADE THE SAWMILL

The maximum output of the sawmill, when sawing pine and eucalyptus in one shift, is planned to be 4,000 m³/annum. With the existing sawmill machinery this is not possible and therefore extra investments are required. The recommendations are in the recommendation box 17. The investment cost calculations for the sawmill operations and this business plan were made with an assumption that at least a minimum of 150,000€ will be needed to up-grade the sawmill. The requirement is even bigger, if the sawmill will be operated with higher production than 4,000m³ per annum.

Maintenance of machines and saw blades are must to operate the sawmill efficiently and to guarantee planned production and training operations. Currently these facilities and equipment are not enough. There is a need to purchase machines and tools for sawdoctoring as well as for maintenance of machines and vehicles. Also, chainsaws, conveyors and material handling equipment for logs and sawn timber handling are needed to reach full capacity of the sawmill.

Recommendation 17 Investments needed for logging, harvesting and sawmilling

LOGGING AND HARVESTING

- 1) Chain saws.
- 2) Safety tools and personal safety cares for forest workers.
- 3) A logging winch for a farm tractor for skidding of logs

SAWMILLING

- 1) Machines, tools and equipment for saw band and circular saw blade maintenance.
- 2) Tools and equipment for maintenance of sawmill machines and vehicles.
- 3) Construction of a log yard area for storing and handling of logs.
- 4) Construction of sorting area for sorting of logs.
- 5) Board edger machine with tables and conveyors to edger sawn timber. Currently the sawmill does not have a board edger machine so edging of is not possible.
- 6) Construction of tables and conveyors for sorting, grading and trimming of sawn timber.
- 7) Construction of a shed for sawn timber drying and storing.
- 8) Procurement of conveyors for sawn timber and material handling at the sawmill.
- 9) Increase of a kiln dryer capacity to dry sawn timber for furniture manufacturers.
- 10) Procurement of a heavy-duty tractor with implements such as forest trailer, loader and a winch for harvesting, skidding and transport operations.
- 11) Procurement of a front-end-loader for logs, sawn timber and by-products (bark and sawdust) handling and transport at the sawmill

When investing more to sawmill machines, conveyors and material handling, the lay-out of the sawmill should also be developed to improve production flow and productivity of the sawmill. In the lay-out design and development the following principles should be considered:

1. Production process should be clear and conducive to optimisation of the internal material movements.
2. Space between the machines should be so large that stock of raw material and products can easily be stocked and handled.
3. Internal and external traffic at the mill area should be arranged so that that safety regulations are followed and access for vehicles can safely be arranged.
4. Roads and the yards should be gravelled or cemented to withstand the rain season.
5. Sufficient drainage should be constructed to maintain clear and dry working areas when raining.

RECOMMENDATIONS 4: GENERAL RECOMMENDATIONS

This Business Plan and its financial and profitability analysis should always be revisited and reviewed annually to guide the annual planning and budgeting processes. To develop FWITC further, it is necessary to:

1. Monitor that FWITC has adequate financing and operating capital for the next four (4) years, which should be made possible through FWITC's own viable business operations rather than direct support from donor funded programme like PFP.
2. Organize FWITC as an independent business and budget unit under the MNRT with its own operational plans for the training services and production operations.
3. Agree on the management and supervision of FWITC with the MNRT, FTI and FITI.

11. CONCLUSIONS

The aim of this Business Plan preparation to FWITC was to identify potential business alternatives for the centre. After identifying them investment and profitability calculations were prepared to calculate and analyse the business viability and profits for different future projections, which were prepared for four years. The selected four business operations were then described with detailed information and instructions for operations.

After preparing the expenditure and profit calculations financing and accounting issues were explained with design and development of a chart of accounts for FWITC's accounting and bookkeeping. Also, the administrative arrangements and management options were studied, and proposed with an organization chart and the management option for the centre.

The risk assessment for various business operations were also prepared with a proposal of mitigation measures to manage them. Finally, four main recommendations were proposed to operationalize and implement the Business Plan with a recommendation for extra investments to upgrade the sawmill for full capacity operations.

In general, it can be concluded that FWITC's viability and profitability in training and production operations are acceptable if the operations are planned and executed well. The profitability calculations indicated clearly that all business operations of the first two years will be challenging and only after the second year a positive business performance can hardly be achieved. However, after the fourth year the business seems to be reasonable good if the projections will happen.

If the production operations are well planned and well-organized operational plan is developed for all business operations the centre can be operated successfully with a reasonable viability. The financial analysis showed that training services only cannot sustain the centre but with combination of all four business operations the sustainability could be achieved with the four-year operations. This is with a condition that all recommended operations will be carried out as planned and the extra investments with adjustments of the lay-outs will be made.

After two years from the start of FWITC's establishment the centre is almost ready for its full operations with training services and technical advisory services as well as business operations. Up-to-date the centre has offered only few training courses, although the needs are there and training plans ready for implementation. Therefore, there is a need to boost the implementation to reach the set targets for 2018. It can be assumed that FWITC would only be regarded as having achieved its mission and goals when:

1. The major output – short courses Training Programme - is demonstrated to be a reality.
2. Production of training materials for short courses are complete.
3. Appropriate balance between training and production are ascertained.
4. Short courses training and production activities are carried out as planned in this BP.
5. Set targets for training and production operations have been achieved as planned.
6. Management of operations with active operational plans for all business operations are rendered operational.
7. Management and staff of the centre are qualified and competent for the training and production operations.
8. Managerial and training staff take the responsibility of the centre to run it sustainably.
9. Forestry and forest industry companies recognize FWITC as a qualified training institution for forestry and wood technology training.
10. The recognition of FWITC as a VETA Certified (VET) centre has been achieved from the Vocational Education and Training Authority (VETA) of Tanzania.
11. Finances for both training and production are properly organized to ensure steady day-to-day operations with a continuous development for a full sustainability of the centre.

By considering the conclusions the BP recommends that the MNRT of Tanzania and the Private Forestry Programme would work on establishing the FWITC as a legal business entity to run its own training and production operations with an aim to sustain its operations through its revenue collection. The following arrangements are recommended for establishment of the centre:

1. PFP to be responsible for FWITC until the end PFP's Phase I in the end of 2018.
2. For the Phase II of the PFP Programme PFP retains as a technical assistance and supporting organization through its designated Team Leader (TL), except for the last year when the centre should be managed by the national FWITC's management team.
3. The Government of Tanzania, through the MNRT, will designate the FBD to be the official Government implementing agency and supervisory institution for FWITC.
4. By the Memorandum of Understanding (MoU) the FTI and the FITI will jointly be designated for the management team of the centre.
5. FWITC will be operated as a legal business unit to collect revenue from the training and technical advisory services, and sales of forestry and wood products as well as forest tree seedlings.

6. FWITC's operations will be restricted so that any income and profit generated from the operations can only be used for FWITC's maintenance, development and sustainability.

The MNRT and the FBD will supervise and monitor FWITC's operations to follow this Business Plan. They will also guarantee that appropriate accounting and beekeeping systems will be established for transparent management and financing of the centre which will be led by the Board of FWITC and managed by the General manager nominated by the MNRT of Tanzania.

Legal registration of the centre is a must before any business operations can be started, payments made, and revenues collected. The MNRT and the FBD are currently working on this issue. The centre should be registered with a Business Registration and Licensing Agency (BRELA) an agency empowered by the government act No 30 of 1997 for business registration in Tanzania.

On the basis of this Business Plan it is anticipated that FWITC's training services and production operations in business wise are well justified. It is therefore recommended that during the PFP's Phase I the programme facilitates commencement of the business operations while it expects starting of its Phase II implementation for 2019-2022 to provide further support for FWITC.

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Annex 1 Training costs and break-even points for short courses

| No. | Name of the FWITC short course | COST PER COST CENTER / COURSE (cost calculated for 1 course) | | | | | | | COSTS OF COURSE (calculated only for 1 course) | | | NUMBER OF COURSES PER YEAR | TOTAL COSTS OF ALL COURSES (2018) | F NUMBER OF TRAINEES / COURSE | H DURATION OF THE COURSE | I TRAINING COST PER DAY / TRAINEE | FINAL COURSE FEE TO BE PAID BY PARTICIPANT (rounded) | BREAKEVEN POINT TO ARRANGE THE COURSE | TOTAL VARIABLE COSTS / COURSE / TRAINEE | TOTAL FIXED COSTS / COURSE | TOTAL INCOME FROM THE COURSE |
|---|---|---|---------|---------------------|---|------------------------------------|-----------|----------------|--|---------------------------|---------------------------------|----------------------------|-----------------------------------|----------------------------------|-----------------------------|--------------------------------------|--|---------------------------------------|---|----------------------------|------------------------------|
| | | LECTURING | LODGING | MEALS & REFRESHMENT | USE OF CLASSROOM / WORKSHOP / TRAINING FACILITIES | TRAINING MATERIALS AND CONSUMABLES | TRANSPORT | ADMINISTRATION | TOTAL NET (total from cost centers left) | OVERHEADS (15% from A) | TOTAL WITH OVERHEADS (A + B) | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| A General courses & management | | | | | | | | | | | | | | | | | | | | | |
| A1 | Basics of information technology | 375 000 | 0 | 0 | 725 000 | 547 500 | 0 | 127 745 | 1 775 245 | 266 287 | 2 041 532 | 3 | 7 349 515 | 15 | 5 | 32 665 | 170 000 | 11 | 1 642 500 | 4 482 096 | 7349515 |
| A2 | Advanced skills in information technology | 375 000 | 0 | 0 | 725 000 | 547 500 | 0 | 127 745 | 1 775 245 | 266 287 | 2 041 532 | 3 | 7 349 515 | 15 | 5 | 32 665 | 170 000 | 11 | 1 642 500 | 4 482 096 | 7349515 |
| A3 | Basic health and first aid in forestry and sawmilling operations | 150 000 | 0 | 0 | 200 000 | 277 500 | 0 | 67 548 | 695 048 | 104 257 | 799 305 | 3 | 2 877 497 | 15 | 2 | 31 972 | 70 000 | 10 | 832 500 | 1 565 414 | 2877497 |
| A4 | Advanced health and first aid in forestry and sawmilling operations | 225 000 | 0 | 0 | 300 000 | 247 500 | 0 | 67 548 | 840 048 | 126 007 | 966 055 | 3 | 3 477 797 | 15 | 3 | 25 761 | 80 000 | 11 | 742 500 | 2 155 664 | 3477797 |
| A5 | Communication Skills | 225 000 | 0 | 0 | 300 000 | 247 500 | 0 | 25 548 | 798 048 | 119 707 | 917 755 | 3 | 3 303 917 | 15 | 3 | 24 473 | 80 000 | 11 | 742 500 | 2 010 764 | 3303917 |
| Sub total General courses & management | | 1 350 000 | 0 | 0 | 2 250 000 | 1 867 500 | 0 | 416 133 | 5 883 633 | 882 545 | 6 766 178 | 15 | 24 358 242 | | | | | | 5 602 500 | 14 696 035 | 24358242 |
| B Entrepreneurship and business development | | | | | | | | | | | | | | | | | | | | | |
| B1 | Introduction to Entrepreneurship and Business | 150 000 | 0 | 0 | 200 000 | 247 500 | 40 000 | 67 548 | 705 048 | 105 757 | 810 805 | 2 | 1 945 931 | 15 | 2 | 32 432 | 70 000 | 10 | 575 000 | 1 046 610 | 1945931 |
| B2 | Business Management | 225 000 | 0 | 0 | 300 000 | 247 500 | 50 000 | 103 548 | 926 048 | 138 907 | 1 064 955 | 2 | 2 555 891 | 15 | 3 | 28 399 | 90 000 | 11 | 595 000 | 1 534 910 | 2555891 |
| B3 | Marketing | 150 000 | 0 | 0 | 200 000 | 247 500 | 0 | 148 548 | 746 048 | 111 907 | 857 955 | 2 | 2 059 091 | 15 | 2 | 34 318 | 70 000 | 11 | 495 000 | 1 220 910 | 2059091 |
| B4 | Bookkeeping and Accounting | 300 000 | 0 | 0 | 100 000 | 247 500 | 0 | 164 345 | 811 845 | 121 777 | 933 622 | 2 | 2 240 693 | 15 | 4 | 18 672 | 80 000 | 11 | 495 000 | 1 372 244 | 2240693 |
| B5 | Financial Management | 225 000 | 0 | 0 | 345 000 | 247 500 | 50 000 | 151 548 | 1 019 048 | 152 857 | 1 171 905 | 2 | 2 812 571 | 15 | 3 | 31 251 | 100 000 | 11 | 595 000 | 1 748 810 | 2812571 |
| B6 | SME Enterprise Management and Business Planning | 362 500 | 0 | 0 | 500 000 | 397 500 | 100 000 | 514 345 | 1 874 345 | 281 152 | 2 155 497 | 2 | 5 173 193 | 15 | 5 | 34 488 | 180 000 | 11 | 995 000 | 3 315 994 | 5173193 |
| B7 | Supervisory and Management Skills | 187 500 | 0 | 0 | 100 000 | 247 500 | 0 | 151 548 | 686 548 | 102 982 | 789 530 | 2 | 1 894 871 | 15 | 3 | 21 054 | 70 000 | 10 | 495 000 | 1 084 060 | 1894871 |
| Sub total entrepreneurship and business development | | 1 600 000 | 0 | 0 | 1 745 000 | 1 882 500 | 240 000 | 1 301 429 | 6 768 929 | 1 015 339 | 7 784 268 | 14 | 18 682 243 | | | | | | 4 245 000 | 11 323 536 | 18682243 |
| C Forestry | | | | | | | | | | | | | | | | | | | | | |
| C1 | Forest work and financial plan** | 750 000 | 0 | 0 | 1 000 000 | 330 000 | 350 000 | 251 310 | 2 681 310 | 402 196 | 3 083 506 | 2 | 7 400 414 | 20 | 10 | 18 501 | 0 | | 1 360 000 | 4 807 012 | 7400414 |
| C2 | Establishing a TGA* | 308 333 | 0 | 0 | 500 000 | 530 000 | 0 | 94 595 | 1 432 929 | 214 939 | 1 647 868 | 2 | 3 954 883 | 20 | 5 | 19 774 | 0 | | 1 060 000 | 2 235 736 | 3954883 |
| C3 | Managing a TGA* | 583 333 | 0 | 0 | 1 000 000 | 530 000 | 0 | 176 190 | 2 289 524 | 343 429 | 2 632 952 | 4 | 12 638 171 | 20 | 10 | 15 798 | 0 | | 2 120 000 | 8 411 810 | 12638171 |
| C4 | Managing occupational health and safety (OSH) in forestry operations | 375 000 | 0 | 0 | 435 000 | 618 400 | 200 000 | 240 595 | 1 868 995 | 280 349 | 2 149 345 | 2 | 5 158 427 | 20 | 5 | 25 792 | 130 000 | 15 | 1 636 800 | 2 661 889 | 5158427 |
| C5 | Ensuring occupational health and safety (OSH) in forestry operations | 75 000 | 0 | 0 | 215 000 | 180 000 | 0 | 176 399 | 646 399 | 96 960 | 743 359 | 2 | 1 784 061 | 20 | 1 | 44 602 | 50 000 | 14 | 360 000 | 1 126 717 | 1784061 |
| C6 | Basic maintenance: Preventive maintenance of forest tools, machines and equipment | 17 500 | 0 | 0 | 330 000 | 135 000 | 0 | 145 149 | 627 649 | 94 147 | 721 796 | 2 | 1 732 311 | 15 | 1 | 57 744 | 60 000 | 12 | 270 000 | 1 173 592 | 1732311 |
| C7 | Advanced maintenance: Managing preventive maintenance of forest tools, machines and equipment | 87 500 | 0 | 0 | 1 650 000 | 347 500 | 0 | 164 345 | 2 249 345 | 337 402 | 2 586 747 | 2 | 6 208 193 | 15 | 5 | 41 388 | 210 000 | 12 | 695 000 | 4 478 494 | 6208193 |
| C8 | Establishing a tree nursery | 308 333 | 0 | 0 | 230 000 | 180 000 | 400 000 | 195 595 | 1 313 929 | 197 089 | 1 511 018 | 1 | 1 813 221 | 20 | 5 | 18 132 | 100 000 | 13 | 580 000 | 931 018 | 1813221 |
| C9 | Managing a tree nursery | 583 333 | 0 | 0 | 655 000 | 330 000 | 650 000 | 297 393 | 2 515 726 | 377 359 | 2 893 085 | 1 | 3 471 702 | 20 | 10 | 17 359 | 180 000 | 15 | 980 000 | 1 913 085 | 3471702 |
| C10 | Plantation establishment & management of young stands* | 41 667 | 0 | 0 | 0 | 150 000 | 0 | 124 399 | 316 065 | 47 410 | 363 475 | 3 | 1 308 511 | 20 | 1 | 21 809 | 0 | | 450 000 | 640 426 | 1308511 |
| C11 | Plantation management of mature stands (pruning, thinning and harvesting)** | 500 000 | 0 | 0 | 330 000 | 165 000 | 845 000 | 207 595 | 2 047 595 | 307 139 | 2 354 735 | 4 | 11 302 726 | 10 | 8 | 35 321 | 0 | | 4 040 000 | 5 378 938 | 11302726 |
| C12 | Forest inventory | 375 000 | 0 | 0 | 230 000 | 303 000 | 240 000 | 548 798 | 1 696 798 | 254 520 | 1 951 317 | 3 | 7 024 742 | 15 | 5 | 31 221 | 0 | | 1 629 000 | 4 224 952 | 7024742 |
| C13 | Forest fire prevention and control* | 375 000 | 0 | 0 | 140 000 | 652 500 | 320 000 | 198 798 | 1 686 298 | 252 945 | 1 939 242 | 4 | 9 308 363 | 15 | 5 | 31 028 | 0 | | 3 890 000 | 3 866 969 | 9308363 |
| C14 | Successful natural regeneration | 495 000 | 0 | 0 | 110 000 | 330 000 | 160 000 | 224 399 | 1 319 399 | 197 910 | 1 517 309 | 2 | 3 641 541 | 20 | 2 | 45 519 | 0 | | 980 000 | 2 054 617 | 3641541 |
| Sub total Forestry | | 4 875 000 | 0 | 0 | 6 825 000 | 4 781 400 | 3 165 000 | 3 045 560 | 22 691 960 | 3 403 794 | 26 095 753 | 34 | 76 747 266 | | | | | | 20 050 800 | 43 905 255 | 76747266 |

| No. | Name of the FWITC short course | COST PER COST CENTER / COURSE (cost calculated for 1 course) | | | | | | TOTAL COSTS OF COURSE (calculated only for 1 course) | | | NUMBER OF COURSES PER YEAR | TOTAL COSTS OF ALL COURSES (2018) | F NUMBER OF TRAINEES / COURSE | H DURATION OF THE COURSE | I TRAINING COST PER DAY / TRAINEE | FINAL COURSE FEE TO BE PAID BY PARTICIPANT (rounded) | BREAKEVEN POINT TO ARRANGE THE COURSE | TOTAL VARIABLE COSTS / COURSE /TRAINEE | TOTAL FIXED COSTS / COURSE | TOTAL INCOME FROM THE COURSE | |
|----------|---|---|-------------------|---------------------|---|------------------------------------|------------------|--|---|---------------------------|--|-----------------------------------|----------------------------------|-----------------------------|--------------------------------------|--|---------------------------------------|--|----------------------------|------------------------------|---------------------------------|
| | | LECTURING | LODGING | MEALS & REFRESHMENT | USE OF CLASSROOM / WORKSHOP / TRAINING FACILITIES | TRAINING MATERIALS AND CONSUMABLES | TRANSPORT | ADMINISTRATION | A | B | | | | | | | | | | | C |
| | | | | | | | | | TOTAL NET (total from cost centers left) | OVERHEADS (15% from A) | | | | | | | | | | | TOTAL WITH OVERHEADS (A + B) |
| D | Wood processing courses | | | | | | | | | | | | | | | | | | | | |
| D1 | Bandsaw Blade Maintenance | 775 000 | 0 | 0 | 1 400 000 | 465 000 | 0 | 909 095 | 3 549 095 | 532 364 | 4 081 460 | 3 | 14 693 254 | 10 | 10 | 48 978 | 490 000 | 8 | 1 395 000 | 10 849 379 | 14693254 |
| D2 | Circular Saw Blade Maintenance | 327 500 | 0 | 0 | 700 000 | 465 000 | 0 | 896 298 | 2 388 798 | 358 320 | 2 747 117 | 2 | 6 593 081 | 10 | 5 | 65 931 | 330 000 | 8 | 930 000 | 4 564 235 | 6593081 |
| D3 | Production Planning in Sawmill Operations | 362 500 | 0 | 0 | 960 000 | 530 000 | 0 | 902 595 | 2 755 095 | 413 264 | 3 168 360 | 2 | 7 604 063 | 20 | 5 | 38 020 | 200 000 | 15 | 1 060 000 | 5 276 719 | 7604063 |
| D4 | Sawing for High Recovery and Value Added Wood Products | 260 000 | 0 | 0 | 645 000 | 347 500 | 0 | 915 548 | 2 168 048 | 325 207 | 2 493 255 | 2 | 5 983 811 | 15 | 3 | 66 487 | 200 000 | 12 | 695 000 | 4 291 510 | 5983811 |
| D5 | Efficiency, Productivity and Economy in SME Sawmill Operations | 460 000 | 0 | 0 | 1 075 000 | 347 500 | 80 000 | 928 345 | 2 890 845 | 433 627 | 3 324 472 | 1 | 3 989 366 | 15 | 5 | 53 192 | 270 000 | 12 | 427 500 | 2 896 972 | 3989366 |
| D6 | Records Keeping in Sawmill Operations | 225 000 | 0 | 0 | 530 000 | 297 500 | 80 000 | 109 149 | 1 241 649 | 186 247 | 1 427 896 | 2 | 3 426 951 | 15 | 3 | 38 077 | 120 000 | 11 | 755 000 | 2 100 792 | 3426951 |
| D7 | Sawn Timber Drying by Air Seasoning | 450 000 | 0 | 0 | 1 190 000 | 547 500 | 80 000 | 886 345 | 3 153 845 | 473 077 | 3 626 922 | 2 | 8 704 613 | 15 | 5 | 58 031 | 300 000 | 12 | 1 255 000 | 5 998 844 | 8704613 |
| D8 | Bandsaw Mill and Track Alignment | 275 000 | 0 | 0 | 875 000 | 372 500 | 40 000 | 115 548 | 1 678 048 | 251 707 | 1 929 755 | 1 | 2 315 706 | 10 | 3 | 77 190 | 240 000 | 8 | 412 500 | 1 517 255 | 2315706 |
| D9 | Circular Breakdown and Re-Saw Operation | 315 000 | 0 | 0 | 1 305 000 | 440 000 | 40 000 | 154 095 | 2 254 095 | 338 114 | 2 592 210 | 1 | 3 110 651 | 10 | 5 | 62 213 | 320 000 | 8 | 480 000 | 2 112 210 | 3110651 |
| D10 | Bandsaw Breakdown and Re-Saw Operations | 315 000 | 0 | 0 | 1 305 000 | 440 000 | 40 000 | 154 095 | 2 254 095 | 338 114 | 2 592 210 | 1 | 3 110 651 | 10 | 5 | 62 213 | 320 000 | 8 | 480 000 | 2 112 210 | 3110651 |
| D11 | Circular and Band Sawmill Machine Maintenance, Alignments and Trouble Shooting | 275 000 | 0 | 0 | 760 000 | 315 000 | 40 000 | 115 548 | 1 505 548 | 225 832 | 1 731 380 | 2 | 4 155 311 | 10 | 3 | 69 255 | 210 000 | 8 | 710 000 | 2 752 760 | 4155311 |
| D12 | Quality Control in Sawmilling Operations | 337 500 | 0 | 0 | 1 190 000 | 397 500 | 40 000 | 925 345 | 2 890 345 | 433 552 | 3 323 897 | 1 | 3 988 676 | 15 | 5 | 53 182 | 270 000 | 12 | 437 500 | 2 886 397 | 3988676 |
| D13 | Quality Requirements, Value and Utilization of Raw Material | 300 000 | 0 | 0 | 600 000 | 297 500 | 80 000 | 964 345 | 2 241 845 | 336 277 | 2 578 122 | 2 | 6 187 493 | 15 | 3 | 68 750 | 210 000 | 12 | 755 000 | 4 401 244 | 6187493 |
| D14 | Safety in Sawmilling | 150 000 | 0 | 0 | 545 000 | 330 000 | 40 000 | 87 899 | 1 152 899 | 172 935 | 1 325 834 | 2 | 3 182 001 | 10 | 2 | 79 550 | 160 000 | 8 | 740 000 | 1 911 667 | 3182001 |
| D15 | Board Edging and Trimming of Sawn Timber | 300 000 | 0 | 0 | 760 000 | 295 000 | 0 | 909 095 | 2 264 095 | 339 614 | 2 603 710 | 1 | 3 124 451 | 10 | 3 | 104 148 | 320 000 | 8 | 295 000 | 2 308 710 | 3124451 |
| D16 | Sawn Timber Sorting and Grading | 300 000 | 0 | 0 | 760 000 | 265 000 | 40 000 | 909 095 | 2 274 095 | 341 114 | 2 615 210 | 2 | 6 276 503 | 10 | 3 | 104 608 | 320 000 | 8 | 610 000 | 4 620 419 | 6276503 |
| D17 | Introduction to Kiln Drying in SME Sawmilling Operations | 347 500 | 0 | 0 | 1 190 000 | 797 500 | 40 000 | 973 345 | 3 348 345 | 502 252 | 3 850 597 | 1 | 4 620 716 | 15 | 5 | 61 610 | 310 000 | 12 | 837 500 | 3 013 097 | 4620716 |
| D18 | Sawn Timber Preservation | 350 000 | 0 | 0 | 760 000 | 397 500 | 0 | 915 548 | 2 423 048 | 363 457 | 2 786 505 | 1 | 3 343 806 | 15 | 3 | 74 307 | 230 000 | 12 | 397 500 | 2 389 005 | 3343806 |
| D19 | Stellite and Carbide Technology in Sawdoctoring | 500 000 | 0 | 0 | 700 000 | 597 500 | 0 | 973 345 | 2 770 845 | 415 627 | 3 186 472 | 2 | 7 647 533 | 15 | 5 | 50 984 | 260 000 | 12 | 1 195 000 | 5 177 944 | 7647533 |
| D20 | Charcoal Making | 150 000 | 0 | 0 | 120 000 | 247 500 | 0 | 145 149 | 662 649 | 99 397 | 762 046 | 2 | 1 828 911 | 15 | 3 | 20 321 | 0 | 0 | 495 000 | 1 029 092 | 1828911 |
| D21 | Fire Prevention for Wood Industries | 75 000 | 0 | 0 | 215 000 | 247 500 | 0 | 106 149 | 643 649 | 96 547 | 740 196 | 2 | 1 776 471 | 15 | 1 | 59 216 | 0 | 0 | 495 000 | 985 392 | 1776471 |
| | Sub total wood processing courses | 6 850 000 | 0 | 0 | 17 585 000 | 8 440 000 | 640 000 | 12 995 976 | 46 510 976 | 6 976 646 | 53 487 623 | 35 | 105 664 021 | | | | | | 14 857 500 | 73 195 851 | 105 664 021 |
| | Total training costs per cost center at FWITC | 14 675 000 | 0 | 0 | 28 405 000 | 16 971 400 | 4 045 000 | 17 759 098 | 81 855 498 | 12 278 325 | 94 133 822 | 98 | 225 451 771 | | | | | | 44 755 800 | 143 120 676 | 225 451 771 |
| | Average cost (Tshs) per course (47 courses) | 312 234 | 0 | 0 | 604 362 | 361 094 | 86 064 | 377 853 | 1 741 606 | | Average cost (Tshs) per course (98 courses) | 2 300 528 | | | | | | | | | |
| | Total cost in Euro | 5 688 | 0 | 0 | 11 010 | 6 578 | 1 568 | 6 883 | 31 727 | | Total costs of FWITC training 2018 in Euro | 87 384 | | | | | | | | | |
| | Percentage of cost centre from the total course costs | 18 % | 0 % | 0 % | 35 % | 21 % | 5 % | 22 % | 100 % | | | | | | | | | | | | |
| | Unit costs for 1m3 of sawn timber produced at FWITC sawmill (annual production 4000m3/a) | Pine | Eucalyptus | Total | | | | | | | | | | | | | | | | | |
| | | 2 000 | 2 000 | 4 000 | 7 101 | | | | | | | | | | | | | | | | |

Annex 2 FWITC's investment costs by cost accounts and cost centres

BREAKDOWN /SUMMARY OF INVESTMENT COSTS OF FWITC

| INVESTMENT COSTS BY ACCOUNTS | INVESTMENT COSTS (Euro) |
|---|--------------------------------|
| 1.1 Common costs | 40 500 |
| 1.2 Civil works | 33 222 |
| 1.3 Machinery | 515 045 |
| 1.4 Piping | 36 901 |
| 1.5 Electricity / Power | 970 |
| 1.6 Spare parts | 0 |
| 1.7 Personnel / Training | 1 375 |
| SUBTOTAL | 628 013 |
| Working capital | 0 |
| Interest during construction | |
| TOTAL INVESTMENT COSTS FWITC SAWMILL | 628 013 |

| INVESTMENT COSTS OF FWITC BY COST CENTRES / DEPARTMENTS | INVESTMENT ACCOUNTS | | | | | | | TOTAL | |
|--|------------------------|--------------------|------------------|---------------|------------------------------|--------------------|--------------------------------|----------|--------------------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY/ POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | WORKING CAPITAL |
| Woodhandling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sawmill | 0 | 27 628 | 466 095 | 0 | 0 | 0 | 0 | 0 | 493 723 |
| Power and water | 0 | 0 | 1 629 | 34 019 | 970 | 0 | 0 | 0 | 36 618 |
| Utilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mill site | 0 | 0 | 0 | 2 882 | 0 | 0 | 0 | 0 | 2 882 |
| Forest nursery | 40 500 | 5 594 | 5 195 | 0 | 0 | 0 | 1 375 | 0 | 52 664 |
| Forest tools | 0 | 0 | 24 545 | 0 | 0 | 0 | 0 | 0 | 24 545 |
| Other sawmill investments | 0 | 0 | 17 581 | 0 | 0 | 0 | 0 | 0 | 17 581 |
| Temporary facilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Temporary services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indirect costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL INVESTMENT COSTS | 40 500 | 33 222 | 515 045 | 36 901 | 970 | 0 | 1 375 | 0 | 628 013 |

SAWMILL

| COST ITEMS | ACCOUNTS | | | | | | | | TOTAL |
|--|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|--------------------|----------------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | WORKING CAPITAL | |
| Common items | | | | | | | | | 0 |
| Sawing | | 27 628 | 311 095 | | | | | | 338 723 |
| Green timber sorting & handling | | | | | | | | | 0 |
| Timber yard and air seasoning | | | | | | | | | 0 |
| Kiln drying | | | | | | | | | 0 |
| Grading and packaging | | | | | | | | | 0 |
| Residue handling (sawdust, slabs etc.) | | | | | | | | | 0 |
| Farm tractor with a front end loader that has forks for sawn timber handling, grab for logs handling and a shovel for sawdust handling | | | | | 120 000 | | | | 120 000 |
| Forest trailer for saw logs transport from forest to road side and short distance transport at the forest plantations | | | | | 35 000 | | | | 35 000 |
| Saw blade grinders | | | | | | | | | 0 |
| Saw blades | | | | | | | | | 0 |
| Sawdoctoring tools and equipment | | | | | | | | | 0 |
| Truck (10 tons) | | | | | | | | | 0 |
| Subtotal | 0 | 27 628 | 466 095 | 0 | 0 | 0 | 0 | 0 | 493 723 |

| FWITC SAWMILL MACHINERY | | | | | | | | | | | | | | | | |
|-------------------------|--------------------|-----------------|--|--------------------|------------------|-------------------|--|--|--|--|---------------------------------|----------------------|---------------------|--|---|---|
| Tax % | Circular Breakdown | Circular Re-saw | Feeding system for small circular saw line | Horizontal bandsaw | Vertical bandsaw | Kiln dryer 4,5 m3 | Container store + offices + garrage + kiln dryer | Grinder for carbide tipped circular saw blades | Saw blade grinder for band saw blades (Saw specialist) | Sawdoctoring saw blades and spares for sawmills (Saw Specialist) | Mobile bandsaw (Saw Specialist) | Wood Treatment plant | Briquetting Machine | Renovations and construction works sawmill, classrooms, offices, security etc. | Carpentry & joinery machines (circular saw, planer machines, tools and equipment for carpentry) | Total FWITC investment to machinery and tools |
| | 16715 | 15862 | 6911 | 5857 | 3164 | 28330 | 100 253 | 2056 | 6 508 | 15 017 | 8 128 | 8 634,59 | 6 579 | 27 628 | 3 823 | 255 466 |
| 27 % | 4513 | 4283 | 1866 | 1581 | 854 | 7649 | | 555 | 1 757 | 4 055 | 2 195 | | | | | 29 308 |
| | 21228 | 20145 | 8777 | 7438 | 4018 | 35979 | 100 253 | 2611 | 8 265 | 19 072 | 10 323 | 8 635 | 6 579 | 27 628 | 3 823 | 284 774 |
| 18 % | 3821 | 3626 | 1580 | 1339 | 723 | 6476 | | 470 | 1 488 | 3 433 | 1 858 | | | | | 24 814 |
| | 1422 | 1349 | 587 | 450 | 350 | 811 | | 165 | | | | | | | | 5 134 |
| | 835 | 792 | 346 | 3608 | 1843 | 4084 | | 103 | 1 235 | 2 850 | 1 543 | 5 308 | 1 454 | | | 24 001 |
| | 27306 | 25912 | 11290 | 12835 | 6935 | 47350 | 100 253 | 3349 | 10 988 | 25 355 | 13 723 | 13 943 | 8 033 | 27 628 | 3 823 | 311 095 |
| | 27306 | 25912 | 11290 | 12835 | 6935 | 47350 | 100 253 | 3349 | 10 988 | 25 355 | 13 723 | 13 943 | 8 033 | 27 628 | 3 823 | 311 095 |

WOODHANDLING DEPARTMENT

| COST ITEMS | ACCOUNTS | | | | | | | | TOTAL |
|-------------------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|--------------------|----------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | WORKING CAPITAL | |
| Common items | | | | | | | | | 0 |
| Log yard and log benches | | | | | | | | | 0 |
| Transport (Bell / front end loader) | | | | | | | | | 0 |
| Debarking | | | | | | | | | 0 |
| Sorting of logs | | | | | | | | | 0 |
| Chipping and screening | | | | | | | | | 0 |
| Bark handling | | | | | | | | | 0 |
| Chip storage | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

POWER AND WATER

| COST ITEMS | ACCOUNTS | | | | | | | | TOTAL |
|-------------------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|--------------------|---------------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | WORKING CAPITAL | |
| Common items | | | | | | | | | 0 |
| Generator | | | | | | | | | 0 |
| Power boiler | | | | | | | | | 0 |
| Electricity supply (Tanesco) | | | | | 970 | | | | 970 |
| Electricity distribution (internal) | | | | 14 956 | | | | | 14 956 |
| Water systems and supply | | | | 2 688 | | | | | 2 688 |
| Bore hole | | | | 10 989 | | | | | 10 989 |
| Water storage | | | | 5 386 | | | | | 5 386 |
| Water intake and pumping | | | 1 629 | | | | | | 1 629 |
| Compressed air plant | | | | | | | | | 0 |
| Fuel storage | | | | | | | | | 0 |
| Off cuts and bark handling | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 1 629 | 34 019 | 970 | 0 | 0 | 0 | 36 618 |

UTILITIES

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|-----------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|----------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Common items | | | | | | | | | 0 |
| Mobile equipment | | | | | | | | | 0 |
| Maintenance facilities | | | | | | | | | 0 |
| Staff facilities | | | | | | | | | 0 |
| Offices | | | | | | | | | 0 |
| Storage facilities | | | | | | | | | 0 |
| Other unspecified utilities | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MILL SITE

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|--------------------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|--------------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Common items | | | | | | | | | 0 |
| Area preparation | | | | | | | | | 0 |
| Roads and parking areas | | | | | | | | | 0 |
| Temporary roads | | | | | | | | | 0 |
| Railroads | | | | | | | | | 0 |
| Gates and fencing | | | | | | | | | 0 |
| Pipings | | | | | | | | | 0 |
| Outside lighting | | | | | | | | | 0 |
| Telecommunication and TV | | | | | | | | | 0 |
| Internet and internal communications | | | | | 2 882 | | | | 2 882 |
| Subtotal | 0 | 0 | 0 | 2 882 | 0 | 0 | 0 | 0 | 2 882 |

FOREST NURSERY

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|--------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|---------------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Common items (bore hole) | | | | | | | 1 375 | | 1 375 |
| Nursery trays | 29 032 | | | | | | | | 29 032 |
| Fencing/Security | | | | | | | | | 0 |
| Wire/tensioners | 1 435 | | | | | | | | 1 435 |
| Poles / planks | 6 040 | | | | | | | | 6 040 |
| Shade net | 3 993 | | | | | | | | 3 993 |
| Tanks and piping | | 5 594 | | | | | | | 5 594 |
| Pressure pump | | | 3 308 | | | | | | 3 308 |
| Irrigation system | | | 1 887 | | | | | | 1 887 |
| Subtotal | 40 500 | 5 594 | 5 195 | 0 | 0 | 0 | 1 375 | 0 | 52 664 |

FOREST TOOLS AND EQUIPMENT

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|--------------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|---------------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Common items | | | | | | | | | 0 |
| Chain saws | | | | | | | | | 0 |
| Logging tools | | | | | | | | | 0 |
| Mensuration equipment | | | | | | | | | 0 |
| Forest inventory | | | | | | | | | 0 |
| Tractor (John Deere) | | | 24 545 | | | | | | 24 545 |
| Trailors and skidders | | | | | | | | | 0 |
| Forest fire fighting equipment | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 24 545 | 0 | 0 | 0 | 0 | 0 | 24 545 |

OTHER SAWMILL INVESTMENTS

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|----------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|---------------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Charcoal kilns | | | | | | | | | 0 |
| Timber treatment tank | | | 11 154 | | | | | | 11 154 |
| Briqueting machine | | | 6 426 | | | | | | 6 426 |
| Sawdust pressuring machine | | | | | | | | | 0 |
| Other materials sawmill | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 17 581 | 0 | 0 | 0 | 0 | 0 | 17 581 |

TEMPORARY FACILITIES

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|----------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|----------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Common items | | | | | | | | | 0 |
| Office construction | | | | | | | | | 0 |
| Office equipment | | | | | | | | | 0 |
| Lightnings | | | | | | | | | 0 |
| Decorations | | | | | | | | | 0 |
| Other temporary facilities | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TEMPORARY SERVICES

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|--------------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|----------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Common items | | | | | | | | | 0 |
| Hoisting | | | | | | | | | 0 |
| Transport (general and office) | | | | | | | | | 0 |
| Storage | | | | | | | | | 0 |
| Site cleaning and maintenance | | | | | | | | | 0 |
| Security | | | | | | | | | 0 |
| Other services temporary | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

INDIRECT COSTS

| COST ITEMS | ACCOUNTS | | | | | | | WORKING CAPITAL | TOTAL |
|------------------------|---------------------|--------------------|------------------|---------------|-------------------------------|--------------------|--------------------------------|-----------------|----------|
| | 1.1 COMMON COSTS | 1.2 CIVIL WORKS | 1.3 MACHINERY | 1.4 PIPING | 1.5 ELECTRICITY / POWER | 1.6 SPARE PARTS | 1.7 PERSONNEL / TRAINING | | |
| Common items | | | | | | | | | 0 |
| Engineering | | | | | | | | | 0 |
| Management | | | | | | | | | 0 |
| Start-up of production | | | | | | | | | 0 |
| Other indirect costs | | | | | | | | | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Annex 3 Annual budget 7/2018 – 6/2019 for sawmill

| EXPLANATION / ITEM | UNIT COSTS (TZS / m3) | July 2018 - June 2019 | | | | | | | | | | | | TOTAL |
|--|--------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|
| | | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | |
| PRODUCTION PLAN 7/2018-6/2019 | | | | | | | | | | | | | | |
| WORKING DAYS | | | | | | | | | | | | | | |
| Working Days Sawmill production | | 10 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 220 |
| Working Days for Logging operations | | 10 | 20 | 15 | 10 | 10 | 20 | 20 | 20 | 15 | 10 | 15 | 10 | 175 |
| PRODUCTION (m3) / DAY | | | | | | | | | | | | | | |
| Sawn timber (m3) (pine) | | 3,00 | 3,00 | 5,00 | 5,00 | 8,00 | 8,00 | 9,50 | 12,50 | 12,50 | 12,50 | 12,50 | 20,00 | |
| Sawn timber (m3) (eucalyptus) | | 3,00 | 3,00 | 5,00 | 5,00 | 8,00 | 8,00 | 9,50 | 12,50 | 12,50 | 12,50 | 12,50 | 20,00 | |
| Slabs (m3) | | 2,38 | 2,38 | 3,96 | 3,96 | 6,33 | 6,33 | 7,52 | 9,90 | 9,90 | 9,90 | 9,90 | 15,83 | |
| Off cuts (m3) | | 1,38 | 1,38 | 2,29 | 2,29 | 3,67 | 3,67 | 4,35 | 5,73 | 5,73 | 5,73 | 5,73 | 9,17 | |
| Sawdust (m3) | | 1,63 | 1,63 | 2,71 | 2,71 | 4,33 | 4,33 | 5,15 | 6,77 | 6,77 | 6,77 | 6,77 | 10,83 | |
| TOTAL PRODUCTION (m3) MONTH / YEAR | | | | | | | | | | | | | | |
| Sawn timber (pine) | | 40 | 70 | 120 | 120 | 250 | 250 | 250 | 300 | 300 | 300 | 300 | 250 | 2 550 |
| Sawn timber (eucalyptus) | | 20 | 50 | 80 | 80 | 70 | 70 | 130 | 200 | 200 | 200 | 200 | 150 | 1 450 |
| Slabs (m3) (= recovery % * total m3 logs) | | 24 | 48 | 79 | 79 | 127 | 127 | 150 | 198 | 198 | 198 | 198 | 158 | 1 583 |
| Sawdust (m3) (= recovery % * total m3 logs) | | 16 | 33 | 54 | 54 | 87 | 87 | 103 | 135 | 135 | 135 | 135 | 108 | 1 083 |
| Off cuts (m3) (= recovery % * total m3 logs) | | 14 | 28 | 46 | 46 | 73 | 73 | 87 | 115 | 115 | 115 | 115 | 92 | 917 |
| Overmeasure and allowances (m3) (= recovery % * total m3 logs) | | 11 | 23 | 38 | 38 | 60 | 60 | 71 | 94 | 94 | 94 | 94 | 75 | 750 |
| Production (output) Total month / annum | | 125 | 250 | 417 | 417 | 667 | 667 | 792 | 1 042 | 1 042 | 1 042 | 1 042 | 833 | 8 333 |
| RECOVERY (%) | | | | | | | | | | | | | | |
| Pine | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % |
| Eucalyptus | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % | 48 % |
| Slabs | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % | 19 % |
| Sawdust | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % | 13 % |
| Off cuts | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % | 11 % |
| Overmeasure and allowances | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % | 9 % |
| Total | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % |
| LOGGING TOTAL (m3) and RAWMATERIAL NEEDED (m3) MONTH / YEAR | | | | | | | | | | | | | | |
| Pine | | 83 | 146 | 250 | 250 | 521 | 521 | 521 | 625 | 625 | 625 | 625 | 521 | 5 313 |
| Eucalyptus | | 42 | 104 | 167 | 167 | 146 | 146 | 271 | 417 | 417 | 417 | 417 | 313 | 3 021 |
| Raw material Total month / annum | | 125 | 250 | 417 | 417 | 667 | 667 | 792 | 1 042 | 1 042 | 1 042 | 1 042 | 833 | 8 333 |
| LOGGING PER DAY (m3) | | | | | | | | | | | | | | |
| Pine | | 8,33 | 7,29 | 16,67 | 25,00 | 52,08 | 26,04 | 26,04 | 31,25 | 41,67 | 62,50 | 41,67 | 52,08 | |
| Eucalyptus | | 4,17 | 5,21 | 11,11 | 16,67 | 14,58 | 7,29 | 13,54 | 20,83 | 27,78 | 41,67 | 27,78 | 31,25 | |
| Logging per day Total | | 12,50 | 12,50 | 27,78 | 41,67 | 66,67 | 33,33 | 39,58 | 52,08 | 69,44 | 104,17 | 69,44 | 83,33 | |

| EXPLANATION / ITEM | UNIT COSTS (TZS / m3) | July 2018 - June 2019 | | | | | | | | | | | | TOTAL |
|--|--------------------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|
| | | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | |
| RAW MATERIAL COST AT FWITC SAWMILL | | | | | | | | | | | | | | |
| LOGGING TOTAL (m3) MONTH / YEAR | | | | | | | | | | | | | | |
| Pine | | 83 | 146 | 250 | 250 | 521 | 521 | 521 | 625 | 625 | 625 | 625 | 521 | 5 313 |
| Eucalyptus | | 42 | 104 | 167 | 167 | 146 | 146 | 271 | 417 | 417 | 417 | 417 | 313 | 3 021 |
| Logging Total | | 125 | 250 | 417 | 417 | 667 | 667 | 792 | 1 042 | 1 042 | 1 042 | 1 042 | 833 | 8 333 |
| Stumpage price | | | | | | | | | | | | | | |
| Logs (royalty pine), TZS/m3 | 21 910 | 1 825 833 | 3 195 208 | 5 477 500 | 5 477 500 | 11 411 458 | 11 411 458 | 11 411 458 | 13 693 750 | 13 693 750 | 13 693 750 | 13 693 750 | 11 411 458 | 116 396 875 |
| Logs (Royalty eucalyptus), TZS/m3 | 16 280 | 678 333 | 1 695 833 | 2 713 333 | 2 713 333 | 2 374 167 | 2 374 167 | 4 409 167 | 6 783 333 | 6 783 333 | 6 783 333 | 6 783 333 | 5 087 500 | 49 179 167 |
| Stumpage price other costs | | | | | | | | | | | | | | |
| Road maintenance fee, TZS/m3 | 8 900 | 1 112 500 | 2 225 000 | 3 708 333 | 3 708 333 | 5 933 333 | 5 933 333 | 7 045 833 | 9 270 833 | 9 270 833 | 9 270 833 | 9 270 833 | 7 416 667 | 74 166 667 |
| Silviculture, TZS/m3 | 8 900 | 1 112 500 | 2 225 000 | 3 708 333 | 3 708 333 | 5 933 333 | 5 933 333 | 7 045 833 | 9 270 833 | 9 270 833 | 9 270 833 | 9 270 833 | 7 416 667 | 74 166 667 |
| Logcess (5% from royalty) | 1 503 | 187 813 | 375 625 | 626 042 | 626 042 | 1 001 667 | 1 001 667 | 1 189 479 | 1 565 104 | 1 565 104 | 1 565 104 | 1 565 104 | 1 252 083 | 12 520 833 |
| Fire fighting, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other costs, TZS/m3 | 1 001 | 125 065 | 250 130 | 416 883 | 416 883 | 667 013 | 667 013 | 792 078 | 1 042 208 | 1 042 208 | 1 042 208 | 1 042 208 | 833 767 | 8 337 667 |
| Stumpage price | 20 303 | 5 042 044 | 9 966 797 | 16 650 425 | 16 650 425 | 27 320 972 | 27 320 972 | 31 893 849 | 41 626 063 | 41 626 063 | 41 626 063 | 41 626 063 | 33 418 142 | 334 767 875 |
| Stumpage price (pine) | 42 213 | | | | | | | | | | | | | |
| Stumpage price (eucalyptus) | 36 583 | | | | | | | | | | | | | |
| Logging costs (forest) incl. capital cost | | | | | | | | | | | | | | |
| Felling, delimiting and bucking TZS/m3 | 21 500 | 2 687 500 | 5 375 000 | 8 958 333 | 8 958 333 | 14 333 333 | 14 333 333 | 17 020 833 | 22 395 833 | 22 395 833 | 22 395 833 | 22 395 833 | 17 916 667 | 179 166 667 |
| Skidding, TZS/m3 (Logs to landing site) | 4 000 | 500 000 | 1 000 000 | 1 666 667 | 1 666 667 | 2 666 667 | 2 666 667 | 3 166 667 | 4 166 667 | 4 166 667 | 4 166 667 | 4 166 667 | 3 333 333 | 33 333 333 |
| Short distance transport in the forest, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Logging control, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Logging costs | 25 500 | 3 187 500 | 6 375 000 | 10 625 000 | 10 625 000 | 17 000 000 | 17 000 000 | 20 187 500 | 26 562 500 | 26 562 500 | 26 562 500 | 26 562 500 | 21 250 000 | 212 500 000 |
| Transport (long distance on the road) cost incl. capital cost | | | | | | | | | | | | | | |
| Loading, TZS/m3 | 4 250 | 531 250 | 1 062 500 | 1 770 833 | 1 770 833 | 2 833 333 | 2 833 333 | 3 364 583 | 4 427 083 | 4 427 083 | 4 427 083 | 4 427 083 | 3 541 667 | 35 416 667 |
| Long-distance transport, TZS/km | 20 000 | 2 500 000 | 5 000 000 | 8 333 333 | 8 333 333 | 13 333 333 | 13 333 333 | 15 833 333 | 20 833 333 | 20 833 333 | 20 833 333 | 20 833 333 | 16 666 667 | 166 666 667 |
| Unloading, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transport overhead, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Road maintenance, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Landings, TZS/m2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage areas, TZS/m2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transport cost | 24 250 | 3 031 250 | 6 062 500 | 10 104 167 | 10 104 167 | 16 166 667 | 16 166 667 | 19 197 917 | 25 260 417 | 25 260 417 | 25 260 417 | 25 260 417 | 20 208 333 | 202 083 333 |
| Organization overhead | | | | | | | | | | | | | | |
| Wages, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salaries, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Social services, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Training, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organization overhead, TZS/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Interest charges on working | | | | | | | | | | | | | | |
| Raw Material Costs Total | | 11 260 794 | 22 404 297 | 37 379 592 | 37 379 592 | 60 487 638 | 60 487 638 | 71 279 266 | 93 448 979 | 93 448 979 | 93 448 979 | 93 448 979 | 74 876 475 | 749 351 208 |

Business Plan
FWITC, Mafinga

| EXPLANATION / ITEM | UNIT COSTS (TZS / m3) | July 2018 - June 2019 | | | | | | | | | | | | TOTAL |
|---|--------------------------|-----------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|
| | | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | |
| BUDGET 7/2018-6/2019 FOR THE FWITC SAWMILL | | | | | | | | | | | | | | |
| EXCHANGE RATE, EURO/TZS | 2 590,00 | | | | | | | | | | | | | |
| PRODUCTION (m3) | | | | | | | | | | | | | | |
| Pine, m3/month/a | | 40 | 70 | 120 | 120 | 250 | 250 | 250 | 300 | 300 | 300 | 300 | 250 | 2 550 |
| Eucalyptus, m3/month/a | | 20 | 50 | 80 | 80 | 70 | 70 | 130 | 200 | 200 | 200 | 200 | 150 | 1 450 |
| Slabs (m3)/month/a | | 24 | 48 | 79 | 79 | 127 | 127 | 150 | 198 | 198 | 198 | 198 | 158 | 1 583 |
| Off cuts (m3)/month/a | | 14 | 28 | 46 | 46 | 73 | 73 | 87 | 115 | 115 | 115 | 115 | 92 | 917 |
| Sawdust (m3)/month/a | | 16 | 33 | 54 | 54 | 87 | 87 | 103 | 135 | 135 | 135 | 135 | 108 | 1 083 |
| Production (output) Total month/ annum | | 114 | 228 | 379 | 379 | 607 | 607 | 720 | 948 | 948 | 948 | 948 | 758 | 7 583 |
| SALES (m3) | | | | | | | | | | | | | | |
| Pine, m3/month/a | | 40 | 70 | 120 | 120 | 250 | 250 | 250 | 300 | 300 | 300 | 300 | 250 | 2 550 |
| Eucalyptus, m3/month/a | | 20 | 50 | 80 | 80 | 70 | 70 | 130 | 200 | 200 | 200 | 200 | 150 | 1 450 |
| Slabs, m3/month/a | | 24 | 48 | 79 | 79 | 127 | 127 | 150 | 198 | 198 | 198 | 198 | 158 | 1 583 |
| Off cuts, m3/month/a | | 14 | 28 | 46 | 46 | 73 | 73 | 87 | 115 | 115 | 115 | 115 | 92 | 917 |
| Sawdust, m3/month/a | | 16 | 33 | 54 | 54 | 87 | 87 | 103 | 135 | 135 | 135 | 135 | 108 | 1 083 |
| Sales Total | | 114 | 228 | 379 | 379 | 607 | 607 | 720 | 948 | 948 | 948 | 948 | 758 | 7 583 |
| UNIT PRICES AND SALES / MONTH / ANNUM (TZS / m3) | | | | | | | | | | | | | | |
| Sawn timber (pine) (TZS /m3) | 372 000 | 14 880 000 | 26 040 000 | 44 640 000 | 44 640 000 | 93 000 000 | 93 000 000 | 93 000 000 | 111 600 000 | 111 600 000 | 111 600 000 | 111 600 000 | 93 000 000 | 948 600 000 |
| Sawn timber (eucalyptus) (TZS /m3) | 307 000 | 6 140 000 | 15 350 000 | 24 560 000 | 24 560 000 | 21 490 000 | 21 490 000 | 39 910 000 | 61 400 000 | 61 400 000 | 61 400 000 | 61 400 000 | 46 050 000 | 445 150 000 |
| Slabs (TZS /m3) | 24 600 | 584 250 | 1 168 500 | 1 947 500 | 1 947 500 | 3 116 000 | 3 116 000 | 3 700 250 | 4 868 750 | 4 868 750 | 4 868 750 | 4 868 750 | 3 895 000 | 38 950 000 |
| Off cuts (TZS /m3) | 20 400 | 280 500 | 561 000 | 935 000 | 935 000 | 1 496 000 | 1 496 000 | 1 776 500 | 2 337 500 | 2 337 500 | 2 337 500 | 2 337 500 | 1 870 000 | 18 700 000 |
| Sawdust (TZS /m3) | 35 000 | 568 750 | 1 137 500 | 1 895 833 | 1 895 833 | 3 033 333 | 3 033 333 | 3 602 083 | 4 739 583 | 4 739 583 | 4 739 583 | 4 739 583 | 3 791 667 | 37 916 667 |
| Income from renting facilities for FWITC training | 7 101 | 426 075 | 852 150 | 1 420 250 | 1 420 250 | 2 272 400 | 2 272 400 | 2 698 475 | 3 550 625 | 3 550 625 | 3 550 625 | 3 550 625 | 2 840 500 | 28 405 000 |
| SALES TOTAL AT SAWMILL, TZS | | 22 879 575 | 45 109 150 | 75 398 583 | 75 398 583 | 124 407 733 | 124 407 733 | 144 687 308 | 188 496 458 | 188 496 458 | 188 496 458 | 188 496 458 | 151 447 167 | 1 517 721 667 |

Business Plan
FWITC, Mafinga

| EXPLANATION / ITEM | UNIT COSTS (TZS / m3) | July 2018 - June 2019 | | | | | | | | | | | | TOTAL |
|---|--------------------------|-----------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|
| | | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | |
| PROFIT CALCULATION SAWMILL | | | | | | | | | | | | | | |
| MANUFACTURING COSTS (TZS) | | | | | | | | | | | | | | |
| VARIABLE COSTS (TZS/m3) | | | | | | | | | | | | | | |
| RAW MATERIAL | | | | | | | | | | | | | | |
| Stumpage price total | 83 692 | 5 042 044 | 9 966 797 | 16 650 425 | 16 650 425 | 27 320 972 | 27 320 972 | 31 893 849 | 41 626 063 | 41 626 063 | 41 626 063 | 41 626 063 | 33 418 142 | 334 767 875 |
| Logging costs (forest) incl. capital cost total | 53 125 | 3 187 500 | 6 375 000 | 10 625 000 | 10 625 000 | 17 000 000 | 17 000 000 | 20 187 500 | 26 562 500 | 26 562 500 | 26 562 500 | 26 562 500 | 21 250 000 | 212 500 000 |
| Transport (long distance on the road) cost incl. capital cost total | 50 521 | 3 031 250 | 6 062 500 | 10 104 167 | 10 104 167 | 16 166 667 | 16 166 667 | 19 197 917 | 25 260 417 | 25 260 417 | 25 260 417 | 25 260 417 | 20 208 333 | 202 083 333 |
| TOTAL RAW MATERIAL, TZS | 187 338 | 11 260 794 | 22 404 297 | 37 379 592 | 37 379 592 | 60 487 638 | 60 487 638 | 71 279 266 | 93 448 979 | 93 448 979 | 93 448 979 | 93 448 979 | 74 876 475 | 749 351 208 |
| Other variable costs | | | | | | | | | | | | | | |
| Chemicals | 18 089 | 1 085 340 | 2 170 680 | 3 617 800 | 3 617 800 | 5 788 480 | 5 788 480 | 6 873 820 | 9 044 500 | 9 044 500 | 9 044 500 | 9 044 500 | 7 235 600 | 72 356 000 |
| Direct labour (not in the payrolls) | 1 090 | 65 400 | 130 800 | 218 000 | 218 000 | 348 800 | 348 800 | 414 200 | 545 000 | 545 000 | 545 000 | 545 000 | 436 000 | 4 360 000 |
| Consumables | 590 | 35 400 | 70 800 | 118 000 | 118 000 | 188 800 | 188 800 | 224 200 | 295 000 | 295 000 | 295 000 | 295 000 | 236 000 | 2 360 000 |
| Electricity, TZS/m3 | 7 774 | 466 449 | 932 899 | 1 554 831 | 1 554 831 | 2 487 730 | 2 487 730 | 2 954 179 | 3 887 078 | 3 887 078 | 3 887 078 | 3 887 078 | 3 109 662 | 31 096 623 |
| Water, m3 | 510 | 30 600 | 61 200 | 102 000 | 102 000 | 163 200 | 163 200 | 193 800 | 255 000 | 255 000 | 255 000 | 255 000 | 204 000 | 2 040 000 |
| Fuel, oil, lubricants (l) | 13 700 | 822 000 | 1 644 000 | 2 740 000 | 2 740 000 | 4 384 000 | 4 384 000 | 5 206 000 | 6 850 000 | 6 850 000 | 6 850 000 | 6 850 000 | 5 480 000 | 54 800 000 |
| Maintenance materials and spares | 6 473 | 388 380 | 776 760 | 1 294 600 | 1 294 600 | 2 071 360 | 2 071 360 | 2 459 740 | 3 236 500 | 3 236 500 | 3 236 500 | 3 236 500 | 2 589 200 | 25 892 000 |
| Sawdoctoring materials and spares | 1 350 | 81 000 | 162 000 | 270 000 | 270 000 | 432 000 | 432 000 | 513 000 | 675 000 | 675 000 | 675 000 | 675 000 | 540 000 | 5 400 000 |
| Saw blades, tools for sawdoctoring | 3 880 | 232 800 | 465 600 | 776 000 | 776 000 | 1 241 600 | 1 241 600 | 1 474 400 | 1 940 000 | 1 940 000 | 1 940 000 | 1 940 000 | 1 552 000 | 15 520 000 |
| Maintenance | 2 974 | 178 440 | 356 880 | 594 800 | 594 800 | 951 680 | 951 680 | 1 130 120 | 1 487 000 | 1 487 000 | 1 487 000 | 1 487 000 | 1 189 600 | 11 896 000 |
| Vehicles and Equipment | 17 600 | 1 056 000 | 2 112 000 | 3 520 000 | 3 520 000 | 5 632 000 | 5 632 000 | 6 888 000 | 8 800 000 | 8 800 000 | 8 800 000 | 8 800 000 | 7 040 000 | 70 400 000 |
| Working clothes | 2 960 | 177 600 | 355 200 | 592 000 | 592 000 | 947 200 | 947 200 | 1 124 800 | 1 480 000 | 1 480 000 | 1 480 000 | 1 480 000 | 1 184 000 | 11 840 000 |
| Safety gears | 1 740 | 104 400 | 208 800 | 348 000 | 348 000 | 556 800 | 556 800 | 661 200 | 870 000 | 870 000 | 870 000 | 870 000 | 696 000 | 6 960 000 |
| Communication | 1 140 | 68 400 | 136 800 | 228 000 | 228 000 | 364 800 | 364 800 | 433 200 | 570 000 | 570 000 | 570 000 | 570 000 | 456 000 | 4 560 000 |
| Office supplies | 1 740 | 104 400 | 208 800 | 348 000 | 348 000 | 556 800 | 556 800 | 661 200 | 870 000 | 870 000 | 870 000 | 870 000 | 696 000 | 6 960 000 |
| Food for staff working on sawmill production | 3 560 | 213 600 | 427 200 | 712 000 | 712 000 | 1 139 200 | 1 139 200 | 1 352 800 | 1 780 000 | 1 780 000 | 1 780 000 | 1 780 000 | 1 424 000 | 14 240 000 |
| Lease for the buildings and land | 1 193 | 71 600 | 143 200 | 238 666 | 238 666 | 381 866 | 381 866 | 453 465 | 596 665 | 596 665 | 596 665 | 596 665 | 477 332 | 4 773 320 |
| Other variable costs (TZS / m3 sawn timber)-workers tretment/hospital bills | 1 820 | 109 200 | 218 400 | 364 000 | 364 000 | 582 400 | 582 400 | 691 600 | 910 000 | 910 000 | 910 000 | 910 000 | 728 000 | 7 280 000 |
| TOTAL OTHER VARIABLE COSTS, TZS | 88 183 | 5 291 009 | 10 582 018 | 17 636 697 | 17 636 697 | 28 218 715 | 28 218 715 | 33 509 725 | 44 091 743 | 44 091 743 | 44 091 743 | 44 091 743 | 35 273 394 | 352 733 943 |
| TOTAL VARIABLE COSTS, TZS | 275 521 | 16 551 803 | 32 986 315 | 55 016 289 | 55 016 289 | 88 706 354 | 88 706 354 | 104 788 990 | 137 540 722 | 137 540 722 | 137 540 722 | 137 540 722 | 110 149 869 | 1 102 085 151 |
| FIXED COSTS | | | | | | | | | | | | | | |
| Personnel salaries incl. ocial security costs | | | | | | | | | | | | | | |
| Management | 5 900 | 354 000 | 708 000 | 1 180 000 | 1 180 000 | 1 888 000 | 1 888 000 | 2 242 000 | 2 950 001 | 2 950 001 | 2 950 001 | 2 950 001 | 2 360 000 | 23 600 004 |
| Supervision and planning | 2 015 | 120 900 | 241 800 | 403 000 | 403 000 | 644 799 | 644 799 | 765 699 | 1 007 499 | 1 007 499 | 1 007 499 | 1 007 499 | 805 999 | 8 059 992 |
| Operations | 12 306 | 738 369 | 1 476 737 | 2 461 229 | 2 461 229 | 3 937 966 | 3 937 966 | 4 676 335 | 6 153 072 | 6 153 072 | 6 153 072 | 4 922 458 | 49 224 576 | |
| Maintenance | 1 560 | 93 600 | 187 200 | 312 000 | 312 000 | 499 200 | 499 200 | 592 800 | 780 000 | 780 000 | 780 000 | 780 000 | 624 000 | 6 240 000 |
| Materials handling | 7 614 | 456 814 | 913 629 | 1 522 715 | 1 522 715 | 2 436 344 | 2 436 344 | 2 893 158 | 3 806 787 | 3 806 787 | 3 806 787 | 3 806 787 | 3 045 430 | 30 454 296 |
| Personnel Total | | 1 763 683 | 3 527 366 | 5 878 943 | 5 878 943 | 9 406 309 | 9 406 309 | 11 169 992 | 14 697 359 | 14 697 359 | 14 697 359 | 14 697 359 | 11 757 887 | 117 578 868 |
| Other fixed costs | | | | | | | | | | | | | | |
| Insurances | 0 | | | | | | | | | | | | | |
| General overheads 5% of sales | | 1 143 979 | 2 255 458 | 3 769 929 | 3 769 929 | 6 220 387 | 6 220 387 | 7 234 365 | 9 424 823 | 9 424 823 | 9 424 823 | 9 424 823 | 7 572 358 | 75 886 083 |
| TOTAL FIXED COSTS, TZS | 29 395 | 2 907 662 | 5 782 824 | 9 648 873 | 9 648 873 | 15 626 696 | 15 626 696 | 18 404 358 | 24 122 181 | 24 122 181 | 24 122 181 | 24 122 181 | 19 330 245 | 193 464 951 |
| MANUFACTURING COSTS TOTAL | | 19 459 465 | 38 769 138 | 64 665 161 | 64 665 161 | 104 333 050 | 104 333 050 | 123 193 348 | 161 662 903 | 161 662 903 | 161 662 903 | 161 662 903 | 129 480 114 | 1 295 550 102 |
| OPERATING MARGIN, TZS | | 3 420 110 | 6 340 012 | 10 733 422 | 10 733 422 | 20 074 683 | 20 074 683 | 21 493 960 | 26 833 555 | 26 833 555 | 26 833 555 | 26 833 555 | 21 967 052 | 222 171 564 |

| EXPLANATION / ITEM | UNIT COSTS (TZS / m3) | July 2018 - June 2019 | | | | | | | | | | | | TOTAL |
|---|--------------------------|-----------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------------|
| | | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | |
| CAPITAL COSTS | | | | | | | | | | | | | | |
| Depreciation | | | | | | | | | | | | | | |
| Woodhandling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sawmill | 14 919 | 895 120 | 1 790 239 | 2 983 732 | 2 983 732 | 4 773 972 | 4 773 972 | 5 669 091 | 7 459 331 | 7 459 331 | 7 459 331 | 7 459 331 | 5 967 465 | 59 674 645 |
| Power and water | 3 319 | 199 165 | 398 330 | 663 883 | 663 883 | 1 062 213 | 1 062 213 | 1 261 378 | 1 659 708 | 1 659 708 | 1 659 708 | 1 659 708 | 1 327 767 | 13 277 668 |
| Utilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mill site | 131 | 7 838 | 15 675 | 26 125 | 26 125 | 41 801 | 41 801 | 49 638 | 65 313 | 65 313 | 65 313 | 65 313 | 52 251 | 522 507 |
| Forest tools | 2 225 | 133 503 | 267 005 | 445 009 | 445 009 | 712 014 | 712 014 | 845 517 | 1 112 523 | 1 112 523 | 1 112 523 | 1 112 523 | 890 018 | 8 900 180 |
| Other sawmill investments | 797 | 47 810 | 95 620 | 159 367 | 159 367 | 254 988 | 254 988 | 302 798 | 398 419 | 398 419 | 398 419 | 398 419 | 318 735 | 3 187 349 |
| Temporary facilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Temporary services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indirect costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Interest (5% from total depreciation) | 1 070 | 64 172 | 128 344 | 213 906 | 213 906 | 342 249 | 342 249 | 406 421 | 534 765 | 534 765 | 534 765 | 534 765 | 427 812 | 4 278 117 |
| TOTAL CAPITAL COSTS / DEPRECIATION | 1 347 607 | 2 695 214 | 4 492 023 | 4 492 023 | 7 187 237 | 7 187 237 | 8 534 844 | 11 230 058 | 11 230 058 | 11 230 058 | 11 230 058 | 11 230 058 | 8 984 047 | 89 840 466 |
| PROFIT BEFORE TAX | 2 072 503 | 3 644 798 | 6 241 399 | 6 241 399 | 12 887 446 | 12 887 446 | 12 959 116 | 15 603 497 | 15 603 497 | 15 603 497 | 15 603 497 | 15 603 497 | 12 983 006 | 132 331 098 |
| TAX (30%) | 621 751 | 1 093 439 | 1 872 420 | 1 872 420 | 3 866 234 | 3 866 234 | 3 887 735 | 4 681 049 | 4 681 049 | 4 681 049 | 4 681 049 | 4 681 049 | 3 894 902 | 39 699 330 |
| DIVIDEND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NET PROFIT | 1 450 752 | 2 551 358 | 4 368 979 | 4 368 979 | 9 021 212 | 9 021 212 | 9 071 381 | 10 922 448 | 10 922 448 | 10 922 448 | 10 922 448 | 10 922 448 | 9 088 104 | 92 631 769 |
| CASH BALANCE | | | | | | | | | | | | | | |
| June 2018 | | | | | | | | | | | | | | |
| In the beginning of the month | 0 | 1 450 752 | 4 002 110 | 8 371 089 | 12 740 068 | 21 761 281 | 30 782 493 | 39 853 874 | 50 776 322 | 61 698 770 | 72 621 217 | 83 543 665 | 92 631 769 | 92 631 769 |
| At the end of the month / June 2019 | 1 450 752 | 4 002 110 | 8 371 089 | 12 740 068 | 21 761 281 | 30 782 493 | 39 853 874 | 50 776 322 | 61 698 770 | 72 621 217 | 83 543 665 | 92 631 769 | 92 631 769 | Transferred to July 2019 |

Annex 4 Labour cost budget for sawmill operations

| Posts of the workers | Number of staff | Salary / month, TZS | Total salary / workers / month, TZS | Salary / person / annum, TZS | Total salaries FWITC sawmill /annum, TZS | Salary TZS/m3 / month / workergroup |
|--|-----------------|---------------------|-------------------------------------|------------------------------|--|-------------------------------------|
| Management | | | | | | |
| FWITC Manager | 1 | 950 000 | 950 000 | 11 400 000 | 11 400 000 | |
| Sawmill Manager | 1 | 516 667 | 516 667 | 6 200 004 | 6 200 004 | |
| Secretary | 1 | 500 000 | 500 000 | 6 000 000 | 6 000 000 | |
| Subtotal management | 3 | | 1 966 667 | | 23 600 004 | 5 900 |
| | | | AVG month | | | |
| | | | 655 556 | | | |
| Supervision and planning | | | | | | |
| Supervisor (planning of sawing and supervising sawmill operations) | 1 | 348 333 | 348 333 | 4 179 996 | 4 179 996 | |
| Supervisor (log and timber yard operations) | 1 | 323 333 | 323 333 | 3 879 996 | 3 879 996 | |
| Subtotal supervision | 2 | | 671 666 | | 8 059 992 | 2 015 |
| | | | AVG month | | | |
| | | | 335 833 | | | |
| Operations | | | | | | |
| Sawmill machine operators | 4 | 230 053 | 920 212 | 2 760 636 | 11 042 544 | |
| Assistant sawmill machine operators | 4 | 181 500 | 726 000 | 2 178 000 | 8 712 000 | |
| Sawmill workers (log handling to the sawmill lines) | 4 | 180 000 | 720 000 | 2 160 000 | 8 640 000 | |
| Sawmill workers (sawn timber and material handling after sawing machines) | 8 | 171 667 | 1 373 336 | 2 060 004 | 16 480 032 | |
| Tally clerks (1 for logs and 1 for sawn timber tallying) | 2 | 181 250 | 362 500 | 2 175 000 | 4 350 000 | |
| Subtotal sawmill operations | 22 | | 4 102 048 | | 49 224 576 | 12 306 |
| | | | AVG month | | | |
| | | | 186 457 | | | |
| Maintenance | | | | | | |
| Maintenance mechanic (maintenance of sawmill machines and transport equipment) | 1 | 260 000 | 260 000 | 3 120 000 | 3 120 000 | |
| Sawdoctor | 1 | 260 000 | 260 000 | 3 120 000 | 3 120 000 | |
| Subtotal maintenance | 2 | | 520 000 | | 6 240 000 | 1 560 |
| | | | AVG month | | | |
| | | | 260 000 | | | |
| Materials handling | | | | | | |
| Bell-logger driver | 1 | 280 000 | 280 000 | 3 360 000 | 3 360 000 | |
| Log yard workers | 2 | 207 143 | 414 286 | 2 485 716 | 4 971 432 | |
| Forklift drivers | 1 | 280 000 | 280 000 | 3 360 000 | 3 360 000 | |
| Sawn timber drying workers | 4 | 207 143 | 828 572 | 2 485 716 | 9 942 864 | |
| Timber yard workers | 4 | 183 750 | 735 000 | 2 205 000 | 8 820 000 | |
| Subtotal log and sawn timber handling | 12 | | 2 537 858 | | 30 454 296 | 7 614 |
| | | | AVG month | | | |
| | | | 211 488 | | | |
| Total manpower / costs FWITC Sawmill | 41 | | 9 798 239 | | 117 578 868 | 29 395 |

Calculation basis for Salary TZS/m3 / month / workergroup

| | | |
|-------------------------------|----------|--------------|
| PRODUCTION, m3/a (Pine) | 2 000,00 | in one shift |
| RECOVERY | 48 % | |
| PRODUCTION, m3/a (Eucalyptus) | 2 000,00 | in one shift |
| RECOVERY | 48 % | |

Annex 5 Cash flow plan for sawmill 7/2018-6/2019

| CASH FLOW PLAN FOR FWITC SAWMILL 7/2018-6/2019 | | | | | | | | | | | | | | |
|---|-------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|
| ITEM | Year | 2018 | | | | | | 2019 | | | | | | Total annum |
| | Month | July | August | September | October | November | December | January | February | March | April | May | June | |
| Cash at the beginning of the month, TZS | | 0 | 3 420 110 | 9 760 121 | 20 493 543 | 31 226 965 | 51 301 649 | 71 376 332 | 92 870 292 | 119 703 847 | 146 537 402 | 173 370 957 | 200 204 512 | |
| Cash inflow, TZS: | | | | | | | | | | | | | | |
| Sawn timber sales (pine) | | 14 880 000 | 26 040 000 | 44 640 000 | 44 640 000 | 93 000 000 | 93 000 000 | 93 000 000 | 111 600 000 | 111 600 000 | 111 600 000 | 111 600 000 | 93 000 000 | 948 600 000 |
| Sawn timber sales (eucalyptus) | | 6 140 000 | 15 350 000 | 24 560 000 | 24 560 000 | 21 490 000 | 21 490 000 | 39 910 000 | 61 400 000 | 61 400 000 | 61 400 000 | 61 400 000 | 46 050 000 | 445 150 000 |
| Sales of slabs | | 584 250 | 1 168 500 | 1 947 500 | 1 947 500 | 3 116 000 | 3 116 000 | 3 700 250 | 4 868 750 | 4 868 750 | 4 868 750 | 4 868 750 | 3 895 000 | 38 950 000 |
| Sales off cuts | | 280 500 | 561 000 | 935 000 | 935 000 | 1 496 000 | 1 496 000 | 1 776 500 | 2 337 500 | 2 337 500 | 2 337 500 | 2 337 500 | 1 870 000 | 18 700 000 |
| Sales sawdust | | 568 750 | 1 137 500 | 1 895 833 | 1 895 833 | 3 033 333 | 3 033 333 | 3 602 083 | 4 739 583 | 4 739 583 | 4 739 583 | 4 739 583 | 3 791 667 | 37 916 667 |
| Income from renting facilities for FWITC training | | 426 075 | 852 150 | 1 420 250 | 1 420 250 | 2 272 400 | 2 272 400 | 2 698 475 | 3 550 625 | 3 550 625 | 3 550 625 | 3 550 625 | 2 840 500 | 28 405 000 |
| Insurance claim | | | | | | | | | | | | | | |
| Short-term loan (PFP) | | | | | | | | | | | | | | |
| Long-term loan (PFP) | | | | | | | | | | | | | | |
| PFP support | | | | | | | | | | | | | | |
| MNRT funding | | | | | | | | | | | | | | |
| Total cash inflow, TZS | | 22 879 575 | 45 109 150 | 75 398 583 | 75 398 583 | 124 407 733 | 124 407 733 | 144 687 308 | 188 496 458 | 188 496 458 | 188 496 458 | 188 496 458 | 151 447 167 | 1 517 721 667 |
| Cash Outflow, TZS | | | | | | | | | | | | | | |
| Raw materials | | 11 260 794 | 22 404 297 | 37 379 592 | 37 379 592 | 60 487 638 | 60 487 638 | 71 279 266 | 93 448 979 | 93 448 979 | 93 448 979 | 93 448 979 | 74 876 475 | 749 351 208 |
| Manufacturing costs | | 5 291 009 | 10 582 018 | 17 636 697 | 17 636 697 | 28 218 715 | 28 218 715 | 33 509 725 | 44 091 743 | 44 091 743 | 44 091 743 | 44 091 743 | 35 273 394 | 352 733 943 |
| Salaries management | | 354 000 | 708 000 | 1 180 000 | 1 180 000 | 1 888 000 | 1 888 000 | 2 242 000 | 2 950 001 | 2 950 001 | 2 950 001 | 2 950 001 | 2 360 000 | 23 600 004 |
| Salaries supervision and planning | | 120 900 | 241 800 | 403 000 | 403 000 | 644 799 | 644 799 | 765 699 | 1 007 499 | 1 007 499 | 1 007 499 | 1 007 499 | 805 999 | 8 059 992 |
| Salaries operations | | 738 369 | 1 476 737 | 2 461 229 | 2 461 229 | 3 937 966 | 3 937 966 | 4 676 335 | 6 153 072 | 6 153 072 | 6 153 072 | 6 153 072 | 4 922 458 | 49 224 576 |
| Salaries maintenance | | 93 600 | 187 200 | 312 000 | 312 000 | 499 200 | 499 200 | 592 800 | 780 000 | 780 000 | 780 000 | 780 000 | 624 000 | 6 240 000 |
| Salaries materials handling | | 456 814 | 913 629 | 1 522 715 | 1 522 715 | 2 436 344 | 2 436 344 | 2 893 158 | 3 806 787 | 3 806 787 | 3 806 787 | 3 806 787 | 3 045 430 | 30 454 296 |
| Supplies (maintenance and services) for buildings | | | | | | | | | | | | | | 0 |
| Insurance | | | | | | | | | | | | | | 0 |
| Lease payments (buildings, land) | | | | | | | | | | | | | | 0 |
| Marketing expenses | | | | | | | | | | | | | | 0 |
| Miscellaneous | | | | | | | | | | | | | | 0 |
| Dividends | | | | | | | | | | | | | | 0 |
| Income tax | | | | | | | | | | | | | | 0 |
| Professional fees | | | | | | | | | | | | | | 0 |
| Bank loan repayment | | | | | | | | | | | | | | 0 |
| Purchase of securities | | | | | | | | | | | | | | 0 |
| General overheads 5% of sales | | 1 143 979 | 2 255 458 | 3 769 929 | 3 769 929 | 6 220 387 | 6 220 387 | 7 234 365 | 9 424 823 | 9 424 823 | 9 424 823 | 9 424 823 | 7 572 358 | 75 886 083 |
| Total cash outflow, TZS | | 19 459 465 | 38 769 138 | 64 665 161 | 64 665 161 | 104 333 050 | 104 333 050 | 123 193 348 | 161 662 903 | 161 662 903 | 161 662 903 | 161 662 903 | 129 480 114 | 1 295 550 102 |
| Cash at the end of month, TZS | | 3 420 110 | 9 760 121 | 20 493 543 | 31 226 965 | 51 301 649 | 71 376 332 | 92 870 292 | 119 703 847 | 146 537 402 | 173 370 957 | 200 204 512 | 222 171 564 | |

Annex 7 Production plan and cost calculations for forest tree nursery

FOREST NURSERY PLAN (Planned for 2018)

Forest nursery for tree seedlings with 128 seedling trays July 2018 - June 2019

Production of seedlings / annum 500 000
Exhance rate 3rd May 2018, 1 EUR = TZS 2 726,68

| VARIABLE COSTS | Total / annum 2017-2018 | YEAR / MONTH | | | | | | | | | | | | | |
|--|----------------------------------|----------------------------------|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---------|
| | | Jul | Aug | 2 018 Sep | Oct | Nov | Dec | Jan | Feb | 2019 Mar | Apr | May | Jun | | |
| Growing medium (TZS) | 9 338 879 | 9 338 879 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Electricity (TZS) | 327 202 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | 27 267 | |
| Fertilizer (TZS) | 490 802 | 0 | 0 | 0 | 98 160 | 98 160 | 98 160 | 98 160 | 98 160 | 98 160 | 98 160 | 98 160 | 98 160 | 98 160 | |
| Chemicals/maintenance etc (TZS) | 2 454 012 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | 204 501 | |
| Seeds (TZS) | 35 384 126 | 35 384 126 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Security | 7 852 838 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | |
| Maintenance | 3 272 016 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | 272 668 | |
| VARIABLE COSTS TOTAL | 59 119 876 | 45 881 844 | 1 158 839 | 1 158 839 | 1 256 999 | 1 256 999 | 1 256 999 | 1 256 999 | 1 256 999 | 1 256 999 | 1 158 839 | 1 158 839 | 1 158 839 | 1 158 839 | |
| FIXED COSTS | | YEAR / MONTH | | | | | | | | | | | | | |
| | Salary/pers on/month (EUR) | Salary/person/ month (TZS) | Total / annum 2017-2018 | Jul | Aug | 2 018 Sep | Oct | Nov | Dec | Jan | Feb | 2019 Mar | Apr | May | Jun |
| LABOUR | | | | | | | | | | | | | | | |
| Nursery workers | | | 10 470 451 | 1 308 806 | 1 308 806 | 1 308 806 | 1 308 806 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 | 654 403 |
| Salary / month | 80 | 218 134 | | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Number of workers | | | | 6 | 6 | 6 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Supervision & Administration | | | 9 816 048 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 | 818 004 |
| Salary / month | 300 | 818 004 | | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Number of workres | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| LABOUR TOTAL | | | 20 286 499 | | | | | | | | | | | | |
| OTHER FIXED COSTS | | | | | | | | | | | | | | | |
| Rents | | | 0 | | | | | | | | | | | | |
| OTHER FIXED COSTS TOTAL | | | 0 | | | | | | | | | | | | |
| General overheads (8% of variable + fixed costs) | | | 6 352 510 | | | | | | | | | | | | |
| FIXED COSTS TOTAL | | | 6 352 510 | | | | | | | | | | | | |
| SEEDLING PRODUCTION TOTAL | | | 85 758 885 | | | | | | | | | | | | |

Annex 8 Cost calculation for briquette manufacturing

This is an estimate for briquette manufacturing that was considered as a new income generating activity of FWITC. It is planned that all pine sawdust produced from the sawmill will be dried and turned to charcoal and compressed to briquettes. Charcoal briquettes will then be marketed to Tanzanian charcoal markets. The following assumptions and calculations were made to find out a unit cost for 1m³ of sawdust if compared for a 1m³ of sawn timber produced:

- 1) Density of pine sawdust:
 - a) Wet pine sawdust = 450kg/m³ (solid m³)
 - b) Dry pine sawdust = 210kg/m³ (solid m³)
- 2) 1 ton of briquette requires 4,762m³ (solid m³) of wet sawdust.
- 3) Sawdust recovery from 1 m³ of saw logs is estimated to be about 13%.
- 4) Annual amount of wet pine sawdust from the planned FWITC's sawmill production (output 2,000m³ of sawn timber and input 8,333m³ of saw logs) = 541,5m³ / annum.
- 5) The accumulated amount of 541,6m³ of wet sawdust will accumulate about 113,7 tons of briquettes.
- 6) Above volume of charcoal will be compressed to briquettes, packed to marketable size of customer packs and will be sold to wholesales around Tanzania.
- 7) It is further assumed that 1kg of compressed charcoal briquette is sold to wholesales with a price of 500TZS/kg. This will give annual income of:
$$113,700\text{kg/annum} \times 500\text{TZS/kg} = 56,850,000 \text{ TZS / annum}$$
- 8) It was assumed that investments and production costs for producing charcoal and briquette will be about 30% of the sales value of the briquette. Therefore, the net value from the briquette production will
$$56,850,000 \text{ TZS/annum} \times 70\% = \text{TZS } 39,795,000 / \text{ annum}$$
- 9) The sawdust revenue collected will only be from the pine saw logs. Therefore, for each 1m³ of sawdust produced at the sawmill (1083m³/annum) the price would be about TZS 36,745. Because there might be some loss of sawdust during charcoal and briquetting process the **price of sawdust is rounded to TZS 35,000 / 1m³ of sawdust**. The estimation is on a lower side so if there is better recovery and some of the eucalyptus sawdust could be sold the profit and business result would be better than now estimated and calculated.

Annex 9 Royalty calculations for raw material prices (TZS/m³)
(United Republic of Tanzania, 2017, 13-14)

**Royalty calculations to define average raw material price (TZS/m³) for
FWITC's business plan preparation**

| | |
|--|----------------------|
| | m³ |
| Base for the raw material calculations was procurement of pine logs | 5 313 |
| or | |
| procurement of eucalyptus logs | 3 021 |

Option 1. PINE even distribution of all 5 DBH classes

| DBH class | TZS/m ³ | % of class | m ³ /class | price total |
|--------------|--------------------|----------------------------|-----------------------|-------------------------------------|
| 1 11-20 | 6 900 | 20 % | 1 063 | 7 331 250 |
| 2 21-25 | 13 700 | 20 % | 1 063 | 14 556 250 |
| 3 26-30 | 34 200 | 20 % | 1 063 | 36 337 500 |
| 4 31-35 | 59 200 | 20 % | 1 063 | 62 900 000 |
| 5 35 above | 65 600 | 20 % | 1 063 | 69 700 000 |
| TOTAL | | 100 % | 5 313 | 190 825 000 |
| | | total m³ | 5 313 | AVG TZS/m³ 35 920 |

Option 2. PINE with weight on clear felling DBH classes 3, 4 & 5

| DBH class | TZS/m ³ | % of class | m ³ /class | price total |
|--------------|--------------------|----------------------------|-----------------------|-------------------------------------|
| 1 11-20 | 6 900 | 5 % | 266 | 1 832 813 |
| 2 21-25 | 13 700 | 5 % | 266 | 3 639 063 |
| 3 26-30 | 34 200 | 40 % | 2 125 | 72 675 000 |
| 4 31-35 | 59 200 | 35 % | 1 859 | 110 075 000 |
| 5 35 above | 65 600 | 15 % | 797 | 52 275 000 |
| TOTAL | | 100 % | 5 313 | 240 496 875 |
| | | total m³ | 5 313 | AVG TZS/m³ 45 270 |

Option 3. PINE with weight on thinnings DBH class 1 & 2 + clearfelling DBH class 3

| DBH class | TZS/m ³ | % of class | m ³ /class | price total |
|--------------|--------------------|----------------------------|-----------------------|-------------------------------------|
| 1 11-20 | 6 900 | 30 % | 1 594 | 10 996 875 |
| 2 21-25 | 13 700 | 20 % | 1 063 | 14 556 250 |
| 3 26-30 | 34 200 | 50 % | 2 656 | 90 843 750 |
| 4 31-35 | 59 200 | 0 % | 0 | 0 |
| 5 35 above | 65 600 | 0 % | 0 | 0 |
| TOTAL | | 100 % | 5 313 | 116 396 875 |
| | | total m³ | 5 313 | AVG TZS/m³ 21 910 |

**Option 3 of the pine calculations was selected for
budgeting and profit calculations**

1. EUCALYPTUS even distribution of DBH classes 1-3

| DBH class | TZS/m3 | % of class | m3/class | price total |
|--------------|--------|-----------------|--------------|--------------------------|
| 1 11-20 | 7 300 | 33 % | 1 007 | 7 350 694 |
| 2 21-30 | 18 200 | 33 % | 1 007 | 18 326 389 |
| 3 30 above | 31 700 | 33 % | 1 007 | 31 920 139 |
| TOTAL | | 100 % | 3 021 | 57 597 222 |
| | | total m3 | 3 021 | AVG TZS/m3 19 067 |

2. EUCALYPTUS weight on DBH classes 1 & 2

| DBH class | TZS/m3 | % of class | m3/class | price total |
|--------------|--------|-----------------|--------------|--------------------------|
| 1 11-20 | 7 300 | 30 % | 906 | 6 615 625 |
| 2 21-30 | 18 200 | 60 % | 1 813 | 32 987 500 |
| 3 30 above | 31 700 | 10 % | 302 | 9 576 042 |
| TOTAL | | 100 % | 3 021 | 49 179 167 |
| | | total m3 | 3 021 | AVG TZS/m3 16 280 |

Option 2 of the eucalyptus calculations was selected for budgeting and profit calculations

3. EUCALYPTUS weight on DBH class 3

| DBH class | TZS/m3 | % of class | m3/class | price total |
|--------------|--------|-----------------|--------------|--------------------------|
| 1 11-20 | 7 300 | 10 % | 302 | 2 205 208 |
| 2 21-30 | 18 200 | 20 % | 604 | 10 995 833 |
| 3 30 above | 31 700 | 70 % | 2 115 | 67 032 292 |
| TOTAL | | 100 % | 3 021 | 80 233 333 |
| | | total m3 | 3 021 | AVG TZS/m3 26 560 |

Annex 10 Chart of accounts for FWITC's accounting and bookkeeping

The following is the "Chart of accounts 2018" FWITC operations. The projects have been established according to the budgeting and accounting structure of FWITC, i.e. short courses and production/business projects implemented at the FWITC e.g. 12 General & management courses, 13 Entrepreneurship & business development courses, 14 Forestry courses, 16 Wood technology courses etc.

Defined courses and production/business projects fall under the MAIN PROJECT GROUPS of FWITC that are (P 1) SHORT COURSES TRAINING, (P 2) SEMINARS AND WORKSHOPS, (P 3) FWITC BUSINESS OPERATIONS and FWITC's supporting service MAIN GROUPS that are from (P 4) to (P 7).

- 1) **MAIN PROJECT GROUPS** are marked as (note: numbered **P 1, P 2, P 3.... P 7**)
- 2) MAIN PROJECT GROUPS P 1, P 2 and P 3 have been divided further into sum-up **PROJECT GROUPS** (note: numbered with two numbers in brackets e.g. **(14) FORESTRY COURSES, (16) WOOD TECHNOLOGY COURSES** etc.
- 3) PROJECT GROUPS have been further split to **projects** (note: numbered with three numbers e.g. **133 Marketing, 152 Forest inventory and 180 Charcoal making** etc.
- 4) Below are explanation how MAIN PROJECT GROUPS have been split to PROJECT GROUPS and projects:
 - **NEW PROJECTS**: future short courses, seminars, workshops or business projects of FWITC on tendering or planning process (i.e. timber treatment for customers, tractor driving course etc.). In connection to these uses always the sector specific component too (1 for Short courses training, 2 Seminars and workshops, 3 for production etc.)
 - **MARKETING: general marketing** that are not directly in connection to a SHORT COURSES OR PROJECTS under implementation
 - **MISSION (invoiceable)**: short-term missions or projects on invoiceable basis that FWITC can invoice
 - **PLANNING AND ADMINISTRATION**: miscellaneous related to work and costs under the MAIN PROJECT GROUP
 - **PROJECTS IN IMPLEMENTATION UNDER EACH PROJECT GROUP**: all costs related to each individual short course or project to be accounted under the respective project

 - GROUPS (P 4): Contract management of FWITC: includes
 - GROUP (P 5): Sales support of FWITC
 - GROUP (P 6): FWITC's management in general including HR management
 - GROUP (P 7): Finance and services for FWITC personnel apart from HR
- 4) Components (cost centres of a project) for each project are listed in the component document for FWITC's chart of accounts document.
- 5) Currently there are no categories established for the chart of account however these can be established to identify cost more precisely under each component.
 - Short courses
 - Production:
 - Other / New Projects: according to project needs (to be specified case by case)
- 6) Account numbers can be found from the accounts sheet:

N.B.

Attention should be given to proper use of component and account numbers to specify expenditures occurring to each project.

Forest and Wood Industries Training Centre (FWITC) 15.6.2018

CHART OF ACCOUNTS 2018

PROJECTS

(P 1) SHORT COURSES TRAINING

| | | |
|------|--|------------------|
| (60) | NEW PROJECTS (Offering <i>phase</i> ; use component 1 to identify component) | (Edigary) |
| 611 | Name here | |
| 612 | Name here | |
| 613 | Name here | |
| (61) | MARKETING | (Edigary) |
| 611 | Marketing | |
| (62) | PLANNING AND ADMINISTRATION | (Edigary) |
| 621 | Administration | |
| 622 | Planning of short courses training | |
| 623 | Development of FWITC education and training | |
| 624 | VETA education (VETA piloting activities) | |

(10) SHORT COURSES PROJECTS (Implementation phase)

| | | |
|------|--|-----------------|
| (12) | GENERAL & MANAGEMENT COURSES | (Yohana) |
| 121 | A1 Basics of information technology | |
| 122 | A2 Advanced skills in information technology | |
| 123 | A3 Basic health and first aid in forestry and sawmilling operations | |
| 124 | A4 Advanced health and first aid in forestry and sawmilling operations | |
| 125 | A5 Communication Skills | |
| (13) | ENTREPRENEURSHIP & BUSINESS DEVELOPMENT COURSES | (Yohana) |
| 131 | B1 Introduction to Entrepreneurship and Business | |
| 132 | B2 Business Management | |
| 133 | B3 Marketing | |
| 134 | B4 Bookkeeping and Accounting | |
| 135 | B5 Financial Management | |
| 136 | B6 SME Enterprise Management and Business Planning | |
| 137 | B7 Supervisory and Management Skills | |
| (14) | FORESTRY COURSES | (Hanne) |
| 141 | C1 Forest work and financial plan** | |
| 142 | C2 Establishing a TGA* | |
| 143 | C3 Managing a TGA* | |
| 144 | C4 Managing occupational health and safety (OSH) in forestry operations | |
| 145 | C5 Ensuring occupational health and safety (OSH) in forestry operations | |
| 146 | C6 Basic maintenance: Preventive maintenance of forest tools, machines and equipment | |

| | |
|-----|--|
| 147 | C7 Advanced maintenance: Managing preventive maintenance of forest tools, machines and equipment |
| | C8 Establishing a tree nursery |
| 148 | C9 Managing a tree nursery |
| 149 | C10 Plantation establishment & management of young stands* |
| 150 | |
| | C11 Plantation management of mature stands (pruning, thinning and harvesting) ** |
| 151 | |
| | C12 Forest inventory |
| 152 | C13 Forest fire prevention and control* |
| 153 | C14 Successful natural regeneration |
| 154 | |

(16) WOOD TECHNOLOGY COURSES

(Edigary)

| | |
|-----|--|
| 161 | D1 Bandsaw Blade Maintenance |
| 162 | D2 Circular Saw Blade Maintenance |
| 163 | D3 Production Planning in Sawmill Operations |
| 164 | D4 Sawing for High Recovery and Value-Added Wood Products |
| 165 | D5 Efficiency, Productivity and Economy in SME Sawmill Operations |
| 166 | D6 Records Keeping in Sawmill Operations |
| 167 | D7 Sawn Timber Drying by Air Seasoning |
| 168 | D8 Bandsaw Mill and Track Alignment |
| 169 | D9 Circular Breakdown and Re-Saw Operation |
| 170 | D10 Bandsaw Breakdown and Re-Saw Operations |
| 171 | D11 Circular and Band Sawmill Machine Maintenance, Alignments and Trouble Shooting |
| | D12 Quality Control in Sawmilling Operations |
| 172 | D13 Quality Requirements, Value and Utilization of Raw Material |
| 173 | D14 Safety in Sawmilling |
| 174 | D15 Board Edging and Trimming of Sawn Timber |
| 175 | D16 Sawn Timber Sorting and Grading |
| 176 | D17 Introduction to Kiln Drying in SME Sawmilling Operations |
| 177 | D18 Sawn Timber Preservation |
| 178 | D19 Stellite and Carbide Technology in Sawdoctoring |
| 179 | D20 Charcoal Making |
| 180 | D21 Fire Prevention for Wood Industries |

(P 2) SEMINARS AND WORKSHOPS

(70) NEW PROJECTS *(Tendering phase; use component 2)*

| | |
|-----|--------------------------|
| 701 | Name of the project here |
| 702 | Name of the project here |

(71) MARKETING

| | |
|-----|-----------|
| 710 | Marketing |
|-----|-----------|

| | | |
|---|------------------------------------|------------------|
| (72) MISSIONS / INVOICABLE | | |
| 721 | Sawmill visits | (Edigary) |
| 722 | Forestry project visits | (David) |
| 723 | Name of project or mission | () |
| 724 | Name of place or mission | () |
| (73) PLANNING AND ADMINISTRATION | | |
| 731 | Administration | |
| 732 | Planning of workshops and seminars | |

(20) SEMINARS AND WORKSHOPS (Implementation phase)

| | | |
|--|-------------------------------------|------------------|
| (22) SAWMILL MANAGEMENT | | (Edigary) |
| 221 | Name if special project of workshop | |
| 222 | Name if special project of workshop | |
| (23) ESTABLISHMENT AND MANAGEMENT OF WOODLAND RESOURCES | | (David) |
| 231 | Name if special project of workshop | |
| 232 | Name if special project of workshop | |
| (24) DEVELOPMENT OF BIO PRODUCTS FROM WOOD WASTE | | (Edigary) |
| 241 | Name if special project of workshop | |
| 242 | Name if special project of workshop | |
| (25) TREE AND STAND MEASUREMENTS | | (David) |
| 251 | Name if special project of workshop | |
| 252 | Name if special project of workshop | |
| (26) UNSPECIFIED WORKSHOPS THAT WILL BE PLANNED AND IMPLEMENTED IN 2018 | | (Edigary) |
| 261 | Name of the new workshop or seminar | |
| 262 | Name of the new workshop or seminar | |
| 263 | Name of the new workshop or seminar | |
| 264 | Name of the new workshop or seminar | |

(P 3) FWITC BUSINESS OPERATIONS

| | | |
|--|----------------------------|--|
| (80) NEW BUSINESS PROJECTS (Tendering phase; use component 3) | | |
| 801 | Name of the project here | |
| 802 | Name of the project here | |
| (81) MARKETING OF BUSINESS PROJECTS | | |
| 810 | Marketing | |
| (82) MISSIONS / INVOICEABLE | | |
| 821 | Sawmill visits | |
| 822 | Forestry project visits | |
| 823 | Name of project or mission | |
| 824 | Name of place or mission | |
| (83) ADMINISTRATION | | |
| 831 | Administration | |

(30) FWITC BUSINESS PROJECTS (Implementation phase)

| | | |
|--|-------------------------------------|------------------|
| (32) SAWMILL (production operations) | | (Edigary) |
| 321 | Sawn timber production (pine) | |
| 322 | Sawn timber production (eucalyptus) | |
| 323 | Sawn timber drying for customers | |
| 324 | Treatment sawn timber | |
| 325 | Treatment poles | |
| 326 | Contract sawing for customers | |
| (33) FOREST NURSERY (seedling production) | | (Rob) |
| 331 | Seedling production | |
| 332 | | |

(30) FWITC BUSINESS PROJECTS (Implementation phase)

| | | |
|---|---|------------------|
| (34) CONSULTANCY & ADVISORY SERVICES TO INDUSTRY | | (David) |
| 341 | Consultancy services to SMEs and industry | |
| 342 | Technical advisory services | |
| 343 | Business advisory services | |
| 344 | Extension services | |
| 345 | Others | |
| (35) SAW BLADE AND MACHINE MAINTENANCE SERVICES | | (David) |
| 351 | Saw blade maintenance | |
| 352 | Machine maintenance and trouble-shooting services | |
| 353 | Others | |
| (36) RESEARCH AND DEVELOPMENT | | (Edigary) |
| 361 | Product development | |
| 362 | Sawmills productivity and efficiency projects | |
| 363 | Others | |
| (37) INCUBATION PROJECT | | (David) |
| 371 | Development of Mafinga wood industry incubator | |
| 372 | Development of Mafinga wood industry cluster | |
| 373 | | |
| (38) OTHER BUSINESS ACTIVITIES AND SERVICES OF FWITC | | (Edigary) |
| 381 | Venues at FWITC | |
| 382 | Trade fairs and exhibitions | |
| 383 | Machine and technology demonstrations | |
| 384 | Others | |

(P 4) FWITC CONTRACT MANAGEMENT

| | | |
|-----|--|------------------|
| | | (Edigary) |
| 401 | Contract management of FWITC contracts | (Edigary) |
| 402 | Other unspecified in contracts | |

(P 5) FWITC SALES SUPPORT

(Pius)

| | | |
|-----|--|------------------------------------|
| 501 | FWITC's Sales support for sale of products and services | (Edigary) |
| 502 | Sales of technical assistance, consultancies and advisory services | (David) (Edigary) |
| 503 | FWITC Internet site development and upkeep | |

(P 6) FWITC MANAGEMENT

(Edigary)

| | | |
|-----|---------------------|------------------|
| 601 | Management | (Edigary) |
| 602 | Personal management | |
| 603 | Recreation | |

(P 7) FWITC FINANCE AND PERSONEL

(Pius)

| | | |
|-----|--------------------|--|
| 701 | Personnel services | |
| 702 | Finance | |
| 703 | Office services | |

Forest and Wood Industries Training Centre (FWITC)

15.6.2018

CHART OF ACCOUNTS 2018

COMPONENTS (cost centres of a project)

(P 1) SHORT COURSES TRAINING

(60) New Projects

1 Tenders

(10) SHORT COURSES PROJECTS (Implementation phase)

- (12) GENERAL & MANAGEMENT COURSES
(Projects 121-125)
- (13) ENTREPRENEURSHIP & BUSINESS DEVELOPMENT
(Projects 131-137)
- (14) FORESTRY COURSES
(Projects 141-154)
- (16) WOOD TECHNOLOGY COURSES
(Projects 161-181)
- 1150 Lecturing short courses
- 1151 Lodging short courses
- 1152 Meal & Refreshment short courses
- 1153 Use of classroom / workshop / training facilities short courses
- 1154 Training material preparation
- 1155 Purchase of training equipment and tools for wood technology training
- 1156 Purchase of forest inventory equipment, tools & materials
- 1157 Purchase of forest inventory software
- 1158 Purchase of textbooks and training materials

(P 2) SEMINARS AND WORKSHOPS

(20) SEMINARS AND WORKSHOPS (Implementation phase)

(70) New Projects

2 Tenders

- (22) SAWMILL MANAGEMENT
- (23) ESTABLISHMENT AND MANAGEMENT OF WOODLAND RESOURCES
- (24) DEVELOPMENT OF BIO PRODUCTS FROM WOOD WASTE
- (25) TREE AND STAND MEASUREMENTS
- (26) UNSPECIFIED WORKSHOPS THAT WILL BE PLANNED AND IMPLEMENTED IN 2018
- 2150 Lecturing short courses
- 2151 Lodging short courses
- 2152 Meal & Refreshment short courses
- 2153 Use of classroom / workshop / training facilities short courses
- 2154 Training materials and consumables short courses
- 2155 Transport short courses
- 2156 Administration short courses

(P 3) FWITC BUSINESS OPERATIONS

| | |
|--|--|
| (80) New Projects | |
| 3 | Tenders |
| (30) FWITC BUSINESS PROJECTS (Implementation phase) | |
| (32) | SAWMILL (production operations) (Projects 321-326) |
| 3250 | Add components |
| 3251 | |
| 3252 | |
| 3253 | |
| 3254 | |
| (33) | FOREST NURSERY (seedling production) (Projects 331) |
| 3350 | Add components |
| 3351 | |
| 3352 | |
| 3353 | |
| 3354 | |
| (34) | CONSULTANCY & ADVISORY SERVICES TO INDUSTRY (Projects 341-345) |
| 3450 | TA services on transfer of new and appropriate technology |
| 3451 | |
| 3452 | |
| 3453 | |
| (35) | SAW BLADE AND MACHINE MAINTENANCE SERVICES (Projects 351-353) |
| 3550 | Add components |
| 3551 | |
| 3552 | |
| (36) | RESEARCH AND DEVELOPMENT (Projects 361-363) |
| 3650 | Add components |
| 3651 | |
| 3652 | |
| (37) | INCUBATION PROJECT (Projects 371-373) |
| 3750 | Add components |
| 3751 | |
| 3752 | |
| (38) | OTHER BUSINESS ACTIVITIES AND SERVICES OF FWITC (Projects 381-384) |
| 3850 | Add components |
| 3851 | |
| 3852 | |

(P 4) FWITC CONTRACT MANAGEMENT

(401, 402)

| | |
|------|--------------------|
| 4001 | Management |
| 4002 | Representation |
| 4007 | Board of directors |
| 4008 | Auditing |

(P 5) FWITC SALES SUPPORT

(501, 502, 503)

| | |
|------|--|
| 5011 | Maintenance of CV roster |
| 5012 | Maintenance & dev. of reference materials |
| 5013 | Support to contract issues |
| 5014 | Dev. of promotional materials |
| 5015 | Other support activities (training) |
| 5016 | Marketing of training services |
| 5017 | Marketing of technical advisory services |
| 5018 | Marketing of products and maintenance services |

(P 6) FWITC MANAGEMENT

(601, 602, 603)

| | |
|------|-----------------------------------|
| 6021 | Management and administration |
| 6022 | Representation |
| 6023 | Board of directors |
| 6024 | Auditing |
| 6025 | Vehicles and transport |
| 6026 | Investments |
| 6027 | Buildings and renovations |
| 6028 | Planning and development |
| 6029 | Staff travel |
| 6030 | Development of physical resources |
| 6031 | Salaries |

(P 7) FWITC FINANCE AND PERSONEL

(701, 702, 703)

| | |
|------|---|
| 7031 | Health service |
| 7032 | ADP, internet, emails |
| 7033 | Recreation activities |
| 7034 | Internal staff training and capacity building |
| 7035 | Recruitment |
| 7036 | Other personnel services |
| 7037 | Teachers, trainers and operators training and capacity building |

(702) FINANCE

| | |
|------|----------------------------|
| 7041 | ADP and finance programmes |
| 7042 | Other finance issues |
| 7043 | Finance / Branch Office |

(P 7) FWITC FINANCE AND PERSONEL

| | |
|-------|--|
| (703) | OFFICE SERVICES |
| 7051 | Office automation |
| 7052 | Other office services |
| 7053 | Technical support services for FWITC |
| 7054 | Office equipment, FWITC office, (Inc. Software) |
| 7055 | Office equipment, sawmill offices (incl. software) |
| 7056 | FWITC office expenditures (fuel, car service, other serve) |
| 7057 | Communication |

CHART OF ACCOUNTS 2018

ACCOUNTS

REIMBURSABLE ACCOUNTS

CATEGORIES

(see the category list and the instructions to 2018 chart of accounts)

PERSONNEL COSTS SALARIES/REIMBURSABLES

| | |
|------|---------------------------------|
| 1201 | Salaries, FWITC |
| 1204 | Salaries, personal. consultants |
| 1209 | Other fees |
| 1211 | Social securities |
| 1213 | Personnel insurances |

| | |
|-----|-----------------------------|
| 121 | Experts / long term, PFP |
| 122 | Experts / long term, other |
| 131 | Experts / short term, PFP |
| 132 | Experts / short term, other |
| 141 | Other personnel, PFP |
| 142 | Other personnel, other |

INTERNATIONAL TRAVEL

| | |
|------|--------------------|
| 1221 | Daily allowances |
| 1222 | Accommodation |
| 1223 | Travel tickets |
| 1224 | Mileage allowances |
| 1229 | Other travel costs |

LOCAL TRAVEL

| | |
|------|--------------------|
| 1231 | Daily allowances |
| 1232 | Accommodation |
| 1233 | Travel tickets |
| 1234 | Mileage allowances |
| 1239 | Other travel costs |

PERM. ACCOMMODATION FIELD STAFF

| | |
|------|--------------------------|
| 1241 | Rent, staff house |
| 1242 | Maintenance, staff house |
| 1243 | Security, staff house |

WORKSHOPS / SEMINARS PARTICIPANTS, SCHOLARSHIP HOLDERS

| | |
|------|----------------------|
| 1501 | Allowances |
| 1502 | International travel |
| 1503 | Local travel |
| 1504 | Accommodation |
| 1505 | Meals |
| 1509 | Tuition fees |
| 1590 | Other |

| | |
|-----|---------------------------|
| 111 | Scholarships VETA |
| 112 | Trainees and participants |
| 113 | VETA students |

| REIMBURSABLE ACCOUNTS | | CATEGORIES | |
|--------------------------------|----------------------------------|-------------------|--------------------------------|
| CONSUMER GOODS | | | |
| 2111 | Office materials and supplies | 151 | Consumer goods, PFP |
| 2113 | Spare parts / vehicles | 152 | Consumer goods, other |
| 2114 | Spare parts / other | 153 | Consumer goods FWITC |
| 2115 | Fuel & oil | | |
| 2118 | Training materials and supplies | | |
| 2119 | Books and printed matters | | |
| 2190 | Other consumer goods | | |
| SERVICES | | | |
| 3101 | Consultant fees, firms | 161 | Services, PFP |
| 3102 | Mailing | 162 | Services, other |
| 3103 | Telecommunication | 163 | Services, FWITC |
| 3104 | Photocopying | | |
| 3105 | Conference facilities | | |
| 3106 | Freight and transport services | | |
| 3107 | Maintenance and repair, vehicles | | |
| 3108 | Maintenance and repair, other | | |
| 3109 | Restaurant services | | |
| 3110 | Other services | | |
| OTHER CONSUMPTION COSTS | | | |
| 4101 | Office rent | 171 | Other consumption costs, PFP |
| 4102 | Other rents | 172 | Other consumption costs, other |
| 4103 | Electricity | 173 | Other consumption costs, FWITC |
| 4104 | Commissions | | |
| 4105 | Insurances (vehicles, e.t.c.) | | |
| 4106 | Exchange rate difference | | |
| 4190 | Other consumption costs | | |
| 4191 | FWITC production facility rents | | |
| INVESTMENTS | | | |
| 5101 | Vehicles | 181 | Investments, PFP |
| 5102 | Machinery | 182 | Investments, other |
| 5103 | Equipment (ADP, e.t.c.) | 183 | Investments, FWITC |
| 5104 | Furniture | | |
| 5105 | Construction materials | | |
| 5106 | Construction contracts | | |
| 5190 | Other investments | | |

NON-REIMBURSABLE ACCOUNTS

PERSONNEL COSTS

SALARIES AND SOS.SECURITIES / NON REIMBURSABLES

| | |
|-------|--|
| 6111 | Salaries, FWITC sawmill |
| 6121 | Salaries, FWITC management |
| 6122 | Salaries, FWITC Forest Nursery |
| 6123 | Salaries, FWITC others. |
| 6113 | Salaries FWITC consultants |
| 6114 | Vacation payments, if paid any |
| 6115 | Allowances, unspecified |
| 6119 | Other fees or DSA, e.g. FWITC's board members meeting fees |
| 61291 | Consultant fees, firms, invoiceable work for FWITC |
| 6211 | Social securities, if paid |
| 6212 | Pension fees |
| 6213 | Accident insurances |
| 6216 | Travel insurances |
| 62182 | Health care |
| 6219 | Other employee costs |
| 6221 | Recreation for FWITC staff |

TRAVEL

| | |
|-------|---|
| 6311 | Daily allowances (only DSA no accommodation included) |
| 63111 | Per Diem (including accommodation and meals) |
| 6312 | Accommodation |
| 6313 | Travel tickets |
| 6314 | Mileage allowances |
| 6315 | Taxi |
| 6319 | Other travel costs |
| 6320 | Leasing or renting of cars |

OTHER PERSONNEL COSTS

| | |
|------|-------------------------------------|
| 6390 | Other personnel costs |
| 6411 | Office supplies and stationary |
| 6412 | Books and printed maters |
| 6413 | Alcohol |
| 6414 | Business presents |
| 6416 | ADP supplies |
| 6417 | Photocopying |
| 6418 | Car expenses |
| 6490 | Other consumption supplies & maters |

NON-REIMBURSABLE ACCOUNTS

CONSUMPTION GOODS SERVICES

| | |
|-------|--------------------------------------|
| 6511 | Consultant fees, firms |
| 6512 | Employee training (FWITC) |
| 6521 | Printing |
| 6522 | Advertisement |
| 65231 | ADP software maintenance |
| 65232 | ADP hardware maintenance |
| 6524 | Telecommunication |
| 6525 | Internet, |
| 6527 | Postage |
| 6528 | Bank commissions |
| 6532 | Restaurant services / representation |
| 6533 | Restaurant services / other |
| 6534 | Cleaning services |
| 6535 | Electricity |
| 6539 | Other services |

OTHER CONSUMPTION COSTS

| | |
|------|--|
| 661 | Office rents |
| 662 | Other rents (leasing-of machines, equipment) |
| 663 | Insurances |
| 664 | Member ship fees |
| 665 | Bank guarantees |
| 667 | Exchange rate difference |
| 669 | Other consumption costs |
| 6691 | Commissions / Firms |

DEPRECIATIONS

| | |
|-----|-------------------------------------|
| 671 | Depreciation of equipment |
| 672 | Depreciation / others from business |
| 679 | Other depreciations |

INTEREST EXPENSE

| | |
|-----|---------------------------------|
| 681 | Penalty interest |
| 689 | Interest expenses of bank loans |
| 690 | Stamp tax0 |
| 695 | Direct taxes |

INCOME ACCOUNTS

EXPORT SALES INCOME

| | |
|------|---|
| 711 | Consultancy income, long term FWITC staff |
| 7112 | Per Diem income |
| 7113 | Consultancy income, short term FWITC TA services |
| 7114 | Consultancy income, short term FWITC TA services |
| 7115 | Income / Direct costs |
| 712 | Reimbursable income |
| 713 | Income / books and printed material |
| 716 | Financing income / PFP subsidy |
| 719 | Other income |
| 720 | FWITC sawmill income |
| 721 | FWITC Forest nursery income |
| 722 | FWITC sawdoctoring and machine maintenance income |
| 723 | FWITC research and development income |
| 724 | Income from FWITC other services |
| 725 | Other donor subsidy |

VAT 0% SALES INCOME

| | |
|-----|----------------|
| 729 | Income / other |
|-----|----------------|

VAT 18% SALES INCOME

| | |
|------|---|
| 731 | Income / books, materials, training materials |
| 751 | Consultancy income, long term |
| 7512 | Consultancy income, short term |
| 752 | Reimbursable income |
| 759 | Income other |

OTHER INCOME

| | |
|-----|-------------------------------|
| 76 | Interest income |
| 77 | Exchange rate difference |
| 781 | Income / rents |
| 799 | FWITC Development fund income |

BALANCE SHEET ACCOUNTS

ASSETS

CURRENT ASSETS

| | |
|-------|--------------------------------------|
| 811 | Cash, FWITC |
| 813 | Bank account, FWITC |
| 8133 | CRDB, FWITC's USD-currency account |
| 81361 | CRDB, FWITC's -EURO currency account |
| 851 | FWITC Inventories |
| 855 | Possible exchange rate loss |
| 8152 | Receivables |
| 8161 | Advance, travel |
| 8162 | Advance, FWITC projects |
| 8164 | Advance, consultants |
| 8165 | Advance, FWITC staff |
| 8169 | Advance, other |
| 817 | Adjusting entries for assets |
| 8181 | VAT- receivables (18%) |
| 8182 | VAT- receivables (%) |
| 8184 | VAT- receivables (%) |
| 8185 | VAT- receivables (%) |

FIXED ASSETS

| | |
|-------|---------------------------------------|
| 8611 | FWITC ADP hardware |
| 86111 | FWITC sawmill machinery and equipment |
| 86112 | FWITC sawdoctoring machines and tools |
| 8612 | Other FWITC machinery and equipment |
| 8613 | FWITC Office equipment |
| 8614 | FWITC Cars and vehicles |
| 8615 | Cellular-telephones |
| 8619 | Other material investment |
| 8621 | ADP -software |
| 8629 | Other immaterial goods |

SHARES AND PARTICIPATION

| | |
|-----|---------------------------|
| 871 | Shares and participations |
|-----|---------------------------|

SETTLEMENT ACCOUNTS

| | |
|------|------------------------------|
| 899 | Accounts payable |
| 8991 | Accounts receivable |
| 8994 | Settlement account |
| 8999 | Others |
| 8159 | FWITC receivables |
| 8160 | Short term receivables FWITC |
| 8161 | Other receivables |

BALANCE SHEET ACCOUNTS

LIABILITIES

SHORT TERM LIABILITIES

| | |
|------|-----------------------------------|
| 911 | Payables |
| 912 | Advance (received, tax-free) |
| 9121 | Advance (PFP) |
| 9122 | Income / FWITC |
| 9123 | Advance (taxable) |
| 913 | Adjusting entries for liabilities |
| 9141 | VAT- payables (18%) |
| 9144 | VAT-payables (%) |
| 9145 | VAT-payables (%) |
| 915 | Social securities, payables |
| 9152 | Insurances payable |
| 916 | Withholding payables |
| 917 | Employee insurances |
| 918 | Member ship fees |
| 919 | Other short-term liabilities |
| 921 | ALV- loan |
| 930 | Exchange rate gains |

LONG TERM LIABILITIES

| | |
|-----|------------------|
| 92 | |
| 922 | Instalment loans |

EQUITY

| | |
|------|--------------------------------|
| 9311 | Share capital |
| 9312 | Reserve |
| 9319 | Other equity |
| 989 | Profit earnings |
| 9400 | Accumulated depreciation FWITC |
| 989 | Balance of the previous period |

Annex 12 Examples for income statement and balance sheet

Example for income statement of the sawmill

| FWITC Sawmill's Income Statement | | | |
|---|--------------------|-----------------------|--------------------|
| May 2018 | | | |
| Revenues | Tshs | Expenses | Tshs |
| Sales | 546 000 000 | logs | 175 000 000 |
| Total Revenue | 546 000 000 | electricity | 4 000 000 |
| | | lubricants | 25 000 |
| | | maintenance | 1 800 000 |
| | | fuel | 90 000 |
| | | transport | 32 500 000 |
| | | labour | 5 000 000 |
| | | supervision | 4 500 000 |
| | | overhead | 10 000 000 |
| | | other | 84 000 000 |
| | | Total Expenses | 316 915 000 |
| | | Net Income | 229 085 000 |

Example for balance sheet of the sawmill

| FWITC Sawmill's Balance Sheet | | | |
|--------------------------------------|--------------------|---------------------------------------|--------------------|
| May 31, 2018 | | | |
| Assets: | Tshs | Liabilities: | |
| Cash in Hand | 16 000 000 | CRNR Working Capital | 100 000 000 |
| Cash in Bank | 314 000 000 | | |
| Inventories | | Total current liabilities | 100 000 000 |
| logs in forest | 0 | | |
| logs CRNR | 0 | Equity: | |
| sawnwood CRNR | 14 000 000 | Current Earnings | 244 125 000 |
| diesel | 50 000 | Total Equity | 244 125 000 |
| petrol | 60 000 | | |
| oil | 15 000 | | |
| Total current assets | 344 125 000 | Total Liabilities & Equity | 344 125 000 |

Annex 13 SWOT analysis of FWITC's management options

| STRENGTHS | WEAKNESSES |
|--|---|
| <p><u>Option 1</u></p> <ul style="list-style-type: none"> • Very define and clearly for training purposes • Easy to manage because there is no mixer of activities – only training • High training delivery because of only one operation that is training • Easier to formulate a constitution because of only one-line business | <p><u>Option 1</u></p> <ul style="list-style-type: none"> • No income generations to support FWITC operations, development and sustainability in a long perspective • Pressure to start production operations to support financing of the centre • No real production examples available for training purposes • Investment is under utilized • Utilization rate of machines and equipment will be low |
| <p><u>Option 2</u></p> <ul style="list-style-type: none"> • Provides firm financial viability of the centre • Improves the sustainability of the centre • Brings funds for development of the centre • Gives good practical examples on forestry and wood processing for training purposes • FWITC will provide good practice ground for trainers and teachers to be real workers' skills developers | <p><u>Option 2</u></p> <ul style="list-style-type: none"> • More difficult to set up as there are two operations • No advantages for getting experiences from the existing institutes • Is challenging for training if too much focus is given for production operations which destroys training and the real impact • Heavy production operations and use of the machines might lower the condition and safety of machinery affecting quality of training • Because of heavy production operations machines turn over time will be shorter |
| <p><u>Option 3</u></p> <ul style="list-style-type: none"> • Financial viability will be better than in option 1 but same as option 2 • Supports the financial sustainability of the FWITC • Brings more funds for development of the centre • Experiences from FTI and FITI as training institutes used more effectively for organizing and implementing training courses and training as a whole • FWITC production operations provide good practice ground for trainers and teachers to become real workers' skills developers • Good opportunity to get trainees to real working situations and work environment | <p><u>Option 3</u></p> <ul style="list-style-type: none"> • More difficult to set up as there are two operations • Challenging from training point of view because production operations might destroy training impact • Heavy production operations and use of machines and equipment might lower safety and condition of machines which may lower the quality of training • Because of heavy production operations machines turn over time will be shorter |

| OPPORTUNITIES | THREATS |
|--|--|
| <p><u>Option 1</u></p> <ul style="list-style-type: none"> • Lots of forestry and wood technology training needed in SME development • Better and full-time training can be offered as the centre is only meant for training purposes | <p><u>Option 1</u></p> <ul style="list-style-type: none"> • Production operations if started might destroy the training • Weak sustainability of the centre unless partners and stakeholders ready to support the centre • No extra funds for development of the centre • Training will be too theoretical because there are no production operations |
| <p><u>Option 2</u></p> <ul style="list-style-type: none"> • Facilitates an operational environment that can be sustainable in a long-term perspective | <p><u>Option 2</u></p> <ul style="list-style-type: none"> • Training will be neglected • Money making takes over the operations and business • Management of the PPP and the centre can get confused about the priority activities unless well focused for training • Training cannot be implemented as planned if maintenance and service of machines is ignored |
| OPPORTUNITIES | THREATS |
| <p><u>Option 3</u></p> <ul style="list-style-type: none"> • Provides a good test and practice ground for trainers and teachers on wood processing operations • Brings all the available know-how, experiences and information from the existing two forestry education institutes • Trainers and teachers gain practical work experiences all the time when operating production unit that can be turned and will improve training offered by the FWITC • Existing two forestry institutes will learn how to run and operate FWITC while the PFP programme is still supporting the centre | <p><u>Option 3</u></p> <ul style="list-style-type: none"> • Training will be neglected if poorly planned and implemented • Money making takes over the operations and business destroys the training • Training cannot be implemented as planned if maintenance and service of machines is ignored |

Annex 14 ToRs for FWITC's key staff

1) General Manager / Principal (GMP)

Duty station: Forestry and Wood Industry Training Centre in Mafinga

Duties and responsibilities:

- 1) Lead planning, management and supervision of all training and production operations and resources of the Forestry and Wood Industries Training Centre as defined in the Business and Training Plan of the FWITC.
- 2) Build the profile of the FWITC and market its services.
- 3) Plan, oversee, monitor, and evaluate implementation of training, seminar and workshop activities of FWITC.
- 4) Take responsibility for budgeting, accounting and bookkeeping of FWITC's business operations.
- 5) Train and mentor forestry and wood technology trainers to teach and train FWITC's trainees (i.e. students and apprentices) to put in practice knowledges, and most of all practical skills and working techniques on forestry and wood processing operations.
- 6) Provide continuous professional development opportunities for forestry and wood industry trainers.
- 7) Provide continuous professional development opportunities for forestry and wood industry professionals working in the Southern Highlands.
- 8) Strengthen financial viability of the FWITC by developing and managing its commercial business operations.
- 9) Maintain close collaborative working relations with forestry and wood industry actors throughout Tanzania.
- 10) Maintain close collaborative working relations with forestry and wood industry training institutions in Eastern and Southern Africa.
- 11) Maintain collaboration with international vocational training institutions in the forestry and wood industry sectors.
- 12) Lead acquisition of publications including text books, reference materials and journals to ensure the facility is kept up-to-date with relevant developments and that both students and teachers have access to reference books, journals and periodicals.
- 13) Lead purchase and procurement of FWITC's equipment and consumables for both training and production.
- 14) Plan, organise and manage special forestry and wood technology exhibitions and trade fairs at the FWITC and in local areas.
- 15) Strengthen management and operations of the Industry Node pilot in Makete that has been developed by UTIIB SME group, according to the MoU between MNRT and that group.
- 16) Prepare periodic progress and financial reports and plans and special reports as needed by MNRT and PFP.

2) Training Coordinator (TC)

Duty station: Forestry and Wood Industry Training Centre in Mafinga

Duties and responsibilities:

- 1) Coordinates, plans and when possible, executes training activities, especially short courses in forestry or wood technologies.
- 2) Plans and manages course schedules of the Wood Technology Training Department.
- 3) Conducts M&E of FWITC's training sawmill operations.
- 4) Manages the course schedules and student rosters of the FWITC training operations.
- 5) Plans and manages training materials.
- 6) Acts as a contact person for all stakeholders and beneficiaries of FWITC's training.
- 7) Assists in marketing and advertising of the training events, short courses, seminars and workshops.
- 8) Manages practical and administrative arrangements for short courses.
- 9) Is responsible for FWITC's training facilities and their development.
- 10) Acts as an administrator for trainees' accommodation and transport issues.

3) Accountant and Administrative Officer (AAO)

Duty station: Forestry and Wood Industry Training Centre in Mafinga

Duties and responsibilities:

1. Manages accounting and bookkeeping of FWITC.
2. Is responsible for FWITC's administration issues.
3. Maintains student rosters & records of short courses training.
4. Provides administrative support to FWITC management and assists trainers in training matters.

4) Teacher Forestry (TF)

Duty station: Forestry and Wood Industry Training Centre in Mafinga

Duties and responsibilities:

1. Plans, organizes and conducts forestry training and forestry short courses of FWITC.
2. Plans and manages short courses implementation with the TC.
3. Coordinates and supervises forestry short courses implementation.
4. Produces training and extension materials for forestry short courses.
5. Conducts on-site training for TGA members, farmers and forest owners.
6. Assists in planning awareness raising campaigns to promote FWITC's training programmes and short courses.

5) Teacher Wood Technology (TWT)

Duty station: Forestry and Wood Industry Training Centre in Mafinga

Duties and responsibilities:

1. Plans, organizes and conducts wood technology training and short courses of FWITC.
2. Plans and manages short courses implementation with the TC.
3. Coordinates and supervises wood technology short courses implementation.
4. Produces training and extension materials for wood technology short courses.
5. Conducts on-site training for MSMEs, sawmillers, farmers and forest owners.
6. Assists in planning awareness raising campaigns to promote FWITC's training programmes and short courses.



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