

## **Introduction**

Green Resources AS (GRAS) owns and manages a group of forest companies in Mozambique, Tanzania and Uganda. The group operates under the same set of principles and objectives across all its companies. Green Resource AS (GRAS), the majority owner of GRL Tanzania Ltd, acquired Idete, Mapanda and Uchindile Forest Plantations since 1997. The management of these forest plantations is done by one management team following GRAS’s principles and objectives.

This revision consolidates the management of all GRL Tanzania Ltd plantations for the harmonization of the responsible management. It covers the period 2018-2023 and is based on the “Management Plan for the Forest operations”. The plan establishes long-term objectives and strategies for the project area and forest management. It also outlines the forest operations essential to meet objectives, while at the same time, minimizing undesirable environmental impacts.

Besides the management plan and the business plan which outline the long-term objectives of the company, the company uses the Annual Plans of Operation (APOs) that outline actual implementation of forest operations on a yearly basis. APOs represent a link between the works proposed in the five-year Management Plan and the financial resources determined through the annual budgeting process. Annual reports document the implementation of forest management operations and monitor the progress towards achieving the targets identified in the forest management plan.

Within the management of its plantations, GRL recognizes the requirements of other forestry uses and users. As such, the planning exercise is participatory and employees provide significant input and review during the planning process. Additionally, activities at various stages of planning and operational processes encourage participation from other stakeholders. These opportunities allow organizations or individuals to supply information, identify concerns, comment on proposals and determine to what extent their comments were considered in decisions regarding identified areas of concern. Therefore, a public summary of this management plan should always be made available in English and Swahili safeguarding the confidentiality of some specific information.

This summary should be produced upon request from any interested party and its aim is to briefly inform stakeholders of our activities and plans, so their active involvement and participation can improve GRL’s planning process.

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## **Management objectives**

GRL' objectives:

- *Maximize returns through the sale of wood products* - GRL is planting eucalyptus and pine species to supply raw materials for the production of poles, logs and biomass. These products will, primarily, be sold to domestic markets.
- *Be a leading supplier of carbon offsets* - through its afforestation programme, the company aims at mitigating climate change by reducing greenhouse gases through carbon sequestration. GRL will mainly operate on the voluntary carbon market under the VCS standard. Ten percent of carbon revenues will be reinvested in the communities surrounding the project.
- *Maintain a strong focus on the environment conservation and social development* - GRL will only plant on land that has been adequately approved for planting, including land that has been abandoned or degraded.

All GRL operations in Tanzania have been approved by the GoT after a process submitted through the National Investment Centre. After the projects' approval, provisional land user rights were also granted to the companies by the Commissioner of Lands. However, before it is issued, the company has to: demarcate all the areas in which it will operate and, prove that it is using the areas in accordance with the approved projects.

## **Project Overview**

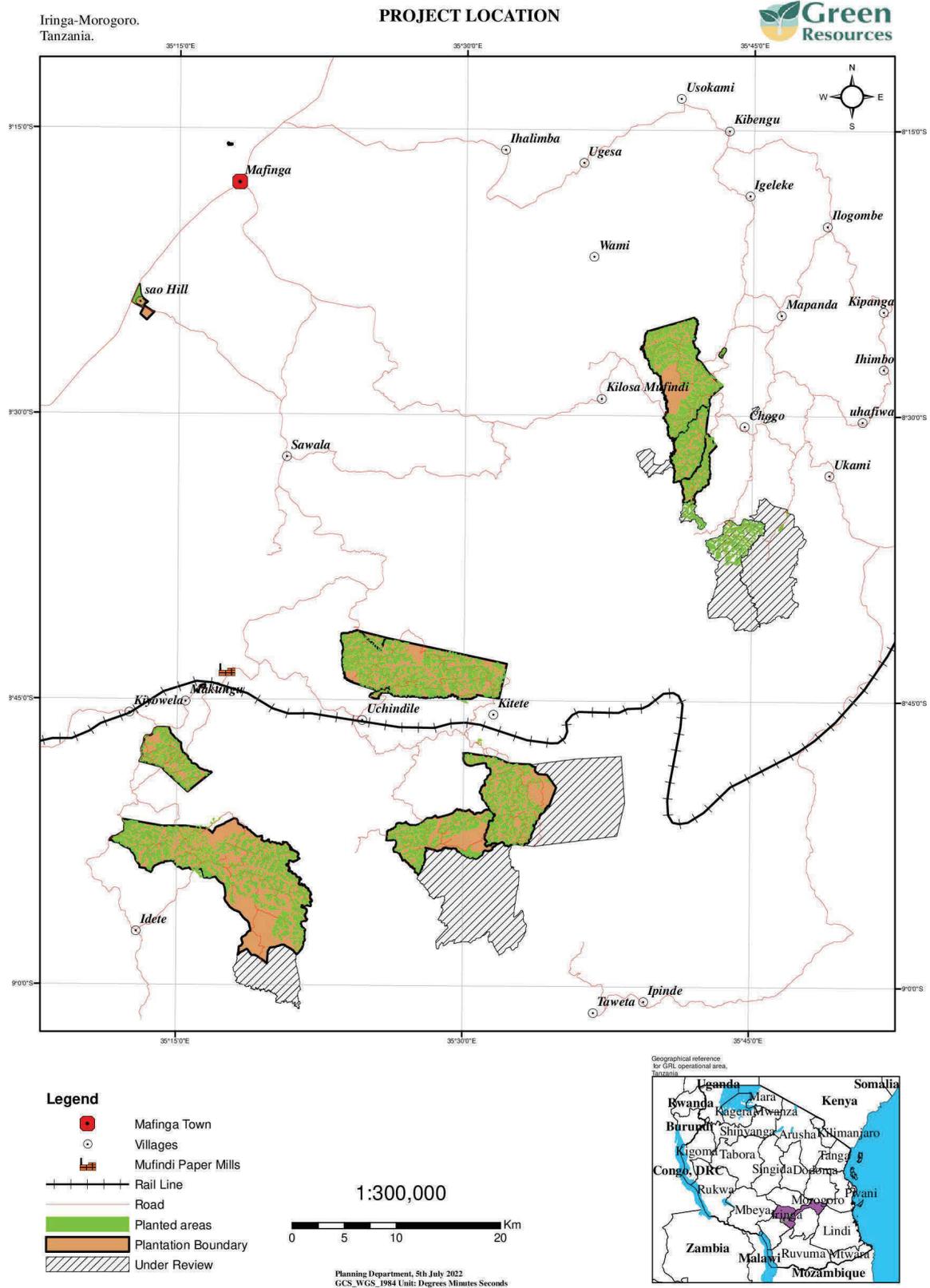
Location: Southern Highlands of Tanzania.

Districts: Kilombero District, Morogoro and Mufindi District, Iringa

Landholding: 60,000ha

Total Plantable Area: 20,000ha

Target Products: Poles, Saw Logs, Peeler Logs, Resin and Biomass



**Figure 1:** Project location within the Southern Highland & location of villages.

### **Land Use Plan**

The project started as a ‘greenfield’ project, where plantations are established on degraded or abandoned land. Pine and Eucalyptus being the primary species planted.

Within the acquired areas surveys should be conducted in regards to soils, Areas of Special Interest (ASI), High Conservation Value Forest (HCVF) and other protected areas as defined in national legislations, or other applicable international standards. The surveys should be a combination of ground truthing and remotes sensing.

The surveys will result in a high-scale desktop land use plan for the acquired areas considering involved stakeholders and act as guiding when developing plantations. A more detailed operational plan will be created on a lower scale as each area is developed.

### **Description of Resources to be Managed**

Land cover and land use assessments, are carried out prior to the operations start to identify and map the LULC that exist in the project area. For GRL operation areas, the following LULC were identified: grasslands (incl. disturbed wooded grasslands), shrub savanna, Miombo woodlands, rocky outcrops, wetlands, rotational crop cultivation mosaic (agriculture and grassland mosaic), water bodies and Riparian Zones (along water courses).

### **Environmental Assessments**

GRL has carried out Environmental and Social Impact Assessments (ESIAs) along with the development of Environmental Management Plans (EMPs) for its plantation areas, complying with requirements of the national legislation. The ESMPs provide for the monitoring of environmental and socio-economic aspects and will be used as basis for the monitoring of the project implementation with the purpose of recording the project performance and mitigating any potential adverse impacts. Additionally, apart from the ESIAs required by law, Site Specific Environmental Impact Assessments (SSEIAs) are also carried out internally, as prescribed in the company Standard Operating Procedure (SOP) for SSEIAs, before commencement of main activities (e.g. mechanical land clearing and bridge construction etc.).

### **Biodiversity and High Conservation Value zones**

Four different vegetation types identified in the plantation areas includes valley bottom, natural grassland, riparian forested/wooded wetland and Miombo woodland. The total number of species varies between vegetation types. Valley bottom wetlands and natural riparian areas had the highest proportion of species compared to all other vegetation types followed by natural grasslands. Wooded grasslands and Miombo woodlands has almost the same proportion of species.

HCVA defined as the areas that contain environmental and social values, such as wildlife habitat, watershed protection, and cultural significance. When these values are considered to be of outstanding significance or critical importance, the areas associated with such values are defined as a High Conservation Value Areas

(HCV). The ProForest HCVF Toolkit will be used as a guide to determine HCV in the plantations. According to the assessment conducted and consultation with expertise, it has been concluded that no HCVs are present within GRL plantations (Idete, Uchindile and Mapanda). However, areas like Miombo woodlands, valley bottoms, wetlands, grave yards and part of grassland area has been set aside as conservation areas.

### **Project Risks**

The analysis of project risks is crucial for the success of the company investment as it forms the basis for risk management and mitigation. Risk assessments have been carried out as part of the project ESIA's to determine if there were major environmental and social issues that could hinder the project implementation. Additionally, prior to the start of the different project operations, specific risk assessments are carried out internally using the risk assessment procedures developed for the company. These risk assessments help to identify potential risks that may arise from the project implementation in the socio-economic and biophysical environments. For any risk identified, mitigation measures are defined and implemented.

### **Socio-economic description**

GRL areas of interest cover 7 villages (Chogo, Mapanda, Ukami, Makungu, Idete, Uchindile and Mapanda) in Kilombero and Mufindi districts. The economy of the villages covered by GRL plantations is characterised by activities of the primary sector, namely agriculture, timber business, livestock and small business practiced by the family sector. Also characterized by informal trade activities, many of them linked to the agricultural activity (e.g. sale of agricultural produce). Besides these, there is also forest exploitation, fishing and hunting taking place in some parts of these areas. Detailed socio-economic assessments were carried out for the plantation areas and results of this studies had provided baseline information about the socio-economic status of the areas as well as support for the community development programme. In terms of infrastructures, the adjacent areas are characterized by: inefficient access routes, with roads that are difficult to use in the rainy season and low availability and unreliability of electric power.

### **Project Management**

In order to plan the plantations operations, a number of regimes will be used that determines the management based mainly on age, specie and desired final product. Pinus and Eucalyptus are the main genus to be planted. The company will operate in 2 main commercial working circles (WC).

The expected mean annual increment (MAI) for Pine is 12-18 and 16-24 for Eucalyptus during the initial phase of the project. Through research and careful selection of species, clones and improved practices, the average MAI is expected to increase by 30% for both pine and eucalyptus in the second rotation.

Current rotation ages for pine saw logs is 10 – 18 years while that for eucalyptus poles and fibre is 6 – 12 years. The rotation ages are to be considered as an indication when the targeted product can be achieved.

The decision of any harvesting activity will also always consider growth rate, wood flow normalization, logistics & quality of the stand.

## **Regimes**

The regime operations should be guiding but not seen as an absolute. The final decision must always be done by recommendations from the forester in field together with management considering several factors such as the stands development, budgeting etc.

### **Pine Regime Options**

Three pine regimes are currently considered to facilitate the management hence achieve the targeted product for the Saw Log Working Circle (WC). Currently there is a lot of variation in the pine stands, especially with regards to stocking and MAI in areas mainly established during the start-up phase. Therefore, the stands have been assigned to the different regimes namely: Standard, No Thin and No Thin +. Going forward the No Thin+ and No Thin regime will be converted to the Standard in the 2<sup>nd</sup> rotation.

### **Eucalyptus Regime Options**

All Eucalyptus stands are being managed for poles, logs and biomass with 3 different regimes, one pole regime with 1 thinning and a shorter rotation age with the objective of primary producing poles and a no thin regime and no thin+ generating mainly logs and some poles at a longer rotation. Biomass includes all products such as; peeler logs, fuelwood biomass etc. No Thin+ and No Thin regime will be converted to the Standard in the 2<sup>nd</sup> rotation.

## **Species Selection**

The selection of species for planting considers different criteria's, except from demand, where some of them are: Growth, pest/disease resistance & wood characteristics. To achieve continues improvement of the planting material a good research program is necessary. In the beginning of the project, a broad variety of species were planted and the *P. maximinoii* & *P. tecunomani* has so far proven to be the superior pine species. For the Eucalyptus, *E. grandis* & *E. urophylla x grandis* are the better ones in terms of growth.

*Pinus patula* has temporally been removed from the planting program for a 3-year period. Substitute pine species that has shown good performance in trials and will be incorporated in the planting program are: *P. caribaea* (var *caribaea* – improved) & *P.ell x P.carr* hybrid & *P. maximinoii* & *P. tecunomani*

## **Nursery Operations**

GRL has its own nursery with a total capacity of 6,000,000 plants of which 4,000,000 are seedlings & 2,000,000 clones. Water source is its own borehole and electricity is supplied through the national grid, with a backup generator. Backup pump & generator in good working condition needs to be availed during the season when the plants require water on a daily basis. The current system is mechanized, utilizing plastic cavities for the growing medium which also offer the possibly of sorting the seedlings individually before transporting them out to field. Good nursery hygiene is of the essence in order to reduce the risk of attacks from pest and diseases.

### **Plantations establishment**

To achieve the best possibly growth and quality of the trees, it is critical that the establishment is done properly. If a tree gets off to a bad start, it will never catch up. Therefore, the aim is to give the seedlings optimal conditions to get to canopy closure as quickly as possible. This is to avoid spending resources on tending, ensuring optimal growth and quickly reducing the risk of fires. As such, establishment should be done in such way that eucalyptus get to canopy closure at year 2 and pines in year 3-4 with a +90% survival. If this is not achieved, the planting cannot be considered successful. An area prepared for planting offers minimum of 60cm effective rooting depth and is free from competition of weeds and other hardy bushes/scrubs and maintained in such way until canopy closure.

### **Pests and diseases protection**

Currently, there is very little manifestation of pest and disease in Southern Highlands as well as in the GRL plantations. Both gall wasp (*Leptocybe invasa*) and termites are present but does not have any significant impact to the plantation at the moment. To be proactive against termites, the euc trays should be dipped in anti-terminate chemical before being sent to field soaking the growing medium. During the first 6 months, new euc plantings require close monitoring and if any sign of termite attack is observed, the plants will be treated again with chemicals by pouring solution on and around the root plug.

### **Plantation harvesting techniques and equipment**

Harvesting will be done either as thinning of the growing stands, clear-fell or thin/fell to waste. The practise of selective harvesting for poles in Euc stands was common in the past creating stands with overgrown trees of poor form with very little value. This practise has since been stopped.

Before any harvesting activities takes place, planning of extraction routes, areas and temporary depos must be completed. All volumes harvested and extracted are recorded using tally sheets.

The aim should be not having clear felled compts unplanted for more than 2 seasons in order to maximize the utilization of the land and reduce the negative effect of bare land.

### **Thinning & Clear felling**

Clear-felled pines intended either for roadside sales or delivered sales are skidded in full length and cross cut at roadside. Standing sales are usually processed in the compartment and only the products are extracted from the compartment. The harvesting waste is stacked inside the compartment and later burnt as part of the land prep.

Moving with machinery in thinning stands during the wet months is highly discouraged due to the risk of soil compaction, erosion and damage to the very shallow lateral roots, especially of the eucalyptus.

Care should be taken not to open excessively large clear-felled areas leading to negative effect of bare land such as erosion. Clear-felled connected areas with the same characteristics (slope, soils etc.) where watershed is not split by roads or natural boundaries should preferably not exceed 50ha.

The harvesting method will also have to be taken into consideration on the clear-fell areas as in compartment processing which usually have much less impact on the soils as little/no machinery is used for extraction.

### **Annual allowable cut**

The annual allowable cut (AAC) is a compilation of the 5 year harvesting plans from each plantation. The wood flow projections are simulated using the forest management system (Micro Forest). The system simulates clear fell and thinning volumes from enumeration data, standard regimes and default site index (SI) where enumeration data is not yet available.

### **Management of Conservation Areas**

The following areas should be set aside by GRL for conservation purposes which will be managed according to the established standard procedures.

- i) **Natural Forests:** which offer habitats for a wide range of animals and birds (Miombo woodland).
- ii) **Riverine forests:** characterized by high species diversity
- iii) **Wetlands** which form an important ecological component that regulate the water systems and are also important for the fauna diversity.
- iv) **Grassland:** The dominant vegetation types that 10% should be set aside as the representative that form ecological importance to species

For the protection of Rare Threatened and Endangered species (RTE's), the training of local/casual labor will be emphasized and the maintenance of sufficient habitat for populations of RTE's. Areas with high concentration or abundance of rare or endangered species should be set aside and conserved. More ecological assessments will be conducted and if there will be any identified HCV in the area, the management prescription will be developed for conservation and protection.

### **Management of Community and Social Relations**

GRL is aware that the success of its plantations is largely dependent on the relation with stakeholders particularly the local communities living in and around its plantation areas. As such, these relations will continue to be reinforced based on the communication plan and grievance management plan. This will be done by conducting and facilitating the community meetings to discuss and promote awareness on the project implementation and other potential positive and negative effects to ensure that community are content with the existence of the plantation.

In line with the legal requirements, consultation processes started before the project implementation as part of the land acquisition and environmental licensing processes. Apart from the legally prescribed consultation processes, GRL is making efforts to ensure that existing stakeholders within the project areas are fully informed and engaged in the project implementation. A good participation requires open communication and share of information. Therefore, GR has created its own mechanism for consultation and information dissemination to local communities and other stakeholders. The procedure determines the need for regular communication with the stakeholders aiming at: i) ensuring a wider participation in the project implementation, ii) finding consensual solutions to perceived problems, iii) enhancing fire protection programmes and, iv) improved workforce availability for achieving the set targets.

### **Complaints, Grievance and Conflict Resolution Mechanisms**

Concerns and disputes may arise during the implementation of project activities. Stakeholders are free to complain and contribute to the success of GRL project activities. Therefore, anyone inside or outside GRL, can disagree and make objection actions on documents, activities undertaken by the company, the certification process and even on the forest management operations. According to this procedure, there are different ways in which objections, disputes, claims and/or complaints can be submitted to the company management including the writing of letters to the manager of the plantation or the use of complaints box that should be made available in the project areas.

### **Research and Development**

The success of the forest plantation projects is largely dependent on the knowledge of species, their growth rates, performance and management techniques to maximize future returns. Therefore, Research and Development (R&D) programmes are being developed and implemented in collaboration with the relevant organizations and research institutions. Research will focus on tree improvement, Species-site matching, fertilization, chemical usage and soil content. The results of the R&D program will serve to increase the use of good forestry practices, information dissemination and the promotion of activities geared to the mitigation of greenhouse gases.

### **Forest Management System and Data Management**

Correct use of and fully implemented management system will form the base for all reporting and record keeping the current system that company use in the forest management system is Micro Forest (MF).

### **Annual Plan of Operations (APO) and Budgeting**

Annual Plans of Operation (APO's) describing the jobs to be accomplished during the financial year and the estimated costs will be prepared. In the initial phase of the budgeting and APO process all planned work for the coming year is done on activity level using established budget norms and resources in excel.

The base of the operations are regimes and spatial properties. The preliminary APO will assist the Finance in budget process and should be done 2-4 months before the new financial year.

Once the budget is approved and the volumes of each activity has been defined the APO is specified down to the lowest spatial unit in the management system (compartment, firebreak, road & infra). The process of allocating each activity down to a spatial unit can take up to 3 months as each is physically checked in field to confirm the selected operations is correct. For example, if the compartment ready for pruning or not.

### **Plantation Monitoring & Reporting**

GRL has put in place a system for monitoring and reporting the project activities. The system will assist the management team in evaluating operations and performance as well as suggest any needed adjustments.

Information of the monitoring exercises and management activities will be stored in Microforest<sup>1</sup> and includes compartment-based inventory, maps, modeling, planning, scheduling, operations and logistics. This software will be the support tool for monitoring and evaluating operations.

An overall annual monitoring report, covering a 12-month period between July and June will be issued every year comprising of all aspects of the management. A summary of the monitoring results is also prepared and made available upon request by interested stakeholders.

The monitoring of plantation establishment and development (maintenance, growth and performance) is conducted, by the planning department, using as the basis the guidelines for forest inventories which describe the methods, frequency and procedures for the plantations monitoring. The monitoring information on plantation development is stored in MF.

Different parameters will be covered in the plantation monitoring exercises namely: plantation establishment, plantation maintenance, plantation performance/growth, chain of custody implementation and chemical usage etc.

### **Environmental Monitoring and Evaluation**

The monitoring of environmental and biodiversity conditions as well as the assessment of plantation impacts is carried out as outlined in the ESMPs and the monitoring procedures and guidelines that were prepared taking into account the requirements of the certification standards that the company adheres.

The outcome or results of the various monitoring exercises will be analysed and reports prepared for use by the management to respond to changing environmental conditions raised in the monitoring reports. These results will also help to determine the effectiveness of the management prescriptions under implementation and to identify the areas where improvement measures should be considered and adjust the company operations accordingly. Summaries of these monitoring reports will be made available to the relevant stakeholders upon request. Parameters to be monitored include, among others: wastes, changes to land use, biodiversity & conservation status, water quality & quantity, soils, climate, pests and diseases and the spread of exotic plantation species

### **Community Monitoring**

The impacts of GRL projects activities to the local communities will be monitored and the recommendations from the EMP to avoid or mitigate negative impacts will be adhered to by the company. The results of the socio-economic assessments will be used to set up the baseline scenario that will be used to monitor changes that occur at the community level.

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<sup>1</sup> Currently Microforest only stores part of the monitoring information therefore, some information is being filed and stored as hardcopies in the office and summary reports produced from them.

**Organization structure and human resources**

Sao Hill offices will serve as headquarters where overall plantation management and planning will be conducted. GRL management will run all aspects of the business and will be overseen by a board of directors. Major departments include Plantations, Planning & Monitoring, ESG, Accounting, Human Resources and Workshop.

GRL will employ workers with the necessary qualifications and experiences for smooth and efficient management of operations. Skilled personnel will transfer knowledge and skills to local workers through formal training, on-the-job learning, and apprenticeships. The company will also include gender considerations to ensure that there is representation of both men and women in forest management. Competitive salaries will be paid to workers, including other social benefits and professional training.

**Law Enforcement**

Education and extension programs and seminars will be conducted so that the communities around and plantation workers are aware of their limitations and rights with regard to the plantations in according to the Tanzanian Laws. The seminars will also be used as tools to educate people on different issues pertaining to plantation activities, such as fire protection and environmental conservation and, where necessary, legal actions will be taken against violators.

**Management Plan Updates**

The management plan is valid for 5 years, effective from January 2018 to Jun 2023. The management plan is liable for revision and amendment depending on prevailing conditions. The General Manager is responsible for the management plan updates.