Floresteca S/A

MANAGEMENT PLAN

1 JANUARY 2019 – 31 DECEMBER 2020

Prepared By:
Teak Resources Company (TRC)
December 2018

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Introduction

Floresteca S.A. ("Floresteca" or the "Company") is a forest company focused on the sustainable and responsible management of Teak plantations in Brazil. Founded in 1994, the Company was established with the objective of developing and managing teak plantations in Brazil. Floresteca forests produce teak round logs for export markets and firewood.

The Company's forest operations currently are focused on sylvicultural maintenance, including thinning, pruning, pest control, road maintenance, among others. The current workforce stands at 86 active employees, distributed throughout Floresteca's 23 teak farms located in the southern portion of Mato Grosso State. Floresteca's forest management process is fully sustainable and ensures that the teak plantation activities occur in accordance with the preservation of the existing native forests reserves. Floresteca has received FSC certification for most of its forests since 1997.

COMPANY HISTORY

Floresteca was originally founded as Floresteca Agroflorestal Ltda, under the National Tax Payers Registry number (CNPJ) 74.301.482/0001-56. The Company began plantation operations in 1994 in the municipality of Jangada, in the state of Mato Grosso, about 90 km from Cuiabá, the State capital. From 1994 to 1999, it expanded to include areas in Rosário Oeste, near Jangada. In 1997, Floresteca received Forestry Stewardship Counsel (FSC) Certification, maintained to the present, for most of the plantations under management. From 1998 Floresteca began planting on third party land through usufruct or land use deal (LUD) contracts. Under these contracts, Floresteca planted teak on the property of the land owner-partner, who in return is due a percentage of the planted forest as payment, with delivery of the timber at roadside. The percentage due to the land partners varies as per the specific contracts. All costs associated with silviculture and maintenance, as well as harvesting and final land clearing for LUD partners are borne by FSA.

Between 1999 and 2000, the Company expanded to the Cáceres and Porto Esperidião regions of Mato Grosso, where there was greater availability of suitable land for teak plantations, as well as greater availability of support services. Over the years the Company has made changes to adapt to the ever changing legal and tax environment in Brazil. Today Floresteca is a Sociedade Anonima (SA) and is now called Floresteca S/A.

In 2016 FSA entered into the phase of annual final harvests.

In March 2017, FSA agreed to a Management Services and Timber Sales Agreement (MSTSA) with TRC Agroflorestal Ltda (TRC), outsourcing a wide range of services previously performed by FSA. This agreement allows FSA to maintain continuity in the management of its forests at on economically advantageous terms, at a variable costs tied to the number of hectares standing annually and assure access to the expert know-how of the largest teak management company in Brazil. While FSA maintains a dedicated workforce to perform silvicultural maintenance, general administration and harvesting will be performed by TRC.

Previously, FSA sold logs directly to buyers in Asia, incurring significant costs and risks for logistics and distribution. FSA now sells its timber roadside in Mato Grosso to TRC, greatly reducing the

working capital requirements and risks associated with log export sales (credit/default risk). The logs are sold at market prices and based on an independently produced quarterly benchmark report for Mato Grosso teak logs. As a result, going forward, top line revenue is less than in the past reflect the lower sales basis (excluding logistics), with selling expenses essentially eliminated.

OVERVIEW OF THE PLANTATIONS

Floresteca is responsible for the management of 30,418.35 of total area including teak plantations, legal reserves, permanent preservation areas, roads, fire lanes, buildings, and other areas unsuitable for teak plantation inside the teak stands.

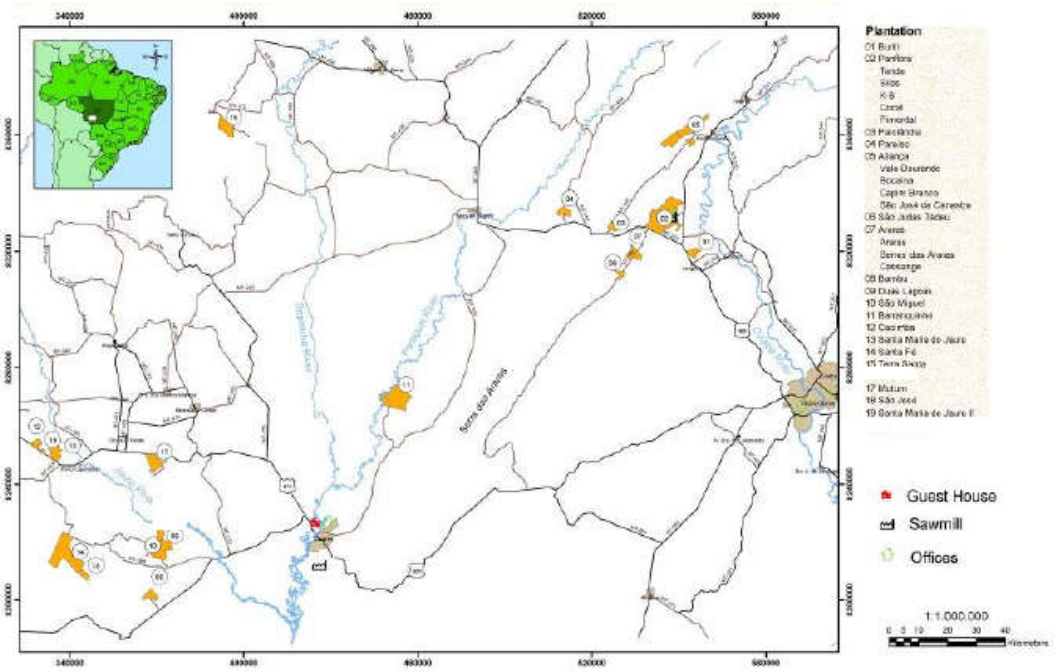
Table 1.1.1 - Floresteca Land Use Summary by Region

REGION	TPA	TMA	CA /FR	OTHERS	TOTAL/FR
JANGADA	3.639,94	2.634,76	2.754,12	988,30	7.382,36
CÁCERES	7.327,81	6.948,17	2.711,33	628,28	10.667,42
PORTO ESPERIDIÃO	6.553,48	6.520,55	5.000,10	814,99	12.368,57
TOTAL	**17.521,23**	**16.103,48**	**10.465,55**	**2.431,57**	**30.418,35**

Notes: TPA = Total Planted Area; TMA = Total Managed Area; CA / FR = Conservation Areas or F Reserve Areas; Other typically refers to areas used for roads, buildings, etc.

We show the locations of the individual farms in the following map, and a more detailed breakdown of each region by project and farm below.

Figure 1.1.1 Location of the Floresteca Plantations in Mato Grosso, Brazil



1. Executive Summary

Please note that all references are to US$ in this report unless otherwise stated. This Management Plan is for the period 1 January 2019 to 31 December 2020, with a specific focus on the first twelve months (F19).
This management plan sets out the guidelines for the sustainable production of teak to be delivered at the roadside of the plantations, describing objectives, responsibilities, available resources and the environment in which the Company operates.

The main objectives of this management plan are:

- Maximize the financial returns of the forests for all stakeholders;
- Manage and harvest the plantations of *Tectona grandis* (Teak) in the most efficient manner and seeking the highest possible production quality;
- Ensure environmentally responsible management, with full compliance with all laws and regulations;
- Contribute to the economic development of our areas of operation, generating a positive impact on the welfare of our employees and adjacent communities, as a leading member of these communities;

Overall project status:

- Floresteca S/A is located in the State of Mato Grosso, where it manages 16,103.48, hectares of *Tectona Grandis* (Teak) at September 31th 2018, planted on 52,862.74 of leased land, and composed of 23 individual farms planted between 1994 and 2008. The area is detailed by farm in appendix 2.

The Manager makes the following recommendations:

1. Maintain scheduled thinnings to avoid in-stand competition and control disease outbreaks, independent of market conditions, as the most important value driver comes from the final cut volumes. During the first 24 months of this plan, our recommended thinning schedule is:

   - **2019 Thinnings:** Barranquinho 2002, 2003 and 2004 (2nd), Cacimba 2002 (3rd), Terra Santa 2004 (3rd), Duas Lagoas 2005 and 2006 (3rd), Mutum 2007 (3rd) and Santa Maria do Jauru II 2008 (2nd);
   - **2020 Thinnings:** Cacimba 2002 and 2003 (3rd), Santa Maria do Jauru 2002 and 2003 (3rd), Santa Fé 2003 (2nd), Barranquinho 2004 (2nd) and Mutum 2007 (2nd).

2. Realize the final harvest, at the eligible projects, according to the recommended schedule:

   - **2019 Final Harvests:** Paiolandia 1997 and 1998, Bocaina 1998 and 1999, Canastra 1998, São Judas Tadeu 1998, Araras 1999, Capim Branco 1999 and Cassange 1999;
   - **2020 Final Harvests:** Paraíso 1997, Bocaina 1998, Capim Branco 1999 and Vale Dourado 1999;

Financial Summary

The table below shows the consolidated accrual basis cash flows forecast for the next 2 years. Detailed information is provided in the subsequent sections.

Table 1.1.2. Accrual Basis Budgeted Cash Flow

	2019		2020		Total	
	BRL	USD	BRL	USD	BRL	USD
Log Sales Revenue	39,066	10,280	34,299	9,026	73,365	19,307
Biomass (Firewood)	100	26	105	28	205	54
Revenues (Net of taxes)	38,159	10,042	33,499	8,815	71,657	18,857
Silvicultural and Other Direct Costs	-5,132	-1,351	-4,868	-1,281	-10,001	-2,632
Harvesting Costs	-10,322	-2,716	-9,504	-2,501	-19,826	-5,217
Managment Service Costs	-7,291	-1,919	-6,988	-1,839	-14,279	-3,758
LUD	-1,298	-342	-797	-210	-2,095	-551
CapEx - Leasing	-592	-156	-82	-22	-674	-177
Accrual Basis Result	**13,523**	**3,559**	**11,259**	**2,963**	**24,782**	**6,522**

2. Financial Forecasts

2.1 Sales Volume

Based on the most recent Growth &Yield data and our internal optimization process to maximize project value, FSA has updated the operations schedule. Details on the decision process are provided in section 5.

The table below summarizes the plan:

Table 2.1.1: Sales volumes (m^3), per harvest type*:

Intervention	Project	2019	2020	Total
2T		**12,046**	**14,457**	**26,503**
	BAR02	5,292	0	5,292
	BAR03	430	0	430
	BAR04	6,324	6,700	13,024
	MUT07	0	850	850
	SMJ02	0	5,107	5,107
	STF03	0	1,800	1,800
3T		**21,689**	**14,393**	**36,082**
	CMB02	1,403	4,000	5,403
	DLG05	552	0	552
	DLG06	5,788	0	5,788
	MUT07	2,083	0	2,083
	SMJ02	0	10,393	10,393
	TST04	11,863	0	11,863
CF		**62,000**	**53,000**	**115,000**
	ARA99	4,908	0	4,908
	BOC98	13,100	3,000	16,100
	BOC99	8,972	0	8,972
	BUR94	4,000	0	4,000
	CAN98	3,770	0	3,770
	CAS99	6,849	0	6,849
	CPB99	3,758	33,000	36,758
	PAI97	8,928	0	8,928
	PAI98	6,491	0	6,491
	PAR97	0	12,000	12,000
	SJT98	1,224	0	1,224
	VDO99	0	5,000	5,000
Total		**95,735**	**81,850**	**177,585**

*Note: 2T = Second Thinning; 3T = Third Thinning; CF = Final Harvest

Table 2.1.2: Sales volumes (m^3) 2019 comparison to last Management Plan Report:

Project	MP 2018-19	MP 2019-20	Var.
ARA99	4,500	4,908	408
BOC98	8,998	13,100	4,102
BOC99	9,000	8,972	-28
BUR94	13,501	4,000	-9,501
CAN98	4,500	3,770	-730
CAS99	6,900	6,849	-51
PAI97	7,940	8,928	988
CMB02	9,000	1,403	-7,597
SJT98	2,800	1,224	-1,576
VDO99	7,300	0	-7,300
SMJ02	13,499	0	-13,499
STF03	2,886	0	-2,886
VDO99	4,500	0	-4,500
DLG05	0	552	552
DLG06	0	5,788	5,788
TST04	0	11,863	11,863
PAI98	0	6,491	6,491
BAR03	0	430	430
BAR04	0	6,324	6,324
CPB99	0	3,758	3,758
MUT07	0	2,083	2,083
BAR02	0	5,292	5,292
Total	**95,323**	**95,735**	**412**

The sales assumptions for the forecast period are shown in the tables below:

Table 2.1.3: Sales Assumptions 2019-2020

	Volume	Revenue USD	Weighted Average Price USD
2019	**95,735**	**10,280,479**	**107.38**
Export	**52,791**	**7,446,961**	**141.06**
Short	17,418	3,629,807	208.40
Semi Long	10,288	913,134	88.76
Long	25,086	2,904,020	115.76
Sawmill	**42,944**	**2,833,518**	**65.98**
Short	42,944	2,833,518	65.98
2020	**81,850**	**9,026,060**	**110.28**
Export	**49,705**	**6,485,135**	**130.47**
Short	13,307	2,955,068	222.06
Semi Long	6,868	562,037	81.84
Long	29,529	2,968,030	100.51
Sawmill	**32,145**	**2,540,924**	**79.04**
Short	32,145	2,540,924	79.04
Total	**177,585**	**19,306,539**	**108.72**

The roadside price has been updated with market information from Consufor October 2018 Teak Timber Price Report. The pricing assumptions used in this Management Plan are provided in Section 4.3.

2.2 Sales Revenue

The 2019-20 budget will generate net stumpage revenue for all the upcoming years, from the thinnings and final harvests commented in the section 2.1above.

Table 2.2.1: Consolidated Stumpage Revenue*

Consolidated										
Description	Unit of Measure	2019			2020			Total		
		Units	USD	USD/Unit	Units	USD	USD/Unit	Units	USD	USD/Unit
Roadside Revenue	m3	95,735	10,280,479	107	81,850	9,026,060	110	177,585	19,306,539	109
Firewood	st	7,143	26,316	4	7,143	27,500	4	14,286	53,816	4
Cost of Production	m3	95,135	-1,884,399	-20	81,850	-1,635,834	-20	176,985	-3,520,233	-20
Tax on Sales	m3	42,944	-265,074	-6	32,145	-238,143	-7	75,089	-503,217	-7
Net Stumpage Revenue	**m3**	**95,735**	**8,157,322**	**85**	**81,850**	**7,179,583**	**88**	**177,585**	**15,336,905**	**86**

*Note that net stumpage revenue does not consider the costs of operations.

2.3 Capital Expenditure

Below there are the list of capital expenditures needed for forestry activities in 2019:

Table 2.3.1:

Equipment	Acquisition Cost USD	Residual Value USD	Net CapEx USD	Activity
15 Polepruners	-11,842.11	1,184.21	-10,657.89	Prunning
1 Tractor 75 HP	-34,210.53	10,263.16	-23,947.37	Mechanical Mower
2 Hydraulic Mower	-7,894.74	789.47	-7,105.26	Mechanical Mower
1 Tractor 100 HP	-42,105.26	12,631.58	-29,473.68	Mechanical Mower
Total	**-96,052.63**	**24,868.42**	**-71,184.21**	

The machinery listed is for replacement of existing, depreciated equipment. The estimated residual value from the sale of the old machinery is shown in the column Residual Value.

2.4 Net Cash Flow (Cash Basis)

Table 2.4.1: FSA Projected Cash Flow for 2019 and 2020 by Quarter (Cash Basis)

	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	Total
Opening Cash	**1.036.927**	**2.010.503**	**2.416.817**	**2.625.385**	**3.952.841**	**5.612.749**	**5.988.282**	**7.174.555**	**1.036.927**
Log Sales Revenue	2.527.766	2.168.905	1.915.736	3.031.552	3.060.921	2.274.329	2.427.328	2.217.889	19.624.427
Biomass (Firewood)	6.579	6.579	6.579	6.579	6.875	6.875	6.875	6.875	53.816
Revenues (Net of taxes)	2.468.729	2.137.260	1.842.561	2.956.653	3.014.262	2.210.159	2.400.904	2.144.500	19.175.026
Silvicultural and Other Direct Costs	-300.849	-399.408	-305.077	-345.324	-317.044	-395.649	-248.235	-320.152	-2.631.737
Harvesting Costs	-494.473	-616.190	-826.467	-779.151	-577.758	-763.078	-499.792	-660.364	-5.217.274
Variable Management fee	-471.777	-476.997	-482.275	-487.612	-452.851	-457.423	-462.042	-466.706	-3.757.685
LUD	-131.810	-209.789	0	0	0	-209.789	0	0	-551.389
CapEx - Leasing	-94.664	-26.982	-18.595	-15.530	-5.055	-7.041	-2.917	-6.615	-177.399
Bank Fees	-1.579	-1.579	-1.579	-1.579	-1.645	-1.645	-1.645	-1.645	-12.897
Closing Cash	**2.010.503**	**2.416.817**	**2.625.385**	**3.952.841**	**5.612.749**	**5.988.282**	**7.174.555**	**7.863.572**	**7.863.572**

The cash from commercial logs harvested and sold is paid within 120 days after harvesting and is used in this table to estimate the net cash available at the end of each quarter.

3. Direct Forest Costs

This section presents the direct forest costs of the FSA plantations, first showing the annual expected expenses and quantities, as well as unit costs in USD for each of the forecast years. Direct forest costs are related to the activities involved in maintaining the plantations, such as pruning and weed/ sprout control. The activities themselves are described in greater detail in Appendix 1.

In the sections that follow, we provide greater detail on the assumptions for each of the main activities.

2019

Description	Unit of Measure	2019		
		Units	USD	USD/Unit
Sprout Control	ha	1,124	58,075	52
Road Maintenance	km	181	95,921	531
Firebreak Maintenance	ha	505	92,926	184
Operational Support	un	-	367,424	-
Total Direct Forest Costs	**ha**	**-**	**614,346**	**-**

2020

Description	Unit of Measure	2020		
		Units	USD	USD/Unit
Sprout Control	ha	1,347	73,904	55
Road Maintenance	km	0	0	0
Firebreak Maintenance	ha	490	104,062	212
Operational Support	un	-	383,516	-
Total Direct Forest Costs	**ha**	**-**	**561,483**	**-**

See the appendix 3 for detailed activity per project.

3.1 Sprout Control

We are currently changing the way we control stump re-sprouting. Until now, we would wait for the sprouts to grow and cut them off using sickles from time to time. Beginning in 2019, we will apply herbicide to the stumps right after thinning so that they do not grow back. This decision was based on trials we have done with different herbicides, where we considered the mortality rate of the stumps and effects of potential toxicity on the remaining trees. With this change, we expect to achieve a minimum mortality rate of 75% on stumps, with no harm done to standing trees, which we expect will largely and permanently resolve all Teak re-sprouting. Our expectation is that this cost will become largely a one-time event following thinning, and should therefore generate cost savings over time.

Appendix 1 provides additional information on sprout control.

3.2 Road Maintenance

The budget calls for maintenance on the main roads of the farms prior to any commercial thinning, so that the wood can be more easily transported. Road maintenance will be performed on the following farms: ARA99, CAS99, BOC98, SJT98, PAI97, TST04, BAR02, CAN99 and CPB99

Appendix 1 provides additional information on road maintenance and Appendix 3 provides the detailed costs per farm.

3.3 Protection & Measurement

3.3.1 Protection

Firebreak maintenance activities are done each year to avoid damage from fires; keeping buffer zones clear from any vegetation around the farm and planted areas.

4. Market Outlook

This section updates the main market factors which impact FSA and the plantations results. In the first section we look at the domestic Brazilian macroeconomic situation, which impacts costs via the FX rate. We then turn factors which impact revenue, first with a discussion of trends in global import supply and demand for the tropical hardwoods and teak markets, followed by a focused look at the Indian market, the largest and most import for teak. We then show the updated evolution of roadside teak prices in Mato Grosso. We finalize with the budget prices for the Management Plan forecast.

4.1 Macroeconomic Outlook and Exchange Rate

While sales of the estates are largely driven by export markets in Asia (to be detailed below in section 4), operations in Brazil are impacted by the local macroeconomic situation. The most direct effects on operations come from the FX rate, which impact USD stated costs, and of which domestic logistics are the biggest element. However, the demand for firewood and even logs for the construction and furniture industry are impacted, as well as labor costs through annual negotiations with unions.

Below we present some selected macroeconomic indicators to show the recent evolution in Brazil, as a basis for our assumptions for the management plan forecast period.

Table 4.1.1: Brazilian Macroeconomic Indicators

Selected Brazilian Macroeconomic Indicators	2015	2016	2017	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2
Real GDP Growth YOY	-3,8%	-3,5%	1,0%	0,0%	0,4%	1,4%	2,1%	1,2%	1,0%
Real Investment Growth (YOY)	-13,9%	-10,3%	-1,8%	-3,7%	-6,7%	-0,5%	3,8%	3,5%	3,7%
Industrial Production	-8,3%	-6,4%	2,5%	1,2%	0,3%	3,2%	4,9%	3,0%	2,0%
Retail Sales (YOY growth)	-4,4%	-6,3%	2,1%	-3,2%	2,9%	4,3%	4,2%	3,8%	1,6%
Unemployment Rate (EOP)	9,0%	11,3%	13,2%	13,7%	13,0%	12,6%	12,0%	12,6%	12,7%
Public Sector Borrowing Requirement (% GDP)	10,2%	9,0%	7,8%	9,1%	9,4%	8,8%	7,8%	7,4%	7,3%
Net Public Sector Debt / GDP	35,6%	46,2%	51,6%	47,5%	48,3%	50,9%	51,6%	52,4%	51,6%
CPI (IPCA Index) YOY	10,7%	6,3%	3,0%	3,9%	0,9%	2,4%	4,7%	2,8%	7,9%
Interbank Rate (CDI) p.a.	10,9%	14,0%	9,9%	12,7%	10,6%	9,3%	7,2%	6,5%	6,4%
BRL / USD (Average per Period)	3,33	3,49	3,19	3,14	3,21	3,16	3,25	3,24	3,61
Trade Balance (Exports - Imports), USD Billions	17,7	45,0	64,0	13,8	21,1	16,3	12,8	11,0	16,5

The overall picture of the last 3 years has been one of deep recession, with GDP having fallen substantially beginning in the second half of 2014, 3.8% and 3.6% declines respectively in 2015 and 2016, with growth returning only in the second quarter of 2017, and the year finishing with 1.0% GDP growth, with growth continuing in the first half of 2018 at about the same level. Overall, the recession has been widespread in the economy, hitting employment hard (currently at 12.7% nationally, having peaked at 13.7% in early 2017). Investment, industrial production, and retail sales all contracted substantially in this period with only the latter two, along with employment, showing clear improvement in more recent quarters.

The origin of the recession is largely a result of overly expansive fiscal policy by the prior federal administration. Net public sector debt grew from 35.6% at the end of 2015 to 51.6% of GDP at the close 2017 and continues on a worrying growth path. The main driver of this growth is federal entitlements and transfers, particularly public pensions and social security. These provide very generous benefits to retired civil servants and low retirement age for all federal pensioners, and when combined with growing life expectancy and slowing population growth, have led to substantial deficits. This spending and subsequent concerns about the trajectory of the public debt led to higher inflation and interest rates, peaking in 2015. Inflation has since come down substantially as the recession has exerted downward pressure on prices and allowed for interest rates to fall to historically low levels.

This situation led to a significant appreciation of the FX rate (BRL / USD), which peaked in early 2016 near BRL 4.00 /USD, before gradually falling to current levels in the BRL 3.15 -3.25 / USD area. However, in 2Q2018, the BRL has depreciated significantly reaching BRL 3.77 / USD at the close of the second quarter and has remained over BRL 3.70 since then with a considerable volatility due to the federal elections in the country, reaching a peak of BRL 4,18 / USD. The combination of a higher exchange rate with falling domestic demand has led to robust trade surpluses, though a more careful analysis shows this is less due to export growth, but a substantial fall in imports.

The fiscal situation remains the main uncertainty in the overall outlook for domestic fundamentals in this Management Plan. While the current administration has taken several steps to address the issue (including a balanced budget law, passed in 2016), pension reforms are the subject of ongoing concern and debate. This subject will require substantive measures from the next administration following the conclusion of federal elections at the end of October 2018. The topic received little substantive attention during the campaign, however the president elect will have to tackle this topic at the outset of his term, beginning January 1st, 2019.

Looking forward, and with the above situation as a backdrop, current market forecasts for inflation and FX are provided by the Brazilian Central bank's monthly FOCUS survey market forecasters. Brazilian inflation is projected at 4.4 % in 2018, 4,2% in 2019 and falling to 4.0% in 2020 (in line with the inflation target). FX rates are forecast to average BRL 3.75 in 2019 and remain close to this level for the subsequent years. We will use a constant FX rate of 3.75 for the full period of this Management Plan and report differences in FX in a separate line item in Quarterly Management reports.

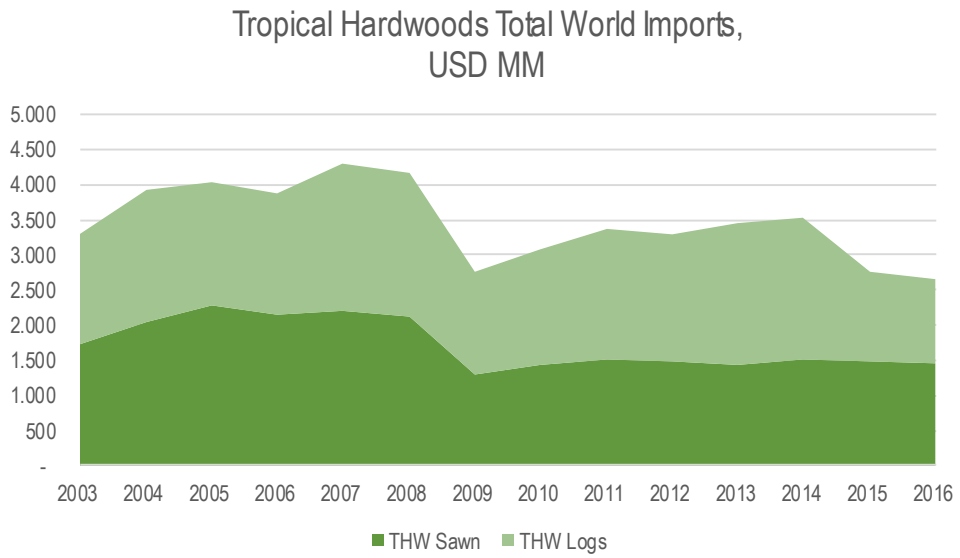
The exchange rates are assumed for any conversions between R$ and US$ dollars during the term of the plan are R$/US$ 3.80 and US$/R$ 0.26

4.2 Tropical Hardwood World

4.2.1 Demand

Tropical hardwoods (THW) imports, which include teak wood along with other mainly natural forest tropical hardwoods, total USD 2.6 billion, of divided nearly equally between logs and sawn products. Total THW imports fell in 2016 and are now considerably below their 2014 peak of USD 3.5 billion. Most of the decline is due to log imports, which we will discuss further below, as THW sawn products demand has been consistently stable in value terms over time.

Figure 4.2.1

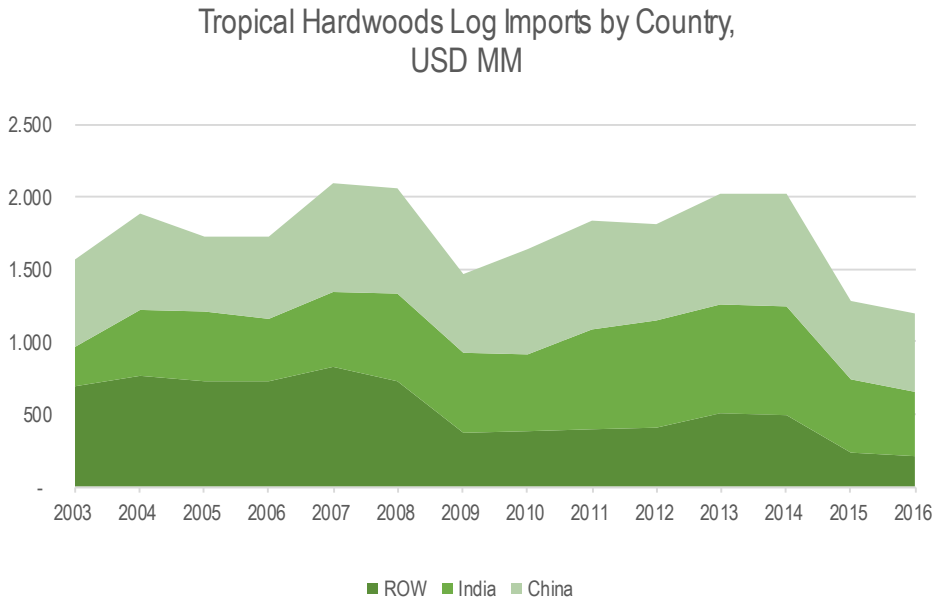


Source: International Tropical Timber Organization

4.2.2 Markets

The THW log import markets are dominated by China and India, the largest individual consumer markets, with 45% and 37% respectively of the total world imports. The remainder (rest of the world, ROW) is very fragmented among many other countries, mostly in Asia and Europe. As shown in the graph below, the THW log market has declined substantially in USD terms since the 2014 peak, with lower demand in 2015 and 2016 (2017 numbers are not available given the reporting lag of many countries). Year-to-date 2017 data shows a substantial increase in Chinese imports in 2017, while Indian imports in 2017 are lagging the same period in 2016 through August.

Figure 4.2.2



Source: International Tropical Timber Organization

In contrast to THW log imports, THW sawn imports are more evenly spread over a larger range of countries. In the table below, we show the top 5 importing countries, led again by China (18% of the total), with India placing 4th (8% of total global imports).

Table 4.2.1

Tropical Hardwoods Sawn Products Imports

USD MM	**2014**	**2015**	**2016**
World Total	**1.508**	**1.487**	**1.451**
China	246	278	266
United States	168	170	149
Belgium	157	153	163
India	71	118	109
Thailand	52	57	69

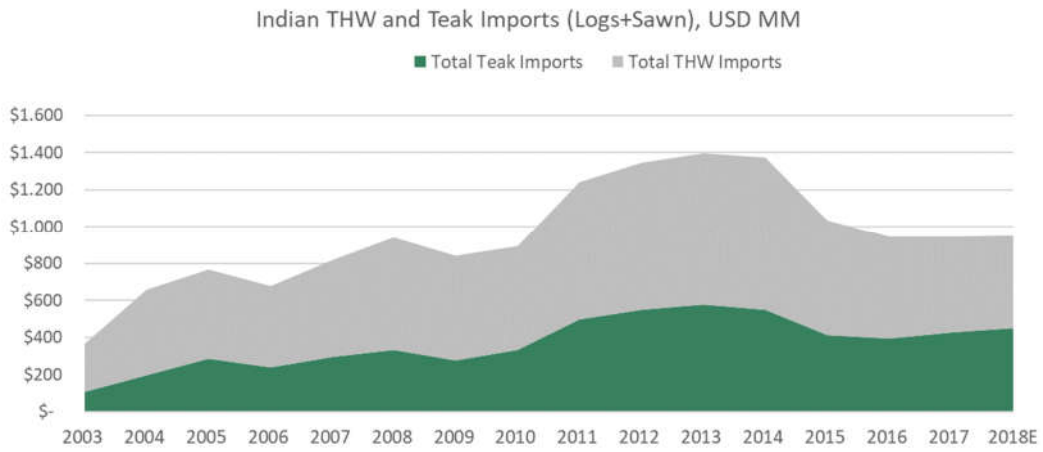
World teak imports are a fraction of the total tropical hardwoods imports, and only a few countries HS customs codes show teak as a specific, separate import product (at the 8-digit level). India is known to be the largest market for teak logs, as China's imports of tropical hardwoods are spread over a wider number of wood species. We thus turn our attention to India, the end-market for the largest share of FSA products, and the main determinant of teak prices.

4.2.3 Indian THW imports vs Teak imports

Teak accounts for most of total Indian imports of tropical hardwoods and represents a consistently higher share over the last decade. The total THW market (including both logs and sawn products)

was around USD 950 million in 2017, down from the 2014 peak at over USD 1.375 billion (though as will be shown below, the fall in total imports is mostly due to supply factors). Teak imports have followed a similar path, down from the 2014 highs, but over USD 426 million in 2017, and slightly higher in value than 2015 and 2016.

Figure 4.2.3

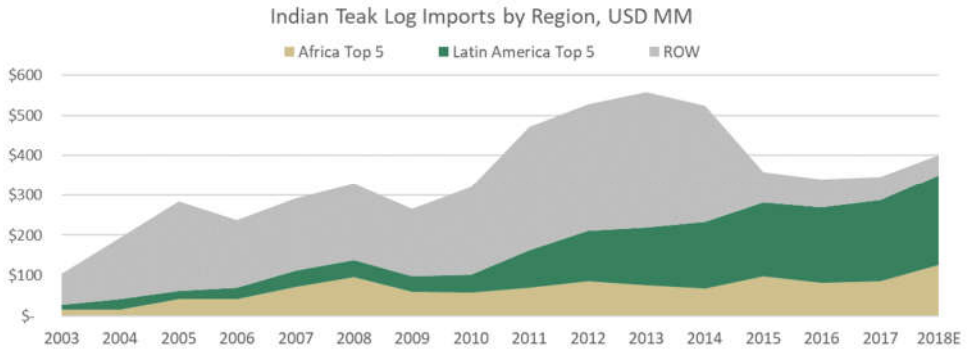


Source: GTA - Global Trade Atlas

4.3 Indian Teak Log Import Market

While overall Indian teak log imports have declined over several years, the trend masks a substantial underlying shift in the composition of log import supply. 2014 was the final year of teak log imports from Myanmar were allowed, and most of these logs were taken off the market from 2015, representing a supply shock, not a decline in demand. An analysis of the composition of the log imports shows that both in USD and volume terms, the demand for logs from the main Latin American exporting countries has grown since 2014, by 8% in value terms, and 6% in volume terms on average.

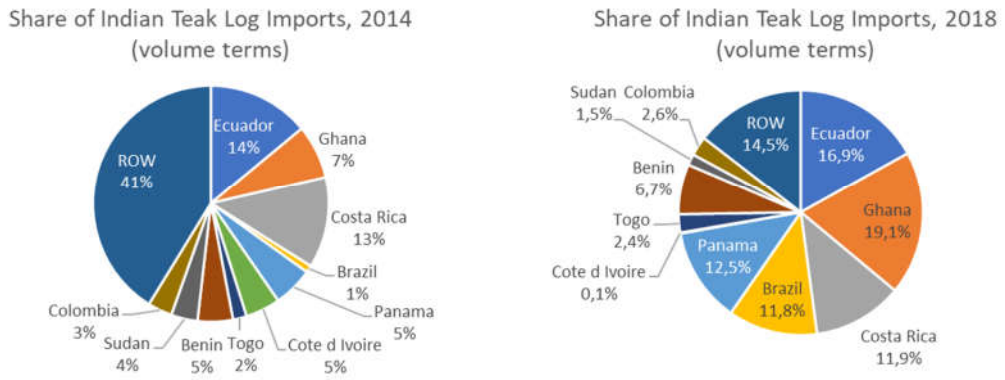
Figure 4.3.1



Source: GTA - Global Trade Atlas

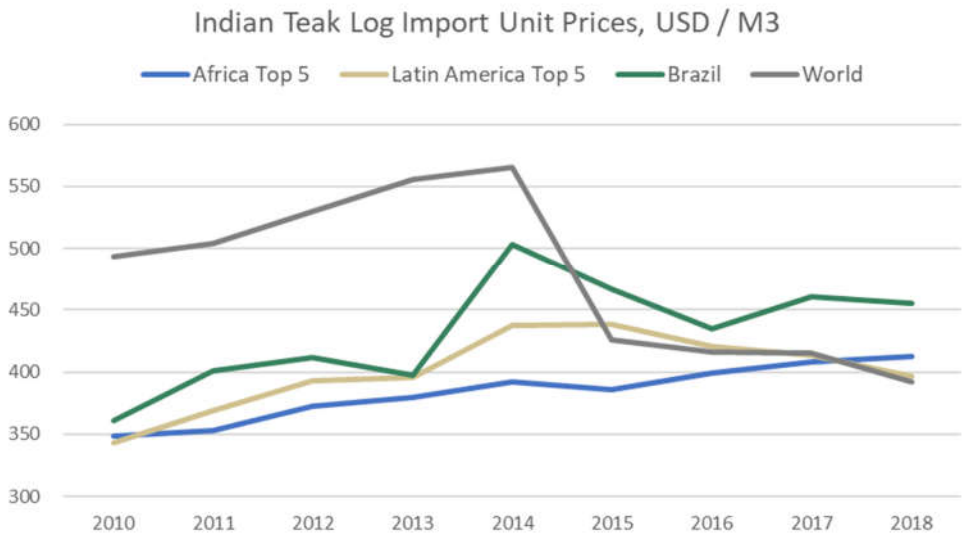
Moreover, the overall share of the market supplied by the top Latam export countries has grown continuously, and now accounts for 60% of total Indian teak log import volume, and slightly less in value terms. Asian supply (from old growth natural forests) has been the biggest reason for the overall drop in imports, but African supply has also steadily declined as well. This can be seen in the following two pie charts, which compare the log imports (by volume) in 2014 and in 2018 (Jan to Aug figures):

Figure 4.3.2



An analysis of unit pricing by area of origin shows that, while overall prices declined after 2014, they have remained stable, with Latam and Brazil prices appreciating, while logs from the rest of the world (ROW) and Africa have generally fallen. Unit prices do not control for mix, so should not be taken necessarily as a precise indicator of prices in a specific period, though the general trends are helpful in understanding relative supply and demand factors.

Figure 4.3.3



Source: GTA - Global Trade Atlas

4.4 Market Developments

Over the course of 2018, India has continued to experience fairly strong economic growth, reporting 2Q2018 GDP of 8.2% on an annual basis, beating market expectations of 7.6%. The IMF, World Bank and Moody's have all recently updated their forecasts for India, and signal continued growth in the 7 to 8% range for the next several years, building on 2016 and 2017 growth of 7.1% and 6.7% respectively.

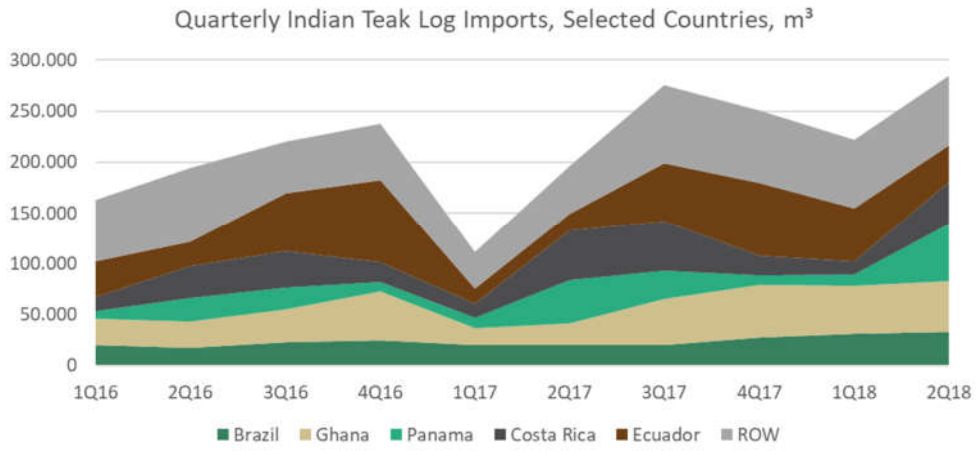
Part of the growth story is down to fiscal stimulus, as the Modi administration looks to fortify its position ahead of next year's elections, with increased focus on public investment, but also including some directed tax relief to electorally significant segments.

The financial sector continues to be a drag on economic activity, in the wake of a banking scandal involving a high-profile jewellery group, responsible for a USD 2.4 billion default to a number of the largest Indian banks. Overall, non-performing loans as a percentage of total financial system assets has continued to grow, reaching 12% in the Reserve Bank of India's most recent accounting. This has resulted in a tightening of credit conditions generally and resulted in less working capital being made available in certain segments, and at higher rates.

Construction investment, which accounts for around 8% of Indian GDP, has been a big focus of the Modi government. It had slowed somewhat in 2016 and 2017, with a build-up of unsold residential units in several the largest cities. In the first quarter of 2018, however, construction began to surge, and the Modi administration is contemplating additional stimulus measures, such as a reduction of the Goods and Services Tax on construction materials, according to local press reports. The administration's Housing for All program entails a number of other measures, aimed at increasing the supply of affordable housing, and should continue to provide stimulus to the sector.

Together, they resulted in a considerable increase of imports in 2Q2018, as can be seen in the following chart:

Figure 4.4.1



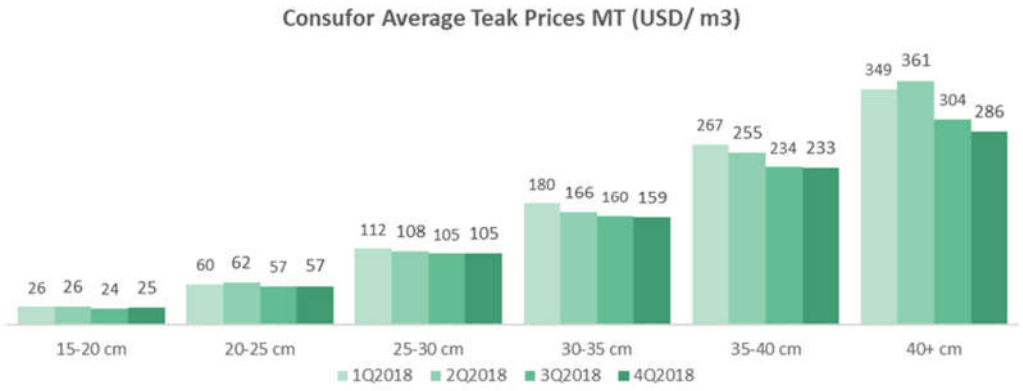
Source: GTA - Global Trade Atlas

In the 2018 full year, Ghana has become the main teak wood supplier in India surpassing Ecuador. Imports from Costa Rica and Panama increased seasonally in 2Q2018, together accounting for 34% of Indian imports, an increase of 312% in Q/Q imports from those two countries. The top 5 exporters (Ghana, Ecuador, Brazil, Panama and Costa Rica), were responsible for 76% of all Indian teak log imports in the 2Q2018.

4.4.1 Mato Grosso Log Market and Pricing Outlook

Log prices are determined based on roadside prices in Mato Grosso. As the market for teak logs is largely private and fragmented, Consufor, an independent forestry services firm, has been contracted to provide a benchmark roadside pricing report for teak log sales in the Mato Grosso region. The reports are done quarterly, the latest of which dated October 2018. All were based on based on a sample of respondents, most which are forest owners, but also include some sawmills and traders. Below we show the prices for all quarters (prevailing at the beginning of each period):

Figure 4.4.1: Consufor Average Teak Prices

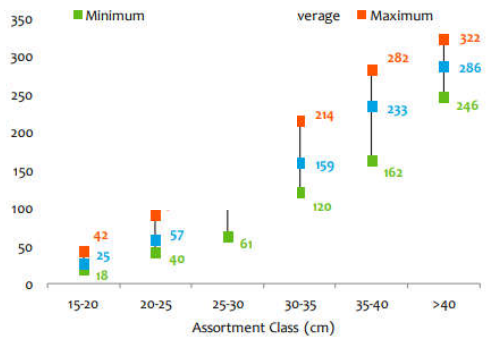


Consufor's most recent report was produced in early October of 2018, based on survey data taken in September (shown as 4Q2018 in the chart above). Log prices for diameters between 15-20 cm until 35-40 cm have been stable, only the price for diameters above 40 cm have decreased by 6%, consistent with the Indian market factors cited above. Additionally, even before the trucker strike, the local transportation costs had increased due increased oil prices. After the strikes, fuel prices have risen as the result of a price floor announced by the federal government as a concession to the truckers. This price floor is still not being practiced in the market and is the subject of a number of legal challenges, whose outcome is not yet known. With the maritime freight cost also increasing (also due to higher oil prices), total logistics costs are higher have risen over the year and have impacted local roadside prices as a result.

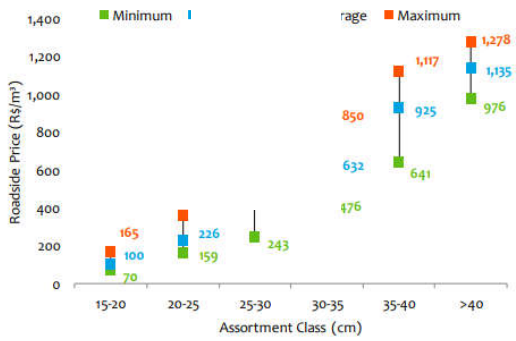
4.5 Budget Price Assumptions

The budget 2019-2020 budget assumes the most recent Consufor (average) prices from the October 2018 report, as per the figure below:

USD / M3



BRL / M3



5. Growth, Forecast Volume, and Harvest Schedule & Operations

5.1 Growth and Forecast Volumes

The monitoring of the development of the forest is done through annual inventory measurement, which is usually carried out during the dry season between May and August. Measurements may happen at different times for specific needs or due to operational constraints of our field team.
This year, we decided to change the form of our sample plots from circular to rectangular. There are two main reasons for this. First, the field work is much simpler and cheaper. Given that our plantations are very well squared in both directions, plots can be easily delimited. Second, it will be much easier to keep track of measurements at tree level when we increase plot size after thinning. Although this may bring variations to this year's results compared to last year, since we are not measuring exactly the same trees, we expect the long-term benefits to outweigh this small, one-off drawback. On areas that the 3rd thinning has already been performed, no changes on the plot form was done.

5.1.1 General Development

Based on the new inventory information, measured in 2018, here we provide some of the specific results for the farms measured. São José 2007 is growing on average almost 2.7 cm/year (diameter), with all areas classified as site I (S1 – Best sites). At 10 years old, Mutum 2007 is growing on average 2.3 cm/year. On this project, the 100 m³/ha are distributed over 385 remaining trees/ha, an average of 0.29 m³/tree. When compared to the previous results (2016), Capim Branco 1999 has increased the diameter in 1.8 cm, in 2 years, with the growth rate decreasing between measurements years.

The 2018 identified a significant area of 376 ha had very high mortality on the 2001 planting year project at Duas Lagoas farm (DLG), . These stands have never developed well, and during these last two years, many trees died (last inventory was in 2016). In any case, they have long been underperforming sites and we have not considered that they would ever produce any merchantable volumes in our previous wood flow projections. So, this will not change the future value estimates for the remainder of the Duas Lagoas 2001 project.

According the last forest inventory, tables 5.1.1 to 5.1.6 show growth data per project per region. Not all areas were inventoried in 2018, so the tables below are the latest available data for each farm (measured either in 2018 or 2017).

Table 5.1.1 – Jangada Region Plantations Inventory Data (2018 Inventory)

PROJECT	PLANTING YEAR	TEAK MANAGED AREA (ha)	AGE (years)	DBH (cm)	HEIGHT (m)	DOMINANT HEIGHT (m)	INDIVIDUAL VOLUME (m^3/Tree)	BASAL AREA (m^2/ha)	NUMBER OF TREES (Trees/ha)	TOTAL VOLUME (m^3/ha)	TOTAL VOLUME (m^3)
Tenda	1996	191,4	20,7	26,2	16,0	17,1	0,37	9,1	166	60,7	11.616
Bocaina	1998	431,6	19,5	37,8	25,6	25,7	1,07	11,8	106	111,6	48.166
Vale Dourado	1998	351,7	18,3	34,1	22,2	22,8	0,84	12,4	141	109,6	38.560
Bocaina	1999	108,2	18,8	38,9	25,0	25,0	1,11	10,9	92	101,7	11.003
Capim Branco	1999	507,9	18,6	35,2	23,5	23,5	0,87	10,3	106	91,4	46.419
Vale Dourado	1999	48,6	17,2	34,1	23,1	23,7	0,84	13,9	152	124,3	6.040
TOTAL											161.804

Table 5.1.2 – Jangada Region Plantations Inventory Data (2017 Inventory)

PROJECT	PLANTING YEAR	TEAK MANAGED AREA (ha)	AGE (years)	DBH (cm)	HEIGHT (m)	DOMINANT HEIGHT (m)	INDIVIDUAL VOLUME (m^3/Tree)	BASAL AREA (m^2/ha)	NUMBER OF TREES (Trees/ha)	TOTAL VOLUME (m^3/ha)	TOTAL VOLUME (m^3)
Buriti	1994	592,3	21,7	24,2	16,4	17,1	0,32	8,0	173	55,1	32.656
Paiolandia	1997	297,9	19,3	27,1	19,3	19,9	0,48	11,4	229	88,6	26.391
Paraiso	1997	555,0	19,7	21,6	16,0	16,7	0,25	10,2	272	68,4	37.975
Paiolandia	1998	94,0	18,4	29,9	21,3	21,7	0,60	10,4	149	87,5	8.221
Sao Jose da Canastra	1998	44,6	18,5	33,2	22,6	22,8	0,76	11,5	131	100,3	4.476
Sao Judas Tadeu	1998	26,8	18,3	35,3	24,4	24,6	0,91	13,9	144	125,6	3.360
Cassange	1999	88,5	17,5	30,6	21,8	22,1	0,63	11,3	151	95,4	8.440
Serra das Araras	1999	105,0	17,3	25,8	19,8	20,7	0,43	13,2	240	102,3	10.741
TOTAL											132.260

Table 5.1.3 – Cáceres Region Plantations Inventory Data (2018 Inventory)

PROJECT	PLANTING YEAR	TEAK MANAGED AREA (ha)	AGE (years)	DBH (cm)	HEIGHT (m)	DOMINANT HEIGHT (m)	INDIVIDUAL VOLUME (m^3/Tree)	BASAL AREA (m^2/ha)	NUMBER OF TREES (Trees/ha)	TOTAL VOLUME (m^3/ha)	TOTAL VOLUME (m^3)
Duas Lagoas	2000	1527,5	17,4	28,5	19,0	19,6	0,50	11,1	173	84,1	128.492
Duas Lagoas	2001	1964,7	16,3	23,8	15,6	16,4	0,33	10,2	256	66,7	131.001
Sao Miguel	2001	97,5	16,3	24,9	17,4	18,0	0,36	11,3	233	81,3	7.925
Sao Miguel	2002	5,7	15,2	27,6	21,1	21,6	0,52	12,3	203	105,8	604
Duas Lagoas	2002	48,4	15,2	37,2	22,8	23,0	0,92	16,2	145	134,3	6.501
Duas Lagoas	2005	207,7	12,3	23,3	15,6	16,9	0,29	14,3	329	94,4	19.604
Duas Lagoas	2006	233,9	11,2	26,3	17,3	18,0	0,38	16,6	298	113,4	26.528
TOTAL											320.655

Table 5.1.4 – Cáceres Region Plantations Inventory Data (2017 Inventory)

PROJECT	PLANTING YEAR	TEAK MANAGED AREA (ha)	AGE (years)	DBH (cm)	HEIGHT (m)	DOMINANT HEIGHT (m)	INDIVIDUAL VOLUME (m^3/Tree)	BASAL AREA (m^2/ha)	NUMBER OF TREES (Trees/ha)	TOTAL VOLUME (m^3/ha)	TOTAL VOLUME (m^3)
Bambu	1999	549,1	17,4	19,5	13,9	14,9	0,18	10,6	347	61,8	33.950
Bambu	2000	513,8	16,4	23,1	16,1	16,8	0,29	11,4	268	76,4	39.255
Barranquinho	2002	970,2	14,5	24,0	18,5	19,5	0,36	15,0	327	114,7	111.285
Barranquinho	2003	12,9	13,8	29,0	23,8	24,7	0,63	22,5	338	211,6	2.741
Barranquinho	2004	1021,0	12,6	22,4	17,7	19,0	0,31	15,1	383	113,8	116.195
TOTAL											303.425

Table 5.1.5 – Porto Esperidião Region Plantations Inventory Data (2018 Inventory)

PROJECT	PLANTING YEAR	TEAK MANAGED AREA (ha)	AGE (years)	DBH (cm)	HEIGHT (m)	DOMINANT HEIGHT (m)	INDIVIDUAL VOLUME (m^3/Tree)	BASAL AREA (m^2/ha)	NUMBER OF TREES (Trees/ha)	TOTAL VOLUME (m^3/ha)	TOTAL VOLUME (m^3)
Cacimba	2002	571,0	15,4	30,3	21,3	21,8	0,60	14,7	203	120,4	68.758
Santa Maria do Jauru	2002	1085,2	15,3	25,4	18,3	19,3	0,38	12,9	265	93,7	101.663
Santa Maria do Jauru	2003	207,9	14,4	30,2	21,0	21,8	0,60	15,9	223	129,4	26.889
Cacimba	2003	10,2	14,3	32,3	23,6	24,2	0,73	17,5	211	153,5	1.564
Mutum	2007	539,2	10,0	22,7	16,4	17,1	0,29	14,8	385	100,2	54.038
Sao Jose	2007	301,3	10,4	28,0	20,3	20,6	0,49	15,6	252	123,0	37.049
Santa Maria do Jauru II	2008	99,9	9,1	20,8	14,5	15,3	0,21	14,1	395	82,5	8.241
TOTAL											298.201

Table 5.1.6 – Porto Esperidião Region Plantations Inventory Data (2017 Inventory)

PROJECT	PLANTING YEAR	TEAK MANAGED AREA (ha)	AGE (years)	DBH (cm)	HEIGHT (m)	DOMINANT HEIGHT (m)	INDIVIDUAL VOLUME (m^3/Tree)	BASAL AREA (m^2/ha)	NUMBER OF TREES (Trees/ha)	TOTAL VOLUME (m^3/ha)	TOTAL VOLUME (m^3)
Santa Fe	2003	2562,7	13,7	24,3	17,9	18,7	0,35	11,9	276	83,9	214.936
Terra Santa	2004	1143,2	12,9	28,5	21,3	21,9	0,52	14,3	230	114,7	131.166
TOTAL											346.102

5.2 Harvest Schedule & Operations

To maximize returns to investors, FSA annually updates its plans to account for the new inventory data and current market and operational characteristics and constraints. To be able to correctly represent in-stand competition given different alternative ages for each thinning and clear fell, we are using a basal area model, developed internally, for short term planning. This decision is made with the aid of Remsoft 's Woodstock, a specialized software for forest planning.

With this process is possible to achieve the best schedule for each operation on each stand, maximizing total net present value, given that it complies with all constraints given. The main constraints include levelling year-to-year volumes, to avoid unfeasible variations, and a maximum harvesting capacity for the rainy season. The list of stands is then input for more detailed calculations to come to the final estimates that are the basis for this 2-year plan.

The selection of projects eligible to be thinned annually is the result of the analysis of several indicators: (i) growth rate in diameter, (ii) basal area volume increases. A sharp decrease in the rate of diameter growth and / or in basal area volume is undesirable, as it usually indicates competition amongst the trees, and the need for thinning. The final harvesting occurs around 20 years after planting, depending on how well the forest has developed. The growth rate of more mature trees declines with age. When the increase in volume and value from additional growth of these trees does not justify waiting longer for harvesting, the trees are eligible for final harvesting. Close tracking of the growth of the forests through inventory measurements and up to date market intelligence, allow the Company to determine optimum harvesting age. (Thinning typically follows a similar process, though it also uses a guideline schedule, which is a function of the planting density).

Tables 5.2.1 to 5.2.4 below show a list of projects by region eligible for thinning and harvesting in 2019 and 2020, and their estimated volume by diameter class. The projects shown are those in principal eligible for thinning and final cuts, based on their individual forest maturity and specific characteristics. While the tables serve as the guideline for planning, adjustments necessarily and frequently occur, due to operational and commercial constraints. It is often the case that specific activities need to be shifted forward or backward in time, due to climate and weather conditions, as well as the operational and commercial constraints. Thus, project activities may be moved forward or delayed up to 6 months. For this reason, the forecast presented is for two years (through the end of 2020) so as contemplate all projects which may be in considered during 2019. It bears emphasizing that as in all forecasting, the farther forward the forecast, the greater the imprecision.

In this sense, the 2020 figures presented are Floresteca's best current estimate, but will be revised for the 2020 management plan.

The yield tables below show the logs broken down by girth class for 3 classes of log length: short logs (SL), 2.3 meters, medium logs (ML), from 5 to 5.8 meters, and long logs (LL), from 9 to 11.8 meters. These size categories estimates are calculated based on the expected average DBH of the removed trees and an optimization of the possible bucking alternatives given their current prices at the time of planning for each tree size.

It should also be noted that the log sizes are shown in circumference (girth), which is the way the logs are typically traded. This is distinct from the diameter classes typically reported in appraisals and other similar reports. To facilitate, we provide the following conversion table:

Table 5.2.1 – Girth - diameter conversion table:

Girth	LL 60-74	LL 74-90	LL 90-100	ML 60-65	ML 65-70	ML 70-73	ML 73-80	ML 80-85	SL 5-50	SL 50-56	SL 56-63	SL 63-72	SL 72-80	SL 80-90	SL 90-100	SL 100-110	SL 110-120	SL 120-130	SL 130-140	SL 140-150	SL 150-160
Diameter	LL 19-24	LL 24-29	LL 29-32	ML 19-21	ML 21-22	ML 22-23	ML 23-25	ML 25-27	SL 5-16	SL 16-18	SL 18-20	SL 20-23	SL 23-25	SL 25-29	SL 29-32	SL 32-35	SL 35-38	SL 38-41	SL 41-45	SL 41-48	SL 41-51

Table 5.2.2– Projects eligible for final harvest in 2019*

FINAL HARVEST VOLUMES (m³)																							
PROJECT	SITE CLASS	AREA (HA)	LL 60-74	LL 74-90	LL 90-100	ML 60-65	ML 65-70	ML 70-73	ML 73-80	ML 80-85	SL 5-50	SL 50-56	SL 56-63	SL 63-72	SL 72-80	SL 80-90	SL 90-100	SL 100-110	SL 110-120	SL 120-130	SL 130-140	SL 140-150	SL 150-160
1997PAI	S1	20,1	382,7	768,3	73,7	20,7	21,0	0,0	0,0	32,9	326,1	1,1	8,8	12,3	16,3	48,8	107,0	209,1	182,3	90,3	22,8	1,8	0,0
1997PAI	S2	66,7	1.330,7	1.447,6	77,4	213,2	143,8	0,0	0,0	43,1	1.004,3	44,4	80,7	123,3	154,7	365,5	328,3	482,6	303,3	120,5	18,5	0,6	0,0
1997PAI	S3	115,3	116,5	21,3	0,0	264,0	86,3	0,0	0,0	0,0	2.672,9	548,9	290,3	336,6	257,9	285,3	22,1	13,0	2,4	0,0	0,0	0,0	0,0
1998BOC	S1	91,4	526,5	2.854,7	1.141,0	6,8	9,3	0,0	0,0	284,6	1.266,0	0,0	5,9	8,1	10,4	34,1	260,5	597,8	982,2	788,9	497,0	124,3	17,9
1998CAN	S1	44,6	609,2	1.447,7	186,1	32,6	38,2	0,0	0,0	84,6	615,3	4,2	16,7	23,0	31,2	83,0	185,4	358,2	373,1	214,8	86,5	0,0	0,0
1998PAI	S1	59,3	922,9	1.879,9	144,3	88,0	58,6	0,0	0,0	59,7	850,7	25,0	42,0	62,4	69,9	152,0	249,4	492,7	444,4	185,1	44,0	0,0	0,0
1998PAI	S2	34,7	330,8	257,4	13,5	132,5	58,0	0,0	0,0	5,2	502,8	94,7	103,3	158,8	123,3	168,9	78,2	91,5	53,6	16,1	4,1	0,0	0,0
1998SJT	S1	26,8	291,2	1.014,6	317,7	18,7	16,1	0,0	0,0	88,2	456,7	2,3	9,4	13,3	18,1	43,3	110,4	217,0	309,3	236,2	130,8	20,2	0,0
1999ARA	S2	98,9	1.034,1	1.186,5	78,4	286,5	126,5	0,0	0,0	35,4	1.243,1	179,0	196,4	304,2	260,6	373,6	255,3	388,3	254,9	102,4	24,8	0,0	0,0
1999BOC	S1	108,2	295,1	2.641,2	1.639,3	0,4	6,0	0,0	0,0	358,1	1.396,5	0,0	1,9	2,6	3,4	27,7	259,8	572,7	1.111,3	1.013,0	750,5	231,3	57,7
1999CAS	S1	56,8	613,8	1.788,5	234,9	106,1	60,4	0,0	0,0	98,2	884,6	50,8	61,6	91,9	85,1	154,5	191,8	403,8	468,0	265,4	100,2	0,6	0,0
1999CAS	S2	31,6	343,6	746,3	71,3	58,6	33,4	0,0	0,0	30,3	465,7	45,0	53,1	70,8	50,4	87,0	95,9	185,5	183,2	87,6	26,6	0,0	0,0
1999CPB	S1	55,3	672,7	1.554,0	161,7	33,9	38,7	0,0	0,0	61,0	634,7	4,0	17,7	25,4	34,1	88,6	192,9	390,1	378,1	185,2	58,6	3,7	0,0
TOTAL		**809,8**	**7.470,0**	**17.607,8**	**4.139,3**	**1.262,0**	**696,2**	**0,0**	**0,0**	**1.181,2**	**12.319,4**	**999,4**	**887,9**	**1.232,7**	**1.115,5**	**1.912,3**	**2.337,1**	**4.402,2**	**5.046,1**	**3.305,5**	**1.764,4**	**382,5**	**75,7**

Table 5.2.3 – Projects eligible for thinning in 2019*

THINNING VOLUMES (m³)																							
PROJECT	SITE CLASS	AREA (HA)	LL 60-74	LL 74-90	LL 90-100	ML 60-65	ML 65-70	ML 70-73	ML 73-80	ML 80-85	SL 5-50	SL 50-56	SL 56-63	SL 63-72	SL 72-80	SL 80-90	SL 90-100	SL 100-110	SL 110-120	SL 120-130	SL 130-140	SL 140-150	SL 150-160
2002BAR	S1	180,5	177,7	0,0	0,0	0,0	0,0	227,5	163,4	0,0	1.315,6	325,5	403,2	597,0	361,3	202,7	7,2	7,8	0,0	0,0	0,0	0,0	0,0
2002BAR	S2	377,5	28,8	0,0	0,0	0,0	0,0	148,5	67,7	0,0	3.566,7	1.020,1	1.064,2	1.231,9	463,0	137,4	1,2	1,3	0,0	0,0	0,0	0,0	0,0
2002CMB	S1	78,7	584,4	165,9	0,0	0,0	0,0	81,1	112,7	0,0	376,3	17,9	55,6	78,8	77,2	98,3	53,2	64,7	7,7	0,0	0,0	0,0	0,0
2003BAR	S1	13,0	100,6	3,4	0,0	0,0	0,0	54,6	55,1	0,0	179,6	23,3	40,9	61,2	53,5	50,5	6,7	3,1	0,0	0,0	0,0	0,0	0,0
2004BAR	S1	274,8	75,0	0,3	0,0	0,0	0,0	415,4	223,0	0,0	3.749,3	1.068,0	1.216,1	1.764,4	930,2	399,9	0,3	0,2	0,0	0,0	0,0	0,0	0,0
2004BAR	S2	79,8	0,0	0,0	0,0	0,0	0,0	27,1	4,0	0,0	2.240,2	654,8	696,4	706,2	179,4	26,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2004TST	S1	818,0	3.742,7	616,0	20,5	0,0	0,0	1.185,6	1.266,5	0,0	4.312,0	457,6	874,3	1.322,4	1.108,2	1.159,1	283,1	271,5	5,4	6,8	1,4	0,0	0,0
2005DLG	S1	7,7	77,4	6,4	0,0	0,0	0,0	36,1	37,6	0,0	123,9	15,9	27,6	41,4	36,4	34,2	5,5	4,4	0,3	0,0	0,0	0,0	0,0
2005DLG	S2	153,9	230,2	0,0	0,0	0,0	0,0	300,0	209,6	0,0	2.277,0	587,3	664,1	882,1	500,1	271,2	12,0	6,5	0,0	0,0	0,0	0,0	0,0
2005DLG	S3	46,1	3,0	0,0	0,0	0,0	0,0	16,9	7,2	0,0	564,5	152,6	126,6	122,0	46,2	15,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2006DLG	S1	52,9	675,3	134,6	0,0	0,0	0,0	169,7	192,3	0,0	675,6	69,7	132,7	200,2	167,4	175,1	54,5	57,1	3,6	0,0	0,0	0,0	0,0
2006DLG	S2	181,0	504,6	59,9	0,0	0,0	0,0	375,1	281,2	0,0	2.183,3	525,2	650,2	971,8	588,5	336,7	29,7	27,4	0,4	0,0	0,0	0,0	0,0
2007MUT	S1	71,1	821,7	157,1	0,0	0,0	0,0	168,1	198,8	0,0	650,7	46,8	109,9	165,2	149,9	173,7	74,5	64,2	0,0	0,0	0,0	0,0	0,0
2008SMJII	S2	58,1	39,2	0,0	0,0	0,0	0,0	71,0	47,6	0,0	695,1	157,5	161,4	203,9	110,5	59,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2008SMJII	S3	41,7	0,0	0,0	0,0	0,0	0,0	0,5	0,2	0,0	331,5	81,6	83,0	50,6	4,0	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0
TOTAL		**2.434,9**	**7.060,7**	**1.143,4**	**20,5**	**0,0**	**0,0**	**3.277,0**	**2.866,8**	**0,0**	**23.241,4**	**5.203,7**	**6.306,4**	**8.398,8**	**4.775,7**	**3.140,9**	**527,9**	**508,0**	**17,4**	**6,8**	**1,4**	**0,0**	**0,0**

Table 5.2.4 – Projects eligible for final harvest in 2020*

FINAL HARVEST VOLUMES (m³)																							
PROJECT	SITE CLASS	AREA (HA)	LL 60-74	LL 74-90	LL 90-100	ML 60-65	ML 65-70	ML 70-73	ML 73-80	ML 80-85	SL 5-50	SL 50-56	SL 56-63	SL 63-72	SL 72-80	SL 80-90	SL 90-100	SL 100-110	SL 110-120	SL 120-130	SL 130-140	SL 140-150	SL 150-160
1997PAR	S2	77,2	631,9	80,0	0,0	684,3	249,5	0,0	0,0	0,0	1.935,6	483,8	483,4	781,7	622,0	787,8	123,2	69,1	1,4	0,0	0,0	0,0	0,0
1997PAR	S3	270,6	53,9	2,7	0,0	782,2	158,0	0,0	0,0	0,0	6.483,2	2.024,3	2.024,2	2.903,4	1.259,3	681,7	4,5	2,4	0,0	0,0	0,0	0,0	0,0
1998BOC	S1	35,4	135,0	1.120,7	573,6	0,0	1,7	0,0	0,0	139,8	533,9	0,0	0,5	0,7	0,9	6,4	98,1	224,1	429,2	378,6	260,5	67,0	12,4
1999CPB	S1	413,2	2.640,7	12.374,7	3.920,5	56,1	103,7	0,0	0,0	1.108,2	5.299,5	6,0	38,4	56,7	73,7	231,1	1.191,9	2.688,2	4.004,7	3.015,5	1.803,2	388,8	97,0
1999VDO	S1	48,6	801,7	1.859,9	379,5	27,9	30,7	0,0	0,0	110,5	820,7	2,9	15,5	24,8	32,6	81,9	248,2	488,0	519,1	300,2	173,3	37,3	4,5
TOTAL		**845,0**	**4.263,1**	**15.438,0**	**4.873,6**	**1.550,6**	**543,6**	**0,0**	**0,0**	**1.358,5**	**15.072,9**	**2.517,0**	**2.561,9**	**3.767,3**	**1.988,5**	**1.788,8**	**1.665,9**	**3.471,8**	**4.954,3**	**3.694,2**	**2.237,1**	**493,1**	**113,9**

Table 5.2.5 – Projects eligible for thinning in 2020*

THINNING VOLUMES (m³)																							
PROJECT	SITE CLASS	AREA (HA)	LL 60-74	LL 74-90	LL 90-100	ML 60-65	ML 65-70	ML 70-73	ML 73-80	ML 80-85	SL 5-50	SL 50-56	SL 56-63	SL 63-72	SL 72-80	SL 80-90	SL 90-100	SL 100-110	SL 110-120	SL 120-130	SL 130-140	SL 140-150	SL 150-160
2002CMB	S1	360,1	1.567,7	482,6	35,5	0,0	0,0	371,2	404,9	0,0	1.528,9	155,0	292,0	434,3	375,9	373,9	135,3	152,2	21,7	0,0	0,0	0,0	0,0
2002CMB	S2	131,0	41,1	0,7	0,0	0,0	0,0	91,8	61,4	0,0	785,2	217,8	253,3	367,3	189,2	86,6	0,8	0,4	0,0	0,0	0,0	0,0	0,0
2002CMB	S3	1,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	8,7	2,6	2,9	3,3	0,6	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2002SMJ	S1	302,7	1.165,4	182,3	0,0	0,0	0,0	407,3	401,7	0,0	1.783,0	281,0	417,1	602,1	454,4	390,5	90,3	74,2	4,2	0,0	0,0	0,0	0,0
2002SMJ	S2	626,8	707,6	98,1	0,0	0,0	0,0	475,3	360,5	0,0	6.051,9	1.573,4	1.713,0	2.013,4	866,6	467,4	50,3	40,5	2,2	0,0	0,0	0,0	0,0
2002SMJ	S3	155,6	26,9	5,0	0,0	0,0	0,0	18,2	13,4	0,0	2.118,6	422,2	295,1	215,6	52,7	21,1	2,0	1,9	0,1	0,0	0,0	0,0	0,0
2003CMB	S1	10,2	106,9	54,0	4,3	0,0	0,0	9,3	13,0	0,0	58,2	1,5	6,4	8,8	9,2	12,1	10,8	15,5	2,6	0,0	0,0	0,0	0,0
2003SMJ	S1	177,0	1.309,7	556,8	40,7	0,0	0,0	183,6	217,6	0,0	993,9	86,2	166,1	239,9	196,9	208,2	128,4	165,2	24,6	1,1	0,0	0,0	0,0
2003SMJ	S2	30,9	3,8	0,2	0,0	0,0	0,0	11,3	6,3	0,0	355,7	103,2	110,4	124,1	36,9	12,9	0,1	0,1	0,0	0,0	0,0	0,0	0,0
2003STF	S1	7,7	3,0	0,0	0,0	0,0	0,0	6,3	3,9	0,0	45,6	12,4	14,7	21,6	11,6	5,7	0,1	0,1	0,0	0,0	0,0	0,0	0,0
2003STF	S2	288,6	108,7	0,3	0,0	0,0	0,0	129,6	93,2	0,0	2.018,9	529,7	524,6	519,4	220,0	117,4	4,1	4,2	0,0	0,0	0,0	0,0	0,0
2004BAR	S1	115,1	13,5	0,0	0,0	0,0	0,0	147,5	86,8	0,0	1.543,3	448,0	507,5	726,7	358,4	141,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2004BAR	S2	448,1	41,6	0,0	0,0	0,0	0,0	178,4	116,1	0,0	6.173,2	1.763,5	1.795,0	1.873,8	592,0	193,0	0,4	0,0	0,0	0,0	0,0	0,0	0,0
2004BAR	S3	103,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1.658,7	290,1	153,4	49,8	0,7	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2007MUT	S2	188,5	70,2	0,0	0,0	0,0	0,0	124,4	76,2	0,0	3.977,6	1.115,0	1.160,8	1.017,0	303,8	116,5	2,4	1,5	0,0	0,0	0,0	0,0	0,0
2007MUT	S3	130,4	5,7	0,0	0,0	0,0	0,0	14,2	8,1	0,0	2.351,2	500,7	375,8	209,8	35,7	12,7	0,0	0,0	0,0	0,0	0,0	0,0	0,0
TOTAL		**3.077,3**	**5.172,1**	**1.380,1**	**80,6**	**0,0**	**0,0**	**2.168,3**	**1.863,0**	**0,0**	**31.452,6**	**7.502,3**	**7.788,1**	**8.426,8**	**3.704,7**	**2.159,8**	**425,0**	**455,8**	**55,6**	**1,1**	**0,0**	**0,0**	**0,0**

*Disclaimer: The projects shown are those in principal eligible for thinning and final cuts, based on their individual forest maturity and specific characteristics. While they serve as the guideline for planning, adjustments necessarily and frequently occur due to operational and commercial constraints. Analysis of key growth indicators may lead to only partial thinning of some projects, to optimize forest value. Volumes are estimated, and actual performance may vary. If there are occurrences of wind, lightning, disease or any other event outside the control of Floresteca, causing tree damage, additional targeted thinnings may be necessary.

5.3 Cost of Production (COP)

The cost of production (COP) for the 2019 harvesting is shown in the table below and is forecast in BRL per cubic meter harvested. At the assumed FX rate of BRL 3.8/USD used throughout the management plan. The overall cost of production is expected to be BRL 75.46 /m3 of total volume, or USD 19.81 /m3 at the budget FX rate.

Operations will be executed according to standard practice. Selection and marking should take place one month prior to the start of thinning. After felling, the logs will be skidded to an intermediary track inside the stands. There, logs are measured and bucked for the formation of export lots. Finally, they are forwarded to the road side where they will be loaded either directly into containers or on open trucks, depending on the logistics channel for each log size.

Table 5.3.1 - Management Plan 2019 Forecast Cost of Production – FX USD to BRL 3.8

	Cost (USD)	Unit	Quantity	USD/un.
Tree Selection	51,160	ha	3,129	16.35
Manual Harvesting	229,365	m3	86,735	2.64
Mechanized Harvesting	223,910	m3	86,735	2.58
Skidding	314,674	m3	86,735	3.63
Yarding	377,396	m3	60,990	6.19
Lot Formation	240,054	m3	60,990	3.94
Loading	160,339	m3	95,135	1.69
Tax (service)	287,500	-	95,135	3.02
Total	1,884,399	m3	95,135	19.81

5.4 Cleaning

Once a farm has completed its final harvest, the land must be cleaned prior to returning it to the landowner. The cleaning process involves extracting the roots, and their subsequent removal from the property, and finally a grading to level the land. Cleaning is included in the Harvesting budget category.

	Cost (USD)	Unit	Quantity	USD/un.
Cleaning	831,883	ha	3,000	277.34

6. General & Administrative Expenses

Table 6.1.1: Costs and Expenses

Description	Unit of Measure	2019			2020			2019			2020		
		Units	USD	USD/Unit	Units	USD	USD/Unit	Units	BRL	BRL/Unit	Units	BRL	BRL/Unit
Variable Management fee	ha	16.107	1.918.662	119	14.810	1.839.023	124	16.107	7.290.916	453	14.810	6.988.286	472
Other Direct Costs	ha	16.107	736.311	46	14.810	719.597	49	16.107	2.797.984	174	14.810	2.734.468	185
Total G&A Costs	ha	16.107	2.654.974	165	14.810	2.558.619	173	16.107	10.088.899	626	14.810	9.722.754	657

General & Administrative expenses refer to the general management of FSA, including local property management related staff and infrastructure maintenance, and administrative services (e.g. treasury, legal, forest planning, IT etc.) The Management Services are provided by Teak Resources Company, TRC, per the Management Services & Timber Purchase and Sale Agreement in place with Floresteca S.A. and is calculated as a fixed amount (currently BRL 445 / per hectare per year, or USD 117 per hectare per year at the budget FX rate). This is paid on quarterly basis and is updated per Brazilian CPI inflation. The budget assumes that G&A increases by expected BRL inflation, as measured by the IPCA index. Note that as the hectares under management fall (as final harvesting is completed) the total G&A expenses fall, as the Variable Management Services Fees are proportional to the hectares under management.

7. Certification and Legal Issues

7.1 FSC Certification

Floresteca has received FSC certification for most of the forests under its management since 1997. The Company's certification is public, and a summary assessment recertification of Floresteca's forest management is available at the website http://info.fsc.org/. Floresteca is certified under Certification Registration Code RA-FM/COC-005657 and FSC License Code FSC-C010728.

The farms with FSC certification, represent a total area of 25,865.80 ha. of which 15,637.62 are planted with teak, as shown below:

Table 7.1.1: Certified Farms

			AREA UNDER CERTIFICATION SCOPE				
FARM	PROJECT	MINICIPALITY	PLANTING YEAR	TCA	CA /FR	OTHERS	TOTAL/FR
Araras	Araras	Rosário Oeste	1999	99,59	38,87	11,18	149,64
Bocaina	Bocaina	Rosário Oeste	1998	433,09	569,04	77,03	1.187,34
			1999	108,18			
Buriti	Buriti	Jangada	1994	603,10	325,59	43,47	972,16
Capim Branco	Capim Branco	Rosário Oeste	1999	508,87	564,09	62,04	1.135,00
Cassange	Cassange	Rosário Oeste	1999	89,45	148,58	26,38	264,41
Paiolândia	Paiolândia	Rosário Oeste	1997	297,99	334,46	81,65	808,57
			1998	94,47			
São José da Canastra	São José da Canastra	Rosário Oeste	1998	44,62	9,47	4,87	58,96
São Judas Tadeu	São Judas Tadeu	Rosário Oeste	1998	42,11	2,50	9,10	53,71
Serras das Araras	Serras das Araras	Rosário Oeste	1999	107,81	13,07	14,88	135,76
Vale Dourado	Vale Dourado	Rosário Oeste	1998	351,68	132,91	154,42	687,58
			1999	48,59			
Bambu	Bambu	Cáceres	1999	549,07	236,06	77,86	1.376,82
			2000	513,83			
Barranquinho	Barranquinho	Porto Estrela	2002	970,20	771,02	249,33	3.024,50
			2003	12,95			
			2004	1.021,00			
Duas Lagoas	Duas Lagoas	Cáceres	2000	1.527,51	1.604,56	349,67	6.109,93
			2001	2.136,42			
			2002	48,41			
			2005	207,67			
			2006	235,69			
São Miguel	São Miguel	Cáceres	2001	97,52	41,60	11,34	156,17
			2002	5,71			
Cacimba	Cacimba	Porto Espiridião	2002	571,08	299,80	99,83	980,90
			2003	10,19			
Santa Fé	Santa Fé	Cáceres	2003	2.562,71	1.482,55	237,49	4.282,75
Terra Santa	Terra Santa	Barra do Bugres	2004	1.143,17	992,19	195,80	2.331,16
São José	São José	Cáceres	2007	301,30	342,11	31,61	675,02
			TOTAL	14.743,98	7.908,47	1.737,95	24.390,38

The current FSC certification for these farms is valid through March 2023.

7.1.1 Non-certified Farms

The Paraíso, Santa Maria do Jauru, Santa Maria do Jauru II, Mutum and São José farms are not certified. The specific reasons vary for each farm, but all are on third party property.

7.2 Legal Issues

7.2.1 Paraiso Farm

Issue 1: Floresteca has received a legal challenge by Mr. Antonio Frigieri, the owner of the Paraíso Farm ("plaintiff"), in a declaratory procedure, requesting the end of the usufruct rights with immediate effect. After being subpoenaed by the Mato Grosso State Court, which held that the plantation area was considered abandoned, the court issued a preliminary decision in August 2016 granting land possession to the plaintiff. However, the preliminary decision did not consider the Usufruct Agreement void, and Floresteca challenged the preliminary decision in the Mato Grosso Superior Court. In May 2017, the Superior Court reversed the initial decision in favor of Floresteca, who has been granted the right to continue under the Usufruct Agreement. Following the court decision and after a relatively short disturbance in the work planning, the maintenance teams of FSA resumed activities at Paraiso. FSA has filed final allegations with the court and was informed in July that the judge has nominated an expert for the case. We have filled the requirements for the forensics and information requested by the judge. We expect to have an update in early 2019.

7.2.2 Mutum Farm

Issue 1: The Mutum farm was invaded by the MST Landless Movement in 2011. The owner of the property (LHS) filed a court order to remove the squatters in the same year. The judge ruled in favor of LHS on June 27, 2011. However, the MST has repeatedly invaded the property over time, motivating the hiring of a private security guard. Prosecutor`s Office has filled an opinion which do not modify any material in the lawsuit. We are waiting for court appointment and/or final decision.

Issue 2: In 2012, the National Agrarian Reform Institute - INCRA, initiated an administrative process aimed at the expropriation of the property, alleging that the property was not being used productively. In (March 27, 2012) LHS filed for a withdrawal of the process in the Federal Court, at Cáceres-MT. On March 28, 2012, the judge decided to suspend INCRA's administrative procedure. Subsequently, on January 09, 2015, a technical opinion declared the property as productive. A Court Hearing was held on November 9th, 2017, where FSA's testimonies were heard to clarify the facts. The judge is expected to issue a final decision at any moment. We are still waiting for the court appointment.

8 SOCIAL AND ENVIRONMENTAL ACTIVITY

8.1 Socio-Environmental Programs

8.1.1 Fauna Monitoring

The purpose of monitoring the fauna is to study the wealth, the abundance and the spatial distribution of the fauna and how it interacts with the local flora and teak forestry management. The Company seeks to minimize its impact on local fauna.

8.1.2 Monitoring of Water

The water quality within the plantations is monitored, and the water consumed by the staff is analysed chemically and physically every six months on all company properties.

8.1.3 Operating Activities Impact Analysis

This monitoring focuses on environmental and social aspects, to gauge the effect of operations. On the environmental side, before the start of activities with significant impacts (and specifically harvesting), Floresteca conducts a survey of management unit before and after this activity. This allows preventative actions and prior identification of areas which will require mitigation and correction of negative impacts should they occur.

On the social side, a health and safety survey is conducted on the management unit level, taking into consideration the surrounding communities. The survey looks to identify and prevent or correct problems that may arise from the greater movement of people, trucks and machinery on and around the plantations, and maintain good relations with the local community.

8.1.4 Waste Collection and Recycling

Floresteca has a waste recycling program that separates, stores and disposes of waste generated in its activities in an environmentally and legally appropriate manner. Waste is separated at source by type, and stored on site in waste bays, and later sent away for recycling. Non-recyclable waste is disposed of according to the assessment criteria set by suppliers and in conformity with local regulations.

Appendices

Appendix 1: Tree Crop Strategy

1. Core strategy concepts

The main objective of our project is to ensure a silvicultural regime which will maximize the net present value of the investment, through the production of high quality Teak logs for final harvest.

2. Broad strategy concepts

Target products

The market for plantation Teak places high value on logs over 30 cm in diameter, with steeper price appreciation on logs over 35cm. Logs below these diameter classes face much higher competition, given the considerable number of suppliers delivering in that range. Currently the market does not attribute additional value for plantation logs with diameters greater than 45 cm. We believe this is largely a function of there being very little supply of plantation teak at these diameters.

Nevertheless, as the flow of such high diameter logs increases, we believe the market will in fact provide a price premium, as is the case for remaining sales of natural forest logs with such diameters (Burma teak).

Decision making

All decision making, especially that related to thinning and harvesting, is based on a comprehensive optimization process to ensure the most favourable financial alternative is selected, based on our current view on the market and within our operational constraints. This process is focused on delivering the highest possible net present value for the assets.

This decision-making process is done annually, though a reforecast may be done for shorter periods. The plans are adjusted during the year in view of new market information, or whenever any significant market shifts occur which justifies a change in plans.

The unit considered for decision making is the stand, which we consider as a piece of homogenous forest that gets a uniform treatment throughout its whole area. Neighbouring stands may have different treatments depending on their development conditions. As another important guideline, all present actions should work in our favour and never harm our future development potential.

Knowledge base

FSA is managed by a company with over 24 years of experience in the Teak business. The knowledge and history behind this is kept in a well-organized and secure database. All past information on growth, silvicultural management, research and other aspects of our forest management is stored and new data is loaded on a continuous basis.

This information provides us with a solid and consistent framework for decision making and for the development of our current assets, as well as helping us make the most well-informed decisions possible.

3. Decision Making Regime

Pre-planting decision criteria

Not applicable for FSA.

Planting decision criteria

Not applicable for FSA.

Weed control decision criteria

A). Site selection

Three main factors affect the decision of controlling weeds:

Type of infestation: if either grasses or broadleaves are present. Usually the presence of grasses is worst for the crop since they present negative allelopathy on the Teak plants. The exception on broadleaves is liana, which, if not controlled, can deform or even break the trees.

Intensity of infestation: visual analysis of how much area is proportionally being dominated by weeds.

Location of infestation: can happen in the planting line or between lines. Weeds inside the planting lines should be controlled earlier, while when occurring between lines it can be left longer to avoid soil erosion and provide shelter for natural predators of pests, as long as it does not compete with the crown or root system of the Teak plants.

The combination of these three factors will determine the control requirement. As a rule, grasses inside the planting lines or taking over more than a third of the area should be controlled.

B). Operations

We currently use a combination of chemical (glyphosate) and mechanical control, depending on the height and vigour of the weed present in the area. They both can be done manually, using sickles or backpack sprayers, or by tractors with proper implements, depending on the conditions of the area.

Pruning decision criteria

A). Site selection

Areas presenting branches thicker than 4 cm up to 6 m high or 50% of tree height, whichever is lower.

B). Operations

This operation is done by field workers with the aid of pruning chainsaws adapted to a long metal pole to reach the upper branches up to 4.5 m. If higher branches up to 6m need to be removed, then a regular pruning saw is used.

Fertilizing decision criteria

A). Site selection

Forests presenting poor development are an indication of P insufficiency given that minimum physical requirements of the soils are met (depth and drainage).

B). Operations

Current operational fertilization scheme is based on application of 250 kg/ha of mono-ammonium phosphate (MAP) + 2 kg/ha of Boron on total area with the aid of broadcast spreaders pulled by tractors.

Pest and Disease Monitoring - Ant Control Decision Criteria

The forest inventory staff inspects all planting sites on a yearly basis and evaluates the occurrence of potential pests and diseases. Regular monitoring allows the company to take measures to guard against and control pests and disease. To date, disease occurrence has not been significant (<5%). As a rule, the Company always thins / eliminates trees with any sign of relevant disease, to preserve the remaining trees.

Among all potential pests, the combatting of the leaf cutter ants is a priority. Leaf cutter ants defoliate the tree crown and cut the main stem top, resulting in lower wood production, and cause stem forking. These leaf cutter ants are monitored year-round over the full teak cultivation cycle. When ant control is required, it is carried out manually by applying products containing deltamethrin and sulfluramid, in strict compliance with worker health and the environmental regulations.

Forest Monitoring and Inventory Methods

The main purpose of a forest inventory is to gather precise information on the current stock of timber, and on the quantitative and qualitative development of the stands. A forest inventory makes it possible to assess current productivity and evaluate the changes throughout the years, thus allowing the planning of harvest activities and the supply of forest products. Inventory also provides valuable information for forecasting, to better optimize thinning decisions and schedules, and of the expected production by site index. This activity is conducted on a yearly basis from the third year of planting until the final cut.

The inventory was planned and structuralized as a Continuous Forest Inventory, making possible the periodic determination of the quantitative and qualitative characteristics of the forest and guaranteeing the return to the same sample plot in future measurements. Before 2013, all plots were located on a regular grid of 1 plot for every 5 hectares of planted Teak and they had fixed sizes, those being: 10.70 m radius for 3x3 m spacing and 12.60 m radius for 4x3m.

From 2013, the inventory methodology was changed to improve our data quality and be more cost effective, while maintaining the same statistical accuracy of the information. Under this methodology, in areas without prior measurements, the initial plot location is still done by systematic sampling, however, now based on a grid of 1 circular plot for every 10 hectares of planted area and

as thinnings occur, the plot size is increased to keep approximately the same number of trees inside each plot. In this way, the information improves as the number of total trees declines.

Where past measurements have already been performed, were conducted a stratification of the area based on classes of total standing volume of the last available inventory. Inside each stratum, a selection of the plots is made so that we have a significant and sufficient sample set, considering a margin of error of 10% at a 95% confidence level. In this way, the number of plots measured can be reduced while guaranteeing the same statistical quality of the assessment.

In 2018, another change in methodology was done, with the modification of the sample plots from circular to rectangular. The main reasons was simplify the field work and to facilitate the recording and tracking of measurements at tree level when plot size is increased after thinning. On areas where the 3rd thinning has occurred, no changes to the plot form were done (since there is not additional benefit, as the final population of trees has already been determined). The area stratification now is based on five variables: Project – Planting Year – Thinning – Clone/Seed – Site Class.

Each sample plot is located according to a rectangular grid point inside the blocks, as follows:

- The beginning of the sample plot is the intersection point of the lines in the grid, as determined with GPS tools.
- The sample plot outset is identified in the field using props settled in the line of the plantation to the side of the initial tree, which has its number painted on the trunk.
- The bordering trees of the plots are identified with blue latex paint, facilitating the visual localization for the periodic measurement or any another purpose.

In the table below, we show the evolution of the plot size for each thinning, to the main spacing.

Table A.1.1 – Variation of Plot Size Following Thinnings

Thinning	AREA (m^2)	Side 1 (Number of Planting Spots)	Side 2 (Number of Planting Spots)
No thinning	315,00	5	7
1P	630,00	5	14
1T	1.080,00	10	12
2D	1.620,00	10	18
3D	2.250,00	10	25
Initial Spacing: 3 x 3 m			

Thinning	AREA (m²)	Side 1 (Number of Planting Spots)	Side 2 (Number of Planting Spots)
No thinning	420,00	5	7
1D	840,00	5	14
2D	1.680,00	10	14
3D	2.160,00	10	18
Initial Spacing: 4 x 3 m			

Thinning	AREA (m²)	Side 1 (Number of Planting Spots)	Side 2 (Number of Planting Spots)
No thinning	576,00	6	6
1D	864,00	6	9
2D	1.440,00	9	10
3D	2.304,00	9	16
Initial Spacing: 4 x 4 m			

Forest Harvesting

Forest harvesting consists of all the activities of thinning and final cuts.

Thinning consists of the felling of trees with the worst growth in their growing area, and the felling is to eliminate the competition of these trees with the remaining trees (with the best growth and quality characteristics).

Final cut is the clear-cutting of all remaining trees at the end of the cycle, which are the best of all original trees in the area.

The actual process of harvesting involves several specific procedures which occur before and following the felling. In the remainder of this section, we describe these procedures in some detail, as they all have an impact on harvesting costs.

Selection and marking

This process consists of selecting and marking the trees to be felled with latex paint. Trees that are diseased, crooked, forked and of small diameter (for their age) are marked, taking into consideration the need for an evenly spaced distribution of the remaining trees. This activity is carried manually, requiring workers to concentrate, observe and have a good sense of spacing. The selecting and marking process enables the best trees to be selected for the future, i.e., those having the best timber quality and yielding the best economic results.

Felling

This activity can be performed manually with chainsaw operators or mechanically by a forest tractor called a Harvester or Feller. The trees are felled, the branches are removed and they are sectioned into logs of a predetermined length.

After the trees are felled, the logs are piled up between planting rows for subsequent forwarding. The felling (whether manual or mechanized) is always directed toward spaces that are free of obstacles so as to prevent damage to the remaining trees and is performed systematically to expedite the activities that follow.

The branches and leaves remain on the ground protecting the soil from the traffic of the harvesting machinery, thus diminishing the compacting effect caused by machinery traffic during harvesting activities, and providing natural compost.

Forwarding

This activity is carried out by a tractor equipped with a forest loader and a forest cart (forwarder) designed to remove the logs from the blocks and haul them to the roadside. The tractor has tongs driven by a hydraulic system that carries the logs piled up in the field to the forest cart and then unloads the logs from the tractor to the roadside, forming piles of timber.

The piles of timber are separated according to diameter and block, making it easier to transport the logs according to different end use purposes (export, sawmill biomass) and to keep track of the timber.

Some of the timber, while of commercial dimensions, is not viable for export due to the logistics costs involved in getting them from Mato Grosso to final markets Asia. In this case, the best value for the wood involves sawmill processing, into blocks and boards.

Thinning and Harvesting Decision Criteria

A). Site selection

Decision on thinning is based on a future cash flow NPV optimization process that considers biological growth projections together with commercial and operational constraints. Future alternatives for harvesting on each stand are simulated and the best option for the discounted cash flow which complies with all restrictions is considered as the optimal solution for the long term. The discount rate applied should reflect the risks of this specific timberland investment and country risk. Usually this involves a calculation which considers a "risk free" benchmark rate (usually assumed to be 10 year USD Treasury yield), or alternatively an investment hurdle rate for similar assets of the same class, plus an appropriate risk premium based on type of asset and its relative risk to other assets, as well as liquidity, an important factor in the case of forestry assets.

The main constraints used here are steady wood flows, respecting a maximum variation in production between years, and acceptable production level for sawmill and export grades. For short

term operational planning (12 months), we use a further set of restrictions which are not contemplated in the long-term model.

First, we currently consider that only areas with basal area above 12 m²/ha are eligible for thinning, ignoring less stocked areas that might have been set for thinning in the previous model. Then, we consider restrictions for wet season operations, since not all areas are workable during this 6-month period (Dec-May) due to heavier soils.

Lastly, we try as much as possible to group all stands of the same site class in each farm as a harvesting unit, to both maintain consistency in management as well as gain scale economies from harvesting larger areas and minimizing transport of machinery and field crews.

B). Operations

Thinning can be done either with the aid of a harvester / feller or by field workers equipped with chainsaws. Forwarding is done with adapted self-loadable tractors or skidders, depending on the size of the trees and length of desired final products.

Building and Maintaining the Infrastructure

Building and maintaining roads and safety strips

The building of roads and safety strips defines the size and shape of the units of area called blocks. However, soil conservation, protection of the trees, and harvesting are factors that must be considered.

The function of roads is to allow access and traffic of machinery, people and timber removal. and the function of safety strips is to isolate the growing blocks to prevent fire from spreading in the event of a possible forest fire in the area.

Well-located roads and safety strips allow a crop layout that optimizes soil use and facilitates future forest maintenance and harvesting operations.

Roads and safety strips are opened mechanically using crawler tractors and moto-graders, among other machinery, using criteria for soil conservation, forest protection and optimization of vehicle and heavy machinery traffic.

The primary roads receive a layer of gravel that is leveled and then compacted to provide greater stability so that it can bear the more intense and heavier traffic of the vehicles and heavy machinery. The secondary roads and safety strips are only leveled. In the case of the safety strips, the vegetable (grasses) and other vegetable residues which are combustible, are kept under control or removed.

The maintenance of roads and safety strips is performed only as necessary, to maintain adequate traffic flow and fire protection. These maintenance actions depend mostly on the characteristics of the topography, soil, extent of road use, and rainfall rates of the region.

Building and maintenance of infrastructure

The building and maintenance of infrastructure at the sites includes buildings (mess halls, housing, workshops, storehouses, offices and other support facilities), electrical and telecommunications installations (extension of transmission lines, telephone and radio communication networks, etc.), hydraulic installations (wells, water pipelines, water tanks, etc.) and security fences.

Appendix 2: FSA Properties Areas Breakdown at September 2018:

Project	Year	SATT	LUD	Total
Buriti	1994	307,91		307,91
Paiolandia	1997	210,44	87,48	297,92
Paraíso	1997	524,04	31,01	555,05
Bocaina	1998	351,53		351,53
São José da Canastra	1998	44,62		44,62
Paiolandia	1998	93,95		93,95
São Judas Tadeu	1998	26,76		26,76
Araras	1999	78,30	20,58	98,88
Bambu	1999	549,07		549,07
Bocaina	1999	108,18		108,18
Cassange	1999	88,49		88,49
Capim Branco	1999	507,87		507,87
Serra das Araras	1999	104,01	1,00	105,01
Vale Dourado	1999	48,59		48,59
Bambu	2000	476,09	37,74	513,83
Duas Lagoas	2000	1.527,51		1.527,51
Duas Lagoas	2001	1.760,42		1.760,42
São Miguel	2001	97,52		97,52
Barranquinho	2002	776,15	194,05	970,20
Cacimba	2002	456,87	114,21	571,08
Duas Lagoas	2002	48,41		48,41
São Miguel	2002	5,71		5,71
Santa Maria do Jauru	2002	1.085,18		1.085,18
Barranquinho	2003	10,36	2,59	12,95
Cacimba	2003	8,15	2,04	10,19
Santa Maria do Jauru	2003	207,87		207,87
Santa Fé	2003	2.562,71		2.562,71
Barranquinho	2004	1.021,00		1.021,00
Terra Santa	2004	1.134,45	8,72	1.143,17
Duas Lagoas	2005	207,67		207,67
Duas Lagoas	2006	233,88		233,88
Mutum	2007	539,18		539,18
São José	2007	301,30		301,30
Santa Maria do Jauru II	2008	99,87		99,87
Total		**15.604,06**	**499,42**	**16.103,48**

**LUD refers to "Land Use Deals", and the hectares belonging to the land ownes of the projects on which the teak in planted.*

Appendix 3: FSA Silvicultural Activities per Project:

Project	2019		2020		Total	
Activity	Units	BRL	Units	BRL	Units	BRL
ARA99	**8.5**	**-99,281**	**0.0**	**0**	**8.5**	**-99,281**
Firebreak Maintenance	5.0	-3,496	0.0	0	5.0	-3,496
Other Direct Costs	0.0	-85,285	0.0	0	0.0	-85,285
Road Maintenance	3.5	-10,500	0.0	0	3.5	-10,500
BAM00	**35.0**	**-24,474**	**35.0**	**-28,245**	**70.0**	**-52,719**
Firebreak Maintenance	35.0	-24,474	35.0	-28,245	70.0	-52,719
BAR02	**40.0**	**-140,560**	**246.0**	**-82,845**	**286.0**	**-223,404**
Other Direct Costs	0.0	-47,560	0.0	-29,790	0.0	-77,349
Road Maintenance	40.0	-93,000	0.0	0	40.0	-93,000
Sprout Control	0.0	0	246.0	-53,055	246.0	-53,055
BAR03	**0.0**	**-21,324**	**0.0**	**0**	**0.0**	**-21,324**
Other Direct Costs	0.0	-21,324	0.0	0	0.0	-21,324
BAR04	**60.0**	**-127,240**	**315.0**	**-224,200**	**375.0**	**-351,439**
Firebreak Maintenance	60.0	-41,955	60.0	-48,421	120.0	-90,376
Other Direct Costs	0.0	-85,285	0.0	-123,501	0.0	-208,786
Sprout Control	0.0	0	255.0	-52,277	255.0	-52,277
BOC98	**49.0**	**-213,395**	**25.0**	**-86,618**	**74.0**	**-300,013**
Firebreak Maintenance	25.0	-17,481	25.0	-20,175	50.0	-37,656
Other Direct Costs	0.0	-159,914	0.0	-66,443	0.0	-226,356
Road Maintenance	24.0	-36,000	0.0	0	24.0	-36,000
BOC99	**0.0**	**-159,914**	**0.0**	**0**	**0.0**	**-159,914**
Other Direct Costs	0.0	-159,914	0.0	0	0.0	-159,914
CAN98	**0.0**	**-42,649**	**0.0**	**0**	**0.0**	**-42,649**
Other Direct Costs	0.0	-42,649	0.0	0	0.0	-42,649
CAN99	**11.0**	**-21,496**	**5.0**	**-4,035**	**16.0**	**-25,531**
Firebreak Maintenance	5.0	-3,496	5.0	-4,035	10.0	-7,531
Road Maintenance	6.0	-18,000	0.0	0	6.0	-18,000
CAS99	**9.0**	**-90,125**	**0.0**	**0**	**9.0**	**-90,125**
Firebreak Maintenance	5.0	-3,496	0.0	0	5.0	-3,496
Other Direct Costs	0.0	-74,629	0.0	0	0.0	-74,629
Road Maintenance	4.0	-12,000	0.0	0	4.0	-12,000
CMB02	**35.0**	**-50,709**	**180.0**	**-179,000**	**215.0**	**-229,709**
Firebreak Maintenance	35.0	-24,474	35.0	-28,245	70.0	-52,719
Other Direct Costs	0.0	-26,235	0.0	-123,501	0.0	-149,737
Sprout Control	0.0	0	145.0	-27,254	145.0	-27,254
CPB99	**30.0**	**-97,289**	**20.0**	**-392,657**	**50.0**	**-489,947**
Firebreak Maintenance	20.0	-13,985	20.0	-16,140	40.0	-30,125
Other Direct Costs	0.0	-53,305	0.0	-376,517	0.0	-429,821
Road Maintenance	10.0	-30,000	0.0	0	10.0	-30,000
DLG00	**60.0**	**-41,955**	**60.0**	**-48,421**	**120.0**	**-90,376**
Firebreak Maintenance	60.0	-41,955	60.0	-48,421	120.0	-90,376
DLG05	**205.0**	**-87,925**	**0.0**	**0**	**205.0**	**-87,925**
Other Direct Costs	0.0	-49,968	0.0	0	0.0	-49,968
Sprout Control	205.0	-37,957	0.0	0	205.0	-37,957
DLG06	**0.0**	**-106,609**	**240.0**	**-81,111**	**240.0**	**-187,720**
Other Direct Costs	0.0	-106,609	0.0	-29,790	0.0	-136,399
Sprout Control	0.0	0	240.0	-51,322	240.0	-51,322
MUT07	**122.0**	**-76,696**	**200.0**	**-124,321**	**322.0**	**-201,017**
Firebreak Maintenance	25.0	-17,481	25.0	-20,175	50.0	-37,656
Other Direct Costs	0.0	-40,557	0.0	-65,973	0.0	-106,530
Sprout Control	97.0	-18,657	175.0	-38,173	272.0	-56,830
PAI97	**32.0**	**-124,614**	**20.0**	**-16,140**	**52.0**	**-140,754**
Firebreak Maintenance	20.0	-13,985	20.0	-16,140	40.0	-30,125
Other Direct Costs	0.0	-74,629	0.0	0	0.0	-74,629
Road Maintenance	12.0	-36,000	0.0	0	12.0	-36,000
PAI98	**0.0**	**-74,629**	**0.0**	**0**	**0.0**	**-74,629**
Other Direct Costs	0.0	-74,629	0.0	0	0.0	-74,629
PAR97	**20.0**	**-13,985**	**20.0**	**-270,841**	**40.0**	**-284,826**
Firebreak Maintenance	20.0	-13,985	20.0	-16,140	40.0	-30,125
Other Direct Costs	0.0	0	0.0	-254,701	0.0	-254,701
SAJ07	**311.0**	**-110,845**	**10.0**	**-8,070**	**321.0**	**-118,915**
Firebreak Maintenance	10.0	-6,992	10.0	-8,070	20.0	-15,063
Other Direct Costs	0.0	-42,966	0.0	0	0.0	-42,966
Sprout Control	301.0	-60,887	0.0	0	301.0	-60,887
SER99	**5.0**	**-3,496**	**0.0**	**0**	**5.0**	**-3,496**
Firebreak Maintenance	5.0	-3,496	0.0	0	5.0	-3,496
SJT98	**9.0**	**-58,145**	**5.0**	**-4,035**	**14.0**	**-62,180**
Firebreak Maintenance	5.0	-3,496	5.0	-4,035	10.0	-7,531
Other Direct Costs	0.0	-42,649	0.0	0	0.0	-42,649
Road Maintenance	4.0	-12,000	0.0	0	4.0	-12,000
SMG01	**5.0**	**-3,496**	**5.0**	**-4,035**	**10.0**	**-7,531**
Firebreak Maintenance	5.0	-3,496	5.0	-4,035	10.0	-7,531
SMJ02	**293.0**	**-115,821**	**60.0**	**-275,018**	**353.0**	**-390,839**
Firebreak Maintenance	60.0	-41,955	60.0	-48,421	120.0	-90,376
Other Direct Costs	0.0	-28,644	0.0	-226,597	0.0	-255,241
Sprout Control	233.0	-45,222	0.0	0	233.0	-45,222
SMJII09	**23.0**	**-6,713**	**5.0**	**-4,035**	**28.0**	**-10,748**
Firebreak Maintenance	5.0	-3,496	5.0	-4,035	10.0	-7,531
Sprout Control	18.0	-3,217	0.0	0	18.0	-3,217
STF03	**310.0**	**-140,003**	**40.0**	**-59,550**	**350.0**	**-199,553**
Firebreak Maintenance	40.0	-27,970	40.0	-32,281	80.0	-60,250
Other Direct Costs	0.0	-57,288	0.0	-27,269	0.0	-84,557
Sprout Control	270.0	-54,745	0.0	0	270.0	-54,745
TST04	**137.0**	**-281,131**	**346.0**	**-151,862**	**483.0**	**-432,992**
Firebreak Maintenance	60.0	-41,955	60.0	-48,421	120.0	-90,376
Other Direct Costs	0.0	-122,176	0.0	-44,685	0.0	-166,860
Road Maintenance	77.0	-117,000	0.0	0	77.0	-117,000
Sprout Control	0.0	0	286.0	-58,756	286.0	-58,756
VDO99	**0.0**	**0**	**0.0**	**-88,595**	**0.0**	**-88,595**
Other Direct Costs	0.0	0	0.0	-88,595	0.0	-88,595
Total Geral	**1,809.5**	**-2,334,516**	**1,837.0**	**-2,133,634**	**3,646.5**	**-4,468,150**