

**JOBS
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PAPER**

Issue No. 30

The Plantation Forestry Sector In Mozambique: Community Involvement And Jobs

Leonor Serzedelo de Almeida
Christopher Delgado



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The Let's Work Partnership in Mozambique is made possible through a grant from the World Bank's Jobs Umbrella Trust Fund, which is supported by the Department for International Development/UK AID, and the Governments of Norway, Germany, Austria, the Austrian Development Agency, and the Swedish International Development Cooperation Agency.

 Austrian
Development Agency

 Federal Ministry
Republic of Austria
Finance



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ABSTRACT

Mozambique had 60,000 hectares of large-scale commercial planted forest in 2009, supporting about 3,000 full-time-equivalent jobs. Very little growth in large-scale commercial planted area has occurred since 2009, unlike what would be required to meet predictions at the time of 1,000,000 hectares planted by 2030. Labor costs are three to four times lower in plantation forestry in Mozambique than in Brazil, South Africa, and Uganda. Yet, unit costs per cubic meter of eucalyptus timber produced in Mozambique are higher due to lower tree volume growth rates, skills gaps, and employee absenteeism up to 50%. Yet, deforestation and imports of high-end wood products are rekindling interest in plantation forestry, with recognition of the need for community involvement. Integration of smaller-scale forestry into community land use patterns is taking off.

Recommended actions include: matching grants financed by public resources to leverage private investment and contract farming through community woodlots; empowerment of an independent third-party organization funded by companies to analyze, broker and communicate amongst relevant stakeholders; private sector mobile agroforestry schools for training in remote areas; community land-use plans developed with local stakeholders, delimiting different kinds of land and different rights; and strengthening of community-based organizations that deal with land.

ACKNOWLEDGEMENTS

This report is part of the Let's Work Partnership program in Mozambique (P155043). The authors are Leonor Serzedelo de Almeida and Christopher Delgado. They thank colleagues in the Let's Work Partnership for regular feedback and advice. An important part of the contribution of the work was to synthesize interviews kindly granted by a large number of experts in the forestry sector in Mozambique. In particular, the authors gratefully acknowledge: Professor João Benedito Carlos Nuvunga, Universidade Eduardo Mondlane; Manuel Monteiro, Ministry of Agriculture and Food Security; Paulo Feniassa and Osvaldo Manso, National Directorate of Land and Forests, Department of Forests; Sancho Cumbi, Tongaat Hulett Açucareira de Xinavane, Ltd.; Tonderai Kachale, Rift Valley Forestry, Ltd.; João Lé, Francisco Nobre and Lucrecia Wamba, Portucel Mozambique Ltd.; Wessel Nel, Investimento Florestal de Mozambique Lda (IFM); Arlito Cuco, GreenResources Mozambique Ltd.; Kobus Botha, Servir Mozambique, Ltd.; Pascoal de Castro, Lucite Empreendimentos, Ltd.; Kevin Pitzer, Construa- Build It, Ltd.; Cremildo Rungo, Ifloma, Ltd.; Issufo Tankar, Centro Terra Viva Mozambique; José Cardoso, Moflor; the team from Thirdway Africa; Simon Norfolk, Terra Firma Mozambique; Maria Overeem, Jobamoz; Luis Muchanga, União Nacional de Camponeses (UNAC); and Lorena Manjane, Organização Rural de Ajuda Mutua (ORAM).

The authors are also very grateful for the detailed and helpful comments provided by peer reviewer Andre Aquino, Sr. Natural Resources Specialist at the World Bank, and Joao Moura Estevao Marques and Muino Amarchande Taquidir, also of the Forestry Team at the World Bank. The report was prepared under the general direction and ongoing support of Ian Walker (Task Team Leader). The authors are grateful to World Bank Country Director, Mark Lundell, for his ongoing interest and support. The authors would also like to acknowledge the outstanding editorial assistance received from Aldo Morri.

The report has been made possible through a grant from the World Bank's Jobs Umbrella Trust Fund, supported by the Department for International Development/UK AID, and the Governments of Norway, Germany, Austria, the Austrian Development Agency, and the Swedish International Development Cooperation Agency. Finally, with so many helpers, it seems possible that some persons consulted may not agree with all points, thus the responsibility for the views expressed belongs solely to the authors.

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ABBREVIATIONS

BERF	Business Environment Reform Facility
CBNRM	National Conference on Community-Based Resource Management
CGEC	Global Commission on the Economy and Climate
CSR	Corporate Social Responsibility
CTV	Centro Terra Viva
DFID	UK Department for International Development
DNTF	Department for Land and Forestry
DUAT	Direito do Uso e Aproveitamento da Terra (Land Use Right)
f.o.b.	free-on-board
FIP	Forestry Investment Program
FSC	Forest Stewardship Council
FTE	full-time equivalent
GHG	Greenhouse gas
GoM	Government of Mozambique
ICT	Iniciativa Terras Comunitárias
IFLOMA	Industrias Florestais De Manica SARL Mozambique
IFM	Investimento Florestal de Mozambique Lda.
IPCC	Intergovernmental Panel on Climate Change
ITC-F	Fundação Iniciativa para Terras Comunitárias'
LAGRI	Luatize - Área de Gestão de Recursos Integrada
LCU	Landscape Coordination Unit
MASA	Mozambique Ministry of Agriculture and Food Security
MITADER	Mozambique Ministry of Land, Environment and Rural Development
MozFIP	Mozambique Forest Investment Program
Mt	Metric Tons
MTF	Mozambique Tree Farming Gro up
ORAM	Organização Rural de Ajuda Mutua
REDD+	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
SAFCOL	South African Forestry Company Limited
UN	United Nations
UNAC	União Nacional de Camponeses
UNDP	United Nations Development Program
UPM	PM Biofore Company of Finland
WB	World Bank
WWF	World Wildlife Federation

EXECUTIVE SUMMARY

Mozambique is a relatively land and forest-abundant country. Interest in promoting plantation forestry has increased as a result of rising demand for forest products, concerns about reducing greenhouse gas (GHG) emissions, rapid degradation of natural forests, and search for local income sources in rural areas. Yet plantation forestry at a large scale has been slow to take off in Mozambique, where community views of land rights often conflict with government land allocations to forestry companies. Furthermore, by far the main use of wood in Mozambique remains charcoal for cooking fuel, even in the capital city of Maputo, and this wood is sourced from natural forests on public land. Thus, this large component of growing demand has not directly added to the viable market for commercial forest plantations.

Recent stepped up enforcement of laws concerning sustainable harvest of natural forests has helped increase interest in promoting plantation forestry for the domestic market as well as for export. Also, Mozambique is a net importer of wood construction materials, and people who need income in often remote rural areas could benefit from forestry business expansion to supply the international and domestic market. That said, existing targets to create 250,000 new jobs from 1,000,000 ha of large-scale commercial plantations by 2030 are unlikely to be met. At just 60,000 ha of large-scale commercial planted forest presently and using an optimistic estimate of one full-time job per 20 ha of plantation going forward, large-scale commercial plantation forests have so far been minor contributors to job creation.

All stakeholders—including government, the private sector, and civil society-- increasingly recognize the need to expand community involvement in forest plantation land use. Disagreements over who gets to use which pieces of land are not as big an obstacle as whether villagers are skilled and reliable enough to be profitably integrated into plantation workforces.

Commercial forestry actors also recognize the need to engage local communities more systematically to successfully plant and eventually harvest large allocations of government land. Even companies where community engagement is typically not common have engaged in costly, large-scale corporate social responsibility (CSR) activities, and a number of civil society actors have emerged to help.

More recently, the potential for better integrating smaller-scale commercial forestry into community land use has emerged as part of “productive landscape” activities, which promote commercialization of community agriculture and forestry as part of broader, more sustainable land use. Approaches such as the World Bank-funded Mozambique Forest Investment Program (MozFIP), discussed in this paper, seek to engage local communities, strengthen local land tenure and land use planning, extend sustainable practices, and facilitate out-grower schemes. In this approach, private companies provide community forest product producers with capital, skills, and market access.

Commercial forestry in Mozambique is hindered by the broader factors that challenge all businesses activities in the country: Mozambique ranked 138th out of 190 countries in the 2018 World Bank’s *Ease of Doing Business Indicators*. For forestry, contract enforcement, high capital costs, and accessing inhabited land (which in the view of communities is most land) are prominent obstacles. However, a survey of large-scale commercial forestry companies in Mozambique used in this study highlighted a strong skills gap problem. Of 43 distinct skills needed for commercial forestry, many require no formal education, and only 10 require technical college or university degrees, yet all skills require some formal training that the company must provide. The remoteness of many plantations

raises training costs, while employee absenteeism rates of 25 to 50 percent raise costs further. Company respondents reported needing to bring in non-locals for many jobs and non-nationals for more skilled jobs.

Comparing unit costs per cubic meter of eucalyptus timber produced commercially in Mozambique with Brazil, South Africa, and Uganda is instructive to evaluate the present international competitiveness of the sector. Although labor costs are three to four times lower in Mozambique and Uganda than the other countries, other costs—establishment and maintenance, community relations, administration, and harvesting—are higher in Mozambique and Uganda. Mozambique overall is less competitive than the other country cases. This is even the case for otherwise comparable Uganda, due to lower harvest biomass volume in Mozambique, a biophysical yield issue stemming from soil and climate conditions over which human action has little sway.

A key take-away from this study is that while large-scale commercial plantation forestry is unlikely to be a major creator of jobs for Mozambicans through 2030, integrated smaller-scale commercial out-grower forest activities, on the other hand, offer significant poverty alleviation and sustainability benefits. Activities include reforestation of hillsides and stream headwaters, which provide significant agricultural ecosystem benefits lost through deforestation. These landscape-level community forestry activities and their benefits need market recognition to grow beyond current socially desirable, but not yet financially profitable, activities. The Government of Mozambique (GoM) appears to recognize this potential.

Meanwhile, some large-scale commercial forest companies also seem to recognize the need for a fundamental shift in business methods to better engage communities and conduct corporate social responsibility (CSR) initiatives. To succeed at larger scale, Mozambique needs a unified, synergistic land use approach that integrates community landscape-level projects, local governance, private forest investment, and national infrastructure investment.

1 INTRODUCTION

1.1 OBJECTIVES

Demand for forest products is soaring globally and is increasingly driven by developing country demand, especially for pulp in Asia and charcoal in Africa. People not usually concerned with forestry issues are becoming more sensitized to the key role forests play in mitigating and promoting climate change adaptation (GCEC 2014). In many land and forest-abundant countries such as Mozambique, demand-driven deforestation and opportunities for more and better jobs from plantation forestry have become key economic and climate issues. For Mozambique and the world, sustainable forest production will increasingly need to include development of forest plantations.

At the same time, countries such as Mozambique, where the overwhelming proportion of the population is rural and very poor and where access rights to natural resources are complex and often not well documented, policies and investments in rural areas cannot ignore the effects of investments on local communities. As this study shows, failures in Mozambique to consider past impacts on local communities have largely precluded development of the successful large-scale corporate plantation forestry seen in developed economies and parts of Asia and Latin America.

This paper seeks to understand the plantation forestry sector in Mozambique to identify market segments and local value chains that can be developed sustainably with potential to create large numbers of better paying jobs. These can also reinforce small-scale agricultural ecosystems that provide the major share of livelihoods for the rural poor.

After setting the context for plantation forestry, the paper will discuss large-scale corporate plantation forestry in Mozambique based on new interviews with plantation forestry companies. The paper will then move to small-scale commercial and community forestry models in Mozambique and assess prospects for more and better jobs in the sector.

1.2 THE RISING DEMAND FOR FOREST PRODUCTS, EMISSION CONCERNS, AND THE SWITCH TO PLANTATIONS

1.2.1 Rising demand and emission concerns

Wood products are increasingly in global demand, propelled by emerging and developing countries. One 2012 projection is for a tripling demand by 2050, while a widely accepted and more recent projection forecasts increases from 28 percent for sawn-wood to 192 percent for recycled paper products for pulp to 2060 (ISU 2015; WWF 2012; Elias and Boucher 2014). Globally, deforestation for pulp, timber, and charcoal is typically converted into agricultural uses rather than being left to a slow process of regeneration into forest (GCEC 2014). This is even more so the case where a primary motivation was gaining access to new land. Deforestation, forest degradation, and associated land

use change directly accounted for 11 percent of man-made global GHG emissions in 2010 (IPCC 2014). About 7.6 million ha of global forests are permanently converted each year to other uses.¹

Mozambique is no exception. Mozambique has 32 million ha of natural forest, covering 40 percent of land area (MITADER reported in World Bank 2018a). Yet annual deforestation in Mozambique of nearly 0.8 percent (roughly 250,000 ha) per annum is estimated to have led to additional greenhouse gas (GHG) emissions of 46 Mt CO₂e annually from 2003 to 2013 (World Bank 2018a). At the same time, the Government registered a Nationally Determined Contribution to mitigation from all sectors of 23 Mt CO₂e from 2020 to 2030, and 53 Mt CO₂e from 2025 to 2030, as part of the United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) 2015 process (Ibid.). Mozambique pledged to reduce deforestation by 40 percent in the UN Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+) strategy for 2016-2030 (GoM 2016). Addressing plantation forestry must be a key component of this ambition.

Between 80 percent to 95 percent of total wood use in Mozambique, as in most African countries, consists of production and consumption of charcoal for cooking (World Bank 2016). Even major cities like Maputo employed charcoal for more than 80 percent of fuel needs as recently as 2015 (Luz et. al. 2015). Unlike other continents, charcoal production is a major driver of forest degradation in Africa (GCEC 2014). Domestic market demand for higher value uses of wood products supplied by plantation forestry—such as timber (sawn logs), artisanal construction beams, and value-added products such as treated utility poles—is currently modest. However, demand for these products is projected to grow rapidly: Industrial roundwood (i.e. logs) use in Mozambique is forecast to increase from 2.4 million m³ in 2014 to 6.3 million m³ in 2040 (World Bank 2016).

Despite having extensive natural forest and deforestation, Mozambique remains an importer of timber products for the domestic market, especially for construction and an expanding electricity transmission grid (World Bank 2018a). Despite Mozambique's large land area, inexpensive labor force, and multiple freshwater sources, its plantation forestry sector needs to improve competitiveness in regional and international wood product markets if it is to expand significantly.

1.2.2 The uncertain rise of large-scale plantation forestry in Mozambique

Worldwide, plantation forestry accounts for only about 7 percent of exploited forest area, yet for 33 percent of global industrial roundwood production (FAO 2014, 2015). Globally, plantation forest production grew 66 percent from 1990 to 2015, but production is highly concentrated in a few countries: China, U.S., Russia, Japan, and India (GCEC 2016).

In Mozambique, despite efforts to grow the sector, the present share of plantation forestry area in total forest area is a very low, about 0.2 percent (Working Paper 1 of World Bank 2016). Yet the country has the underlying physical requirements for a sustainable forestry plantation sector: favorable soil and climate conditions provide reasonable—if not stellar—annual growth rates; plantation land is available without jeopardizing food security; and Mozambique is close to growing wood markets in Asia and Southern Africa, which are served by large ports in Nacala, Beira and

¹ Calculated from FAO 2016; this is the estimated annual average for 2010–2015. Reforestation and afforestation averaging 4.3 million ha per year reduce the net loss to 3.3 million ha per year, but old-growth and new forests are not ecologically equivalent.

Maputo. In addition, the government has affirmed its commitment to this sector (GoM MITADER, 2016).

Mozambique's 2009 National Reforestation Strategy aimed to increase commercial forest plantation area to 1 million ha in 2030, up from about 60,000 ha at the time, primarily through large-scale corporate plantations (GoM MASA 2011; World Bank 2016). Growth 2005 to 2011 was subsequently estimated at 65,000 ha, accounting for an estimated 8,000 jobs, or one job per eight ha (Government of Mozambique MASA 2011). Planned establishment of one million ha of forest plantation was estimated to be able to create 250,000 permanent jobs based on optimistic assumptions of one job created per four ha planted. This figure is high even when factoring use of low-skill manual work (World Bank 2016 Working Paper 1). It is also optimistic when compared to an international (middle-income country) benchmark of one worker per 20 ha planted, which would create 50,000 jobs (Ibid.).

The afforestation and reforestation foreseen in the 2009 plan was undoubtedly ambitious, relying on large-scale corporate plantation forestry akin to that in countries with very different land use rights, rural governance, and poverty status compared to Mozambique.² The large-scale sector requires extensive and largely contiguous areas planted with large amounts of homogenous wood. This demands heavy and expensive industrial and operational structures. Such large-scale models require socially accepted and enforceable land rights, a skilled labor force, low-cost and reliable transportation, a conducive and predictable business environment, and low capital cost.

The Mozambique Ministry of Land, Environment and Rural Development (MITADER) REDD+ Strategy of 2016 marks a significant change of approach in dealing with reforestation and afforestation compared with the 2009 Strategy, addressing some of the lessons learned from 2009 with regard to practicing large-scale commercial plantation forestry in inhabited landscapes. The 2016 Strategy addresses the agricultural production needs of local populations, including the need for a consultative approach (MITADER, 2016)

1.2.3 Growing recognition of the importance of community involvement

Our interviews of major players in large-scale commercial plantation forestry for this paper shine a light on the current situation of the large-scale sector: While Mozambique's potential for large-scale plantation forestry potential is apparent, several major constraints in Mozambique limit potential.³ High initial expectations from investors were rarely met. Problems included actual availability of large areas of suitable land for large-scale commercial plantation forestry ostensibly assigned by the government, availability of qualified rural labor, productivity of the work force, and efficient infrastructure for transporting products. The Government's initial enthusiasm for the investment also tended to fade at later stages of the projects and when difficulties emerged with communities.

² Afforestation refers to planting trees on land that has not been forested for a considerable time period. Reforestation results from allowing natural forest to regenerate (with or without help from planting) after being cleared.

³ Interviews conducted by Serzedelo de Almeida with Direção Nacional de Terras e Florestas, Ministerio da Agricultura e Segurança Alimentar (MASA), Portucel Moçambique, Florestas de Niassa, Construa- Build It, Servir Mozambique, Green Resources, Lucite, Moflor, Ifloma, Investimento Florestal de Mozambique Lda (IFM), American Leaf Tobacco, Centro Terra Viva, Terra Firma, Malonda foundation, UNAC, and ORAM. Responsibility for interpretation of the interviews lies solely with the authors and should not be imputed to any specific entity interviewed.

Complications in the relationship between large-scale commercial plantation forestry operators and local communities was identified by all stakeholders as a major obstacle to development of a sustainable forestry sector in Mozambique. Indeed, the information gathered suggests that local community issues should be carefully treated in the very early stages of a project during land rights acquisition (*Direito do Uso e Aproveitamento da Terra*, DUAT). Commencing a plantation forestry project marks the beginning of a long-term relationship between three entities: local communities, forestry operators, and government. If not properly structured and conducted, conflicts between the three entities may be difficult to overcome.

In the same vein, community integration in forestry plantation projects is crucial for livelihoods improvement, but also for the success and sustainability of forestry projects. Ideally neighboring communities would be a source of project labor, including better-paid jobs, communities would also reap a share of returns to the land planted with trees, and as guardians of remote areas where these projects are normally located.

2 STAKEHOLDERS IN MOZAMBIQUE'S PLANTATION FORESTRY SECTOR

2.1 PUBLIC STAKEHOLDERS

According to article 109 of the Mozambican Constitution, the State of Mozambique owns all land in the country and regulates concession of land use rights in exchange for a relatively low annual fee, which may initially appear attractive to forest investors (World Bank 2016 Working Paper 1). The Land Law of 1997 establishes the right of use and benefit of land (*DUAT*). *DUATs* can be obtained by the following groups: individuals and communities that occupy land in accordance with their customary practices; Mozambican individuals using land in good faith for at least ten years; and other groups or individuals that can apply for a *DUAT* title. The first two groups have permanent rights (i.e. *DUATs*) that can be inherited but not sold. The law also stipulates that the absence of land title or registration does not prevent the use of land by its traditional occupants.

The Forestry and Wildlife Law of 1999 (10/99) and Law Regulations of 2002 (12/02) further define procedures for access to long-term concessions and short-term licenses (for Mozambicans only) for exploitation of natural (i.e. not planted) forests. Regulation of the plantation forest subsector—by definition in the realm of long-term concessions—is divided between the Ministry of Agriculture and Food Security (MASA) and the Ministry of Land, Environment and Rural Development (MITADER). Presidential Decree No. 15/2015 assigns the tasks of MASA and MITADER in forests and forestry as follows (MASA, 2017).

MASA's main roles in forests and forestry are: a) to promote and coordinate commercial and industrial reforestation (pulp and paper, chips, lumber, energy, etc.); and b) to develop agroforestry in industrial and commercial plantations and in areas of itinerant agriculture. MITADER, as the Ministry with primary responsibility for promoting sustainable land use, is responsible for promoting reforestation for conservation purposes in unclaimed and uninhabited areas, concessions, reserves, degraded areas, and wood fuel supply areas.

2.2 LARGE-SCALE PRIVATE PLANTATION STAKEHOLDERS

Company profiles⁴ illustrate the nature of the large-scale corporate plantation forestry sector in Mozambique since Independence.

2.2.1 IFLOMA

Industrias Florestais De Manica SARL (IFLOMA), formerly a state-owned company and is now a mixed company with a major South African counterpart, is the oldest forest plantation company in Mozambique. Created in 1977, it was acquired during privatization in 1998 by a Portuguese company, Sonae. In 2002, the State took over again, only to sell back 80 percent of its shares in 2004 to Komatiland Forest Ltd., a subsidiary of South African Forestry Company Limited (SAFCOL), while 20 percent remained with the Instituto de Gestão das Participações do Estado (IGEPE), the entity of the

⁴ From interviews conducted by the first author with main large-scale plantation forestry firms.

Mozambique Ministry of Economy and Finance responsible for managing Stated Owned Enterprises in Mozambique. From 2013 to 2017, the company was virtually dormant. It has now been revived with major investments made in 2018.

IFLOMA has a contiguous block of about 69,000 ha through a DUAT in Sofala Province, of which 35,000 ha can be planted and the rest is for conservation. About 700 ha have been planted so far. In Manica Province, it has a 31,000 ha DUAT, 16,275 ha of which can be planted (pine and eucalyptus). The main products are sawn timber used for construction material, mainly for Maputo; treated poles for the local market; and a projected woodchips plant in Beira for paper fiber. The company has a sawmill with capacity to produce 30,000 cubic meters/year, but it has not been in operation since 2013. However, the company is planning to restart the sawmill in 2018. Their Maputo warehouse distributes construction sawn timber to retailers across the country.

IFLOMA has 595 permanent workers. In Sofala, it has 180 employees as seasonal workers, some of whom will be converted to permanent. Some of its technicians come from South Africa. Counting temps as permanent, this is equivalent to 66 ha planted land operated per worker and 129 ha of DUAT per worker.

2.2.2 Moflor

Moflor, a Mozambican company that belongs to *Grupo Entrepuesto*, grows both native and exotic trees in Sofala and Manica. Moflor has a planted area of about 10 000 ha (*Eucalyptus saligna* or *grandis*), whose production is mainly destined to the domestic market (creosoted poles of various sizes - 6 to 18 m), and the main customers are large companies linked to electricity distribution and telecommunications. It opened an industrial wood processing unit in Dondo, where it produces railway sleepers and wood poles with higher quality and longer durability due to treatment with creosote. Processed exports to South Africa consist mainly of decking from *Eucalyptus saligna* or *grandis*. Presently, the planted area does not exceed 500 ha while the area available for plantation is about 2,100 ha.

Plantation products were harvested for decades with minimal or no replantation. This was due primarily to the difficulties of the Mozambican economy in the post-independence period, and secondarily to the long civil war that rendered the management of plantations a dangerous activity. Moflor has progressively abandoned its industrial forest plantations to focus more on processing native wood. The company has considerably shrunk its industrial output. In the past it produced 1.2 million railway sleepers per year, compared to a current 20-30,000.

Virtually all low-skilled workers are recruited in the villages where the plantations and concessions are located. Several seasonal workers are recruited during the harvest season, depending on the activities to be carried out. Moflor currently employs about FTE 200 workers, 85 percent of whom originate from local communities. Ten years ago, the number reached 350, but nowadays the reduction in plantation activity is the major cause for the cutback.

2.2.3 Three other big companies started after the end of the civil war

In 2012, Niassa Investments had approximately 60,000 ha of planted forests located in an area of 760,000 ha of concessional land covered by a DUAT. The planted forests and concession areas were divided among thirteen identified plantation forestry operators (World Bank 2016, especially

Working Paper 1). At the time, approximately 50 percent of the planted forests were in Niassa province. Plantation forestry operators in the Niassa region have gone through a phase of consolidation. In 2012, there were seven operators in the province and currently three remain: Florestas de Niassa (recently purchased by Construa Build It); Green Resources (purchased Chikweti, Companhia Florestal Massangulo and Florestas de Planalto); and South African-managed Servir, which took over operations from New Forests.

Portucel Moçambique plans to invest US\$ 3 billion on an integrated forestry, pulp, agribusiness and green energy investment in Manica and Zambézia Provinces. Portucel Moçambique received land use rights (DUATs) totaling 356,000 ha and intends to plant eucalyptus trees on approximately 220,000 ha to produce wood pulp for export. It has developed a “mosaic” model that foresees planting only two-thirds of the total area, reserving the remaining one-third for community use. However, the project has experienced continued delays and the company had to write off EUR 14.5 million from the anticipated value of its timber plantations in Mozambique. According to the company’s interim published results of 2016, “the political and economic situation in the country is unstable, which presents additional challenges, in terms of the safety of everyone involved and also the security of products’ supplies, materials and services needed for the project”. By 2017, Portucel Mozambique had planted only 13,000 hectares, representing 4 percent of its DUAT

The Mozambique Tree Farming Group (MTF) and its plantation forestry operating subsidiary Investimento Florestal de Mozambique Lda. (IFM) were born out of South African interest to expand eucalyptus plantation farming operations into Mozambique. For economic viability, the company specified the following pre-conditions: a) a suitable dedicated site within an export harbor to facilitate stockpiling, processing and dispatch of plantation timber. Export would be in ship-loads of 25,000 tons plus, and the site had to be inside the harbor for this to be loaded efficiently; b) access to sufficient timber land with production potential of 20 tons per hectare, per annum or better; and c) plantation areas not more than 250 km to the harbor to reduce land transportation costs. The first MTF/IFM forestry phase foresees establishing 6,500 hectares of plantation in total, spread over Sofala and Manica Provinces. Sufficient land has been secured for this first phase and authorities and communities have offered further land for future expansion thereafter. The MTF/IFM has planted 2,100 hectares, an additional 1,350 hectares will be planted in the coming rainy season, and the balance of phase 1 completed in the year thereafter. Plantations will be felled on a seven-year rotation and exports are planned to commence in 2019.

Future plans according to MTF/IFM are to: a) increase production volumes annually; b) establish a functioning export chain for plantation grown eucalyptus; c) encourage local communities and individuals to plant trees as an additional cash crop, and provide technical advice, management assistance, and access to seedlings; d) develop a stable and weatherproof working environment in Beira harbor for bulk-handling of timber products; and e) add woodchipper facilities to the harbor site as soon as export volumes increase. The company currently employs 350 permanent personnel and 170 temporary workers, and this is set to increase.

2.3 COMMUNITY-LEVEL PLANTATION FORESTRY STAKEHOLDERS

2.3.1 Public sector community-level initiatives relevant to plantation forestry

Efforts have been made to involve communities in land management, critical for the future of plantation forestry. The *Iniciativa Terras Comunitárias* (ICT), established in 2006, provides a good example of such efforts to empower rural communities to lead development processes in relation to land. Funded by a group of donors⁵, this initiative has shown that the registration and formal recording of land-use rights renders smallholder farmers and communities less vulnerable to losing their land. Delimitation combined with basic community land-use planning helps to protect local rights and prepares communities to engage more effectively with external interests such as potential forestry operators.

The Government launched its “Terra Segura” program in 2015. It represents an opportunity to secure land rights for rural communities, either through delimitation or demarcation. “Terra Segura” focuses on three main objectives: consolidate land administration and management systems; protect local community rights while promoting citizenship and sustainable development; and deliver information about community land rights and the rights of citizens with respect to land in general (MITADER, 2015). This program guarantees land rights by making them public— that is, recognized by the state—and protects land rights holders against claims by third parties.

Initiatives such as the Malonda Foundation, created in 2005, resulted from a cooperation agreement between the Mozambican and Swedish governments. Plantation forestry was identified as a key sector. Calculations found that 350,000 ha planted forest would be needed for break-even and the Government of Mozambique’s endowment to the Foundation was nearly 220,000 ha. The main role of the Foundation is to attract foreign investment to Niassa. Five major forestry companies have joined in: Chikweti, UPM, Florestas de Niassa, New Forests, and Green Resources (previously known as Tree Farms). Together they are interested in planting 500,000 ha. The Foundation’s role has been to lower risks by intermediating between the Government and investors, facilitating DUAT acquisition, helping arrange community agreements, and assessing legal implications. Associated private investments boosted employment in several rural districts of Niassa (Chimbonila, Lago, Sanga, Majune and Muembe). Some 3,000 jobs were created, all earning more than the statutory minimum wage. Unfortunately, problems in the management of the Foundation has jeopardized its reputation. Furthermore, only three companies continue to operate under consolidation of ownership. Construa Build It has acquired Florestas do Niassa; Green Resources purchased Chikweti, Companhia Florestal Massangulo and Florestas de Planalto; and South African-managed Servir took over the operations from New Forests.

2.3.3 Civil society engagement in plantation forestry issues

Civil society in Mozambique, as elsewhere, tends to be very sensitive to issues affecting of poor persons’ access to land, and to date has taken a keen interest in the public and private sector initiatives above. Three civil society organizations in particular stand out: UNAC (União Nacional de Camponeses) and ORAM (Organização Rural de Ajuda Mutua) (interviewed for the present paper),

⁵ United Kingdom, the Netherlands, Switzerland, Sweden, Denmark, Ireland, and the U.S. Millennium Challenge Corporation

and Justiça Ambiental. They are actively engaged in supporting community rights in dealing with large-scale corporate plantation forestry (see Manivel et. al. 2011; ORAM 2018).

The Centro Terra Viva (CTV) in Maputo aims to contribute to better public decisions with respect to environmental policies, strategies, and legislation through bringing to bear science and technology. It has an active knowledge outreach program in environmental areas, including community forestry (for example, CTV 2014).

The *Fundação Iniciativa para Terras Comunitárias'* (ITC-F) mission is to strengthen organizational and management capacities of rural communities, delimit community land, sustainably use natural resources, and secure the full benefit of different social groups in partnership with other actors (ITC-F 2018). ITC-F has recently achieved considerable outreach through press accounts in Mozambique of community conflict with large-scale commercial plantation forestry operators (Annex III).

2.3.4 Large-scale private sector community-level initiatives relevant to plantation forestry

Recognizing the need to involve communities better, the large-scale private sector has launched a number of community initiatives relating to plantation forestry. The American Mozambique Leaf Tobacco Afforestation Program, an example of an investor-community partnership, is based on three pillars: a) involving local communities and small-scale farmers in the planting of “live barns” to cure tobacco leaves (made of standing trees specifically planted and pruned for this purpose); b) maintaining communal commercial forestry plots of firewood with a minimum of seven-year harvest cycle following specific community forestry management training; and c) managing regeneration forest (*miombo* woodlands). It seeks to engage closely with communities and those involved in charcoal production or field clearing by fire to identify firewood areas used by farmers and to train them in indigenous woodlands management to ensure long-term sustainability.

Rift Valley Corporation is establishing another initiative through subsidiary Florestas de Niassa (now Construa Build It), with financial support from the UK's Department for International Development's (DFID) Partnerships for Forests Fund. This is the LAGRI (Luatize - Área de Gestão de Recursos Integrada) initiative in Lichinga, Niassa. It intends to create a managed, multiple land-use conservation area as a buffer between forest plantations and protected conservation forest areas. It also aims to integrate local communities into the project through: a) preservation of large tracts of managed *miombo* woodlands that maintain biodiversity and provide income to communities; b) introduction of improved and sustainable agricultural methods to communities that will increase yields, reduce poverty, and improve food security; c) implementation of a strategic plan to manage natural woodland, providing a sustainable source of fuelwood, building material, charcoal, and opportunities for small businesses through forest harvest and beekeeping; d) generation of sustainable revenues for communities through sale of carbon units; and e) provision of employment and a range of wider economic prospects to resident communities through development of the plantation forestry industry.

These community-endorsed business interventions, as well as the introduction of improved management models through land use zoning, aim to contribute to a vibrant and long-term economy in the Lichinga region. Ultimately, the initiative intends to help grow a sustainable regional economy and optimize benefits to communities within Niassa. If successful, this initiative could scale to other Mozambique regions.

In addition to the partnerships above that directly support mutual forest production management objectives of investors and communities, a number of more traditional large-scale corporate social responsibility partnership initiatives between forest companies and communities exist. Examples in Mozambique would be significant programs by the New Forest Company, Green Resources, and Portucel that support community health, housing, and schools, among other areas. (World Bank 2016 Working Paper 2).

2.3.5 Plantation forestry landscape-level interventions and out-grower schemes

Finally, some out-grower schemes for plantation forestry products associate the private sector with broader land use management at the landscape level through productive activities and land use governance of whole rural communities.

Out-growers are typically smallholder farmers that sign a contract with a company to receive inputs and extension advice; in return they are expected to furnish output to the firm, known in this context as an aggregator. In Mozambique, such schemes have been more successful in agriculture than in forestry, likely due to ambiguity in ownership rights over forest land (World Bank 2016 Working Paper 2). However, a number of plantation forestry schemes using out-growers in South Africa and on other continents, where land rights are clearer, have been successful (Ibid).

The Government of Mozambique and the World Bank are launching a series of landscape-level interventions involving community-level plantation forestry and out-grower schemes through the Mozambique Forest Investment Program (MozFIP) (World Bank 2018a). These are initially focused on 160 communities in nine districts in Zambezia and seven districts in Cabo Delgado; they involve investment of \$47 million in public-sector resources and additional private investment (Ibid.).

MozFIP seeks to promote sustainable biomass energy; land delimitation, planning and tenure regularization; and establishment of new planted forests and agroforestry areas. The Project attempts to address multiple drivers of deforestation and aims to facilitate establishment of Landscape Coordination Units (LCUs). It will promote engagement with local communities, strengthen local land tenure and land use planning, and promote mutually-beneficial partnerships between local communities and the private sector. Land security would be linked to investment opportunities to ensure that communities benefit and can continue their own investments on their land. It would also help ensure that they are incentivized to sustainably manage the natural resources under their control. A key component is that MozFIP will promote small-scale forest plantation for commercial purposes through performance-based grants to smallholders. Another key strategy is to engage the private sector to reduce dependence of such initiatives on donor finance, and instead embed productive activities in systems that can be sustained long term. The Project aims to stimulate entrepreneurial programs through the planted forest grant scheme, agroforestry systems that are linked to the market, community-based forest management, and smallholder charcoal production.

3 CONSTRAINTS ON THE DEVELOPMENT OF COMMERCIAL PLANTATION FORESTRY

3.1 BUSINESS ENVIRONMENT AND ACCESS TO CAPITAL

Despite attractive natural conditions, abundant availability of suitable land, and demonstrated political will to expand Mozambique's commercial forestry plantations, a poor business environment and limited access to capital hinders development of the sector. According to the World Bank's *Ease of Doing Business Indicators*, Mozambique ranks 138th out of 190 economies in terms of overall business environment, and Mozambique ranks 184th out of 190 economies in ease of contract enforcement (World Bank 2018b).

In interviews conducted for this report, large-scale plantation forestry operators describe the overall business environment in Mozambique as challenging, characterized by corruption, highly bureaucratic procedures, constrained access to capital, and underdeveloped domestic markets. Mozambique compares to Uganda in the sense that plantation forest operations are characterized by low mechanization and low skilled labor; however, Mozambique has a very limited domestic market, while Uganda has a more established domestic and regional market.

Political and military tensions, growth deceleration, and financial instability have contributed to deterioration of the business environment for rural investment in Mozambique over the years, making the sector less attractive to investment than once expected. Furthermore, Mozambique's capital markets are poorly developed, and the commercial banking system remains highly constraining. The cost of capital is high for plantation forestry operators given front-loaded costs alongside backend-loaded economic returns, and the long-term nature of the forestry business cycle.

In this context, the importance of collaboration among stakeholders— the Mozambican government, communities and civil society, the private sector, and development partners—cannot be understated. Collaboration is needed to reduce investment barriers and to improve the legal and regulatory environment for establishment of new, value-generating forest plantations (World Bank 2016 Working Paper 1).

3.2 INFRASTRUCTURE

Transport infrastructure in Mozambique is primarily developed west to east, connecting mining and agricultural clusters in Mozambique and neighboring countries to seaports in Maputo, Beira, and Nacala. There are three clear corridors: a) Maputo to Gauteng in South Africa (also connecting with Zimbabwe and Swaziland through a railway network); b) the Machipanda line connecting Beira to Zimbabwe and Beira to Tete (Moatize); and c) the Malawi to Nacala railway line. In addition, infrastructure projects such as the Macuse deep water port or the railway in Zambezia province will, once completed, add further logistic alternatives for plantation forestry operators.

Bottlenecks such as insufficient investments in rehabilitation, and lack of human resources sufficient to properly carry out road projects, have kept Mozambique behind in terms of road developments. However, the efficiency of Mozambique's highway network has significantly improved since the 1990s: In the early 90s, the percentage of roads in good or fair condition was 30 percent, but as of 2007, 83 percent of the main network is in good or fair condition (Dominguez-Torres and Briceño Garmendia 2011). However, a network is only as strong as its weakest link and road infrastructure remains troublesome for many plantation forestry operators.

Furthermore, interviews with forestry operators confirmed that transport infrastructure continues to be a major issue, specifically the poor quality of secondary roads and sections of the main network. For a plantation forester in the vicinity of Nampula, road infrastructure is very poor: survey respondents stated that five hours are required to cover 100km, of which only 30km are paved. Port costs in Nacala were also identified as prohibitively high, making it more cost-effective to transport by truck to Maputo or Durban. Furthermore, transport costs by the railway built by Vale in the Nacala corridor are not seen as an option due to prohibitively high transport fares. Infrastructure developments to lower transport costs are key to make the forest plantations in Mozambique viable and competitive in the international market.

Figure 2: Transport



3.3 ACCESS TO LAND AND COMMUNITY ENGAGEMENT

Procedures to access land include complex and time-consuming investigations and negotiations, and constitute a barrier for plantation forestry operators. Applications for DUAT's (as in section 2.1 above) require extensive investigation, desktop study, and local consultation. Government land blocks allocation under DUATs tend to be relatively small in area, even if in aggregate this can involve several blocks at a time and be large. This practice is in place in theory to give the government the flexibility to avoid allocating areas to companies populated by permanent local residences using the land, thus minimizing negative effects on pre-existing farms.

At first glance, Mozambique compares favorably in terms of leasing costs per ha of land when compared to Brazil, Paraguay, South Africa, and Uganda (World Bank 2016 Working Paper 1). The annual fee paid to the government is very low (between US\$ 0.30 and 1.00 per ha per year). In addition, according to the Department for Land and Forestry (DNTF), an average value of US\$ 35 per ha per year is added to compensate communities and implement community development projects (Ibid.. Other hidden costs, due to things like corruption, are likely.

Thus, one of the major arguments for investing in the planted forest sector in Mozambique is relatively low land cost. However, based on plantation forestry operators' experiences in Mozambique, as revealed in the literature and confirmed by the present survey, additional costs to be considered relate especially to necessary compensation of local communities. When including

these costs, Mozambique loses its significant land cost advantage compared to other countries, but it remains competitive.⁶

Not surprisingly then, the corporate forestry sector considers land policy in Mozambique to be sound; however, its implementation is seen as problematic. Institutional arrangements are not clear, leading to land use registration duplication, and land administration services are weak (BERF, 2017). MITADER's "*Terra Segura*" project aims to encourage more efficient land administration, focusing on access, registration, and information management.

For investors, securing a DUAT is very complex. Among other things, it requires public authorities to conduct an assessment that must include provincial cadastral services, local authorities, and local communities. The average duration of this assessment is two years, according to interviews. The results must be documented and signed by all interested parties to identify the exact area of concessions for private investment, and to identify areas where previous DUATs exist. If other customary rights exist in the area, the document needs to provide details on how to govern a partnership between the rights' holder and the applicant (Seufert, 2012).

Communities traditionally occupy vast areas of land; this has been persistently underestimated in the DUAT-granting process. Concessions have been awarded without sufficient consultation by the government for land that communities have been using for some time by tradition. This is a major cause of land conflicts between communities and forestry operators (Centro Terra Viva, 2014). Expectations of government, forestry operators, and communities are not easy to manage, especially in the case of a foreign investment (Ibid.).

Mozambique's customary land tenure regimes vary by region, shaped by factors such as population density, kinship organization, livelihood strategy, local ecology, land quality, and historical experience (Norfolk and Tanner, 2007). Both customary and official systems define land rights with the same objectives of social, environmental and economic sustainable development at a local and national level. Nevertheless, community involvement in land acquisition is weak, with frequent conflicts between customary and official land rights, which lead to conflicts between communities and forestry operators (Monteiro et al., 2016). This deters foreign investment while also creating mistrust and insecurity within communities.

To protect unregistered customary land rights, the *Lei das Terras nº19/97*, 1 October requires that to obtain a DUAT, the investing entity must follow a consultation process with communities, under the rules and procedures of the regulatory *Lei das Terras decreto nº43/2010* and the Ministerial diploma nº 158/2011 of July 15.

In addition, Mozambique's population is projected to more than double by 2050, a trend expected to increase pressure on land, and consequently on the land administration system. Improvement of the mechanisms to involve communities and their customary rights in the land administration process is thus crucial. Plantation forestry operators have identified slash and burn agricultural as a major problem, as communities near the DUAT areas cause detrimental forest fires that damage commercial plantation areas, a problem that is increasing with demographic pressures.

⁶ A finding consistent with World Bank 2016 Working Paper 1.

3.4 LABOR-FORCE SKILLS

Mozambique ranked 180 out of 188 countries and territories in the 2018 Human Development Index (UNDP, 2018). Human capital is one of the main challenges the country faces, with an illiteracy rate close to 50 percent of the population.

Despite major progress in access to primary schooling, three-quarters of the work-force have not completed primary education. A majority of those concluding primary school will do so without having acquired basic reading and writing skills. The high illiteracy rate is partly explained by a lack of qualified teachers and education infrastructure, the high upfront cost of going to school as opposed to working for household subsistence, delayed entry to school, absenteeism and high rates of grade repetition.

Regarding further and higher education, the Government of Mozambique has supported establishment of several institutions spread over the country. However, the educational programs in these institutions are seen as being too theoretical and not sufficiently adapted to present market needs (JOBA, 2016), causing doubts about suitability of graduates.

The JOBA skills report identifies a serious lack of trained manpower and managerial capabilities. Education and training in forestry technology, entrepreneurship, business management and marketing are deficient (Sutton, 2014). This is underlined by the fact that in the majority of plantation forestry operations management teams and senior skilled staff are hired from abroad (especially from Zimbabwe and South Africa). Previous studies have observed that the typical forest worker at plantation forestry operators in Niassa is a local farmer with no previous work experience or established skills in commercial forestry. By improving the skills of the workforce, increasing their productivity, and reducing absentee rates (estimated to be 25 percent to 50 percent), relative labor costs between Mozambique and its competitors can be lowered and competitiveness increased (World Bank 2016 Working Paper 2). The interviews of large-scale commercial plantation forestry actors confirmed a general lack of needed skilled workers.

3.5 OVERVIEW OF ELEMENTS SHAPING MOZAMBICAN COMPETITIVENESS IN PLANTATION FORESTRY

Comparative financial competitiveness of plantation forestry across zones and countries is determined by the measurable relative biophysical growth conditions for trees and the measurable financial outcomes stemming from biophysical factors. These outcomes manifest as land costs per ha, per year; plantation establishment costs; administrative costs (including annual government costs and security and also Corporate Social Responsibility (CSR) costs; harvest costs (which involve multiple factors besides labor and machinery); and transport (typically to a free-on-board [f.o.b.] export point or domestic wholesale market) (World Bank 2016, Working Paper 1). Table 1 summarizes key comparative cost elements for Mozambique and comparator countries.

Table 1: Illustrative production costs for 1 m³ timber in Mozambique and comparator countries (circa 2014)

Cost item	Unit	Brazil	South Africa	Uganda	Mozambique
Labor (chain saw operator)	US\$/mo.	350	375	100	100
Land	US\$/ha/yr	120	100	40	30
Plantation establishment & maintenance	US\$/ha	1,650	1,600	2,100	2,000
Administrative	US\$/ha/yr	95	160	150	130
Harvesting cost	US\$/m ³	8	9.5	10.5	15
Harvest volume	m ³ /ha/yr	336	240	260	184
Accumulated cost 8-year rotation	US\$/ha	3,370	3,680	3,620	3,280
Unit Production Cost	US\$/m ³	10.03	15.33	13.92	17.83

Note: These unit costs are meant as illustrations for cross-country comparisons of eight-year Eucalyptus plantations; there is no time discounting and differences in transport costs to final market are not fully included. Harvest volume is mostly a result of biophysical factors (“mean annual increments” in forestry terms), but also the efficiency of the production system beyond these biophysical factors.

Source: World Bank 2016 Working Paper 1; original data are from multiple sources, including UNIQUE databases and Castren *et al.* (2014)

As Table 1 indicates, comparatively inexpensive land and very inexpensive labor in Mozambique could be attractive to international investors. The accumulated cost of producing a 1 ha rotation of eucalyptus in Mozambique seems to compare favorably even to Brazil, if ignoring the notable omission of the difference in capital costs in the two locations. However, much lower harvest volume per hectare on Mozambican plantations renders unit production expensive even compared to high-cost South Africa. This lower harvest volume is explained primarily by climate and soil factors, but could also be affected by the quality of maintenance and low labor productivity of the operation. The bottom line is that scaling and creating more and better-paying jobs in the Mozambican plantation forestry sector requires boosting labor productivity in local communities.

4 BOOSTING LABOR PRODUCTIVITY IN PLANTATION FORESTRY THROUGH IMPROVING SKILLS

As seen above, improving skills is critical for improving plantation forestry competitiveness in Mozambique. Skills improvement is a pre-condition for more significant job creation in plantation forestry and bringing more benefits to local communities. It will also be a precondition for better jobs overall. Lack of progress on community skills building adds costs and leads to sourcing more qualified workers from outside the community. The skills barrier to widespread local hiring provides grounds for community disappointment. Therefore, it is worth looking more closely at what skills are needed and what can be done to meet the skills need.

4.1 TRAINING NEEDS ANALYSIS FOR LARGE-SCALE COMMERCIAL PLANTATION FORESTRY

A Training Needs Analysis for large-scale forestry plantations was conducted on the basis of interviews with several plantation forestry operators in Mozambique (see Annex 1 for a sample questionnaire response). The Analysis provides a useful planning tool for potential forestry plantation operators and can serve as a reference guide for other stakeholders interested in the integration of communities into the forestry sector through job creation.

A vital factor with regards to access to skilled labor in the plantation forestry context, as discussed with JOBA for the present report and also seen in JOBA (2016), is that training should primarily be driven by demand-driven and focus on integrating people directly into the labor market.

Thus, the purpose of the Training Needs Analysis was to better understand: a) the process of integration of local community workers in a commercial forestry plantation in Mozambique; b) the amount of training plantation forestry operators need to integrate community members into their labor force; and c) the number of workers per hectare needed for each forestry activity.

4.1.1 Methodology for the Training Needs Analysis

The first step was to identify the most relevant plantation forestry activities in a standard commercial plantation. This was done through a data survey based on Best Forestry Practices (Direcção de Serviços de Valorização Florestal, 2003) and Tree Planting Guidelines for Uganda (Jacovelli, 2018). Table 2 provides a comprehensive list of activities a plantation forest operation undertakes.

Table 2: List of commercial plantation forestry activities

List of activities
Foreman
Land Preparation
Initial Clearing Manual Cutting/Slashing Initial Clearing Burning Initial Clearing Spraying with Herbicide
Initial Clearing Mechanical Equipment
Weeding Control
Chemical Weeding Mechanical Weeding Manual Weeding
Soil Mobilization
Manual Mobilization Mechanical Mobilization
Chemical Mobilization
Elimination/Control the Blossom out of Trees
Mechanical Elimination (Blossom out of trees)
Chemical Elimination (Blossom out of trees)
Planting and Sowing
Plant Selection/Seed Selection Transport and Packaging Lining Out
Pitting
Water Planting Beating-Up (replace seedling)
Construction and Maintenance of Infrastructure
Planning Timber Landing Area and Loaders
Construction and Maintenance auxiliary road and forest fire divisional network Water Zones (Fire and Biodiversity)
Pruning
Planning Pruning Pruning
Thinning
Stocking Marking and Thinning Extraction and Loading after Thinning
Measuring Trees and Monitoring Plantation Growth
Sampling and Measuring
Harvesting
Manual Harvesting Mechanical Harvesting (Harvester) Pruning, Marking and Cutting Logs Debark the Logs
Removing Wood from the Plot
Extraction and Loading Transport
Fire Control and Prevention

Working with Communities Ensure Early Detection
Common Pests and Diseases
Routine Inspections Collect/Package/Label Samples Diagnose and Follow the Treatment
Eucalyptus Coppice

Once the list of activities of a standard commercial forestry plantation in Mozambique was identified, the second step was to understand how workers are selected. A team of interviewers met with both relevant academic and business stakeholders to better understand the issues related to filling different kinds of plantation forestry jobs in remote areas without a large-scale plantation forestry tradition.⁷

The interviews revealed two common practices: 1) a preliminary selection is done by community leaders, and 2) workers are divided in different categories. A pattern emerged based on previous work experience represented in the four generic categories of workers identified in Table 3.

Table 3: Commercial forestry plantation worker typology

Worker typology
Inexperienced subsistence farmer
Worker that had some previous professional training
Worker with previous experience in an agriculture or a forestry company
Worker with technical or university degree

A series of preliminary interviews were then carried out to understand how forestry companies are currently dealing with the challenge of working in remote areas with a very limited supply of skilled workers. It was addressed to large-scale forestry company managers in Mozambique selected on the basis of experience in training specific tasks to workers. The survey included *Portucel Moçambique*, *Florestas de Niassa/Rift Valley*, *Servir Mozambique*, Green Resources, Lucite.

Based on the interviews with operators, skills training could be separated into four segments depending on the activity. Table 4 reflects that the numbers of training days for a specific forestry activity is directly linked to the level of complexity it requires.

⁷ Professor João Nuvunga from Universidade Eduardo Mondlane has vast experience working with communities in Mozambique; Sancho Cumbi from Tongaat Hulett Açucareira de Xinavane represents a success story in training subsistence farmers to partake in out-grower activities. Responsibility for the interpretation of the sense of the interviews lies solely with the present authors.

Table 4: Training day intervals selected in survey to enable a worker to perform each forestry activity

Training day intervals
1 to 5 days
5 to 10 days
22 to 90 days
More than 90 days

Following the interviews, a questionnaire was sent to forestry operators to further elaborate skills needed by specific companies (see Annex B Table A1 for an example of a completed questionnaire). The questionnaire focused on the list of forestry activities mentioned above coupled with the typology of workers found to be employed by a forestry plantation operator.

4.2 Findings of the Training Needs Analysis for Large-Scale Commercial Plantation Forestry

The primary finding of the firm survey is that most of the activities needed in a forestry plantation can be performed by community members without a technical or university degree. Furthermore, for several tasks, literacy is not a decisive factor for employment.

However, the findings of the firm survey suggest that the Mozambican generally lacks skilled workers, which raises plantation forestry operational costs. Given the difficulty remote communities face in accessing urban centers to attend formal training, most training needs need to be provided on site, further boosting costs to operators. These increased corporate costs make it challenging to integrate communities into large-scale corporate plantation forestry.

Table 5 shows two distinct levels of qualification for forestry activities: activities not requiring formal educational qualifications and the ones that require either a technical or university degree.

Table 5: Forestry activities and level of educational qualification required

Forestry activities that do not require educational qualifications	Forestry activities that require a technical or university degree
Foreman Initial clearing manual cutting/slashing Initial clearing spraying with herbicide Initial clearing burning Initial clearing mechanical equipment Chemical weeding Mechanical weeding Manual weeding Manual mobilization Mechanical mobilization Chemical mobilization Mechanical elimination Chemical elimination Plant selection/ seed selection Transport and packaging Lining out Pitting Water planting Beating-up (replace seedlings) Water zones (fire and biodiversity) Planning pruning Pruning Stocking Marking and thinning Extraction and loading after thinning Manual harvesting Mechanical harvesting (harvester) Pruning, marking and cutting logs Debark logs Extraction and loading Transport Selection of shoots for coppice	Collect/pack/label samples for pests and diseases Construction and maintenance of auxiliary roads and a network of forest fire breaks Diagnose and follow up with treatment for pests and diseases Ensure early detection of fire Planning timber landing area and loaders Routine inspections for pests and diseases Sampling and measuring trees Working with communities Manager Administrative

Source: Firm survey

Another important finding is that the skills most onerous to train, and at the same time most pressing, are those that demand more than a month of training. Operators consider these to be intermediary and specialized skills. According to the plantation forestry operators surveyed, these skills require having had some previous professional training or work experience in a formal agriculture or forestry

company. The length of specialized training also implies higher costs to the company due to long periods of onsite training.

Table 6: Prioritized forestry skills by type of worker, location and number of workers per hectare

Prioritized forestry skills (all skills that require more than 22 days training)	Type of worker	Specific training	Number of workers per ha
Construction and maintenance of auxiliary roads and forest fire break networks	some professional training	on-site training sessions	8 per ha
Extraction and loading	some professional training	on-site training sessions	no data
Initial clearing with mechanical equipment	some professional training	on-site training sessions	1 operator/machine/ha
Mechanical harvesting (harvester)	some professional training	on-site training sessions	no data
Planning pruning	some professional training	on-site training sessions	0.2 per ha
Planning timber landing area and loaders	some professional training	on-site training sessions	0.25 per ha
Pruning	some professional training	on-site training sessions	4 per ha
Routine inspections for pests and diseases	some professional training	on-site training sessions	2 per ha
Transport of wood from the plot	some professional training	on-site training sessions	5 per ha
Water zones (for fire protection and biodiversity)	some professional training	on-site training sessions	0.25 per ha
working with communities	some professional training	on-site training sessions	not quantifiable
administrative	with technical or university degree	technical institute or university	not quantifiable
diagnose and follow the treatment for pests and diseases	with technical or university degree	technical institute or university	2 per ha
sampling and measuring trees	with technical or university degree	technical institute or university	1-2 per ha
ensure early detection of fire	previous experience in agro or forestry company	on-site training sessions	community members (not quantifiable)
marking and thinning	previous experience in agro or forestry company	on-site training sessions	2 per ha
foreman	subsistence farmer (community)	on-site training sessions	1 supervisor per 50 workers

Source: Firm survey

Regarding the added-value for workers due to training, questionnaires revealed a significant increase in employment opportunities. For instance, it showed that the number of forestry activities that can be performed by a subsistence farmer can increase to 22 after attending minimal formal training, as shown in Table 7 below.

Table 7: Training effect on subsistence farmer skills

Subsistence farmer that had attended some previous professional training (22 forestry activities)
Beating-up (replace seedling)
Chemical elimination
Chemical mobilization
Chemical weeding
Collect/packet/label samples
Construction and maintenance of road and forest fire divisional network
Debark the logs
Diagnose and follow treatments with chemicals
Ensure early detection of problems
Extraction and loading
Foreman
Initial clearing burning
Initial clearing mechanical equipment
Initial clearing spraying with herbicide
Lining out
Manual harvesting
Marking and thinning
Mechanical elimination
Mechanical harvesting (harvester)
Mechanical mobilization
Mechanical weeding
Planning pruning
Planning timber landing area and loaders
Plant selection/seed selection
Pruning
Pruning, marking and cutting logs
Routine inspections
Sampling and measuring trees
Selection of shoots stocking
Transport of wood from the plot
Transport and packaging of plants
Water planting
Water zones (for fire combat and biodiversity)
Working with communities

Source: Firm survey

Other relevant findings from the surveys included that commercial forestry plantations normally select workers within local communities. To avoid community conflict, preliminary selection is made by community leaders.

Community relations can be complex. Hiring priorities of local male community leaders may run counter to the priorities of outsiders. Implementing initiatives must be done thoughtfully and community sensitivities about female workers must be considered. Outsiders must be aware of and be sensitive to local governance and community gender roles, especially related to how communities may view male company representatives. It is good practice for companies to hire female extension staff to recruit female workers.

Respondents from large-scale companies stressed that training should be primarily driven by demand and focused on specific skills rather than general educational curriculum covered by public education. Most operators agreed that all degrees--whether technical or from a university--require additional specific training to complement what school learning. Finally, work ethic in terms of financial ambition and showing up reliably was identified as a particular issue to address in Mozambique compared to company experience in other countries, even in the region. While very difficult, plantation forestry operators that do offer training are trying to address ethic issues.

Respondents identified very high levels of worker absenteeism of between 25 and 50 percent in addition to lack of skills of the workforce. Therefore, plantation forestry operators tend to engage more workers than required to guarantee delivery of tasks. It was not clear from responses how many workers are actually employed on full-time equivalent (FTE) basis.

According to the interviews, three typologies of workers are currently found in a forestry plantation: full-time, occasional, and subcontractor workers. The number of workers fluctuates a great deal, depending on the type of intervention and the rotation period. For small and medium plantations (<7,000 ha), the number of workers varies between 16 and 30 full time and up to 300 part-time. For bigger plantations (>7,000 ha), the number of workers is roughly 100 full-time and 2,500 part-time.

4.3 THE OVERALL IMPACT OF PLANTATION FORESTRY ON JOBS IN MOZAMBIQUE

A reality check on employment estimates from large-scale commercial plantation forestry is provided by the estimate of approximately 60,000 ha of large-scale commercial plantation forestry managed forest at the present time (World Bank 2018a) and a generous estimate of an average one FTE job per 20 ha based on the analysis above, translating to a maximum of 3,000 FTE jobs in large-scale commercial plantation forestry in Mozambique presently.

If the very ambitious objectives discussed above of achieving 1,000,000 ha of planted forest by 2030 (World Bank 2018a) were realized, this would lead to a maximum of 50,000 FTE jobs in large-scale commercial plantation forestry using the 20 ha per job yardstick. But the realities of competition at that scale across countries would likely lower average labor/output ratios to closer to current

regional norms, or by at least half, to 40 ha per FTE job.⁸ A survey of applicable ratios in other countries found 50 ha per job in large-scale commercial plantation forestry (World Bank 2016 Working Paper 3). Together, these two estimates would suggest an upper jobs limit likely closer to 20,000 to 25,000 FTE jobs in large-scale commercial plantation forestry in Mozambique by 2030.⁹ This figure is also based on expansion in large-scale commercial plantation forestry areas that is not consistent with experience to date because of conflicts with communities.

Instead, it seems likely that the best prospects for creating forestry jobs at scale in Mozambique for the time being—especially for the poor for whom they would be net gains in employment—lies in community forestry initiatives underpinned by corporate forestry ventures with a commercial objective. These community initiatives would need to integrate planted forests as a mosaic with agriculture, and like commercial smallholder agriculture in Mozambique, would need to bring commercial opportunities to communities on both the input cost reduction and market growth side of plantation forestry via out-grower schemes. Such schemes can also be integrated with larger commercial reforestation schemes in adjoining areas, especially in relation to topography (slope) and watercourse headlands (World Bank 2016 Working Paper 3).

Smallholder agriculture is the main source of land user in Mozambique and is the main source of livelihoods to rural populations, both directly and indirectly. It still represents the main livelihood of 70 percent of Mozambique's population. Mosaic forestry, reforested hilltops in agricultural areas, and reforested headwaters of watercourses are key to providing ecosystem services to agriculture, such as water control, soil retention, wind breaks, pollination, and many other vital services that natural forests are providing less of in deforested agricultural areas. While the social benefits of community-based forestry exceed the market-mediated benefits, the latter are still high enough to support the activity (GCEC 2014).

The symbiosis of the right kind of plantation forestry with agriculture, and consequently its delivery of real benefits to farming communities, is the likely driver of success at scale. Mozambique is currently behind more densely populated countries such as Ethiopia and Malawi in this area, but has the potential to scale up widely and quickly. Unlike agriculture, most community forestry costs are up front, and potentially seven to eight years must pass before realizing significant direct profits from harvested wood. Since many of the ecosystem benefits of growing trees and crops/livestock in close proximity are not market-mediated, this gives rise to market externalities where those who bear the cost of planting community forest are not necessarily the same people who reap the ecosystem benefits for proximate agriculture. This implies the need for community-level institutions to govern productive landscapes and platforms that can coordinate the interests of different stakeholders, including the private sector (GCEC 2014, Delgado et al. 2015).

As noted above, the Government of Mozambique and the World Bank are partnering on a US\$47 million project (MozFIP) promoting integrated landscape management at the community level and

⁸ A figure roughly supported by Negede et al. (2015) in a study of employment in Ethiopia's 419,000 ha of planted forest when all casual labor is included. Similar norms in Asia and Latin America with larger plantations and more capital equipment might approach 60-80 ha per FTE.

⁹ As noted above, the official (MITADER) estimate of the impact of 1,000,000 ha of planted forests by 2030 would be to create 250,000 jobs, but that is not consistent with evidence in Mozambique and elsewhere on commercially viable employment under large-scale commercial plantation forestry, so there is a need to look to other ways of achieving these gains.

strengthening the enabling conditions for sustainable forest management in Zambezia and Cabo Delgado. The eventual evaluation of this endeavor will provide both lessons and a proof of concept for scalability of the initiative.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 TWO FACTORS CONSTRAINING COMMERCIAL PLANTATION FORESTRY

Two main constraints to flourishing large-scale commercial forestry in Mozambique emerged from interviewing stakeholders, backed up by a survey of literature. The most important is positive community involvement in granting land and operational access to companies. The need for improved policy to address the needs of the whole productive landscapes is the second most important constraint to confront.

5.1.1 Community involvement in land access

The uneasy relationship between communities, on the one hand, and plantation forestry operators and government on the other, remains a major issue. More attention and resources must be allocated to engage with communities from the very early stages of a plantation forestry project. This is essential to reducing the high likelihood of conflict. There is a need to better address land access security and an improved enabling business environment for forestry plantation operators.

A lack of clarity and transparency regarding land negotiations and land use has resulted in community conflicts and increased costs to plantation forestry operators, discouraging potential investors. There is a clear need for efficient and transparent administrative processes regarding land negotiations, and strategic investment policy is still lacking. Such a policy should seek to link remote production areas and transportation routes to allow forestry products to find their way up value chains.

5.1.2 The need for policy to take a holistic approach to productive landscapes

MITADER has in the past three years taken significant actions to promote forest sector reforms. Although these are mainly targeted to halting degradation of natural forests, they are of major importance for development of plantation forestry (World Bank 2018a), and include an effort to clarify land rights at the individual parcel and community levels. Public sector actions also target agroforestry growth and more sustainable charcoal production.

Ultimately the objective of expanding plantation forestry at scale has to be part of the larger ongoing effort to prepare a National Land Use Plan, including a National Forest Policy, Strategy, and Law. An effort to promote expansion of the National Conference on Community-Based Resource Management (CBNRM) to facilitate dialogue between civil society, research and community-based groups, and government and the private sector. Matching concessional public sector grant resources can leverage private investment in community woodlots, other community-led plantation forestry, and commercial plantation forestry efforts with community out-growers.

5.2 KEY INTERVENTIONS

5.2.1 Related to corporate access to land

An independent third-party organization could be endorsed by relevant stakeholders and paid by companies to intermediate communications between forestry operators, communities, and government. Different cultures can be a constraint for mutual understanding between communities and foreign plantation forestry operators. Both sides (plantation forestry operator and the community/employee/out-growers) will have to adapt and be flexible to create constructive dialogue that guarantees integration of community members along the value chain.

Communications would include distribution of information to enhance awareness within communities of their rights and land values. Topics should include current and new activities and areas for communities, including activities and areas that might be more usefully ceded to investors and what the communities could realistically expect to get out of doing that. Other topics could include informational materials outlining the negative impact of practices such as slash-and-burn agriculture on asset values—both market-mediated and eco-system service related—that would accrue to the community as a whole. Government development of spatial territorial plans with adequate community and private participation is an essential tool for sustainable management of the country's natural resources.

Out-grower schemes provide an opportunity to form sustainable and inclusive partnerships between plantation forestry operators and communities. Initiatives such as the World Bank's (WB) Forestry Investment Program (FIP) support sustainable plantations for multiple purposes, involving rural cooperatives, local service providers, and entrepreneurs. Private out-grower schemes developed in the agriculture sector for commodities such as cotton, poultry, sugar and so forth, and provide lessons learned for use in the plantation forestry sector.

5.2.2 Interventions related to access to knowledge

Mobile agroforestry schools supported by companies in their concession areas would fall in the category of "doing well by doing good". Mobility between remote areas and urban centers constrains job training. Displacing people from the communities to training centers for long periods of time is costly and challenging for individuals. Mobile agroforestry schools mitigate current lack of access to training in remote areas while avoiding the heavy costs of placing training institutions throughout a vast country such as Mozambique. Sending instructors into communities also familiarizes trainers with community needs and concerns, providing important inputs into future programs.

The absence of a representative body of forestry plantation operators in Mozambique—a corporate membership association of forestry plantation operators--was noted by most corporate stakeholders interviewed. As in most countries with a plantation forestry sector, a body of forestry plantation operators could help standardize and harmonize policies, and help organize, advocate for, and represent the sector both nationally and internationally. It could also become a think tank on best practices, including community engagement and infrastructure development.

Finally, the process of defining minimum criteria for sustainable forest management legislation and establishment of Forest Stewardship Council (FSC) directives is under way in Mozambique. This will

allow for greater transparency in creating and applying forest management rules, and elevating quality standards for corporate forest operations and products.

5.2.3 Policy actions

Interventions to regularize land tenure for local communities are essential to better manage productive landscapes. This involves development of community land-based plans with local stakeholders, delimitation of different kinds of land and related rights, and strengthening community-based organizations that deal with land. It will eventually entail issuance of DUATs to community stakeholders and strengthening land registries to keep track of records and land administration more generally. These efforts will likely require improved geo-spatial and information handling technologies and tools to facilitate the above tasks.

The immediate market for community-based forest products in Mozambique mainly involves hardwood timber for furniture, construction timber, transmission poles for utilities, and above all sustainable feedstock for charcoal. As we discussed, the private sector largely needs to provide the technical forestry, business, and other skills and inputs that do not exist in large numbers in Mozambican communities.

Forestry is by definition a user of multi-annual credit, also missing in Mozambican villages. Facilitating private out-grower schemes through a public-sector grant scheme is a priority to build the sector and support self-reliance. Beyond infant industry arguments, the positive externality benefits of replanting forests support the logic for public financing. Community-level grant schemes, however justified by underlying economics, require substantial investment in local self-governance institutions.

Finding ways both to deliver and fund ecosystem services in integrated landscapes requires landscape-level institutions. In some parts of South, Central, and North America, a single farm includes hill crests, riverine areas, headwaters, and downstream fields. In such cases, land use planning occurs within the farm. In Mozambique, community-level institutions (or larger) will be necessary to solve landscape-level problems. Emergence of such institutions will be easier if they can also offer a degree of social income protection and agricultural benefits in addition to dealing with forest issues. This suggests a large public-sector role, but also the need for financing from private sector partners.

Finally, having a strong national Land Use Plan and credible national governance efforts for both natural and planted forests will ease mobilization of concessionary support from development partners, corporate social responsibility investments from forestry firms, and fiscal support from non-land parts of Government. Mozambique appears to be embarking in this direction, meaning the time for plantation forestry in the country may at last be at hand.

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This report is based on a synthesis of three significant but unpublished working papers by the organization UNIQUE, commissioned by the World Bank, all originally dated May 21, 2016 (see below)

Working Paper 1: Assessing the investment climate in the planted forest sector in Mozambique. Available at:
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Working Paper 2: Addressing smallholder needs in planted forests in Mozambique, Available at:
<http://www.biofund.org.mz/wp-content/uploads/2019/01/1548407183-Smallholder%20report%20FINAL.pdf>

Working Paper 3: Activity plan to improve the investment climate in the Mozambican planted forest sector. Available at: <http://www.biofund.org.mz/wp-content/uploads/2019/01/1548406715-Roadmap%20FINAL.pdf>

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ANNEX A

List of Interviews

(NB: Responsibility for views expressed in the paper, even as coming out of the interviews, cannot be attributed to any one source alone unless stated as such. All responsibility remains with the authors.)

Professor João Benedito Carlos Nuvunga, Departamento de Produção Vegetal da Universidade Eduardo Mondlane, [Interview](#)

Mr. Sancho Cumbi, Agriculture Operations, Training and Small Scale Growers; Development Manager at Tongaat Hulett Açucareira de Xinavane, Sancho.Cumbi@tongaat.com, [Phone Interview](#)

Mr. Manuel Monteiro, Ministry of Agriculture and Food Security / National Directorate of Agriculture and Plantations, manuelmonteiro946@yahoo.com.br - [Interview](#)

Mr. Paulo Feniase, National Directorate of Land and Forests (DNTF) - Chefe repartição da Industria florestal, paulofeniase@gmail.com- [Interview](#)

Mr. Osvaldo Manso, Department of Forests - National Directorate of Land and Forests (DNTF), omanso@yahoo.com.br , [Interview](#)

Mr. Tonderai Kachale, Managing Director at Rift Valley Forestry, tkachale@riftvalley.com , [Phone Interview](#)

Mr. João Lé, CEO at Portucel Mozambique, [Interview](#)

Mr. Francisco Nobre, Sustainability Manager at Portucel Mozambique, francisco.nobre@portucelsoporcel.co.mz , [Interview](#)

Ms. Lucrecia Wamba, Director Communication and Community Relations, lucrecia.wamba@portucelsoporcel.co.mz , [Interview](#)

Mr. Wessel Nel - Project Director at Investimento Florestal de Mozambique Lda (IFM), wesselnel@mozfiber.com , [Phone Interview](#)

Mr. Arlito Cuco, Managing director at GreenResources Mozambique, arlito.cuco@greenresources.no , [Interview](#)

Mr. Kobus Botha, CEO at Servir Mozambique, kobus@servir.co.mz, [Interview](#)

Mr. Pascoal de Castro, Manager at Lucite Empreendimentos, rio.lucite@gmail.com, [Phone Interview](#)

Mr. Kevin Pitzer, Managing Director at Construa- Build It, kevin@construa.co.mz,

Mr. Cremildo Rungo, Regional Manager, Ifloma, Cremildo.Rungo@safcol.co.za, [Interview](#)

Mr. Issufo Tankar, Environmental Policy and Legislation Program at Centro Terra Viva,
issufotankar@gmail.com, Interview

Simon Norfolk, Managing director at Terra Firma Mozambique simon@terrafirma.co.mz - Interview

Maria Overeem, Jobamoz team leader –movereem@jobsmoz.org Interview

Nuno Carepa, General Management at Universal Leaf Africa Phone - still waiting for enquiries
Phone Interview

Vanessa Cabanelas, Justiça Ambiental vanessacabanelas@gmail.com, jamo@gmail.com, – Phone
– still awaiting answers- Refused an Interview afraid of being associating JA with large scale forestry
plantations

Luis Muchanga, UNAC, sonyabanda@gmail.com Interview

Lorena Manjane, ORAM (Organização Rural de Ajuda Mutua) Interview

ANNEX B:

Example of training needs for commercial forestry

Figure B1: Questionnaire response by Florestas de Niassa

List of Operations	FLORESTAS DO NIASSA		
	Type of Operator capable of doing The Each Forestry Operation (Column B)	Estimate of Necessary Training Days to enable the selected Worker to Perform Each Forestry Operation	Type of Operator capable of doing The Each Forestry Operation (Column B)
Foreman	Previous experience in a Agro or Forestry company	1 to 5 Days of Training	1 supervisor per 50 general labour
Land Preparation			
Initial Clearing Manual Cutting/Slashing	Subsistence Agricultor (Community)	1 to 5 Days of Training	4 to 12 depending on weed intensity
Initial Clearing Burning	Subsistence Agricultor (Community)	1 to 5 Days of Training	2.5 people per ha
Initial Clearing Spraying with Herbicide	Operator that had Some Professional Training	1 to 5 Days of Training	6.5 people per ha
Initial Clearing Mechanical Equipment	Operator that had Some Professional Training	1 to 5 Days of Training	0.25 per ha
Weeding Control			
Chemical Weeding	Operator that had Some Professional Training	1 to 5 Days of Training	2.5 people per ha
Mechanical Weeding	Operator that had Some Professional Training	1 to 5 Days of Training	0.25 per ha
Manual Weeding	Subsistence Agricultor (Community)	1 to 5 Days of Training	4 to 6 per ha
Soil Mobilization			
Manual Mobilization	Subsistence Agricultor (Community)	1 to 5 Days of Training	4 people per ha
Mechanical Mobilization	Previous experience in a Agro or Forestry company	1 to 5 Days of Training	0.25 per ha
Chemical Mobilization	Operation not applicable	Operation not applicable	Operation not applicable
Elimination/Control the Blossom out of trees			
Mechanical Elimination	Operation not applicable	Operation not applicable	Operation not applicable
Chemical Elimination	Operation not applicable	Operation not applicable	Operation not applicable
Planting and Sowing			
Plant Selection/Seed selection	Operator that had Some Professional Training	More than 90 Days of Training	0.5 people per ha
Transport and Packaging	Previous experience in a Agro or Forestry company	1 to 5 Days of Training	
Lining Out	Previous experience in a Agro or Forestry company	5 to 10 Days of Training	1 per ha
Pitting	Subsistence Agricultor (Community)	1 to 5 Days of Training	4 people per ha
Water Planting	Subsistence Agricultor (Community)	1 to 5 Days of Training	4 people per ha
Beating-Up (replace seedling)	Subsistence Agricultor (Community)	1 to 5 Days of Training	2 people per ha
Construction and Maintenance of Infrastructures			
Planning Timber Landing Area and Loaders	Operator With Technical or University Degree	22 to 90 Days of Training	0.25 per ha
Construction and Maintenance auxiliary road and forest fire divisional network	Operator With Technical or University Degree	22 to 90 Days of Training	3km per day (grading) & 2.5 people per day firebreak construction
Water Zones (Fire and Biodiversity)	Operator that had Some Professional Training	22 to 90 Days of Training	0.25 per ha
Pruning			
Planning Pruning	Operator that had Some Professional Training	22 to 90 Days of Training	0.2 per ha
Pruning	Previous experience in a Agro or Forestry company	5 to 10 Days of Training	4 per ha
Thinning			
Stocking	Previous experience in a Agro or Forestry company	5 to 10 Days of Training	1 per ha
Marking and Thinning	Operator that had Some Professional Training	22 to 90 Days of Training	2 per ha
Extraction and Loading	Operator that had Some Professional Training	22 to 90 Days of Training	Not as yet at this stage
Measuring Trees and Monitoring Plantation Growth			
Sampling and Measuring	Operator With Technical or University Degree	22 to 90 Days of Training	10 to 15 ha per person
Harvesting			
Manual Harvesting	Previous experience in a Agro or Forestry company	5 to 10 Days of Training	Not as yet at this stage
Mechanical Harvesting (Harvester)	Operator that had Some Professional Training	More than 90 Days of Training	Not as yet at this stage
Pruning, Marking and Cutting Logs	Operator that had Some Professional Training	22 to 90 Days of Training	Not as yet at this stage
Debark the Logs	Previous experience in a Agro or Forestry company	1 to 5 Days of Training	Not as yet at this stage
Removing Wood from the Plot			
Extraction and Loading	Operator that had Some Professional Training	22 to 90 Days of Training	Not as yet at this stage
Transport	Operator that had Some Professional Training	22 to 90 Days of Training	Not as yet at this stage
Fire Control and Prevention			
Working with Communities	Operator With Technical or University Degree	More than 90 Days of Training	Not quantifiable
Ensure Early Detection	Previous experience in a Agro or Forestry company	5 to 10 Days of Training	Not quantifiable
Common Pests and Diseases			
Routine Inspections	Operator that had Some Professional Training	5 to 10 Days of Training	Difficult to quantify per ha
Collect/Pack/Label Samples	Previous experience in a Agro or Forestry company	5 to 10 Days of Training	Difficult to quantify per ha
Diagnose and Follow the Treatment	Previous experience in a Agro or Forestry company	5 to 10 Days of Training	Difficult to quantify per ha
Eucalyptus Coppice			
Selection of Shoots	Operation not applicable	5 to 10 Days of Training	Not applicable in our case

Notes: Days of training required by a forestry operation for each labor category:

- **List of Operations:** based on the most common operations undertaken on a forestry plantation
- **Type of Operator:** capable of doing each plantation forestry operation. The typology of operators is: “Subsistence farmer” - local community member without any labor experience; “Previous experience in agriculture or forestry company” - a community member or from the neighborhood; “Operator that had some professional training” - could be a community member, but also an operator with a technical degree.
- **Estimate of Necessary Training Days:** days needed to enable the selected worker to perform each forestry operation: between 1 to 5 days; 5 to 10 days; 22 to 90 days and more than 90 days of training
- **Estimate of Operators per hectare:** needed for each forestry operation

ANNEX C:

Community conflicts in the Mozambican press

Figure C1: Community conflicts in the Mozambican press



Community conflicts within the plantation forestry sector have sparked much controversy in the Mozambican press. Some headlines published by major Mozambican newspapers are shown above and underline the importance of effective and reliable management between the community, forestry plantation operators and the government.

Newspapers in Figure A2.1 report that policies that guarantee the channelling of financial benefits to communities in regions where forestry activities are being conducted have not been implemented, exemplified in the articles by cases from Tete and Zambezia provinces. Also, there have been reported community revolts in Nampula due to misunderstandings concerning the right of land use by plantation forestry operators, as well as due to disappointment by community members who allegedly have not seen any benefits being generated by the plantation forestry operator through their social responsibility commitments.

The main source of reported conflict, however, involves the use of land by large-scale corporate forestry plantations that had been customarily used by communities for subsistence agriculture. It is also reported that there have been successful instances of mediation that have reduced land conflicts in provinces with forestry operators through programs conducted by the 'Iniciativa de Terras Comunitárias'. This civil society actor has the mission to strengthen organizational and management capacities of rural communities, delimit community land, sustainably use natural resources, and secure the full benefit of different social groups in partnership with other actors. Nevertheless, finding better ways to manage community interests, land governance, and plantation forestry operator relationships remain key aspects to improve in order to develop the sector.



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