

Working Paper 1

**Assessing the investment climate
in the planted forest sector
in Mozambique**

TA Project:
Improving the business climate for planted forests

5/21/2016

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List of Acronyms

CCP	Company-Community Partnerships
CPI	Corruption Perception Index
CSR	Corporate Social Responsibility
DFID	U.K. Department for International Development
DNTF	Portuguese acronym for: Directorate of land and forests (Direcção Nacional de Terras e Florestas)
DUAT	Portuguese acronym for: Acquired land use right (Direito de Uso e Aproveitamento de Terra)
EDFI	European Development Finance Institution
EIA	Environmental Impact Assessment
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GoM	Government of Mozambique
HDI	Human Development Index
IFC	International Finance Corporation
MAI	Mean Annual Increment
MASA	Ministry of Agriculture and Food Security
MINAG	(former) Ministry of Agriculture
MITADER	Ministry of Land, Environment, and Rural Development
NGO	Nongovernmental Organizations
PIREP	Portuguese acronym for: Technical and professional training sector (Programa Integrado de Reforma da Educação Profissional)
PROFOR	Program on Forests
REDD+	Reducing Emission from Deforestation and Degradation
R&D	Research and Development
SADC	Southern African Development Community
SME	Small and Medium Enterprises
S4E	Skills for Employment
TA	Technical Assistance
TIMO	Timberland Management Organization
TOR	Terms of Reference

Executive Summary

Background

i. The Government of Mozambique (GoM) wants to increase the area of commercial forest plantations from its current area of around 64,000 ha to 1 million ha in 2030, requiring investments within the range of USD 2 to 4 billion. Despite the strong political will formulated in the National Reforestation Strategy, the availability of appropriate land and the growth of the national timber market, the lack of significant investments in Mozambique's planted forest sector suggests the persistence of shortcomings in the business climate. This report aims to assess Mozambique's investment climate and inform the Government about options to mitigate investment barriers and improve the investment climate.

The planted forest sector in Mozambique

History and biophysical potential

ii. Mozambique's forest plantation history goes back to the 19th century, although major investments have only taken place since 2007, increasing from two companies with 17,000 ha of planted forests to thirteen companies with a planted area of 64,000 ha. The biophysical conditions in the country have proven to be suitable for different eucalyptus and pine species with a Mean Annual Increment (MAI) ranging from 20 to 30 m³/ha/yr.

Land availability and production costs¹

iii. Regarding land availability for forest plantations, a study carried out in 2007 by the national Government identified around 7 million ha of suitable land. This figure is estimated to drop to 3.5 million ha when considering other land use options. The annual land lease rates are low (less than USD 1 per ha and year). However, companies leasing land are expected to put in place a rural development plan and company-community partnerships (CCPs).

iv. The costs for the establishment of forest plantations in Mozambique from planting until the creation of the first revenues are USD 2,000 and above per ha without considering land costs, which is high by international standards. Lower cost figures were implied by the National Reforestation Strategy and assumed by investors due to the perceived low costs of land and labor. In practice, however, high transaction costs for obtaining and maintaining a concession area and the lack of skilled labor and professional service providers have been undermining this comparative advantage.

Availability and qualification of workers and service providers

v. The National Reforestation Strategy suggests the creation of 250,000 jobs based on a ratio of one worker per 4 ha of planted area. This is high when compared to the international figure of one worker per 20 ha planted. So far, massive recruitment of local residents has not been achieved as companies increasingly adopt mechanized work, requiring fewer but more skilled workers which are often not available locally. To promote skilled labor, several initiatives of the Ministry of Education, U.K. Department for International Development (DFID), and the

¹ The report is partially based on interviews and data collected from individuals and businesses. Therefore some of the analysis is based on confidential and proprietary business information which was received on a condition that the source is not disclosed.

World Bank are underway. In addition to the support required to train the workforce, technical support is usually required to support companies with managerial and technical forestry measures.

vi. Currently, most of these services are delivered by technicians and companies from other countries as local service providers in the forestry sector are young, and are currently still developing their technical capacities.

Markets and market development

vii. The domestic energy biomass market has been identified as an attractive market by the National Reforestation Strategy due to the large demand for charcoal and fuelwood. However, this market is highly informal and over 90 percent of the consumed energy biomass comes from open access unmanaged forests. On the other hand, an interesting market is provided by the growing construction industry, especially considering the expansion of the electricity grid. Regarding exports, the proximity of Mozambique to Asian markets opens up many possibilities. At the moment, processing facilities are being planned by various investors anticipating the eventual export of wood products.

Forest plantation investment benefits

viii. The expectation that forest plantations will boost rural development through employment is likely overrated at this stage. Large forestry companies are also expected to support small and medium enterprises (SMEs) through value chain integration, substituting forest product imports, and diversifying exports and reducing pressure on natural forests. These benefits have to be carefully analyzed to estimate their actual impacts.

Cross-sectoral activities

ix. Most of the constraints identified for forest plantation development are limiting other sectors as well. Several initiatives are taking place in various sectors which are expected to have a positive effect on the investment climate in the forestry sector, including capacity building, infrastructure development, and rural development programs.

Institutional and political framing of forestry

International policy and conventions

x. Mozambique is currently developing its national Reducing Emission from Deforestation and Degradation (REDD+) strategy. In this context, forest plantations are expected to play an important role in increasing carbon stocks. Furthermore, it is part of the Southern African Development Community (SADC 2002), a protocol that creates space for regional cooperation regarding forestry practices and markets.

National legislation and regulations

xi. Mozambique's forest legislation provides a modern framework for forestry activities, as the forest and wildlife law was reviewed in 1999 to align it with the principles of sustainable forest management. Regarding land use rights and tenure, land in Mozambique is state owned and cannot be sold. Customary rights are fully acknowledged under the land law, and land use rights (*Direito de Uso e Aproveitamento de Terra, DUAT*) are subject to consultations with local

communities. Land access has proven to be a highly complex process as companies and communities are left to negotiate land rights without professional assistance. During negotiations communities plead for social benefits, and often companies have to ensure these social responsibilities without any support from the local government.

xii. Another associated challenge has been the lack of land use planning and the absence of coordination between the different sectoral institutions that manage land acquisition processes. In this regard, significant reforms are underway with the national agro-ecological zoning process and the restructuring of responsibilities and roles that oversee land use activities.

Certifying forest plantations

xiii. Forest Stewardship Council (FSC) certification is important for many international investors in the forestry sector. The lack of a national definition of natural forest makes the certification process difficult, as any activity which clears land of its natural vegetation is likely to be classified as the conversion of natural forests, impeding certification and exposing companies to reputational risks.

Competitiveness of Mozambique's forest investment climate

Key criteria for commercial investors

xiv. This study focuses on commercially driven investments undertaken by both strategic and asset investors. Considering this target group, identified key investment criteria are:

- Production related: Biophysical growth conditions/growth potential, land availability, land costs, plantation establishment costs, harvesting costs, labor costs, and unit production costs of timber;
- Market related: Internal wood consumption, timber prices, infrastructure and transportation costs (competitiveness in international markets);
- Enabling environment related: Political and economic stability, security of land tenure, governance, and transparency.

xv. These key investment criteria are assessed comparing Mozambique to countries from Sub-Saharan Africa (South Africa, Uganda, Ethiopia) and South America (Brazil, Paraguay). Data sources include primary data collected through interviews with forest sector stakeholders, the databases of UNIQUE and Malinovski Florestal and additional statistical data.

Production-related criteria

xvi. Mozambique has a high potential for plantation forestry, in particular related to land availability and growth conditions. However, the growth potential is limited owing to biophysical constraints (rainfall regime with a relatively long dry season). This is partially compensated by attractive land costs, even when high transaction costs and compensation payments to communities are considered. A critical point is that limited technological capacities, low availability of skilled labor, and high land clearing costs result in significantly higher production costs per cubic meter of roundwood, especially when compared to the market leaders in South America (regarding cost efficiency).

Market-related criteria

xvii. Although there are some attractive niche markets such as pine lumber or poles, the domestic forest product market is still dominated by timber coming from unmanaged natural forest and characterized by its informality. Hence, investments in planted forests in Mozambique are more export oriented. A major challenge to developing the commercial forestry sector is that there is weak public infrastructure for transporting products, which increases the cost to access the international market.

Enabling-environment-related criteria

xviii. While improvements in political stability and economic growth in the last decade have become increasingly evident, some of the current policies and legislation may be considered a limiting factor for investors. Major broadly shared concerns include the need to enhance and streamline the time-intensive and expensive bureaucratic procedures for establishing plantations, and the lack of governmental presence in rural areas, especially with regard to local negotiations for land access.

The way forward: How to improve Mozambique's forest investment climate

xix. The target of establishing 1 million ha of forested land by 2030 is highly ambitious. If the challenges with respect to improving the forest investment climate are efficiently addressed, reaching between 300,000 to 500,000 ha in the next 15 years will be a major accomplishment.

Production-related criteria

xx. The development of decision support systems based on sound forestry knowledge and the provision of high-quality planting material is of utmost importance to increase productivity. More investments should be targeted at applied research and result dissemination, the implementation of clonal programs, promotion of forest associations, research and development (R&D) programs, and the establishment of partnerships between public research organizations and forest companies.

Market-related criteria

xxi. Legality and formality are key preconditions for ensuring fair market competition and sustainable forest management. Actions to improve the timber market and investment climate should concentrate on efforts to formalize the forestry sector. This includes actions to tackle corruption. A regional cluster approach could support the integration and development of local service providers, and the establishment of a professional timber processing industry. This regional approach could strengthen the planted forest sector and help attract investors. Finally, improvements in infrastructure, particularly investments in railways and road networks, could significantly increase the competitiveness of Mozambique's planted forest sector in international markets.

Enabling environment

xxii. It is paramount to set up transparent administrative processes for the licenses needed to establish a project, and particularly for processes related to land acquisition. Land negotiation between communities and companies should be facilitated either by strengthening the local

government to support this process or by establishing an independent and professional institution.

xxiii. Many forestry companies in Mozambique have problems in qualifying for FSC certification. The mapping of plantable forest land that would potentially qualify for FSC certification would be a key step towards improving the investment climate in Mozambique's forestry sector.

Roadmap for improved forest investment climate and small holder integration

xxiv. The findings of this report have contributed to the development of an activity plan to tackle the main shortcomings of the investment climate in Mozambique's forestry sector.² The roadmap shall be designed considering the manifold positive impacts and trade-offs of large-scale forestry investments. Within this framework, required actions will be identified, prioritized, and harmonized with the National Reforestation Strategy.

² Refer separate Working Paper prepared as part of this study - *Roadmap to improve the investment climate in the Mozambican planted forest sector*.

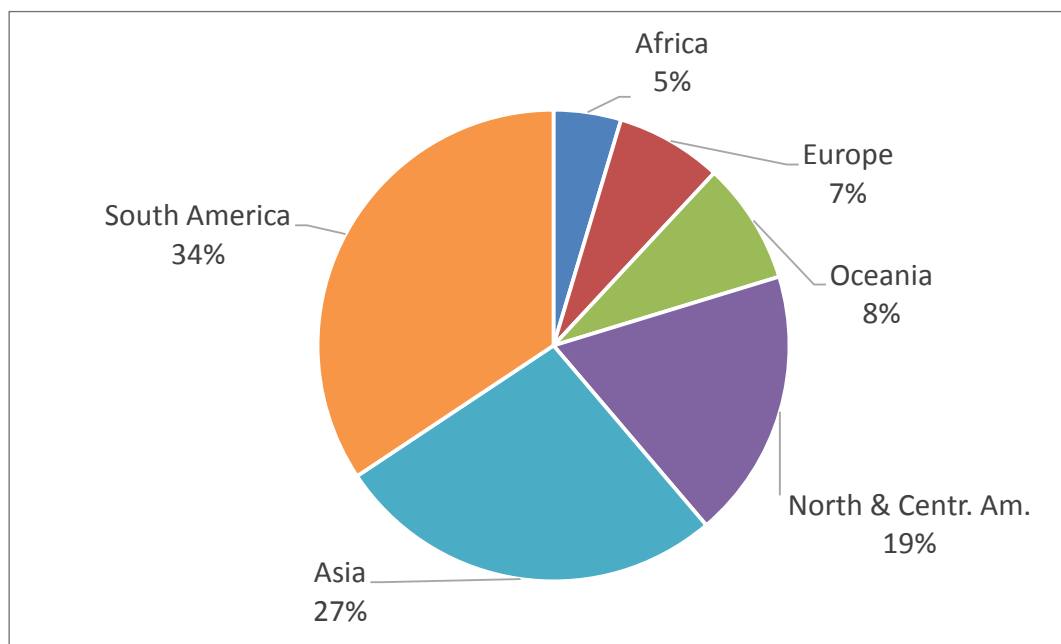
1. INTRODUCTION

1.1 Global Overview of Forest Plantations

1. Forest plantations are becoming increasingly important as a sustainable wood supply to meet global demand.

2. Planted forests are multifaceted and they range from strictly protected conservation forests established for erosion control or water protection to highly productive industrial plantations to provide wood, fiber, or non-timber products. Society meanwhile often views planted forests as a legitimate land use activity, addressing industrial roundwood demand in addition to supporting sustainable livelihoods. Forest plantations worldwide in all climate zones cover 264 million ha, corresponding to 7 percent to the total world forest area (FAO 2010). About 75 percent of the planted forests are classified as ‘productive plantations’, meeting more than 65 percent of total global roundwood demand. Between 2005 and 2010 an annual increase of 5 million ha was observed.

Figure 1.1. Biggest Plantation Wood Producers per Regions and Countries



Source: Jürgensen et al. (2014).

3. The largest producers of industrial roundwood in plantations in 2012 are located in South America, followed by Asia and Oceania (Jürgensen et al. 2014). Africa is in last place on roundwood production volume from planted forests, with only 26 million m³ sourced from plantations. The largest industrial roundwood producers from plantations include Brazil followed by United States, China, India, and Chile.

4. The main tree species planted in tropical and subtropical regions today are of the genus *Eucalyptus* (24 percent), *Pinus* (18 percent), *Hevea* (18 percent), *Tectona* (17 percent), and *Acacia* (9 percent) (FAO 2010). Specifically the hardwood-like eucalypts and teak are of increasing economic importance at a global level, representing the highest increase in area in

the last decade. Economic evaluation of planted forest investments are often driven by the profit margins that might be reached by these plantations.

5. The significance of forest plantations for the global wood supply and its important social and environmental benefits are fully recognized today. Over time, national and international standards and best practices have been developed by companies, certification institutions, and governments to overcome existing problems and mistakes committed in the past. The objective is to guarantee the economic, social, and environmental sustainability of the entire chain of custody.

1.2 Forest Plantations as a Driver for Rural Development

6. A well-planned and sustainable, plantation-based forest industry can bring many benefits to a country like Mozambique. This can be seen in countries with large, mature plantation industries such as Brazil, Uruguay, Chile, and South Africa. While the investors in forestry plantations worldwide are of course looking for profitable ventures, the business can bring positive economic and social benefits to the countries. Indeed, forestry can be a powerful tool for rural development, putting money directly into rural economies.

7. In Mozambique, where at present limited options for rural employment are available, forest plantation investments have the potential to contribute substantially in improving job creation. The National Reforestation Strategy estimates one worker for every 4 ha of plantation in Mozambique but this is considered too optimistic, with a global average of one worker for every 20 ha. Nevertheless, large forest companies investing in Mozambique will promote the development of forest and wood industry clusters that include both large-scale industries and SMEs as well as service and technology providers and outgrowers.

8. Investments in forest plantations also have the potential to substitute forest product imports, in addition to supporting the diversification of exports. Further benefits include reducing pressure on natural forests and addressing the informal forest sector, which contributes to the protection of nature and wildlife, which in turn provides a foundation for developing ecotourism. These economic, social, and environmental aspects have the potential to provide important support for the transition to a green economy, where well-developed environmental laws enforced by an effective working administration system are indispensable preconditions.

9. Another positive factor when establishing a plantation forestry sector is the positive infrastructural development in rural areas. The construction of roads facilitates access to rural communities, partnerships with companies can provide boreholes and additional benefits, for example, related to education and health. Also, there are diverse synergies which can be shared between different industrial sectors on infrastructure, such as the example of the Japanese Government investing in infrastructure development in the Nacala Corridor to support the natural resource exploration. The construction of roads, railways, and harbors are seen as key investments to make forest plantations in Niassa and Nampula viable, otherwise transport costs would be prohibitive. The importance of a cross-sectoral cluster approach to infrastructure development is also addressed in the activity plan.

1.3 Background to this Study

10. According to the National Reforestation Strategy (2009) the GoM plans to increase its commercial forest plantation area from its current area of 64,000 ha to 1 million ha in 2030. This requires an investment within the range of USD 2 to 4 billion.³ This ambitious target can only be achieved with significant private sector investments in the planted forest sector and to support these investments, the improvement of the business environment in forest plantations requires a long-term vision.

11. The National Reforestation Strategy states that the focus areas for establishing plantations are industrial production (pulp and paper, reconstituted wood products such as particle boards or fiberboard, sawn timber, energy), forest protection, community forest plantations, and ecosystem services. The strategy is focused on both the plantation operations and the potential benefits. The objective of the forestry industry component is to “establish, develop and consolidate commercial and industrial plantations, which are efficient, competitive and sustainable from the economic, social and environmental points of view, so as to satisfy the needs of raw materials of the local industry, in the medium- and long-term, and to produce higher value added products for the internal and international market.”

12. Despite the fact that there is strong political will, an abundance of land suitable for forest plantations, and growing global and regional timber markets—the lack of significant investments into forestry indicates that the business climate for planted forests has not yet been sufficiently developed. This report “Assessing the investment climate in the planted forest sector in Mozambique” is part of a technical assistance (TA) project of the World Bank to support the GoM in attracting private sector investments.

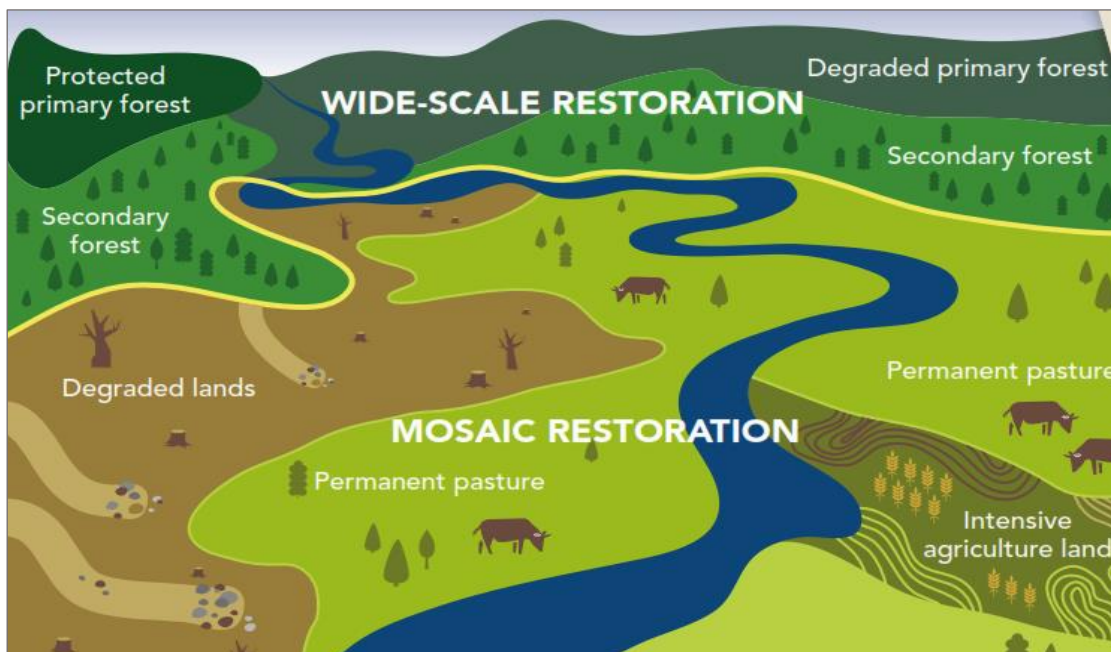
13. For forest investments, mature markets with stable and conducive investment environments and developed value chains and markets offer lower risks (that is, United States, Canada, Australia, New Zealand, and Scandinavian countries). However, over the past years an increasing number of investors have engaged in multi-regional forest investments outside of these regions. Most of these investments remain in advanced emerging markets like South Africa, Brazil, Chile, or Uruguay. In these countries investments in plantations are mainly made by downstream actors (that is, industrial investors; also called strategic investors as described in the following section), particularly those coming from the pulp and paper industry. However, to meet the increasing timber demand in Africa and to support socioeconomic development in rural areas, more plantation investments in Africa are required. Owing to deforestation, land use change and forest degradation and also more stringent conservation laws, the availability of timber and other forest products derived from natural forests is decreasing across a number of African countries.

14. When combined with an increasing demand for forest products throughout the region, many countries are rapidly approaching a major shortage of timber (GEF 2013). Plantation forestry is seen as a viable solution to provide the timber needed, while also reducing the growing pressure on natural forests. Furthermore, investments in plantation forestry are expected to provide employment and infrastructure in underdeveloped and economically disadvantaged rural areas.

³ The operational costs (land preparation, planting, weeding, tending) before generating first revenues for 1 ha of planted forests are in the range of USD 2,000 to 4,000.

15. In addition to discussing the issues directly related to the forest investment climate, this TA project also seeks to contribute to the dialogue surrounding landscape restoration (see Figure 1.2) and sustainable landscape management in Mozambique. Within this framework, natural forests (protected and managed), forest plantations, agroforestry systems, and agriculture all have an important role and interact within a multi-functional landscape.

Figure 1.2. Restoration of Productive Landscapes



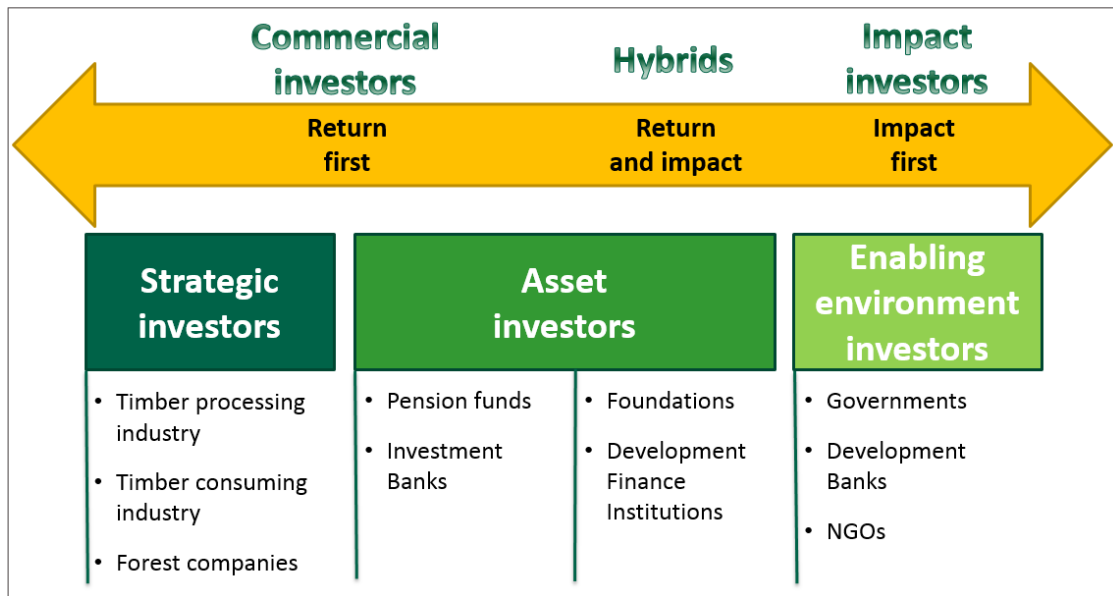
Source: IUCN and WRI (2014).

1.4 Different Investor Groups and Investment Objectives

16. When analyzing, comparing, and benchmarking the forest investment climate a set of transparent, relevant, and meaningful criteria has to be applied. The relevance of investment criteria is strongly related to the type of investor: For an investor coming from downstream industries the growth potential of the plantation is of utmost importance, while for a pension fund the security of the investment is probably the most important criteria and an impact investor seeks out high social and environmental returns. In consequence, the magnitude of the investment climate only can be analyzed when the reference level, in this case the investor type, is clearly defined. The timberland investment community can be differentiated into the following groups⁴ (see Figure 1.3):

⁴ The investor typology used in framework work of this TA is very similar to the typology used by Program on Forests (PROFOR) (Castrén et al. 2014).

Figure 1.3. Investor Groups



- (a) **Strategic investors:** Strategic or industrial investors are directly related to the forest sector and are part of the value chain. They are mainly driven by the economic performance of the forest investment. The group includes forest management companies interested in investing in their own economic activities, companies from the timber processing industry interested in securing their timber supply, and companies from other industrial branches, such as agro-industry or the mining sector seeking to secure the supply of timber necessary for their activities (mainly for energy uses). Strategic investors are by far the most important group related to forest investments, for example, this category of investors owns more than 90 percent of the forest plantations in Brazil (Brookfield 2012). Backward integration of forest plantations by timber industries occurs frequently in the pulp and paper sector. In South Africa, around 50 percent of plantations are held by the pulp and paper industry (own database information) and around 60 percent in Brazil (Brookfield 2012).
- (b) **Asset investors, private sector:** This group invests in assets mainly driven by the economic performance of the investment opportunity. However, unlike industrial investors, they are not directly related to the forest sector. This group includes institutional investors carrying large portfolios of several billions, mainly pension funds and investment banks, as well as family offices and private **entities**. They are mostly invested in funds where investments in the forest sector are common portfolio assets as they have proven to stabilize portfolios. In the case of large institutional investors, forest portfolios are often managed via Timberland Management Organizations (TMOs).
- (c) Private sector asset investors focus on investments in mature markets, such as North America and Australia, and more recently in select Latin American countries such as Brazil, Chile or Uruguay.
- (d) **Asset investors, public sector:** This category of investors is mainly driven by economic performance, but is also strongly influenced by political and ethical parameters. Development finance institutions and development banks are the most relevant

investors in this group. Their purpose is to promote sustainable development by providing finance and capital in sectors and countries where there would otherwise not be access to funding. The International Finance Corporation (IFC) and the members of the European Development Finance Institution (EDFI) group⁵ are the largest development finance institutions investing in emerging markets.

- (e) **Enabling environment investors or impact investors:** Unlike previous investor groups, the focus of impact investors is on environmental and socioeconomic impacts. Investments are made with the intention of generating measurable, beneficial social and environmental impacts, alongside a reasonable financial return. This group includes public investors, such as governments and donor agencies, as well as nongovernmental organizations (NGOs) and to a certain extent also foundations and Corporate Social Responsibility (CSR) divisions. Investment volumes from private impact investors in emerging markets amounted to USD 1.4 billion by the end of 2010 (JP Morgan 2011). Impact investments are considered to be a fast growing market.

17. In summary, there are investors mainly driven by the commercial aspects of the investments ('return first'), investors emphasizing the impact of their undertaking ('impact first'), and there are hybrid investors that are in between. With regard to the present study it has been agreed to focus on commercially driven investments undertaken by both strategic and asset investors. The ambitious target of 1 million planted hectares by 2030 requires investments of USD 2 to 4 billion. This amount in such a short period can only be brought up by commercially driven investments in the planted forest sector.

1.5 Objectives of the TA, Methodological Approach and Work Plan

18. The objective of this consultancy is to support the GoM in promoting investments in planted forests (both large and small scale), and their role in enhancing socioeconomic development in rural areas. Three major results have to be achieved by this assignment:

- Result 1: An assessment of the investment climate to inform an action plan to promote investments in planted forests;
- Result 2: Improved information on mechanisms and policies to promote smallholder engagement in the planted forest sector; and
- Result 3: Improved knowledge on sustainable forest sector investments in Mozambique.

19. The present report (Task 1), together with the report on smallholder integration⁶ (Task 2), represents the diagnostic basis for a fact- and knowledge-based activity plan⁷ (Task 3). Together they aim to enhance the competitiveness of the planted forest sector while also

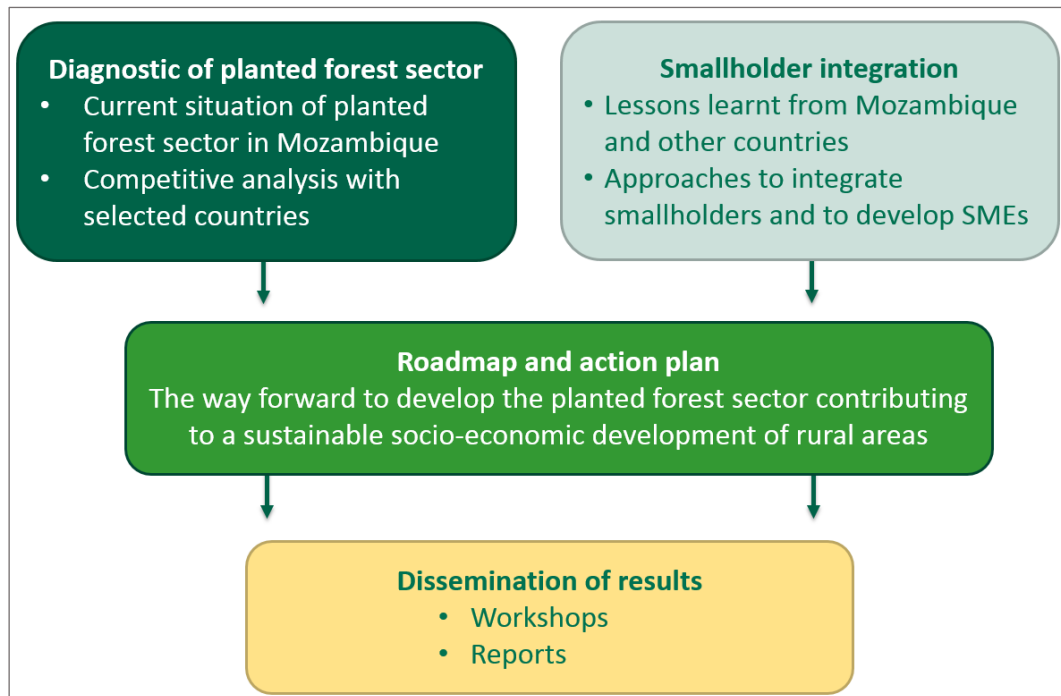
⁵ EDFI is a group of 15 bilateral investment organizations, among them are the CDC (United Kingdom), COFIDES (Spain), DEG (Germany), Finnfund (Finland), FMO (Netherlands), IFU (Denmark), Norfund (Norway), Proparco (France), and Swedfund (Sweden). The allocation of EDFI investment is 34 percent in Africa, 27 percent in Asia, and 15 percent in Central and South America (Source: DALBERG 2011).

⁶ See separate Working Paper produced as part of this study - *Addressing smallholder needs in planted forests in Mozambique*.

⁷ See separate Working Paper produced as part of this study - *Activities and action plan to improve the investment climate in the Mozambican planted forest sector*.

improving smallholder integration and the overall investment climate for planted forests (see Figure 1.4).

Figure 1.4. Overall Work Plan



20. The present report is structured as follows:

- Chapter 2 describes the history and current status of Mozambique’s planted forest sector including key legislation and regulations that impact the sector.
- Chapter 3 describes the criteria for determining the investment climate for the planted forest sector from investors’ perspectives. Using the key criteria, the competitiveness of Mozambique’s planted forest sector is discussed in detail in this section.
- Finally, Chapter 4 shows the way forward providing a first outlook on the activity plan for improving the investment climate in planted forests and smallholder integration.

2. MOZAMBIQUE'S FOREST PLANTATION SECTOR

2.1 Planted Forests in Mozambique: History and Current Status

21. Mozambique's forest plantation history goes back to the 19th century when, as a Portuguese Colony, exotic species were introduced for several purposes. This included introducing exotic species to support swamp drainage in Maputo, sand dune protection along the coast, as well as timber and wood fuel for tea drying in the upper Zambézia. By the time of independence, Mozambique had about 20,000 ha of exotic plantations, mostly *Eucalyptus*, *Pinus*, and *Casuarina*. The dominant plantation regions were Manica, Niassa, Zambézia, Maputo, and Gaza.

22. The period following the national independence in 1975 was characterized by large investments in forest plantations for biomass energy in the main urban centers of Maputo, Beira, and Nampula. The major objective of these plantations was to supply fuelwood and charcoal to the cities and to reduce the emerging pressure on natural forests. It was also in this period when the first industrial investment based on forest plantations was established. The IFLOMA company (Indústrias Florestais de Manica), where 80 percent of shares were owned by the South African company, Komatiland Forests (Pty) Ltd ('KLF'), and the remaining 20 percent were owned by the GoM through the Institute for the Management of Government Shares (IGEPE), had a sawmill and a particle board plant based on eucalyptus and pine species in Penhalonga, Rotanda, and Cafumpe, Manica Province. At the same time, several species/provenances assays were established to guide the forest plantation sector in this matter. The planted area expanded from 20,000 ha in 1975 to 42,000 ha in 1992. Unfortunately, the increase of the forest plantations in the 1990s was discontinued.

23. To support the growing forest plantation area and industry, a graduate course and a diploma level course in forestry were established to provide technicians and managers for the forest industry and plantations. In addition, a Forest Research Center was established with the main objective of providing technical solutions for the forest plantations. In 2007 a local study identified considerable potential for the use of fast growing species in the Northern provinces (MINAG 2007a). This study was used to support a campaign to attract investments in forest plantations in the region. By 2015, eleven new companies were registered and the planted area has since increased to around 64,000 ha.

2.2 The Current Status of Forest Plantations in Mozambique

24. The work of the Malonda Foundation had a substantial impact. The Malonda Foundation⁸ was established in Niassa to facilitate foreign investments in planted forests; they support project developers to identify suitable land use activities and to support the land acquisition process. This has resulted in the establishment of six forest plantation companies in Niassa. In 2012 companies in Niassa had been issued more than 155,000 ha of DUAT (concession area), of which more than 30,000 have been planted to date. Due to these activities, Niassa has become the province with the largest forested area in the country (Table 2.1). The forest

⁸ The foundation is a nonprofit, private entity of Mozambique. It was founded in 2005 and resulted from a cooperation agreement between the Governments of Mozambique and Sweden, with the aim to promote and develop the private sector in Niassa and create in this way a substantial improvement of the business environment.

companies have invested about USD 70 million and have directly created around 3,000 jobs (Nhantumo and Macqueen 2013).

Table 2.1. Forest Plantation Companies and Land Allocation in Mozambique in 2015

No.	Company	Province	District	DUAT Area (in ha)	Area Planted (in ha)
1	IFLOMA	Manica	Manica	15,000	13,285
1	IFLOMA	Sofala	Muanza	69,350	100
2	Chikweti forest	Niassa	Lago e Lichinga	63,040	14,250
3	Companhia florestal Massangulo	Niassa	Ngauma	5,332	4,378
4	New Forest	Niassa	Lichinga	33,040	3,400
5	Fundação Malonda	Niassa	Lichinga e Sanga	4,076	1,101
6	Green Resource	Niassa	Sanga	7,880	2,683
7	Floresta do Niassa (Rift Valley)	Niassa	Lichinga	42,102	5,400
6	Green Resource	Nampula	Mecuburi, Ribaue e Nampula	126,060	3,612
8	Portucel	Zambezia	Ile e Namarroi	173,000	6,500
8	Portucel	Manica	Manica, Gondola, Barue, Sussundenga, Mussurize	183,000	0
9	Ntacua	Zambezia	Ile, Alto Molocue, Lugela	9,500	2,000
10	Tectona Forest	Zambezia	Gurue, Milange e Namarroi	13,935	4,228
11	ATFC II	Zambezia	Namarroi	6,000	1,500
12	Moflor	Manica	Gondola	3,800	1,800
13	UPM	Niassa	Abandoned the project		
	TOTAL			755,115	64,237

Source: Company websites and interviews.

25. It should be noted, however, that in a study carried out in 2009 (ORAM 2009), investors expressed disappointment with what they found on the ground. This is demonstrated by an interview held in Niassa with one investor: “We were attracted to invest in the province on an area of 50,000 ha; we prepared our investment plan for 50,000 ha of plantation; we arrived here and found that part of the land is rock, another part of the land is occupied by villages and their machambas and we cannot move them, and at the end we can only plant on 25,000 hectares; we cannot accomplish our investment plan with this situation.”

26. According to a more recent study (Nhantumbo and Macqueen 2013), land conflicts resulting from poor communication between forest companies and local communities continue to be a problem, but one that is gradually decreasing. Nhantumbo and Macqueen (2013) also reported that the ambition of forest companies to acquire large portions of land (for example, Chikweti: 258,000 ha; UPM: 150,000 ha), is creating substantial pressure on the overall availability of land for other land uses in the province. Delays in assuring legal access land to establish forest plantations have created insecurity among forest companies.

27. It seems that although there was an interest from the national and provincial government to attract investors, there were no provisions in place to handle the complexity of land access in a country with state-owned land occupied by local communities. Most of the land aspects were left to be dealt with by unprepared forest companies and communities, resulting in the current company-community challenges over land and other associated issues. The land use issue is summarized in the following section.

2.3 Land and Forest Legislation in Mozambique

Land use rights and tenure

28. The land in Mozambique is state owned and cannot be sold or included in transactions. It is licensed to users provided they submit a land use plan. Article 109 of Mozambique's 2004 Constitution states that all ownership of land is vested by the state and all Mozambicans shall have the right to use and enjoy land as a means for the creation of wealth and social well-being. The Constitution further explains that the state shall recognize and protect land rights acquired through inheritance or by occupation, unless there is a legal reservation or the land has been lawfully granted to another person or entity (GOM 2004). DUATs can be obtained through (a) occupancy of land according to customary norms and practices or (b) occupation of land for 10 years. Local communities have DUATs for their traditional territory. DUATs obtained by occupancy are perpetual and do not require plans for the use of the land. Delimitation and registration is voluntary: communities are not required to delimit or register their land to assert their DUAT. However, pursuant to a 2008 resolution, if local communities want to register their DUAT, they must prepare a land use plan.

29. Members of local communities can also obtain DUATs for individual plots within the community land. Local communities can also grant third parties, such as investors, rights to use land within their territories (Akesson et al. 2009; GoM 1997). The Mozambican land law recognizes customary land rights at the same level as acquired rights. People who live on and use a piece of land for more than ten years have the rights to use the land. Local communities, therefore, have the rights to use the land that they and their ancestors have lived on and farmed for centuries or decades. The population distribution pattern in Mozambique is very scattered, making it difficult to find large contiguous areas that are completely uninhabited. Therefore, the land law requires consultations with local communities before an acquired land use right (that is, DUAT) can be issued. These are the core aspects of the land tenure characteristics in Mozambique. Land access and land use security have been identified as a limiting factor for investors to improve the business climate in forest plantations. The large extensions of land required for commercial plantation forestry and the long rotation cycles require a stable legal and contractual base to attract long-term investors.

30. Land access and security are ranked among the major limiting factors for investments in forest plantations in Mozambique. The key issue is that land mapped for planted forest activities by the Government is often already used by local communities, requiring intense and often long-lasting consultation and negotiation before a DUAT can be issued. It is very important for the success and the dynamic of the DUAT concession that there are good mediators present in the negotiation process. Furthermore, it is critical that procedures are clear and not favoring any of the parties, and agreements are fixed in a written contract, which are understood and approved by both parties. The lessons learned from former forest investments are that some of the consultations did not follow the rules or were not transparent enough to generate security and trust between the communities and the forest company. Different perceptions of communities and the company directors resulted in conflicts. Cultural issues may also interfere in these perceptions—while an investor will consider a signed memorandum as a valid and binding document, for the local communities it is considered less binding. The director of a big forest company mentioned in an interview that the consultations must be videotaped to ensure that people could see themselves agreeing on specific issues.

Forest legislation and regulation

31. The forest and wildlife law was revised in 1999 to align it with the principles of sustainable forest management, including the newer concept of community forestry/community participation in forest management. The forest regulation was further reviewed in 2002 to comply with the law. The regulation is mainly centered on natural forests and there are few details regarding planted forests. The few articles relevant to forest plantations state that a DUAT (Art. 79) and an environmental license (Art. 81) are required before industrial plantations can be established. This regulation also states that logging in forest plantations can be done without logging fees or taxes, but the owner of the plantation must submit a request for approval of their operations to the Forest Service (Art. 38). In addition, the logging fee (of the natural forest logging) includes a reforestation tax, destined to support “forest recovery and reforestation” (Art. 101). No secured sources about the destination or the use of the reforestation taxes could be found. It is unlikely that significant amounts of these taxes were really used for reforestation or related projects.

32. Of particular relevance to the development of the plantation forest sector in Mozambique is the land use planning legislation and regulations. The national agro-ecological zoning process is in progress now. This is considered a first step towards systematic land use planning in Mozambique. At present, the occurrence of land use conflicts is attributed particularly to the lack of land use plans. In addition to this, the existence of several (sectorial) state entities, sometimes assisted by nongovernmental institutions that manage the land attribution process with limited inter-sectorial coordination creates room for difficulties to access and secure land. Although there have been no reports so far of serious conflicting land uses between investors in different sectors, issues between investors and local communities have been frequently reported.

33. The new GoM (in 2015 and 2016) is restructuring the responsibility of handling land issues, which was handled by the Ministry of Agriculture and Food Security (MASA) in the past. The newly created Ministry of Land, Environment, and Rural Development (MITADER) is seen as an attempt to prioritize the issues associated with land tenure and access in the national agenda as well as to improve its alignment with the relevant institutions to facilitate investments. After the new structure the planted forest sector is administrated by MASA, while the native forest management is under administration of MITADER.

34. A detailed description about the legal procedures to for getting the “Right and Use of Enjoyment” (provisional and definitive DUAT) as well as the environmental impact assessment (EIA) are given in the instructions published by the Association of Commerce and Industry (ACIS 2009, 2012). The legal frameworks surrounding land use investments in Mozambique are also discussed in Chiziane et al. (2015).

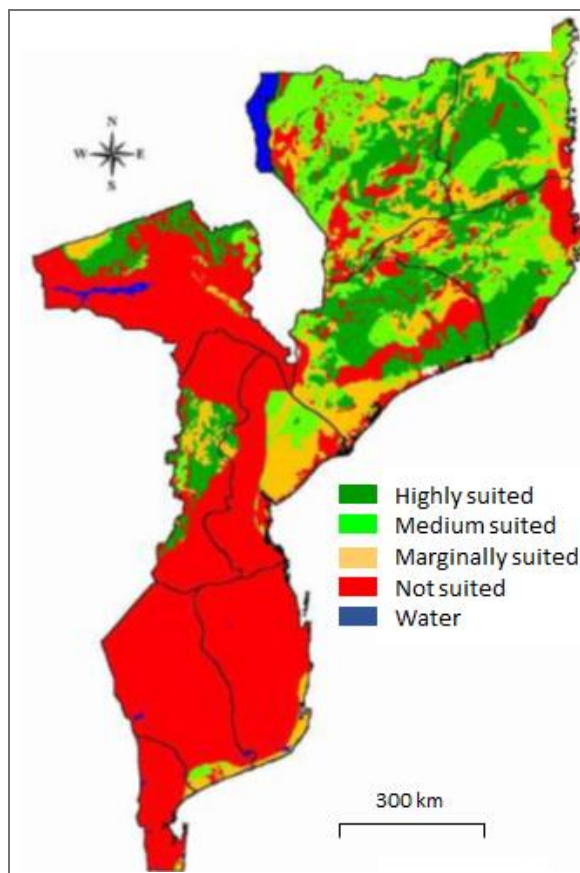
2.4 Available Land Suited for Planted Forests

35. A study carried out by Ministério de Agricultura (MINAG) in 2007 reported that there are approximately 7 million ha of available land with the potential for forest plantations (MINAG 2007a). The parameters considered for the plantation potential include: (a) rainfall (>1000 mm per year), (b) effective soil depth (>100 cm), (c) altitude (<1000 m), (d) water retention capacity, and (e) areas of contiguous blocks of land with 1,000 ha or more. Most of the area with a high or moderately high biophysical potential is located in Niassa, Cabo Delgado, Nampula, Zambézia, Tete, and Manica (see Figure 2.1).

36. If additional criteria like other land use options, peasant agriculture, industrial agriculture, rights and needs of local communities, or fulfilling the criteria for FSC certification are considered, this figure is estimated by the people of the responsible ministry to drop to around 3.5 million ha, which are considered to be suitable land for forest plantations.

37. As a follow-up, provincial evaluations were conducted by MINAG in provinces with a high potential for commercial forestry, such as Niassa, Nampula, and Zambézia. The figures produced in this process were used extensively to portray Mozambique as a country with ample amounts of available land and with a high potential for forest plantations.

Figure 2.1. Suitable Land for Forest Plantations



Source: MINAG 2007a.

2.5 Production-relevant Aspects

38. Forest plantation establishments require substantial, long-term investments. The global prices for the establishment of a forest plantation covering land preparation, plantation and maintenance activities until the first revenues falls within the range of USD 2,000 and 4,000 per hectare (without considering the costs for land). The costs recorded by different forest companies in Mozambique are all within this range.

39. This section discusses the main production-related issues that impact the competitiveness of Mozambique's plantation forest sector—namely, growth rates, land costs, labor availability, and productivity. The key messages are summarized after each section.

Species and growth potential

40. Another important factor influencing production costs is the volume increment of the trees that can be reached in forest plantation activities. The production costs per cubic meter of wood produced are closely linked to the volume produced in a given rotation cycle. In

Mozambique, the productivity per hectare currently is low due to a variety of factors. First, there is little research done in the area of site-species matching, the same is true for tree breeding and clonal programs. There is still potential that can be raised. Second, the growth conditions in Mozambique are limited by climatic conditions, the long dry seasons do not allow the outstanding growth rates as compared to other tropical countries with a more constant rainfall regime. Third, the silvicultural practices might be significantly improved by adopting better soil preparation, fertilizing, and irrigation schemes applying the newest technologies available in the plantation forest sector.

41. The Forest Research Center and the Department of Forestry of the Eduardo Mondlane University conducted several species and provenance trials during the 1980s. Although no formal results were released from these experiments, species such as *Eucalyptus grandis* and *E. saligna* were found to have a high potential in the wetter highlands, for instance in Penhalonga, while *E. camaldulensis* was more adapted to the drier lowlands. Species of pines, such as *Pinus caribaea*, *P. patula*, *P. taeda*, *P. elliottii* also showed potential in the highland region of Manica, where most of the plantations at that time were established.

42. With the discontinuation of new forest plantations in the 1990s, the work which was initiated on species and provenance trials was also discontinued. At present, the companies which invest in forest plantations conduct the required species and provenance trials themselves before commencing with forest plantations on an industrial scale. As result of technological advances, hybrids and clones have evolved in the forest sector, and most forest companies have adopted these species as they show higher potential when compared to pure species and traditional planting methods. However, some clones (mainly *grandis* x *camaldulensis* hybrids) are susceptible to pests, such as the gall wasp (*Leptocybe invasa*) that feeds on leaf sap.

43. Private companies have tested different hybrids, provenances, and/or clones to achieve the best site-species matching. The (preliminary) results are promising. According to the specific site conditions (here mainly rainfall regime) and planting material, the Mean Annual Increment (MAI) ranges from 20 to 35 m³/ha/yr.

Land costs

44. One of the assumed comparative advantages in Mozambique is the low cost of land and labor. This comparative advantage suggests that the production costs will be lower than in many other parts of the world. As per the National Reforestation Strategy,⁹ it is predicted that investments in the magnitude of USD 1 billion will result in a plantation area of 1 million ha, implying an average cost of USD 1,000 per ha. We consider that this cost estimate is too low. The cost figures collected as part of this study do not support the above-mentioned low unit costs per hectare. In practice either the cost of land access or forest operations or both combined might be higher than expected for various reasons. The complexity of procedures for determining land access, the time required for issuance of the environmental license, the insecurity of land access, and the proportion of effectively 'plantable' area, sum up to a higher cost than initially estimated.

45. According to the World Bank (2015), the costs of registering agricultural land in Mozambique amounts to more than 36 percent of the property value, while these costs amount to less than 2 percent for the majority of the additional country case studies covered by the

⁹ The document is available at http://www.minag.gov.mz/images/stories/pdf_files/cb.pdf

study. These findings indicate the enormous administrative costs of accessing land in Mozambique. Second, the lack of skills, professional forestry service providers, and labor regulations all tend to increase the cost of forest operations, especially when observing the failure in plantations and high replanting rates.

Key messages

46. The growth rates in Mozambique are currently low not only because of climatic limitations but also due to less than optimal silviculture.

- Yields can be significantly increased by adopting the latest technological advancement in the sector.
- While the cost of land initially appears low in Mozambique, the real costs are much higher owing to the complicated land access process and the low proportion of effective plantable land.
- The lack of skilled labor and the low productivity of labor also increase production costs.

Labor market and technology

47. The National Reforestation Strategy estimates the creation of 250,000 jobs, based on a ratio of one worker per 4 ha of planted area. This is a relatively high figure even when assuming the use of low-skilled manual workers, especially when compared to the international figure of one worker per 20 ha planted forest (Blid 2014), which would create only 50,000 jobs.

48. It has to be considered that forest operations such as land preparation, planting, and silvicultural treatments have gradually been switching from manual to mechanized operations. The process is not only driven by the higher productivity associated with mechanized systems but also by worker safety and ergonomic considerations. Thus, some operations are only acceptable if they are mechanized (for example, loading, chainsaw work). This is also addressed by certification institutions (ISO as well as in the social parts of FSC, PEFC, among others), where the workload and safety of the worker plays an increasingly important role in the certification process.

49. The move towards mechanization requires skilled labor which is often not available locally.¹⁰ The reduction of manual work has thus reduced job opportunities in the forest sector, resulting in disappointment for local communities, who often have high expectations of local employment. An ongoing study (Bleyer et al. 2015) carried out in Niassa, found that households with a household member working in plantation forestry still rely on agriculture for subsistence, suggesting that forestry jobs do not create food security. Currently the paid wages do not compensate for all household needs, and households will therefore continue to depend on land for agriculture to maintain their livelihoods. Also labor-intensive activities like harvesting, road construction and maintenance, and wood transport are not yet implemented on a significant scale due to the relatively short history of current plantation forest projects. In addition, some

¹⁰ For the employers their biggest problem is the high level of workers' absenteeism (between 20 to 25 percent) in the plantations. Thus, they expressed the need to train the workers on the 'work culture' and pay salaries based on goals of task performance, for instance, number of holes. Some companies also intend to increase the mechanization level in the plantations and use third-party provision of services for some activities, as a method to minimize the absenteeism problem (Blid 2014).

initiated large-scale reforestation projects, which promised job creation in rural areas, failed and created an environment of job insecurity in the plantation forest sector.

50. Studies about the current labor market situation in Mozambique indicate that SMEs in the forestry sector are usually led by individuals with limited business management expertise and experience (Nhancale et al. 2009; Nhantumbo et al. 2013). Demonstrable business management skills based on technical and vocational training are essential to meet bank requirements for credit and for facilitating access to financial services. The Malonda Foundation provided help to entrepreneurs with bureaucratic and administrative issues to SMEs, by offering direct counsel and training. The Ministry of Commerce and Industry to some extent also provide support to SME projects. Along with this initiative, there are other initiatives to provide support in training and coaching SMEs. This support is expected to result in the enhanced management of SMEs and improved access to finance from commercial banks (see for instance, the work in the forestry sector by Nhancale et al. 2009; Nhantumbo et al. 2013).

51. Experience in forestry shows that technical support is required in specialist areas and in the absence of these skills and expertise in locally operated companies, large-scale forest companies often hire these services from outside (Nhantumbo and Macqueen 2013). In the upper management of forest plantation investors down to the supervisor level of forest operations, the presence of expatriate labor force is particularly evident. In Mozambique, specialists are mostly hired from South Africa, Zimbabwe, and even from Portugal, because of the lack of skilled and experienced personnel in Mozambique.

52. Therefore, current activities to overcome these problems are focused on increasing the availability of skilled labor. For instance, the Ministry of Education is initiating a reform process of the education system to introduce a competence-based system for professional technical schools (Programa Integrado de Reforma da Educação Profissional, PIREP). This process includes the diploma level forestry school where the forest operators are trained. In addition, DFID and the World Bank are funding a private initiative to support forest companies by establishing a training school for skilled labor called S4E (Skills for Employment). The activity aims to support the development of the abilities of forest workers for routine tasks ranging from land preparation, nurseries, plantation, silvicultural treatments, and machine operations, among others (DFID Mozambique 2014).

53. Finally, the availability of state-of-the-art technology in Mozambique has to be discussed. Companies expressed their concerns about difficult, long-lasting, and bureaucratic import procedures for acquiring the necessary modern technology required for productive plantation forestry. Currently, there exist lists for tax-reduced and priority import of technology for agriculture and plantation forest business. However, the lists are not updated frequently while the market of providers is very dynamic with a high degree of innovation. That makes the import of state-of-the-art technology and spare parts difficult for the forest companies.

Key messages:

- Both GoM and local communities seemingly have very high expectations for employment by forestry companies. More realistic employment estimates should be used, with the international average of 1 worker for 20 ha of plantation.

- Increased mechanization in forestry is inevitable due to the dangerous nature of certain activities (for example, timber loading and chainsaw work). In Mozambique, however, it is also driven by poor labor productivity.
- The lack of skills in the sector is forcing companies to import trained people and while this is partly being addressed by various technical training initiatives—including support to SMEs—it will take many years to supply the necessary skills.
- The bureaucratic process for importing new technology to support the industry is frustrating the large companies and this needs to be addressed.

2.6 Markets and Market Development

Domestic market

54. The domestic use of forests in Mozambique may be divided based on the target market of wood products, including (a) quality timber for higher-value aggregation—for example, furniture or flooring, (b) construction timber, (c) pulpwood, and (d) fuelwood/charcoal. Wood is already being produced for all of these purposes, even if consumption is currently very low or if some of the industry is still in the planning stage. The market is dominated by charcoal, with an annual consumption estimated at 15 million tons (Sitoe et al. 2008). Charcoal and fuelwood are mainly consumed by households for cooking and heating.

55. The National Reforestation Strategy recognizes energy biomass production as one of the potential areas for investments within the domestic market. However, the lack of sustainable forest management projects and their corresponding wood production in the country indicates that at present nearly all (more than 90 percent) of the consumed energy biomass is produced from open access unmanaged natural forests—and thus Mozambique’s charcoal value chain is largely informal. Producing biomass for energy would not be competitive under these circumstances, because the costs for the raw material wood is close to zero.

56. Previous attempts to produce biomass for energy from forest plantations at the community level resulted in high-quality outputs that could be sold as higher-value products which would fetch a higher price, such as poles (Solidaridad and Suez 2013). As a consequence, producers did not sell their products in the energy market. As long as other producers within the energy market (mainly firewood and charcoal producers) get their biomass ‘for free’ in native forests, it is unlikely that investors will establish plantations for bioenergy.

57. Domestic timber markets are currently expanding in Mozambique. The fast-growing construction industry and the expansion of the electricity grid are the largest consumers of timber in Mozambique. Currently, the domestic timber supply is not sufficient to cover these growing demands, and thus it is necessary to import poles for transmission lines and construction timber. In 2010, wood product imports were estimated at USD 68 million (2.3 percent of total imports; Marques 2012), while in 2011 wood product imports were estimated at USD 85 million (Instituto Nacional de Estatística 2015). These figures reveal the potential of the domestic market to supply a variety of wood products and reduce the reliance on imports.

Export market

58. There is a general belief among current and potential investors that the Asian market will emerge as a major export market for Mozambican forestry products. In fact, one of the

reasons to refer to Mozambique as a favorable country for forest plantations is the proximity to Asian markets. One major investor in planted forests, with a total DUAT area of 166,360 ha, had expectations to supply raw materials for the planned UPM pulp factory. However, UPM closed their business activities in Mozambique, because of reasons that are not yet fully disclosed.¹¹ Another major investor¹² in forest plantations now assumes that more investors will become engaged once forest plantations have been established, secured, and produce wood at competitive costs. They plan to build a wood chip factory in Nacala for export in 2017 and establish a pulp factory by 2025 (Blid 2014). In addition, Portucel is planning to build a paper mill to process the wood produced in their plantations, especially focusing on the eventual export to Asian markets.

Key messages:

- The domestic market for wood is dominated by firewood and charcoal but as long as this remains unregulated, investors will not establish bioenergy plantations in Mozambique.
- Its proximity to the Asian markets is one of Mozambique's strengths and the main forestry investors in Mozambique plan to target the Asian pulpwood market. Investment in the industry, however, will only come when there is a minimum resource established.

2.7 Institutional, Political, and Legal Framework

59. The institutional and political framework for forest plantations is represented in Figure 2.2. Important aspects for forest plantation governance range from institutional setup, legal aspects, and technical aspects at the national level, but is also influenced by international factors including conventions and markets. Below, these aspects are analyzed in detail with regard to their impact on the investment climate of forest plantations in Mozambique. The key messages are summarized after each section.

¹¹ Some former personnel mentioned problems with the DUAT licensing processes and other bureaucratic issues, while others stated that other countries offered better production conditions. Additionally there are two more reasons for UPM's decision that circulate: (a) The business plan of UPM stated planting 150,000 ha within 10 years (annually 15,000 ha). Due to lack of contractors and skilled labor the UPM management appraised this as impossible. (b) Without Miombo conversion it is nearly impossible to plant such a large area. Conversion is not compliant with FSC and for UPM FSC is a must.

¹² Green Resources

Figure 2.2. Enabling Environment for Forest Investments



International policy and conventions and the national forest strategy

60. Increasingly international investors aim to maintain a positive reputation when making investments. Therefore, countries that disregard globally expected social and ecological standards are not eligible for many investors. The acceptance of global markets for not ‘correctly’ produced goods is very low, and thus the use of investment criteria related to the political and institutional framework remains a very sensitive issue.

61. One international renowned indicator for good forestry governance is the participation in REDD+ mechanisms. REDD+ is an initiative to reduce emission from deforestation and forest degradation by applying sustainable forest management practices according to internationally recognized standards. Mozambique has a high forest cover but also a high deforestation rate. It was on this basis that Mozambique decided to adopt the REDD+ mechanism to reduce deforestation and degradation and increase forest carbon stocks. Although the REDD+ strategy is still under preparation, it is already clear that forest plantations will play an important role in increasing carbon stocks and reducing the pressure on natural forests through the provision of forest products, including firewood and charcoal.

62. Another positive aspect to attract forest investors is the participation of the country in the SADC protocol on forestry. The protocol indicates that member states shall cooperate in many areas including regulatory aspects in forestry, human resource development in forestry, promoting sustainable forestry practices, forest monitoring, and regional markets issues. This

protocol has the potential to improve forest operations in Mozambique, and should be assessed to further explore potential synergies and opportunities, such as international cluster approaches.

63. Legality and formality are key preconditions to ensure fair market competition and sustainable forestry (EUTR 2016; U.S. Lacey Act 2008). For addressing the informality of timber markets, effective control is required by implementing cross-cutting reforms in many policy areas and promoting good governance practices. This includes actions to tackle corruption and industrial and fiscal policy reform, but also social and development programs, because rural populations depend on additional income coming from the illegal use of forests. The clear commitment to initiate the process to have fully legal and formalized operational timber value chains including products from both natural forests and forest plantations, will improve the investment climate in Mozambique. Again, the legal framework that permits and facilitates value chain integration, company-company partnerships, applied research, and promotes the establishment of SMEs and private sector associations may create incentives to establish more value-added products and support the development of a professional forest sector (including both forest producers and timber processing industries at different scales).

Key messages:

- International and regional conventions have the potential to improve the environment for plantations in Mozambique through increasing carbon stocks (REDD+) and improved management (SADC Forestry Protocol).
- The legal framework is also important, particularly with regard to the value chain of products from natural forests (and eventually plantations also when they come on-stream).

Negotiations between investors and local communities

64. The complications surrounding the land consultation (DUAT) process were discussed earlier (section 2.3). The consultation process is regulated by land law regulations. A ministerial order (Diploma Ministerial 158/2011) ensures that the following bodies must participate in the community consultation: the district administrator, a representative of the SDAE (Districtal Service of Economic Activities) and the Cadaster Service, members of local consultative council, community members (including the land title or occupants of neighboring land plots), and the investor (or his/her representative). The participation of local authorities is meant to ensure that the consultation will follow the rules and will produce consistent agreements. While the procedure appears to be sound and has good intentions, the perception on the agreements may quickly change when problems arise between the investor and the community once forest operations have commenced. Interviews conducted during this study indicate that communities have high expectations in job opportunities, which cannot always be fulfilled. This can result in disappointment, since communities perceive that they have given land against job promises. In other cases communities expect companies to invest in social infrastructure or services through sponsoring schools, providing access to clean water or establishing health stations. However, these social investments are either not fulfilled within an agreed upon timeframe or simply cannot be fulfilled, creating further disappointment in communities.

65. The local government has a responsibility to both the community and the investor. Taking either side would be sensitive and would lead to further tensions. Presently, there are no neutral brokers or knowledgeable institutions which could facilitate and mediate the process

without having a personal interest in the matter. Although some NGOs try to fulfil this role, the ministerial order does not expect their participation and their role in the consultation process could be interpreted as an interference, as it has been seen in some of these processes (for example, see the case of Anadarko in Palma published in SAPO Noticias 2013). Studies (ORAM 2011) report that while the local government is expected to be impartial to the process, in most cases they do not have enough knowledge of the land law or an adequate understanding of the consultation process. As such, consultations are not always in line with the law, and therefore create room for potential conflicts between communities and investors. It is strongly suggested to document the problems that occur or may arise during DUAT negotiations and after DUAT concessions to improve the existing procedures. Key issues are addressed in the activity plan within the chapter ‘smallholder integration related actions’ and the Task 3 report.

Key message:

- More active participation of local authorities in the land negotiation (DUAT) process is essential, as is the need to formally document the process.
- Investors need to make clear (and follow through on) their promises during these negotiations.

Informalities and corruption

66. Mozambique ranks 119 (out of 175 countries) with a score of 31 (out of 100) on the Corruption Perception Index (CPI).¹³ There are no references to corruption in the forest plantation sector, but in the natural forests and hard wood timber sector, corruption has been extensively reported as a major limiting factor to assure sustainable forest management.

67. The export of logs to China is by far the most significant reported activity linked to corruption. The forest revenue loss is estimated at more than USD 29 million in 2012 alone (EIA 2013). The revenue loss has negative consequences in the functioning of the governing forestry institutions, resulting in a weakened institutional base and a low capacity to enforce the law. As there is no large-scale commercialization of wood sourced from planted forests yet, there is no evidence of corruption in this sector. Self-commitment to ‘clean management’ and streamlined controlling mechanisms in planted forests make it unlikely that corruption takes place in the planted forest sector to the same extent as in native forests. However, measures for efficient financial controlling should be implemented by the Government. It should be noted, however, that within the new government structure, the responsibility for forest plantations will remain with the MASA, while the responsibility for natural forests (with logging licenses and timber concessions) will move to the MITADER.

Key message:

- Corruption is prevalent in the natural forest sector, causing huge revenue loss to the GoM and a clearly unsustainable business: measures for efficient financial control in both natural forest and plantation sectors should be implemented by the GoM.

¹³ The CPI ranks countries/territories based on how corrupt a country’s public sector is perceived to be. It is a composite index, drawing on corruption-related data from expert and business surveys carried out by a variety of independent and reputable institutions. Scores range from 0 (highly corrupt) to 100 (very clean). See more on: <https://www.transparency.org/country/#MOZ>

Local development programs, CSR, and local government

68. National, regional, and local development programs¹⁴ are part of the government strategy to promote rural development. The focus of decentralization and devolution processes has been at the district level. The relevant processes are slow but progressing. While most of the district capitals offer basic services such as a health center, a water well or bore hole and a school, there are still several localities without access to such services. Thus, during the negotiation process for land access rights communities often seize the opportunity and ask for these facilities from the company rather than the Government as part of their negotiation settlement in exchange for land use rights. Some companies promised and established these facilities, but others have made promises without following up on them or have not completed promised tasks during the agreed timeframe. This situation has led to discussions on whether these requirements are mandatory or voluntary, and whether the provision of this infrastructure and these basic services are part of the Government's responsibility or whether companies should provide them as part of their CSR activities. The main issue discussed is that companies made promises which they did not fulfill. Furthermore, the use of transparent procedures and tools should be promoted which are easy to understand and facilitate a fair and transparent negotiation process for all actors. Building and maintaining social service facilities require additional costs for the company, and if these are not included within the project investment plan, it can become difficult to justify and implement them.

69. The real situation on the ground, however, may be that investors will have to make investments in infrastructure including roads, bridges, and other social facilities such as health centers and schools to facilitate their own operations and to ensure the availability of their workforce. There is a dispute as to whether or not the investor should bear these costs after following all the rules and legislation and paying the required taxes and duties. The point here is "what is the role and responsibility of the local government?" Interviews conducted in this study indicate that companies feel left alone with the social responsibilities without the necessary support from the Government. As local development is not the core business of forest companies, most companies are inexperienced in this regard. It is important to have clear rules and regulations about value, volume, and duration of social responsibilities for the companies to include them in the overall cost calculation of the investment, as these activities may have strong impact on the overall production costs.

Key messages:

- As many basic services are lacking in rural areas—notably health, education, and infrastructure—communities expect the large forestry investors to provide them.

¹⁴ Poverty Reduction Action Plan (PARP) was launched in 2011. The plan focuses on pro-poor economic growth as the means of combating poverty and envisages three main thrusts for development activities: (a) Strategic Plan for Agricultural Development (2010–2019), which emphasizes the need to increase food and market-oriented production, and to promote market links and the sustainable management of natural resources. (b) Strategic Plan for the Artisanal Fisheries Sector (2006–2015), which provides a vision for progressively upgrading from subsistence to commercial artisanal fishing through improved access to services and infrastructure, and an emphasis on participatory, community-based management of fishing resources. (c) Rural Finance Strategy (2011), which promotes an inclusive financial system to serve the different segments of the rural population.

- Investors are thus questioning the role of the GoM and the high cost of meeting communities' expectations.
- The role of the GoM and the social responsibilities of investors needs to be clarified and formalized.

SFM Certification of forest plantations

70. Large forest plantation companies have expressed interest in becoming certified by an internationally recognized standard of sustainable forest management (mainly FSC or PEFC). Currently are that there are no national FSC or PEFC standards although this is not mandatory as certification can also be done based on international standards. The main constraint is the lack of an explicit national definition of natural forest which is required for certification to ensure that natural forests have not been cleared for plantations. Miombo woodland, the most common forest type in Mozambique, covers a variety of subtypes with a canopy cover ranging from open to dense. While there is no clear definition, any land that is cleared from natural vegetation is very likely to be classified as conversion of natural 'forests', impeding the issuance of the sustainable forest management certificate.

71. Past forest inventories used a 10 percent canopy cover as the threshold between forest and non-forest, resulting in extensive areas having been mapped as forests. Presently and within the context of REDD+, a national definition is being discussed, and among the proposed definitions there is one suggesting an increase in the threshold to 30 percent. In the long run, a clear definition of natural forest would simplify the certification process. However, it is still a matter of discussion if the REDD+ forest definition under development will apply for other purposes, including forest certification.

Key message:

- Certification by an independent, international body is essential for the major investors in the sector, and for this, it is essential to agree a national definition of what constitutes a 'natural forest'.

3. COMPETITIVENESS OF MOZAMBIQUE'S FOREST SECTOR

3.1 Key Criteria from an Investors' Perspective

72. For specific countries with outstanding established plantation forests and a successful wood industry fulfilling key investment criteria like profitability and low risk, became a benchmark for all other comparable investments. Therefore, it is useful to compare a set of selected key investment criteria to the conditions found in Mozambique, with the objective to get a realistic understanding of the investment climate in the country.

73. When commercial investors conduct due diligence on a specific investment opportunity, the considered criteria are manifold and refer to different levels (country level, project level). The applied criteria for investment due diligence can be assigned to the following thematic groups:

- Production (capacity and costs)
- Markets
- Politics and governance
- Macroeconomics
- Finance
- Nonfinancial impacts
- Safeguards and reputational aspects

74. Commercially driven investors seek to maximize their risk-adjusted returns. As such, they focus their assessment of forest investment opportunities along the following key criteria:

- **Production costs:** the unit production costs (USD per m³ or per ton of timber). These costs are defined by the actual costs of land and operations divided by the realized yield. The latter depends on the biophysical conditions and the availability of silvicultural skills and technologies.
- **Market access:** To create value the product has to be sold. Timber coming from forest plantations represents a product with a high sensitivity to transport costs. Access and proximity to markets in addition to the overall logistic intelligence are key.
- **Enabling environment:** Economic stability, production friendly forest legislation and regulation, and good governance are all essential to attract investors.

75. These key investment criteria are backed by recently published PROFOR studies (Castrén et al. 2014; Castrén, Katila, and Lehtonen 2014). These criteria guided and structured the competitiveness check of Mozambique's planted forest sector.

76. The key investment criteria have been broken down into a list of parameters that can be used for benchmarking (see Table 3.1).

Table 3.1. Parameters Used for Benchmarking

Key Criteria	Parameter Used for Benchmarking
Production costs	<ul style="list-style-type: none"> • Biophysical growth conditions/growth potential • Land availability • Land costs • Plantation establishment costs • Harvesting costs • Labor costs • Unit production costs (for 1 m³ timber)
Market access	<ul style="list-style-type: none"> • Internal wood consumption • Timber prices • Infrastructure and transportation costs
Enabling environment	<ul style="list-style-type: none"> • Political and economic stability (Human Development Index [HDI], Gross Domestic Product [GDP], Doing Business Index) • Security of land tenure • Governance and transparency (CPI)

77. The reference countries for the competitiveness check were selected based on the following criteria:

- Leading countries in the production of wood from planted forests based on the genus *Eucalyptus* and *Pinus* within each region. For South America, Brazil was selected while Sub-Saharan Africa is represented by the Republic of South Africa.
- Countries within each region with an emerging or already established plantation forest sector, but who are not yet important global players. In South America, Paraguay was taken as an example and in Africa, Uganda and Ethiopia were chosen.

78. For the benchmarking of production costs, detailed information and reliable data at the company level have been considered. The data sources include:

- Primary data gathering in Mozambique by interviews with forest companies and other forest sector stakeholders.
- Databases of UNIQUE and Malinovski Florestal. Both companies have extensive data on company operations and on timber markets.

79. For the market parameters and enabling environment, statistical data and macroeconomic indicators have been considered. This information has been cross-checked by expert interviews with key actors of the Mozambican planted forest sector.

3.2 Results of the Country Comparison

80. In the following chapter, the benchmarking results are presented. The used data were carefully selected and calculated to make them comparable. It is difficult to always have the same baseline for comparison, because the operational procedures, taxes, mechanization degree, or even the accounting of companies may cause variations. In this study, the real costs linked to forest operations were brought to a comparable level for benchmarking. Beside the

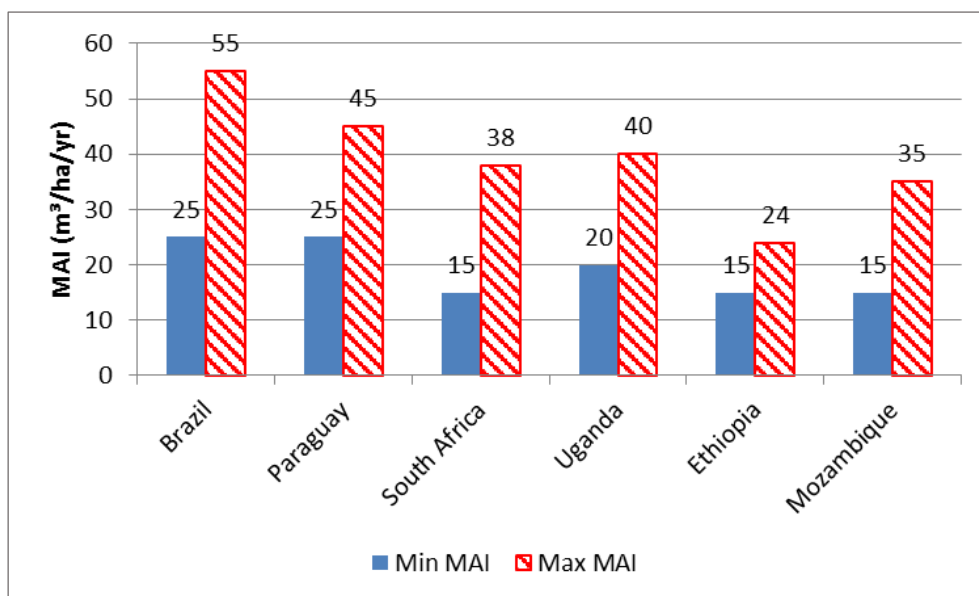
absolute costs for operations, a more important parameter is assessing competitiveness unit costs per cubic meter or ton of timber produced; or even more importantly, the costs per unit of wood delivered in log yard of timber-processing industries.

Production-related aspects

Biophysical growth conditions

81. The first criteria forest plantation investors usually look at are the biophysical growth conditions. Soils, climate, and genetic material determine to a wide extent the productivity of the forest sites. The amount of wood produced per area unit and its conversion factor to a specific target product are essential for the forecast of the potential economic results of an investment. The top value presented for Mozambique is based on estimations that tree breeding programs result in well-adapted materials and that silvicultural operations are optimized. The estimated Mean Annual Increment (MAI) achieved by the plantation companies in Mozambique is still below potential growth with improved genetic material and management practices.

Figure 3.1. Mean Annual Increment of Selected Countries



Source: Data bases of UNIQUE, Malinovski, and official websites listed in the references.

Note: In the graph the average of the minimum and maximum MAI of eucalypt-based forest companies are shown.

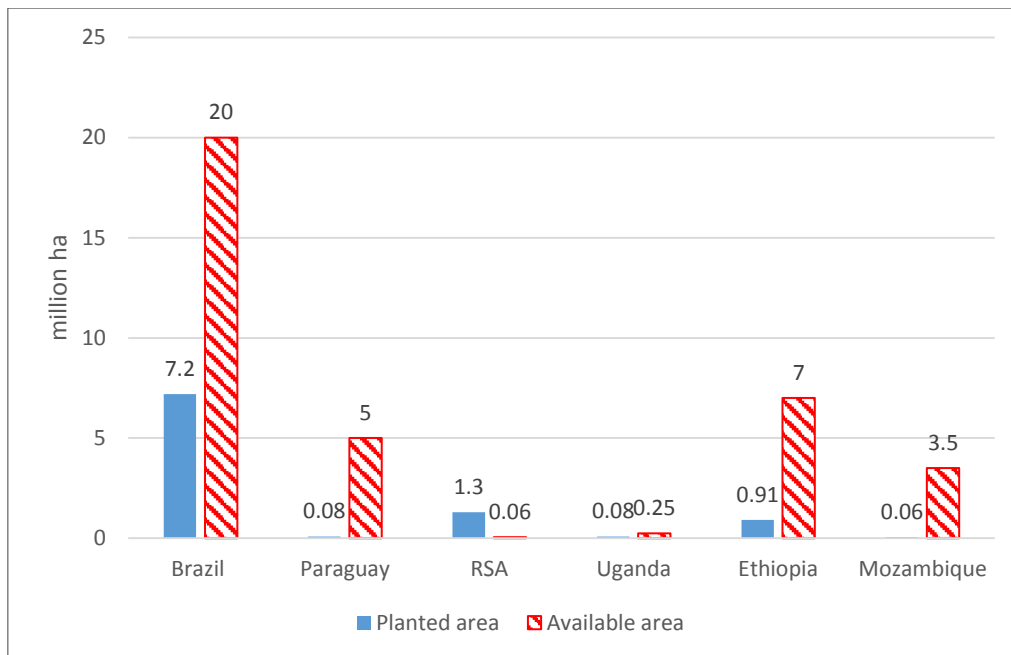
82. The growth potential of Mozambique is mainly limited by climatic conditions. The long dry periods in most of the regions designated for plantation forestry negatively influence the MAI. While the overall biophysical growth conditions are not outstanding in these regions, they are still comparable to those of South Africa, which is a successful global player in the planted forest sector (Figure 3.1).

Land availability

83. Another important criterion is the availability of land for forest plantations. In general, the wood industry based on industrial plantations requires a critical mass of raw material production and space for future expansion. Mozambique is a country with 3.5 million ha

available for forest plantations,¹⁵ allowing the country to become a major player in plantation forestry.

Figure 3.2. Land Availability for Forest Plantations and Planted Area



Source: Data bases of UNIQUE, Malinovski, and official websites listed in the references.

Note: The planted forest areas are taken from official statistics which are reliable. The estimation of available area in Mozambique is based on study carried out by MINAG in 2007. As discussed in chapter 2.4, this figure overestimates the availability of land for planted forests. The estimation of the available areas outside Mozambique are mainly expert estimates, with exception of South Africa where a designated land use plan for forest plantations determines the remaining area available for reforestations.

84. Mozambique has a relatively small area of planted forests, especially in comparison to the very ambitious 1 million ha target established within Mozambique’s strategic development plans. According to official land use planning sources and the amount of suitable areas available in the country, Mozambique shows significant potential to become an important global player in plantation forestry investments. Mozambique may be of special interest for South African investors due to their geographical proximity, comparable growth conditions, and limited land availability in South Africa.

Land costs

85. Investors in general closely assess and follow the cost of land. In economies where it is possible to purchase the land, some investors prefer to purchase the land, often speculating on increasing land prices. Strategic investors on the other hand are more interested in the wood production and accept long-term land lease contracts.

86. In Mozambique, the land cannot be owned by the investors and instead they have to pay an annual fee. The direct annual fee costs are highly competitive when compared to the

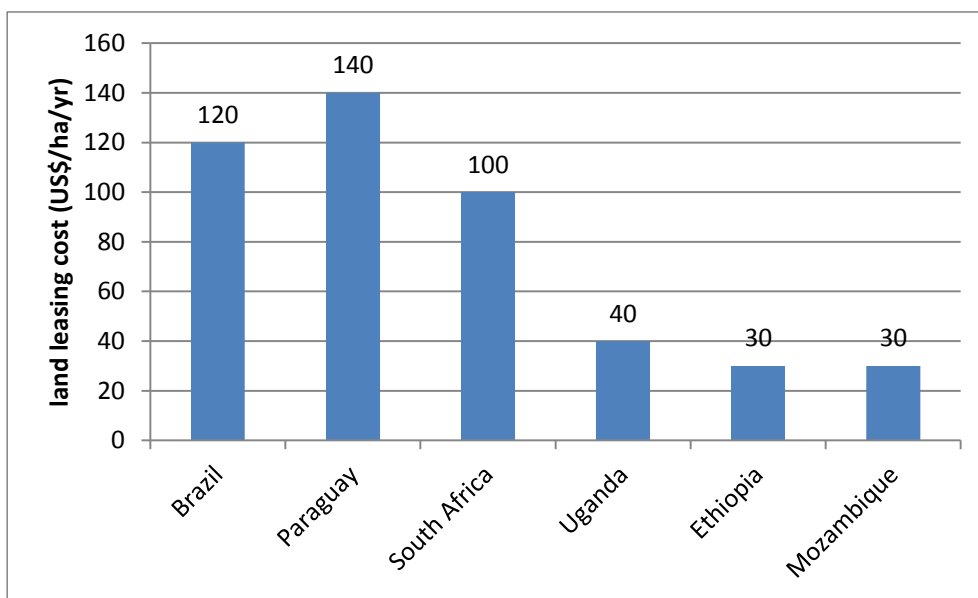
¹⁵ Oral communication from DNTF 2015. This represents about 50 percent of the level estimated in the 2007 strategy.

other countries included in this study. Regardless, it is essential to consider that the actual land costs not only consist of this annual fee but also compensation payments to local communities and upfront investments as agreed upon within the DUAT negotiation process (see previous chapters). The total leasing cost, including compensations, annual fees and transaction costs, are difficult to quantify given the variation in negotiation settlements. In the interviews, aggregate land costs ranged between USD 20 and 80 per ha per yr—with an average cost of approximately USD 30 per ha per yr.

87. In Brazil, for example, the forest companies are required to have a legal reserve and permanent preservation area for each planted hectare, which on average amounts to 0.9 ha for every 1 ha planted area. In general, when calculating the cost of land for one planted hectare the value of 1.9 ha is used, and thus the leasing costs for one ha of planted land can exceed USD 200 per ha.

88. The land costs data presented in **Error! Reference source not found.3.3** are average costs for one planted hectare (net production area). It is important for investors to have a clear and reliable understanding and basis for land cost calculations, without having unpleasant surprises, especially during the stage of building up the business.

Figure 3.3. Average Land Costs for One Hectare Planted



Note: The data are based on information from companies. There might be slight variations in the costs per hectare because of the different budgeting of costs for social projects and environmental licensing. In the case of Mozambique, the annual fee to be paid to the Government is very low (between USD 0.30 and 1.00 per ha and year). However, according to information provided by the Department for Land and Forestry (Direcção Nacional de Terras e Florestas, DNTF) and interviewed companies an average value of USD 20–40 USD per ha and year has to be added for compensation payments to communities and for implementing development projects. In Ethiopia, a similar land leasing system is in place. Costs are stated as USD 2 per ha (Keeley et al. 2014), but social and infrastructural costs raise the total estimates to a comparable level as found for Mozambique. In Uganda, the direct lease fee paid to the Government is USD 4–10.

89. One of the main arguments for investing in the planted forest sector in Mozambique is the low cost of land, mentioned by nearly all interviewed companies. However, there are

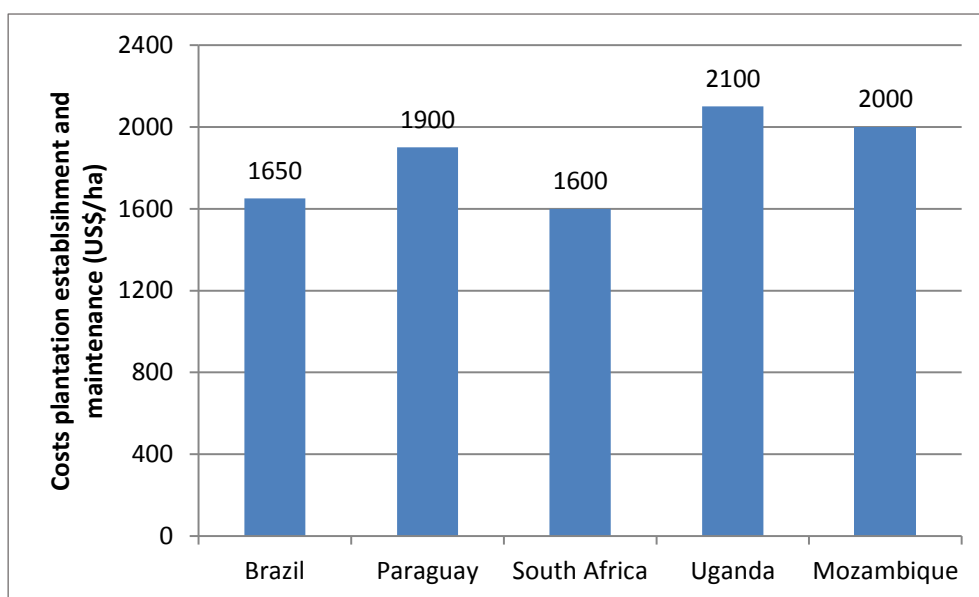
additional costs to be considered, especially costs related with compensation of local communities. Including these costs in the comparison with other countries, Mozambique loses its outstanding advantage with regard to land cost, but still is highly competitive.

Plantation establishment costs

90. The costs associated with plantation establishment are the sum of a sequence of operations which require continuous investments until the plantation can be classified as successfully established. In general, this is the case when the canopy closes. The inputs in silvicultural operations are often directly linked to the growth rates that can be achieved within the plantations. Operations like ripping, sub-soiling, or buffering soils by liming can improve growth rates substantially. The costs, derived from interviews with companies in Mozambique, are very high in comparison to the other countries included in the comparative study. Partially, this is because companies often invest in greenfield operations with high land clearing costs. However, this does not explain the entire magnitude of the differences indicated in the graph. Interviewed companies noted high replanting costs due to the use of unskilled labor, unfavorable climatic conditions, and difficulties in logistics because of poor infrastructure. Another problem mentioned is the limited availability of optimized planting material.

91. The plantation establishment and maintenance costs in Mozambique are rather high in comparison to the best (Brazil, South Africa). The reasons are manifold and largely varied among the interviewed companies. Primarily, the high failure rate in planting due to the use of poor genetic material, low planting quality, climatic conditions, and high transport costs for fertilizers were concerns raised by the companies. Furthermore, often greenfield operations have not sufficiently cleared the land which requires frequent mechanical or manual cleaning of the areas—leading to higher plantation establishment costs. If operating with high technical standards and in well cleared areas, the costs for plantation establishment are reduced to an internationally comparable level. However, the lack of a skilled workforce and the limited availability of adequate technologies still contribute to the high costs of plantation establishment in Mozambique.

Figure 3.4. Costs for Establishing Forest Plantations

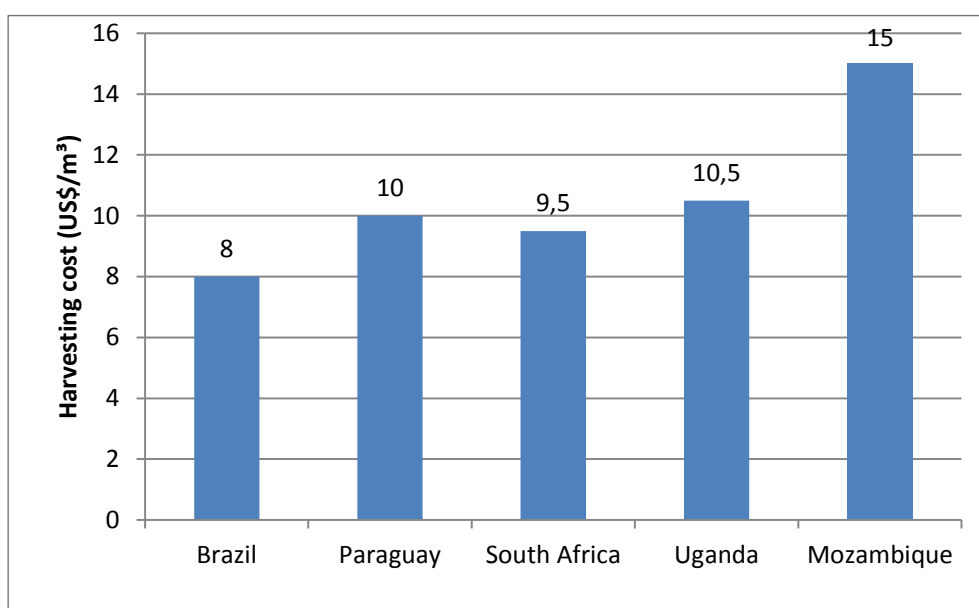


Note: Plantation cost establishment includes all costs for soil preparation, planting material, fertilizing, weeding, pest, and fire control. Costs for heavy machinery for land clearing were not included. The data represent the average from several companies operating in each country included within this study for short rotation biomass plantations for pulp or energy uses.

Harvesting costs

92. Harvesting costs correspond to a large percentage of the overall production costs. Harvesting operations in general involve high-risk activities with larger accident rates. In response to this, the global trend has been to mechanize the whole process. This mechanization trend has created a demand for skilled and trained machine operators. The trade-off between job creation and mechanization by implementing up-to-date technology is evident.

Figure 3.5. Costs for Wood Harvesting



Note: Harvesting costs were calculated based on the average of several companies or service providers in the respective countries. It includes the felling, processing (debarking, delimiting, bucking), and hauling of the wood until it is piled at the forest roadside. Differences in the costs of mechanized harvesting might also be explained by the different working hours of machine operators (for example, Brazil 6.5 hours/day and South Africa 11 hours/day at same salary). The data for Mozambique represent estimates based on the databases of UNIQUE and Malinovski.

93. The case of Uganda shows that a lower level of mechanization and limited availability of skilled workers result in higher costs, which ultimately reduce their overall international competitiveness. An adequate level of mechanization and skills is also regarded as a key factor for safe and ergonomic working conditions.

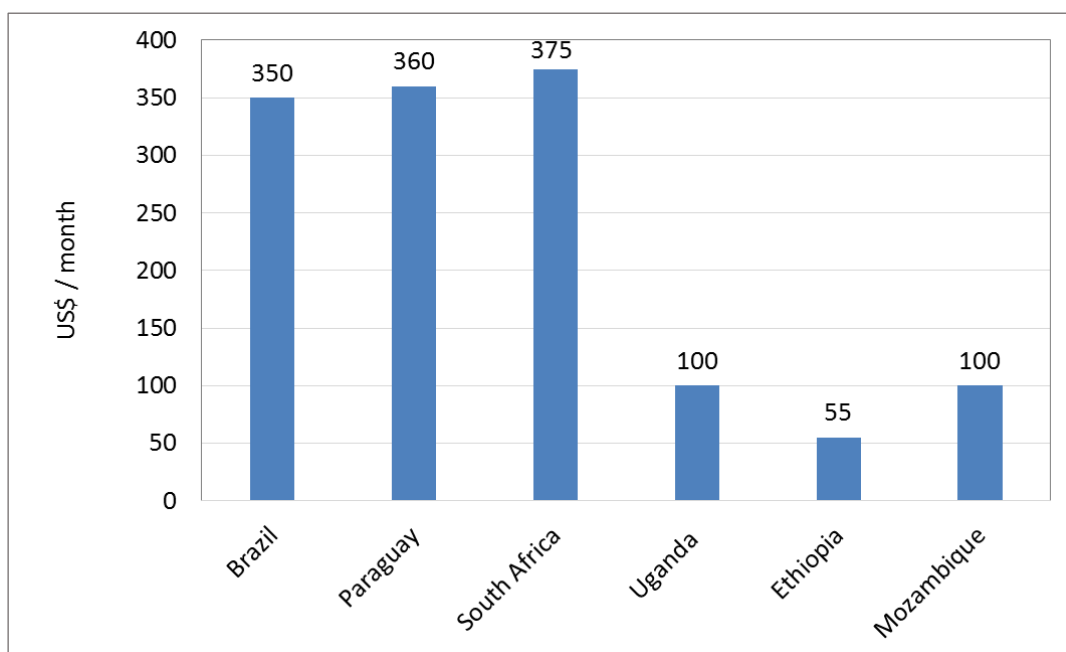
94. For Mozambique, no costs estimates are available at the moment, since most planted forest operations are very recent and larger volumes have yet to be harvested. The data are based on expert estimates. All interviewed companies stated that they intend to use mechanized harvesting operations when the first plantations are mature. Owing to the limited availability of skilled machine operators, technology, and maintenance potentials in Mozambique, the average harvesting costs will be high at least the first five years of operation.

These assumptions are based on experiences from other countries which switched from motor-manual to fully mechanized systems.

Labor costs

95. Labor costs are always of high importance for decision making in forest investments. Even with no precise statistics about the labor intensity of the planted forest sector available, forest operations are classified as being rather labor intensive. Therefore labor costs play an important role in cash flow planning. Labor costs in Mozambique are very competitive, but forest companies complain about the lack of a skilled workforce, low productivity per worker, and high absence rate of the employees, which lead to relatively higher unit labor costs.

Figure 3.6. Costs for Labor (based on chainsaw operator)

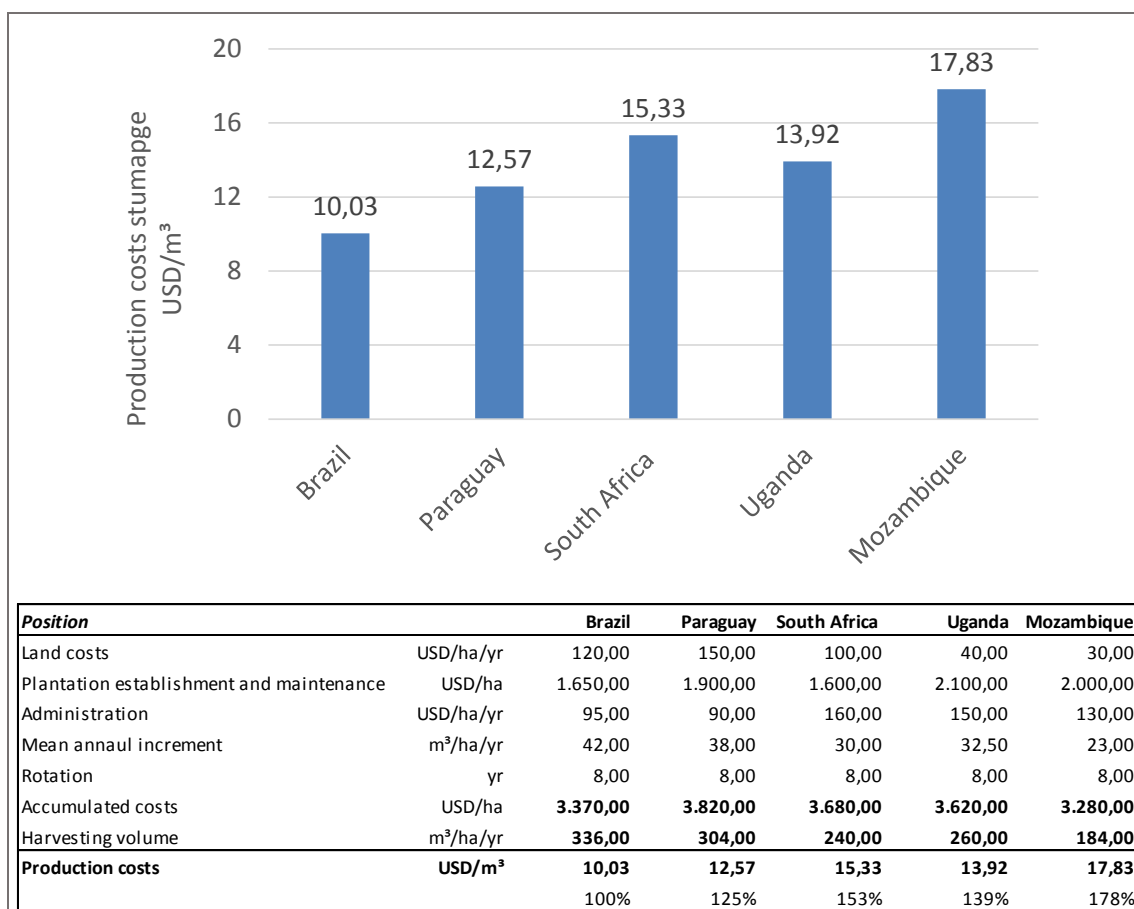


Note: Labor costs are calculated for medium-skilled workers, in general regulated by national laws in the respective countries of the study. In these cases the average salary of a chainsaw operator was used.

Unit production costs

96. The actual cost to produce one cubic meter of timber is the product of the standing volume at the end of the rotation time divided with the costs for land, operations, and administration. Figure 3.7 shows the pure production costs for 1 m³ of wood produced in a standing tree for a selection of countries. Harvesting and transport costs are not included, since they are highly variable and not yet available on a sound data base in Mozambique since only few plantations are at harvesting age in the country.

Figure 3.7. Production Costs for One Cubic Meter of Timber (stumpage)



Note: Data on administration costs have been available only from a few companies. In Africa administration costs are significantly higher than in Latin America. The reason is that there is more bureaucracy, more expenses for human resource management, and higher expenses on CSR.

97. Owing to high costs for the plantation establishment and high administration costs, the unit costs for the production of one cubic meter of industrial roundwood (standing tree) are significantly higher compared to countries with the lowest production costs. Regarding administration costs per unit produced, the bureaucratic obstacles in Africa seem to be higher, causing additional costs. Human resource management and expenses for CSR are definitely higher when compared with the countries in Latin American. From the interviewed companies in Mozambique, all of them had a full-time employee who worked as a contact person to oversee bureaucratic issues and to be in close contact with government authorities and administration.

Market-related aspects

98. Market demand and market access are both key when evaluating investment opportunities. In this section, the demand of the domestic market, the timber prices in domestic markets, and the transport costs are analyzed.

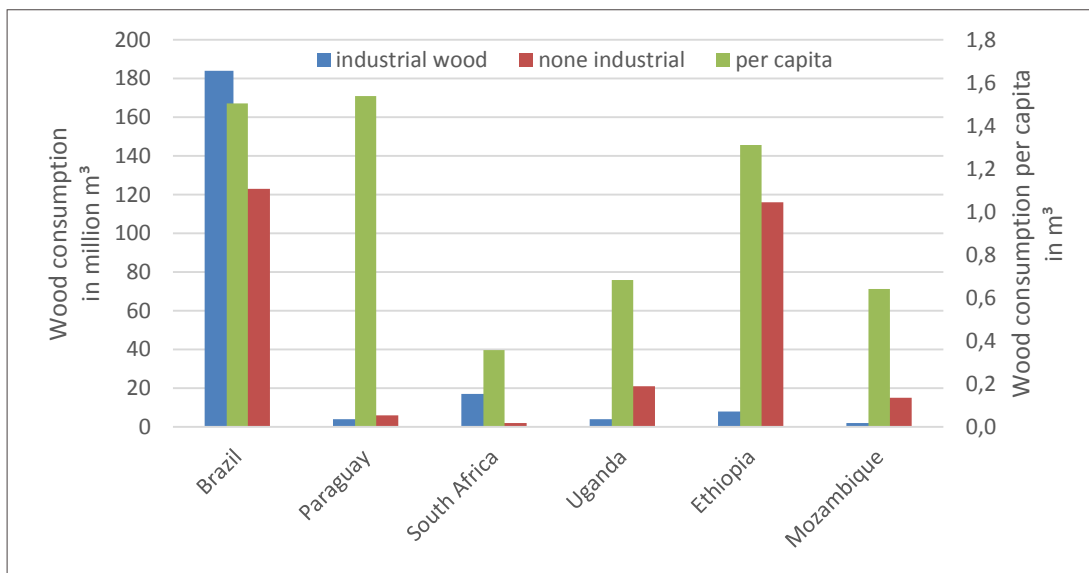
Domestic timber market

99. For evaluating potential investment opportunities, the wood consumption in internal markets was analyzed. If wood produced in planted forests is consumed or converted to higher-

value products close to the place of raw material production (forest), investments tend to be more promising. In general, there is a strong correlation between population and wood consumption within a country (Keogh 2009). On average about 0.5 to 1.0 m³ of wood per capita is consumed.

100. For Uganda, Ethiopia, and Mozambique, a high percentage (between 80 percent and 95 percent) of the wood is consumed as firewood or charcoal, coming from informal sources, mainly native forests. Only a few percentage is consumed as industrial wood with respective value aggregation, which is the opposite in countries with long-term plantation history like South Africa or Brazil. In countries where a considerable amount of wood for energy (fuelwood, charcoal) comes from illegal logging in native forests, markets based on sustainably produced plantation wood for energy hardly can be established successfully. The low-cost supply with raw material from informal markets is seen as critical for investments.

Figure 3.8. Wood Consumption within Internal Markets

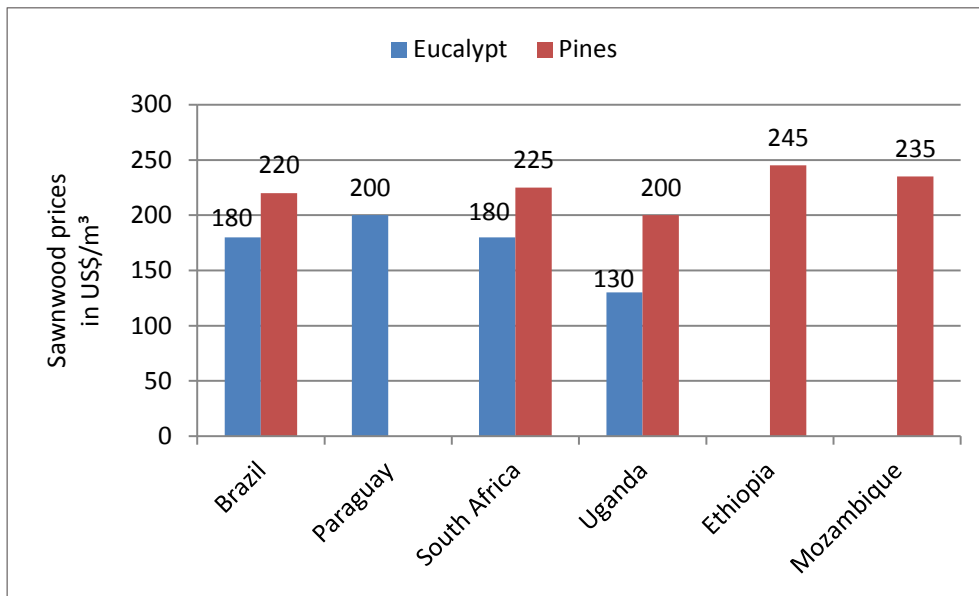


Note: Data from official statistics and market studies, reflecting total wood consumption within the above selected countries. In Brazil, more than 160 million of the consumed wood is produced in forest plantations and consumed by the forest industries (mainly pulp and charcoal for ore smelting), while in Uganda, Ethiopia, and Mozambique most of the wood is consumed as fuelwood.

Timber prices in domestic markets

101. Besides wood consumption, the prices for standard sawnwood (pine and eucalyptus) are of interest for market evaluation (Figure 3.9). The standard sawnwood markets tend to be global in nature, since low shipping costs allow for sawnwood prices to approximate each other and remain more or less at the same level.

Figure 3.9. Prices for Eucalypt and Pine Sawnwood



Note: Data represent averages from official sources and interviews, and are based on low-quality eucalypt lumber and medium-quality softwood sawnwood (FOB). The sawnwood prices are at a comparable level, influenced by international market prices. In Ethiopia and Mozambique, the data are from only a few sources where producers have high production costs and a rather ‘monopolistic’ status.

102. In Ethiopia and Mozambique, the prices are slightly higher when compared to other players in the global market. It is very likely that sawnwood prices will drop to the international level of USD 220 per m³ as soon as the supply and demand dynamics enter into a more ‘global’ environment.

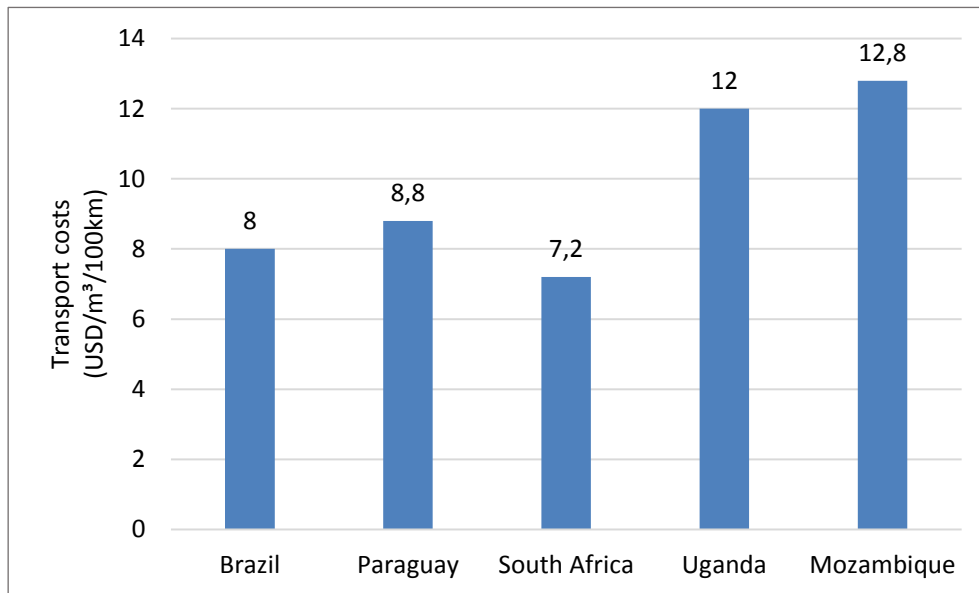
Infrastructure and transport costs

103. The transport of the raw material wood to processing units is a crucial point in investment evaluations, since wood is a product of high weight and volume and low value. Therefore, wood production is very cost sensitive in respect to both transport distance and transport speed. Also, the transport of converted wood products to local, regional, or international markets is of high importance for competitiveness, and thus standardized forest products such as pine or eucalyptus sawnwood, pellets, or chips are increasingly becoming a global market commodity with global market prices.

104. The existing infrastructure and strategic location of a country is of importance for its overall competitiveness. The comparative country studies (Figure 3.10) demonstrated that in South Africa and Brazil, two of the biggest global players in the planted forest industry, the lack of investments in infrastructure have led to increased transport costs which have been associated with a significant loss in competitiveness. Mozambique has access to international markets due to its geographical location, but in many regions of the country the infrastructure is still weak. In the interviews, identified challenges included the lack of a developed road network, problems during the rainy season, and poor overall conditions of existing main and secondary roads. Better railway network is also essential, because the best forest sites are far away from the coast and long transport distances are necessary to reach key markets. At the

four main ports (Pemba, Beira, Nacala, Maputo), improved loading facilities are in the process of being established, however utilization fees are high and the energy supply is not guaranteed.

Figure 3.10. Roundwood Transportation Costs



Note: These are average roundwood transport costs on roads (expressed in USD/m³/100 km - company based data). The costs normally refer to tons and not to cubic meters. We transformed the ton-related costs to cubic meters by using 1 m³ = 0.8 tons.

105. Roundwood transportation costs are directly linked to the available infrastructure. However, currently there are no available reliable data for developing countries in Africa related to this. In general, special trucks with high payloads have to be used, but do not allow back-freight. Therefore, transportation costs are higher in the earlier post-harvesting stages than for final products that can be transported, from a logistical point of view, more efficiently. Investors will check if the benchmark for (a) transport distance and (b) costs (USD/ton and km) meet the international standards in other countries. Experts in the interviews stated that these costs ranged from USD 50 to 100 per ton and 100 km for goods (fertilizer, planting material) to be transported on secondary and forest roads of poor quality.

106. The study of Teravaninthorn and Ravelland (2009) showed comparable price ranges for transport costs in Africa. However, the author stated that the costs are kept low by the constant overloading of trucks and low investments in maintenance and renovation of transportation fleets. The study does not consider the few possibilities of back freight linked to roundwood transport-adapted trucks, and thus the above estimates are probably on the lower end of the real transport costs. Mozambique will have to invest in both road and railway systems to be competitive. An integrated concept for infrastructural development linked with other economic sectors will be necessary, since the forest and wood sector alone will not justify the high costs for infrastructure improvements.

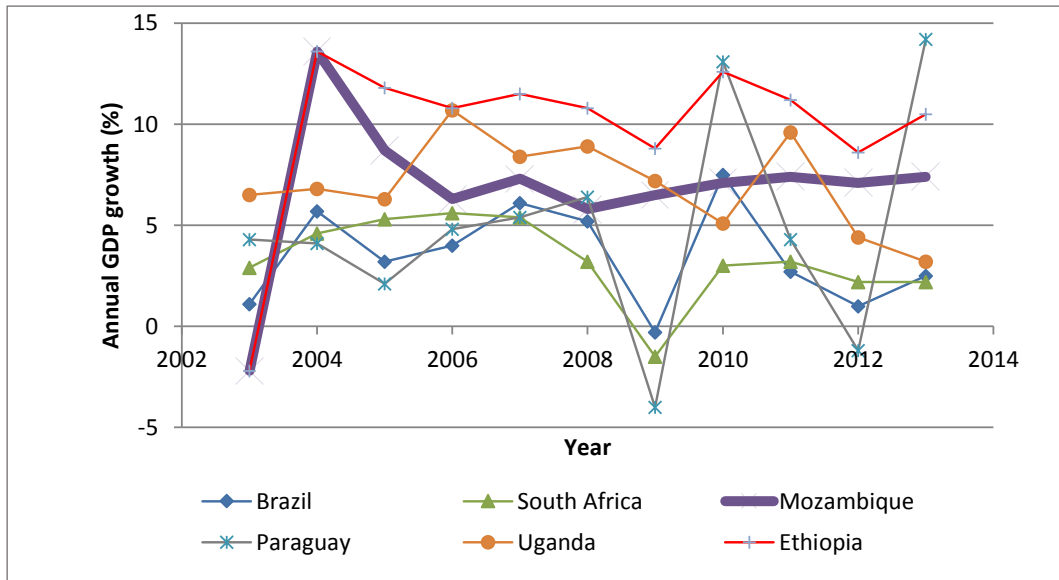
Enabling-environment-related aspects

107. The economic, political, institutional, and legislative framework for investments have been summarized in relation to their effect in providing an enabling environment. We have analyzed the following parameters: political and economic stability, security of land tenure, national policies, legislation and regulations, and governance and transparency.

Political and economic stability

108. The political and economic stability of Mozambique was evaluated as positive by the investors already operating in Mozambique. One important indicator is the country's GDP growth (Figure 3.11).

Figure 3.11. Gross Domestic Product Development

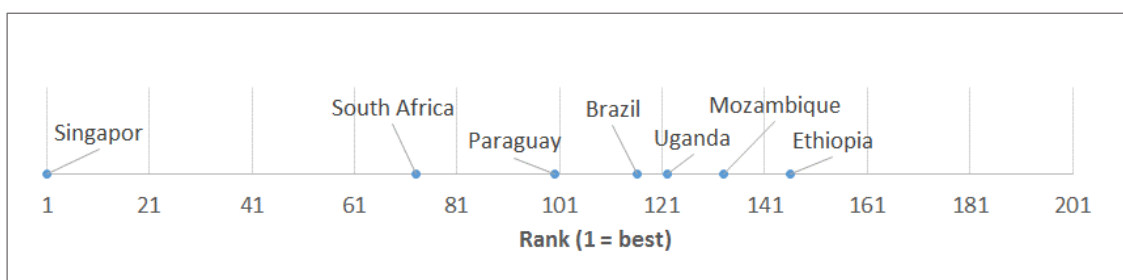


Source: World Bank, time series for GDPs (website accessed April 2015).

109. GDP growth is more stable throughout the last decade in the lesser-developed African countries than in the other countries included within the study. This indicates that they are less susceptible to global economic crises, which guarantees continuous economic growth.

110. Another indicator to evaluate the investment climate is the Doing Business Index of the World Bank in Mozambique. This indicator is clearly below the average of the other countries included within the study (Figure 3.12). This indicates that there structural issues in the business climate preventing tapping the full potential of the private sector.

Figure 3.12. Doing Business Index of the World Bank 2015

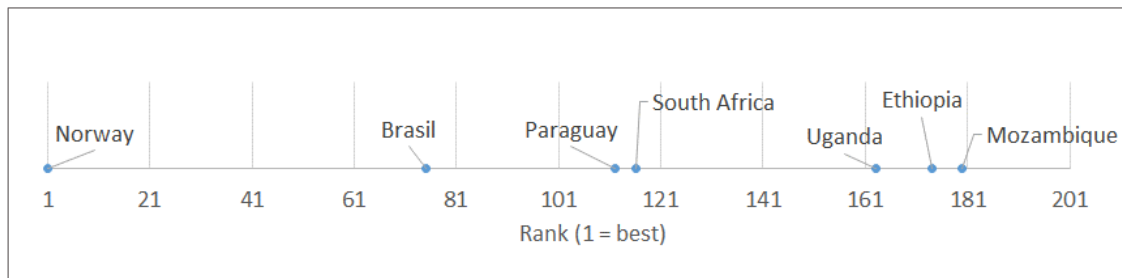


Source: *Doing Business Index World Bank 2015*. Economies are ranked on their ease of doing business, from 1 (best) to 189. A high ranking means the regulatory environment is more conducive to the starting and operation of a local firm.

111. The climate for business investments has, according to the World Bank, become more positive in the recent years. There are still high transaction costs, but gradual changes can be noted. While South Africa, followed by Paraguay and Brazil are already accepted as countries

that have already reduced barriers for doing business, the other African countries still struggle with problems. Relating these findings to the planted forest sector, it confirms that many barriers and shortcomings still have to be removed to facilitate investments in Mozambique. However, a more negative outlook might be expected if the HDI (Figure 3.13) is closely examined.

Figure 3.13. Human Development Index 2015



Source: United Nations Development Program, Human Development Index (website accessed February 2016). The HDI is a composite statistic of [life expectancy](#), [education](#), and [income per capita](#) indicators, which are used to rank countries into four tiers of [human development](#). A country ranks lower when the life expectancy at birth is longer, the education period is longer, and the income per capita is higher.

112. The HDI is a mix of indicators showing the livelihoods of the population. A high rank, as found in the African countries included within this study, indicates the low availability of a skilled labor force and the persistence of problems related to purchasing power within domestic markets. On the other hand, a high internal demand for certain goods can be expected with the ongoing economic development of these countries. Currently, companies in Mozambique tend to focus on export markets and tend to fill many higher positions within forestry companies with skilled foreign workers.

Security of land tenure

113. The availability of land, costs, and owner conflicts have always been of high importance for forest investors in tropical and subtropical countries. Most tropical countries have a fast economic development potential, which is often linked with increasing land prices. Many investors calculated this as a 'risk minimizer', that is, if the forest project is below expectations with regard to the investment return, the land can be sold with profit and thus financial losses are reduced. Regarding these aspects, land ownership (political issues), land access security, and land price development were and still are important indicators for investors. In the evaluated countries, land ownership became less important when political stability was provided. Under these conditions, renting or leasing land supported the creation of viable investment models with adapted exit strategies (for example, Brazil, South Africa).

114. As already stated, Mozambique law prohibits the acquisition of land. The land is leased by the Government for a very low annual fee, which may initially appear attractive to forest investors. On the other hand, there is no long-term history nor experience with plantation forestry, and thus the 'political risk' index may be a limiting factor for companies when considering whether or not to invest in plantation forests. High initial investments are linked to the establishment of planted forests, for example, land clearing for road construction, which often have a lower impact on the cash flow if they can be calculated for several forest rotations. As such, land ownership or at least a land use guarantee for several rotation periods would be a

decisive factor for forest investments, to have competitive conditions that are comparable to other countries included in the study.

National policies, legislation, and regulations

115. Basic national policies, legislation, and regulations, in principle, have been described as positive by the investors interviewed, being in line with the international framework described in section 2.3. The National Reforestation Strategy of Mozambique is a clear point of advantage in comparison to other African countries like Ethiopia and Uganda. However, there is still a need to improve certain issues within the environmental legislation, in addition to addressing issues related to legal security and company-community relations to be more competitive to the Latin American countries in the study. Specifically, the following points were seen as critical by investors:

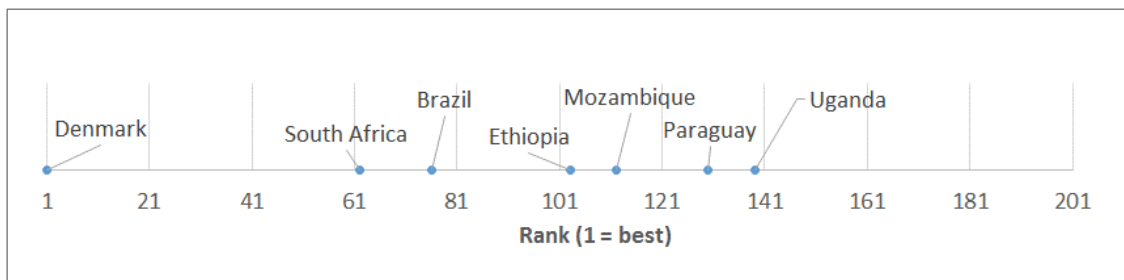
- Providing a clear definition of 'forests' to avoid problems with certification processes in regard to land clearing for forest plantations; countries with a long-standing history of plantation forestry, such as Brazil or South Africa, have clear definitions in their laws about what is classified as native forest. Being in line with the law is a must for the eventual certification of forest operations. In Brazil the clearing of native forests in the past to establish plantations created a major problem for the certification of these areas at a later stage. This should be avoided, and the GoM should provide detailed legislation with clear definitions.
- Enhancing legal security and law enforcement: In case of any dispute with contractors, workers, or the administration, the investor has to have the security that he can take the case to court and that there is jurisdiction according to the national legislation. In countries like Brazil or South Africa, there is a high degree of confidence in the legal system, providing investors with an increased sense of legal security.
- Ensuring clear labor legislation and regulations to address the extremely high absence rates of rural workers (40 to 50 percent of working time). Ensuring secure planning of the labor force necessary for forest operations is a crucial point for investors. Duties and rights of all involved parties have to be clearly described in the legislation, communicated to all stakeholders and the law has to be enforced by the Government. Insecurity related to this point has led to rapid mechanization within the forest sector and many jobs have been lost in previous years.
- Providing clear regulations concerning duties and rights of investors and communities. In Brazil the problems observed in the last decades were solved by clear reforms in land tenure legislation, mediation by the Government and NGOs, as well as social programs driven by the private sector and/or the Government. In South Africa, companies are struggling with the land claims made by communities, but ongoing mediation efforts by the Government and the establishment of clear rules are making all involved parties confident that the problems can be resolved soon. In Mozambique, actions from the Government are urgently required to overcome existing problems with the licensing of DUAT areas, environmental licensing, and land negotiations with local communities.

Indicators for governance and transparency

116. Many of the major challenges leading to clear disadvantages in establishing a conducive enabling environment are related to the governance and transparency criteria.

117. As previously mentioned, the CPI—although it is not an exact indicator—is an important aspect in investment climate assessment. Many companies acting in the plantation forest sector have committed themselves to a ‘clean management’ mandate, prohibiting any participation in activities considered to be illegal. When comparing the case of Mozambique to other global players in the planted forest sector, there remains the need to develop strong measures to address the identified concerns (Figure 3.14).

Figure 3.14. Corruption Perception Index 2014



Source: Transparency International, CPI (website accessed February 2015). A country's rank indicates its position relative to the other countries in the index. This year's index includes 168 countries and territories.

118. The most critical comments regarding the investment climate were made about the role and presence of the Government. The following points have been identified as critical elements to address and improve:

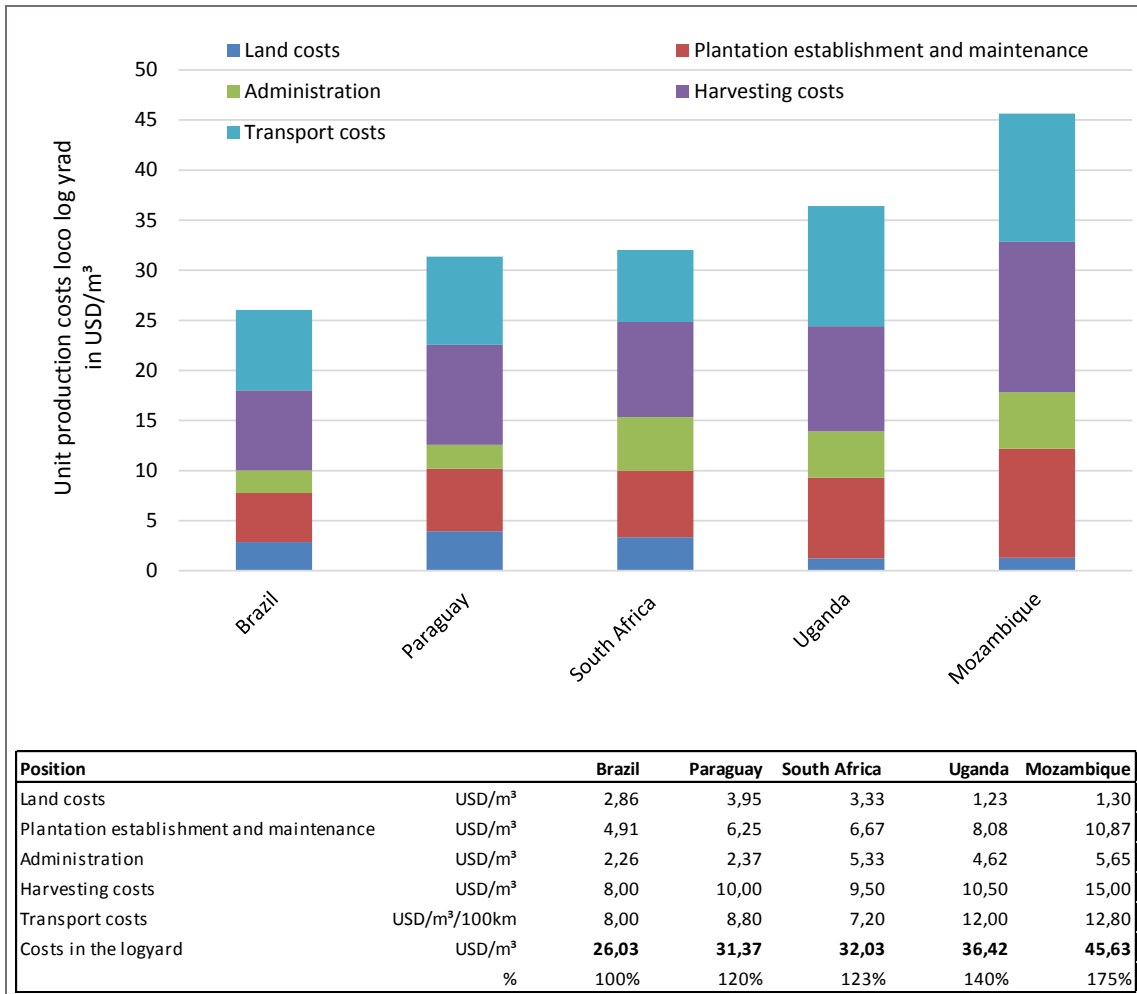
- The processes for licensing DUAT areas (concession areas) and EIAs.
- The ‘absence’ of government involvement in land use negotiations with local communities, including mediation and, if necessary, law enforcement.
- The missing presence of governmental authorities at the district level, where the main problems occur and have to be solved.

119. With respect to the investment climate, these points were highlighted as the ones aggravating or even impeding economically feasible forest investments in Mozambique. Detailed focused analyses and expert interviews found that most of the investors that left Mozambique saw fundamental problems related to these governance concerns.

3.3 Competitiveness of Raw Material Costs

120. For analyzing the competitiveness of the raw material costs the unit costs of wood put in the log yard of the industry is a meaningful indicator. This cost includes production, harvesting, and transport. As Figure 3.15 shows, the African countries with a newer plantation forestry sector have considerably higher raw material costs for the industry supply. The costs in Mozambique for 1 m³ of wood is about 50 percent to 70 higher compared to the benchmarking countries like Brazil, South Africa, and Paraguay.

Figure 3.15. Costs for One Cubic Meter of Wood Put in the Log Yard



121. In summary, Mozambique has clear opportunities to leverage competitiveness in the planted forest sector. A number of achievable actions could, if introduced, lower costs and increase biological growth significantly. Operational costs can be reduced by deploying state-of-the-art technology and also by building up a skilled workforce as soon as possible. Transport costs could be substantially reduced with better infrastructure (and this is especially important where the plantations are remote from the end market as in parts of Mozambique). Tree growth can be significantly increased through applied research programs, especially focusing on clonal forestry and optimal site-species-market matching. Thus, with relatively few inputs over the next few years, Mozambique could make a major jump and become a serious contender in the planted forest sector worldwide. In comparison, countries like Brazil and South Africa require huge inputs to increase the productivity of their plantations further.

122. The final chapter of this report summarizes what steps Mozambique needs to take to improve the investment climate for forestry. In combination with the task 2 report on smallholder support, these then feed into the detailed activity plan (task 3 report) to guide the process.

4. THE WAY FORWARD: HOW TO IMPROVE MOZAMBIQUE'S FOREST INVESTMENT CLIMATE

123. The results of this assessment confirm Mozambique's attractiveness for investments in the planted forest sector, but also identify challenges that must be addressed if forest investments ought to be mainstreamed. Considering the current conditions, the target of establishing 1 million ha of planted forests by 2030 seems highly ambitious. If the identified challenges are efficiently addressed, reaching between 300,000 to 500,000 ha in the next 15 years would be a major accomplishment.

124. With joint efforts and cooperation of different institutions and targeted investments, the investment climate of Mozambique can be significantly improved as no insurmountable biophysical constraints have been identified, such as unsuitable site conditions or physical barriers to markets. The main challenges identified by this assessment and discussed in this chapter are summarized as follows:

- **Production-related aspects:** Lack of competitiveness due to high production costs;
- **Market-related aspects:** Small domestic market and expensive access to international markets;
- **Enabling-environment-related aspects:** Lack of clarity and transparency regarding land negotiation and land use planning; resources for conflict resolution.

125. In the following and closing sections of this report, possible alternatives to improve the forest investment climate based on this assessment are discussed; and a roadmap to improve the investment climate in Mozambique is presented. The implementation of the roadmap and its monitoring need to be based on continuous communication with key stakeholders and institutions. The ultimate goal is to jointly identify solutions and embed them in both national policies and the institutional framework of Mozambique to avoid patchwork solutions and generate an effective sectorwide impact.

4.1 Main Challenges

Production-related aspects

126. On production-related criteria, a key challenge identified was related to production costs, which are significantly (up to 60 percent) higher in Mozambique than in the other countries included within this study. This difference is mainly due to the biophysical conditions that restrain tree growth, limitations with regard to silvicultural knowledge and available technology, and the shortage of skilled labor. Although biophysical conditions cannot be changed, the application of best practices regarding the silvicultural regime and its stringent implementation on the ground can substantially increase the productivity of plantations. This would require the engagement of different institutions at all levels (for example, national, district) to enhance silvicultural knowledge and ensure that silvicultural practices are well adapted to the country's specific conditions and needs. A major task of plantation silviculture is to achieve the best match between the site, species, and markets. Consequently, a cornerstone for a successful planted forest sector is the development of decision support systems that are based on proper site classification and a detailed understanding of the behavior and requirements of tree species and the availability of high-quality planting material. To build up a body of knowledge on this topic, the following options could be considered:

- Applied research and dissemination of research results.
- Development and implementation of a clonal program that can pave the way to make clonal material available for the planted forest sector of Mozambique.
- Promotion of forest associations and knowledge exchange between different companies.
- Implementation of R&D programs and Public Private Partnerships between universities or other public research organizations and forest companies.

Market-related aspects

127. Regarding market-related criteria, the assessment revealed that Mozambique's domestic market is largely dominated by timber extracted from natural forests. Although attractive niche markets for plantation timber have been identified, such as poles, the widespread informality and the lack of industrial consumers who could absorb larger production volumes from legal sources still hinder the establishment of a competitive domestic market. In the past, this situation has led producers to turn to the export market, but high costs associated with logistics (transport and harbor costs) prevent reforestation timber from being competitive as opposed to high-value (and often illegal) Miombo timber.

128. Improvement options to enhance the competitiveness of the market should concentrate on efforts to formalize the natural forests sector and strengthen the rule of law to curtail the flow of illegal and unsustainable wood to the domestic market. As structural incentives for illegal logging are especially high where transparency, accountability, and intra-institutional competition are low, effective control requires cross-cutting reforms in many policy areas and is associated with the promotion of good governance. This includes actions to tackle corruption, land reform, and industrial and fiscal policy reform. In addition, a cluster approach within the forest policy that incorporates aspects such as value chain integration could highly benefit the sector by setting incentives for more value-added products and the development of a professional timber- and wood-processing industry. Finally, investments to improve infrastructure, particularly regarding the development and extension of railways and road networks to the main harbors would significantly improve the access of wood products to the international market.

Enabling-environment-related aspects

129. Some criteria related to the enabling environment have proved to be critical in this assessment. Complex land acquisition and licensing processes in addition to non-predictable actual land costs and the lack of a clear definition of natural forested land have discouraged investments in the past.

130. A key aspect that has attracted investors to Mozambique is the low cost of land. However, the lack of clarity in the procedures to acquire land from communities and the lack of government support in this process has often led to long-lasting, expensive, and inefficient negotiation processes which often result in unfruitful outcomes for the parties involved. To pave the way for achieving the country's ambitious reforestation plans, it is paramount to clearly communicate land acquisition processes and actively foster fair communication within the negotiation processes. The creation of an independent institution with the task of facilitating

company-community negotiations and establishing clear procedures seems to be a promising alternative to improve the situation. Here the lessons learnt from the experiences of the Malonda Foundation in the Niassa Province can be very useful (section 2.2). The final target is to establish fair and stable CCPs.

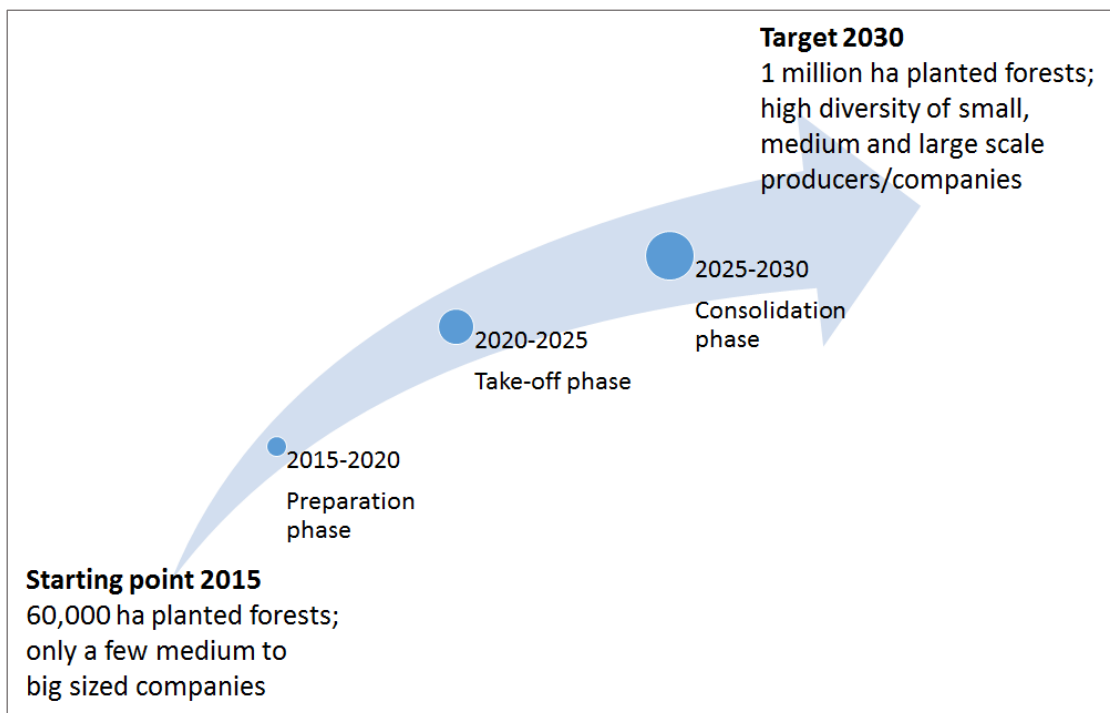
131. In addition, the lack of clear definitions regarding what is considered to be natural forest has hampered investments in the planted forest sector. As most of the available land for reforestation is covered with Miombo vegetation in different stages of degradation, the lack of clarity exposes companies to high reputational risks and leads to a deadlock situation, as the conversion of natural forest is incompatible with FSC standards and is non-justifiable to investors and society. In this regard, several improvement options have been identified:

- Definition of a nation-wide mapping of suited areas for reforestation.
- Clear definition of Miombo forest.
- Development of a national FSC standard (of second priority, as experiences in many countries show that a national standard is not premise for successful establishment of FSC-certified planted forests).

4.2 Activity Plans Toward One Million Hectare of Planted Forests

132. Based on the outcomes from the forest sector diagnostic (presented) and from the analysis on how to integrate smallholders in commercial forestry (separate report), a detailed roadmap towards the target of 1 million ha planted forests by 2030 has been drafted and is presented in a separate report.

Figure 3.16. Phased Roadmap to Enhance the Planted Forest Sector



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Information from Interviews and Databases

GoM:

- CEPAGRI Interviews
- DNTF Interviews

Others:

- DFID Mozambique Interviews

Interviewed forest companies in Mozambique (biological potential, production costs, investment environment)

- MOFLOR
- Portucel
- Florestas do Niassa (Rift valley Group)
- Green Resources
- IFLOMA

Databases from UNIQUE and Malinovski Florestal (data of forestry companies and reliable statistical resources of diverse countries):

- Growth potential (MAI);
- Productivity and costs of harvesting and transport operations;
- Detailed plantation establishment costs;
- Land leasing costs;
- Labor costs;
- Market data (completed by country statistics and data from associations);

Annex: Criteria to Assess Business Attractiveness for Planted Forests

Important Criteria to Assess Business Attractiveness for Planted Forest			
Thematic Group	Criteria	Indicator	Reference Level
Markets	Existence and scale of domestic markets	Existence of big industrial players; volumes consumed by industries	Country
	Product prices on domestic market	Prices for sawlogs/veneer logs/ industrial roundwood/energy wood	Country
	Expected development of domestic timber market	Development in the past, projected trends	Country
	Infrastructure for forestry product transport	Roads, railways, domestic shipping, international shipping	Country
	Access to international markets and export logistics	Number of ports for container shipping; share of exports	Country
	Forest investment track record	Number of transactions selling/buying plantation assets	Country
	Existence of investment partners	Project developers, asset investors, strategic (forest industry) investors	Country
	Maturity of forest sector	Plantation area; number of investment transactions	Country
	Vertical integration	Yes/no	Project
	Diversified and anticipative marketing strategies	Yes/limited/no	Project
Production capacity	General biophysical conditions	Climate, soils, topography	Country
	Existing plantation area	Ha	Country
	Availability of suited land for forest plantations	Ha	Country
	Productivity	MAI	Country / Project
	Natural risks and hazards	Frequency of fire, droughts, storms, and floods	Country / Project
	Availability of skilled labor force and qualified forest managers	Yes/limited/no	Country
	Availability of service providers	Number of nurseries, existence of nurseries with genetically improved material; Number of forest service companies (silviculture, harvesting, transport)	Country
	Availability and access to equipment and production technology, maintenance, and service	Forest technology resellers, spare parts and service providers	Country
	State-of-the-art silvicultural management	Applied silvicultural regimes and technologies	Country/ Project
	Site-species-market matching	Yes/no	Project

Important Criteria to Assess Business Attractiveness for Planted Forest			
Thematic Group	Criteria	Indicator	Reference Level
Production cost	Price for suited forestry land	USD/ha	Country
	Land price development	% per year (past 10 years)	Country
	Plantation establishment costs (until plantation is secured)	USD/ha (for each species and production goal?)	Country / Project
	Harvesting costs	USD/m ³	Country / Project
	Transport costs	USD/m ³ /100 km	Country / Project
	Administration costs	USD/ha/yr	Project
	Stumpage costs of standing timber volume (as indicator of production costs)	USD/m ³	Country / Project
	Labor costs (wage/nonwage)	USD/person/yr	Country / Project
	Road infrastructure costs (construction and maintenance)	USD/ha or USD/meter	Project
	Buildings, other infrastructure	USD/ha	Project
Politics and governance	National and regional forest legislation provide enabling environment for forestry investments	Forest legislation favors/does not harm the project	Country
	Political situation is stable	No current or latent political conflict	Country
	Secure land tenure	Frequency of land tenure conflicts; presence of land occupations	Country
	Corruption	Corruption index	Country
	Bureaucracy	Time (in months) from planning a project until start of production	Country
	Handling of import/export of production goods and products	Average time (months) for importing means of production not available on national markets	Country
	Activities of labor unions in the political framework	Predictable/controlled (open for constructive dialogue)	Country
	Formality/informality of the sector	Market share of timber from illegal/informal sources	Country
	Local stakeholders in favor of forestry investment	Yes/limited/no	Project
	Local communities are/were actively engaged in planning phase	Yes/limited/no	Project
Macroeconomics	GDP	Absolute; per capita	Country
	HDI	HDI rank	Country
	Economic growth	GDP development	Country
	Importance of forest sector	Share in GDP	Country
	Inflation	% (past 5 to 10 years)	Country
	Currency risks	Stability of exchange rates	Country

Important Criteria to Assess Business Attractiveness for Planted Forest			
Thematic Group	Criteria	Indicator	Reference Level
	Tax stability	Frequency Tax changes in the past	Country
	Incentives for forestry sector	Yes/no; in case of yes: explain	Country
	International trade	Free trade possible yes/no	Country
Finance (project level)	Investment volume	USD	Project
	Expected return	IRR	Project
	Cash flow profile	Positive cash flow after xx years	Project
	Exit strategy	Explain strategy	Project
Nonfinancial impacts	Project beneficial to rural socioeconomic development	Employment generation; supplying local/regional forest industries	Project
	Project beneficial to environment	Carbon sequestration; taking pressure of natural forests Others (please name and explain)	Project
	Application of international standards (forestry and value chain, if applicable)	FSC certification or other certification schemes (like PEFC or national certification schemes)	Project
Safeguards and reputational aspects	Good relations to local NGOs		Project
	Good relations to international (donor) organizations		Project