

# Journal of Agricultural Sciences Research

Acceptance date: 28/10/2024

## ANALYSIS OF THE CHALLENGES AND OPPORTUNITIES FOR NATURAL RUBBER PRODUCTION IN BRAZIL

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**ABSTRACT:** The state of São Paulo is the largest producer of natural rubber in the country, accounting for 63.1% of national production. However, the crop is experiencing one of the biggest crises ever announced by the sector. There have been no new plantings in the state and production areas are falling year after year, due to the process of eradicating rubber plantations to replace other more profitable crops. With the social and environmental aspects generated by the crop in mind, and especially the strategic importance of this precious raw material, the aim of this paper is to discuss the crisis the sector is facing and propose alternatives so that the natural rubber sector in the state of São Paulo can become competitive by valuing its product, which meets all the environmental and social requirements demanded by the more demanding and conscious consumer market.

**Keywords:** rubber trees, production chain, sustainability, niche markets, trends.

## **NATURAL RUBBER PRODUCTION: CHALLENGES AND OPPORTUNITIES**

Brazil has gone from being the largest producer of natural rubber in the world to an importer. We currently produce 50% of what we consume (Brisolara, 2023).

The pricing policy for natural rubber in Brazil was regulated by specific laws and benefits that the production sector lost over the years. After the laws came to an end and all the benefits were lost, an agreement was reached between two entities in the production chain, which resulted in the creation of an index that was used as a market reference, called GEB 10, and contracts for the purchase of clot in the field were made based on the value of GEB 10, whose calculation methodology takes into account international natural rubber prices, freight, taxes and duties. The loss of these

benefits and the changes that have taken place can mainly be attributed to: the disunity and disorganization of the production sector and the lack of representation of the sector in the main discussion forums in the past.

Since 2012, there has been strong pressure from the production sector to explain the method of calculating the index, as producers wanted to know the items that made up the calculation formula. For decades, this index called GEB10 was used by the sector to pay for clot in the field, but the dissatisfaction and discontent on the part of the productive sector and the struggle of the Associations to create a new index for the sector, calculated by a research institute, led in 2020 to the creation of a new index for imported rubber called the IEA/CNA index, the result of a partnership between the Institute of Agricultural Economics (IEA) and the Confederation of Agriculture and Livestock of Brazil (CNA), (FAESP, 2023).

The Brazilian cabbage industry has suffered from a lack of competitiveness with the imported product and from the severe drop in domestic prices paid for clot (53% DRC - Dry Rubber Content) since March 2002, when it reached R\$5.48/kg (real price deflated by the IGP-Di/IBRE-FGV, base February 2023, based on the São Paulo market price series). Although it represents only 43% of the reference import price, as published by the Institute of Agricultural Economics - IEA/SAA-SP, of the São Paulo State Department of Agriculture and Supply, this price is almost double that of February 2023, at R\$2.92/kg. Comparing the periods, there was a 47% drop in the price paid for the product (Brisolara et al, 2023).

The cost of production for natural rubber clot in the state of São Paulo, calculated by the Institute of Agricultural Economics (IEA/SSA - SP) in February 2024, is R\$6.07/kg (Oliveira & Gonçalves, 2024), while the average price received by the producer on the market in the same month was R\$3.01/kg, IEA, 2024.

With the lack of adequate remuneration in the field and the absence of government policies to guarantee equal conditions of competitiveness with Asian rubber (cheaper inputs and labor) and incentives for production in Brazil, the expansion of the crop in the country and self-sufficiency are becoming increasingly distant. Natural rubber is a strategic product for development and, therefore, new trade relations, such as using the Integration Law and opening up new markets that value sustainable production (respect for the environment and valuing the labor used in production) are fundamental for the survival of a sector that is so important for the country (Oliveira & Gonçalves, 2022).

Far from self-sufficiency, what we see today is that natural rubber production in the country is heading down a path that has led to the eradication of many rubber plantations, unemployment, rural exodus and the uprooting of countless planted forests (Oliveira & Gonçalves, 2024).

### **ALTERNATIVES TO MAKE THE NATIONAL NATURAL RUBBER PRODUCTION SECTOR COMPETITIVE**

Taking into account all of the above, it is understood that various measures can be taken to ensure that natural rubber production in the country prevails and that there is no external dependence on other countries:

#### **DECLARE NATURAL RUBBER A STRATEGIC PRODUCT FOR THE COUNTRY'S DEVELOPMENT**

Natural rubber is a strategic raw material used in countless products that are essential to the country's survival and development. Most of Brazil's agricultural production is transported by road, we have a large road fleet and a huge dependence on tires and, consequently, natural rubber. A week-long

truckers' strike caused major damage to the country, imagine what a shortage of natural rubber would cause.

In addition to the pneumatic industry, which absorbs 70% of production, there is the light market, which uses natural rubber in different sectors, including healthcare. During the Covid-19 pandemic, rubber gloves had to be imported because Brazil didn't have enough production to supply the market.

Natural rubber is imported from Asian countries and any problem, be it climatic, political and/or economic, could affect the supply of rubber in Brazil. Making the country self-sufficient should be one of the government's flagships. In addition to protecting the country, self-sufficiency would provide decent working conditions and a better quality of life for countless people, since the crop is highly labor-intensive, second only to coffee.

#### **ADOPTION OF THE IEA/CNA IMPORTED RUBBER VALUE INDEX**

In 2020, the natural rubber import reference price (TSR-20) was launched, a benchmark released by the Institute of Agricultural Economics - IEA/SAA-SP, in partnership with the Confederation of Agriculture and Livestock of Brazil - CNA, formed by a more comprehensive calculation methodology, as it now takes into account important additional costs. Its adoption leads to fairer and more realistic negotiations, since it is an official independent government institution. The IEA/CNA reference price shows the calculation and consistency of the data considering all the variables that make up the process of importing goods, in this case referring to technically modified TRS-20 rubber similar to GEB 10- granules sold by the processing plants, most of which are located in the state of São Paulo (Bini and Oliveira, 2022).

The use of this reference price, published monthly by the IEA and the CNA, would bring greater transparency, security and predictability to the formation of rubber prices in Brazil. The GEB 10 market benchmark presents serious problems because it is linked to the behavior of TSR-20 rubber (GEB 10 equivalent) on the Asian market, but without fully considering the costs of internalizing the product, which underestimates the amount to be paid to the national producer (which can be up to 30% lower). As Brazil is a net importer of natural rubber, with around 50% of its domestic supply coming from imports, domestic prices should be similar to the prices paid by the industry for the international product, especially considering the superior quality of the domestic product compared to the imported one.

If the IEA/CNA reference price had been in force, it certainly wouldn't have been necessary to use the Equalizer Premium Paid to Rural Producers (PEPRO) auctions held by the National Supply Company (Conab) through the Minimum Price Guarantee Policy (PGPM) in 2023 and 2024, because the minimum price in force would have been covered by the values calculated by this reference.

The Natural Rubber Sector Chamber of the São Paulo State Department of Agriculture and Supply set up a working group to discuss the GEB 10 market and IEA/CNA calculation methodologies and the group concluded that the IEA/CNA methodology should be recognized because it is transparent and has scientific criteria.

## **USE OF THE FOREST CODE IN FORCE WITH REGARD TO IMPORTS FROM COUNTRIES THAT DO NOT RESPECT THE ENVIRONMENT**

**Law No. 12.651**, of May 25, 2012 (the new Brazilian Forest Code), provides, in the caput of **art. 74**, authorization for the Chamber of Foreign Trade - CAMEX to adopt measures to restrict imports of goods of agricultural or forestry origin, produced in countries that do not comply with environmental protection norms and standards, compatible with those established by Brazilian legislation.

In Brazil, 20% of the area of rural property is not used for agricultural production (areas declared as legal reserves, as well as areas classified as permanent preservation), so the Brazilian rural producer loses competitiveness compared to producers in countries that do not make this requirement. There is also the use of labor analogous to slavery (poorly paid) and non-compliance with working conditions;

## **ENCOURAGE THE ESTABLISHMENT OF NEW RUBBER PLANTATIONS AND THE MAINTENANCE OF EXISTING ONES**

The creation by the São Paulo State Department of Agriculture and Supply (SAA/SP) of a rubber tree program, with a multidisciplinary team made up of researchers and extension workers, as a way of encouraging the technical formation of new rubber plantations and stimulating the use of new clones developed by São Paulo research using the vast knowledge and expertise of these SAA/SP professionals.

Encouraging the establishment of new rubber plantations through the support of financing lines, stimulating an increase in the area planted with a few years' grace period, since rubber is a perennial crop with a formation period of six years and it is only from the seventh year onwards that around 50% of the trees come into production, reaching 100%

of the rubber plantation in bleeding only in the tenth year, reaching full production in the twelfth year, which can extend to forty years of production.

Encouraging the creation of seedling nurseries and the production of bench and substrate seedlings that are healthier and transmit quality and productivity characteristics to the adult plants.

The adoption of a reference price that remunerates production costs, as mentioned above.

### **RAISING THE COMMON EXTERNAL TARIFF**

Since the Common External Tariff (CET) has a direct impact on the value of imported products, one way to help the natural rubber production chain and make domestic rubber production more competitive (since Brazil's main competitors are able to produce with subsidies, cheaper labor and without any labor and/or environmental legislation) is to increase the tariff, since for years it has fallen far short of the values demanded by the production sector. A study carried out and presented by FAESP (Federation of Agriculture and Livestock of the state of São Paulo) to the Ministry of Agriculture, Livestock and Supply (MAPA) in 2023 shows that the minimum import tax rate for natural rubber is 22% and the ideal is 29% (Brisolara, 2023).

There are several laws that prevent the import of some tire models from some producing countries and the TEC for tire imports is 16%, which is higher than that for natural rubber, which is currently around 10.8%. Other *anti-dumping* measures that protect the tire industry from competition with other countries are in force, such as GECEX Resolution No. 3, of January 14, 2020, which extends the definitive *anti-dumping* duty, for a period of up to 5 (five) years, applied to Brazilian imports of new rubber tires of the types used in passenger

cars, of radial construction, of the 65 and 70 series, rims 13 and 14 inches, and bands 165, 175 and 185, originating in the Kingdom of Thailand, the Republic of Korea and Chinese Taipei; suspends application to South Korea (Camex,2020).

**RESOLUTION No. 13, OF FEBRUARY 17, 2020** extending the definitive *anti-dumping* duty, for a period of up to five (5) years, applied to Brazilian imports of new rubber bicycle tires, originating in the People's Republic of China, the Republic of India and the Socialist Republic of Vietnam.

**RESOLUTION No. 22, OF MARCH 25, 2020** granting a temporary reduction, to zero percent, of the Import Tax rate under Article 50(d) of the Treaty of Montevideo of 1980, internalized by Legislative Decree No. 66 of November 16, 1981, with the aim of facilitating the fight against the Coronavirus / Covid-19 pandemic.

**RESOLUTION No. 03, OF FEBRUARY 16, 2017, which** applies a definitive *anti-dumping* duty, for a period of up to five (5) years, to Brazilian imports of agricultural tires originating in the People's Republic of China.

**GECEX Resolution No. 540 OF 15/12/2023** that adds an interpretative article on the application of anti-dumping measures on tire imports, amending SECINT Ordinance No. 505/2019 and GECEX Resolutions No. 18/2019, No. 3/2020, No. 13/2020, No. 176/2021, No. 198/2021 and No. 452/2023.

*Dumping*, according to the Brazilian Machinery and Equipment Industry Association (Abimaq), is the practice of exporting a product at a lower price than that practiced in the exporting country's domestic market, with the aim of conquering markets or releasing excess

production. This practice is condemned by the World Trade Organization (WTO), which regulates the “use of anti-dumping duty - that is, the application of a rate equivalent to (or lower than) the dumping margin that is found on imports”. As such, importers are not prohibited from bringing the product into Brazil, but they will have to make a correction, with a “rate equivalent to the anti-dumping margin”, to the prices in dollars per kilo, which can vary from US\$ 0.14 to US\$ 2.56.

According to the SERPA group website, in the context of tire imports, Brazil adopts the *Antidumping* rule, a form of protectionism determined by the government so as not to harm the domestic industry, imposing a surcharge on imports to maintain competitiveness. The average cost of this surcharge is between 1 and 2 dollars per kg.

The same policy should be adopted for the production of natural rubber, i.e. imported rubber should have an equivalent *anti-dumping* rate.

### **CREATION OF QUOTAS FOR NATURAL RUBBER IMPORTS**

As opposed to quotas, we could think about creating import quotas for Asian rubber, so that the marketing of domestic production is guaranteed. Today, there is no guarantee that domestic production will be purchased. Imports are uncontrolled and producers have no guarantee that their production will be marketed. This makes it very difficult for producers to obtain credit and lines of financing to stockpile production, since there is no guarantee that production will be sold. During the pandemic and when there was a significant increase in imports, the president of the Sector Chamber went to ask the Credit Chamber to release some kind of funding for the sector and the justification for not releasing the resource was that there was no guarantee of purchase due to imports.

### **ENCOURAGING ASSOCIATIONS AND COOPERATIVES**

For years, the production sector has been losing the benefits and laws that protected the price policy for natural rubber in the field, and several studies attribute this to the lack of organization among producers.

Encouraging associations is important if the production sector is to organize itself and start discussing the problems and solutions that need to be taken to make the crop viable. Associations can represent their members in different discussion forums and take the demands of the production chain to the government. There are various producers' associations in different regions of the country.

In addition to encouraging associations, cooperatives are also a way of gaining strength in negotiations and sales of agricultural production. In recent years, many cooperatives have been set up and this has meant that the market, the sales value and the way natural rubber is sold have changed significantly.

The clot was always purchased in the field taking into account the weight of the rubber in the field, and not the amount of dry rubber present in a kilo of clot (DRC - Dry Rubber Content). The producer was often penalized because he delivered dry rubber and received the value of green rubber. With associations and cooperatives, and the active participation of producers, negotiation models have changed and today the final price paid to the producer is adjusted after analysis of the dry rubber content (DRC).

## RECEIPTS FOR ENVIRONMENTAL SERVICES RENDERED AND THE ESG ISSUE

The rubber tree provides numerous environmental gains, as it contributes to reducing the greenhouse effect, conserving and regenerating degraded soils, minimizing erosion problems, preserving water sources and protecting fauna and flora, as well as minimizing problems caused by monocultures.

The advent of industry came about to meet the needs of a growing population that wanted comfort, quality and improved living conditions. However, to make this possible, we often cause serious problems such as water, air and soil pollution, large-scale deforestation, loss of biodiversity, ecological imbalance and even climate change. When we talk about climate change and global warming, we are referring to the increase, beyond the normal level, in the atmosphere's capacity to retain heat. This has been happening due to a progressive increase in the concentration of greenhouse gases in the atmosphere over the last 150 years ABNT, 2017. This increase has been caused by human activities that produce excessive emissions of pollutants into the atmosphere. This increase in the greenhouse effect could have serious consequences for life on Earth in the near future,

Several gases are responsible for the greenhouse effect, however, carbon dioxide (CO<sub>2</sub>) is the one that has caused the most concern, as it has a growth rate of 0.4% per year. Recent studies at the University of Viçosa (MG) revealed that rubber trees can remove 1,109 tons of carbon dioxide from the atmosphere, if all possible forms of fixation and avoided emissions are taken into account. "Eucalyptus, which is one of the forestry activities that is most highly rated for generating credits under the CDM (Clean Development Mechanism), stores approximately 317 tons of CO<sub>2</sub>/hectare in its biomass" (Carmo et al, 2007).

In addition to the social benefits that rubber tree plantations can provide to small and medium-sized producers, according to Carmo et al, 2007, the species is an efficient carbon sequester and can generate income for the country through the carbon credit market, since it is a perfectly sustainable crop and falls within the eligibility criteria of the Kyoto Treaty's Clean Development Mechanism (CDM).

Nowadays, the trend is for crops to also be paid for the gains they make for the environment, mitigating climate change and contributing to efficient and sustainable agriculture;

Rubber tree cultivation generates several environmental gains:

- It is a crop that has a low water demand compared to others (water supply);
- It allows the soil to be exploited with other crops from the outset, promoting (greater land use, increased biodiversity);
- It conserves the soil, as there is the possibility of using intercropping and other crops, and in addition, the annual leaf fall that occurs in the crop creates a layer of organic matter in the soil and promotes nutrient recycling; The rubber tree is a deciduous crop and is characterized by the fall of leaves and other components of the aerial part, which will form the litter, constituting an important mechanism for transferring nutrients from the plant phytomass to the soil. According to Andrade et al. (2003), the accumulation of litter on the soil surface is regulated by the amount of material that falls from the aerial part of the trees and its rate of decomposition. Understanding the dynamics of litter decomposition is important for gauging the carbon and nutrient balance in forestry and agroforestry systems (Carmo et al, 2007).

- The rubber tree works to sequester carbon. Studies show that one way to combat the greenhouse effect and contribute to global climate change, which is taking place on the planet, would be to conserve native and/or commercial forests and plant new commercial forests. Rubber tree cultivation makes a major contribution to carbon sequestration, with some studies reporting up to 10 tons of C/ha/year. The producer should therefore be paid for the environmental services generated by the crop (Alvarenga and Carmo, 2006).

As society and the buying market are very concerned about climate issues and the question of sustainable production and valuing carbon-neutral products (these are products where the entire production chain is mapped and all gas emissions for the production of this product must have been offset in some way), it could be through the preservation of planted forests, with the possibility of rubber tree forests being remunerated.

In 2004, a United Nations report coined the term ESG, which stands for Environmental, Social and Governance. In general, ESG shows how much a business is looking for ways to minimize its impact on the environment, to build a fairer and more responsible world and to maintain the best management processes. ESG encompasses a set of practices aimed at preserving the environment, responsibility towards society and corporate transparency (&CO, 2024).

The world is changing, and these three concepts: social responsibility, sustainability and ESG are in the sights of consumers and investors. More than just a trend, ESG practices are competitive factors in the business environment in general. Society and the market look favorably on companies that practice ESG actions and are concerned about environmental, social and governance issues.

According to the Corporate Finance Institute (CFI), capital markets can be a powerful tool for creating change. By restricting access to capital (or making the terms on which it is available less favorable), bad actors can be incentivized to improve performance on the E, S or G measures. On the other hand, rewarding companies and their management teams that perform well on ESG factors encourages progress and continuous improvement. Many green bonds, mutual funds, ETFs and index funds (among others) have emerged.

In this way, the consumer market should be made aware of the production of natural rubber in Brazil, which is produced according to all these criteria, and the unfair competition with Asian production, through international media, so that the market itself can guarantee the appreciation of national natural rubber production. The rubber tree is one of the crops that generates the most environmental and social gains and should be paid for this by factories that have environmental liabilities. A study on the emission of gases by the chain and their payment to the productive sector would be an alternative for the productive sector to stay in business.

There are various components in the composition of tires, and in addition to natural rubber, synthetic rubber is used, which comes from oil. Oil exploration is the second largest emitter of greenhouse gases on the planet, generating environmental impacts and contributing to climate change. Replacing and/or using less synthetic rubber in the production of tires to the detriment of increasing the use of natural rubber would contribute to the environment in two different ways.

Carmakers who have joined society's calls and adopted ESG practices can start demanding that the tires used on their vehicles are not made from natural rubber planted in deforested areas and using child labor or labor analogous to slavery.



## FOREST REPLACEMENT CREDITS

Forest Replacement is "*the compensation of the volume of raw material extracted from natural vegetation by the volume of raw material resulting from forest planting to generate stock or recover forest cover*". (Article 13 of Decree 5.975/2006). The aim is to guarantee a balance between planting and exploiting forests, thus avoiding an increase in deforestation rates in the country. With this in mind, forest replacement credits were created. Forest Replacement Credits are securities representing the volume of raw material resulting from forest planting, which are generated after proof of effective planting of suitable forest species. These credits provide a stock or recovery of forest cover, so that individuals or companies that have carried out voluntary planting can sell their credits to those who are obliged to carry out replanting, under the terms of the law.

In the state of Tocantins, rural producers who have planted areas with forest, including areas with rubber tree plantations, are benefiting and receiving these forest replacement credits through COEMA/TO Resolution No. 74 of 29/06/2017.

## PRODUCTION TRACEABILITY, GREEN SEAL, DIFFERENTIATED MARKET NICHES

Traceability makes it possible to identify the origin of the entire production chain process, with information on the planting of crops, planted forests or the installation of structures and pastures for raising animals, guaranteeing compliance with legal and regulatory requirements. It also makes it possible to guarantee the quality of products and services used throughout the chain, helping to detect and correct possible problems, reducing the risk of negative impacts that could affect the quality of end products. By implementing traceability, producers can identify the origin

of inputs such as fertilizers, seeds and pesticides, making it possible to choose suppliers who also adopt sustainable practices in the process of obtaining and manufacturing these resources. The practice also makes it possible to monitor the use of pesticides, in order to monitor and control the presence of these products throughout the chain, ensuring that they are applied safely, in compliance with regulations, avoiding damage to the environment and human health (Crop Life Brasil, 2024).

According to Crop Life Brasil, 2024, it is also possible to manage and monitor the use of natural resources, such as irrigation management, monitor deforestation and contribute to reducing greenhouse gases. Another advantage of traceability in agricultural production is the adoption of ethical and socially responsible practices, such as ensuring that there has been no slave labor or use of materials from illegal deforestation.

With the traceability of rural properties and the production of natural rubber in Brazil, a Green Seal of production can be created within this chain, given all the environmental and social benefits that the crop generates and which have been described above. In addition to these benefits, the use of pesticides in rubber cultivation is much reduced when compared to other crops and several producers have used biological products to control pests and diseases. This Green Seal would certify that the production of natural rubber in Brazil meets all the environmental, social and niche requirements of the most demanding markets and with this the national product would have an added value, as there are differentiated niche markets that pay for sustainable production and for ESG principles.

Producing with quality, respecting the environment and playing a major social role, costs more. However, the European market has already signaled that it will no longer import

agricultural products from countries that deforest to produce and that use child labor or labor analogous to slavery. There is a great opportunity for Brazil to seek out new market niches that value sustainable production and pay for this differential.

### **CONSUMER MARKET AWARENESS CAMPAIGNS**

The government could help producers and bleeders with an advertising campaign to raise awareness of the type of rubber produced in Brazil, the commitment made by companies and the adherence of tires to ESG practices. This would guarantee the sale of our production and create differentiated market niches that pay more for products produced without deforestation and without slave and child labor.

### **REGULATION OF THE PROFESSION OF BLEEDER**

Regulating the profession of bleeder would give the agricultural link in the chain greater legal certainty for bleeders and owners and would guarantee labor rights for these workers.

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### **FINAL CONSIDERATIONS**

There is discontent among all the links in the production chain, who complain about the prices and marketing conditions for their products. The primary sector suffers the most because it is unable to add value to its product and competes with countries where the production system and working conditions are very different from domestic production.

Brazil produces with sustainability, responsibility and social respect and this can add value to our production, given that markets are increasingly demanding and there is a lot of multinational support from corporations for ESG objectives (Environment Social & Governance, which refers to practices that prioritize environmental, social and governance sustainability in companies). The prices received by producers are not enough to compensate for any level of production costs and productivity, but sustainable production and good business practices that contribute to the environment and social development could be valued and encouraged by both the buying market and the government. In this respect, rubber growing has a lot to contribute.

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