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1. INTRODUCTION

This report presents the roadside Teak price in Mato Grosso State, referring to the month of March, 2018. Mato Grosso State is located in the Central-West Region and is the most important State related to Teak plantations in Brazil. Its share reaches 70% of the country’s total planted area. Figure 1.01 shows the location of Mato Grosso and the density of Teak plantations within the State.

It is important to mention that according to the interviewed companies, Teak logs with diameter under 15 cm are destined almost exclusively for firewood. In addition to that, the regional firewood prices were included as a component of this study.
2. METHODOLOGY

2.1. Equalization of Sale Modality

The market operates on different Teak log selling arrangements (stumpage, on the truck, at road side and FOB). In order to have the roadside price for Teak log as a result, the costs with transportation and port handling costs were subtracted.

2.2. Equalization of Assortment

Despite the existence of standardized assortments by the market (15-20, 20-25, 25-30, 30-35, 35-40 and >40 cm), there are many variations practiced. Thus, to provide prices for different assortments, CONSUFOR has developed, based on renowned statistical techniques, functions that estimates the price per any negotiable diameter class on the market.

2.3. Prices and Costs

All prices presented in this report are based on weighted average, considering the wood traded volume. The prices were determined not considering Floresteca samples.

2.4. Sample Composition

Figure 2.01 presents the composition of the sample base. In total, 26 companies/forest owners were consulted, generating 80 price samples.

*FIGURE 2.01 – SAMPLE COMPOSITION*

- Forest Producer: 65%
- Trader: 12%
- TIMO's: 8%
- Timber Industry: 15%

*SOURCE: CONSUFOR*
2.5. Equalization of Measure Unit

The market sells wood in different units of measure (st, m³ Hoppus, t). To equalize the measures, based on specific conversion factors, all measures were converted to m³.

The main destination of Brazilian Teak is the international market, therefore some features and particularities should be considered when formulating wood prices.

The first Teak logs market rule is to be absolutely sure of which measurement method is being used, since the evaluation and price negotiations will depend on it. The main trading partner of Brazilian Teak is India, where the most commonly used measurement unit is Hoppus while in Brazil the most common is Smalian.

It is important to note that the Hoppus measurement takes into consideration a “discount”, which considers some log characteristics, such as bark thickness and the amount of sapwood. Typically this amount varies from 4 to 8 cm. The higher the “discount”, the lower the log volume.

Considering an average “discount” of 5 cm, the Hoppus measure is equivalent to approximately 69% of the Smalian cubic meter.

Example of Equivalence:

<table>
<thead>
<tr>
<th>VOLUME</th>
<th>PRICE</th>
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<tr>
<td>1 m³</td>
<td>100 R$/m³</td>
</tr>
<tr>
<td>SMALIAN</td>
<td>0.69m³</td>
</tr>
<tr>
<td>HOPPUS</td>
<td>144.93 R$/m³</td>
</tr>
</tbody>
</table>

HOPPUS

A measurement system developed in Britain and widely used in India to measure Teak logs and to quantify loaded volumes of logs in containers.

\[
\frac{(C - d)^2 \times (h - d)}{16}
\]

C = circumference (meters);
\(h\) = height (meters)
\(d\) = discount (meters)

SMALIAN

A method widely used by the forest sector. The formula states that the volume of a log can be estimated by multiplying the average of the two log ends areas by the log’s length.

\[
\frac{(A_b + A_t) \times h}{2}
\]

\(A_b\) = base area (square meters);
\(A_t\) = top area (square meters);
\(h\) = height (meters)

SOURCE: CONSUFOR
3. TEAK WOOD PRICE

In order to identify the average wood prices, CONSUFOR interviewed several companies in the region. The majority of the participants practice the Teak log price in USD (Figure 3.01). Aiming to convert it to R$ (Brazilian Reais) CONSUFOR applied an exchange rate of R$ 3.25/USD which represents the average observed in the last quarter.

The dataset consisted of 80 samples (not considering Floresteca, outliers and not representative samples), weighted by traded Teak volume.

The observed data resulted in a function and R², which are presented in Figure 3.02.

The coefficient of determination, also called R² is an adjustment measure of a statistical model to the observed values. R² varies between 0 and 1, indicating in percentage, how the model can explain the observed values. The higher the R², more explanatory the model is, the better it fits the sample.

**FIGURE 3.01 – PARTICIPATION ACCORDING TO CURRENCY**

**FIGURE 3.02 – TEAK PRICES SURVEYED AND TRENDLINE**

\[ y = 0.81x^2 - 10.87x + 67.04 \]

\[ R^2 = 0.89 \]

**y = Roadside Price (R$/m³)**

**x = Diameter (cm)**

**SOURCE: CONSUFOR**
3.1. Log Prices

Current Teak prices are presented in Figure 3.03 and Figure 3.04 considering the roadside prices, in Dollar and Reais, per assortment class (diameter). It is worth noting an aspect related to the sales modality. Very few companies adopt selling at roadside modality. In general, companies sell logs or blocks delivered at Port (FOB Port).

Thus, the roadside prices presented here can be understood as a potential price. Roadside price was determined according to the following equation:

\[
\text{R$/m}^3 \text{ at Roadside} = \text{R$/m}^3 \text{ FOB port} - \text{Terminal Handling Charges} - \text{Freight Cost} - \text{Transportation Cost}
\]

The International Market classifies the logs according to quality grades. This arrangement is especially related to the heartwood proportion presented in the log. Prices presented in this Report are related to the Teak prices of logs classified in the highest grade (Grade A).
3.2. Firewood Prices

Current firewood prices are presented in Figure 3.05 and Figure 3.06 considering the roadside prices, in Dollar and Reais. For firewood prices were considered all genus traded in the region, not only Teak.

**FIGURE 3.05 – FIREWOOD PRICES – US$ ROADSIDE**

**FIGURE 3.06 – FIREWOOD PRICES – R$ ROADSIDE**

**SOURCE: CONSUFOR**
4. SUMMARY OF KEY MARKET FACTS

In this quarter were identified some important aspects related to the Teak market that deserve to be highlighted:

• The behavior of Teak prices in the first quarter of 2018 is a reflection of the high volume of rainfall that occurs between October and May in the study region. During the rainy season, harvesting, hauling and loading operations within the forest are more expensive, and in some critical cases, totally restricted.

• This volume of rain can affect the Teak price, since there can be a significant reduction of the stocks, mainly of logs with diameters above 40 cm. Therefore, the assortments with diameters above 40 cm presented a slight increase in prices, since these dimensions are more required by the international market.

• Other assortments presented lower average prices in relation to the last quarter. This reduction in prices may be related to the need to maintain the sales volume. Even with impaired quality, companies seek to market their stocks in order to maintain the revenue flow. However, the seasonal reduction of prices is related to the financial need of each company and its organization.

• The logs not suitable for export – presenting high proportion of sapwood, excessive bend and knots – are being sold at residual prices in the Domestic Market. Logs with diameter varying from 15 – 25 cm are still suffering price pressure due to the difficulty of trading it with the International Market. This occurs because part of these logs do not meet the minimum specifications required. Therefore, most part have to be sold in the Domestic Market by much lower prices.

• The exchange rates causes fluctuation in price, independently on the demand movement. Since the majority of prices is provided in USD FOB term, and internal costs (harvesting, transportation, freight, terminal charges, etc.) are in Brazilian Reais (BRL), changes on exchange rates impacted the log prices.

SOURCE: CONSUFOR
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