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COFFEE PRODUCTION AND MARKETING IN BRAZIL

PRODUÇÃO E COMERCIALIZAÇÃO DE CAFÉ NO BRASIL

PRODUCCIÓN Y COMERCIALIZACIÓN DE CAFÉ EN BRASIL

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ABSTRACT

The Brazilian coffee market has undergone significant transformations over time, reflecting changes in production, marketing strategies, and economic impacts. As one of the most widely consumed beverages in the world, the journey of coffee from bean to cup is shaped by multiple factors, including climate change, technological innovations, and the evolution of consumer preferences. This study aimed to evaluate coffee production and commercialization in Brazil in recent years. The research was conducted at the State University of the Tocantina Region of Maranhão, Center for Agricultural, Natural, and Language Sciences, during the period of 2023 to 2024. Data were collected from articles, journals, and official websites, such as the Ministry of Agriculture, Livestock and Supply (MAPA), the National Supply Company (CONAB), and the International Coffee Organization (ICO). The information covers the period from 2010 to 2023, enabling an analysis of trends and changes throughout these years, during which Brazilian coffee production, despite climatic fluctuations, has remained stable, consolidating the country as the world's largest producer. The adoption of agricultural technologies, such as efficient irrigation systems and precision agriculture, has been fundamental to increasing both productivity and bean quality. Economically, coffee is indispensable, making a significant contribution to employment generation and export revenues. The Southeast region of Brazil, particularly the state of Minas Gerais, stands out as the leading producer and trader of coffee in the country. Minas Gerais alone accounts for more than 50% of Brazil's total coffee production.

Keywords: Varieties. Processing. Trade.

RESUMO

O mercado brasileiro de café passou por transformações significativas ao longo do tempo, refletindo mudanças na produção, estratégias de marketing e impactos econômicos. Como uma das bebidas mais consumidas no mundo, a jornada do café do grão à xícara é moldada por vários fatores, incluindo mudanças climáticas, inovações tecnológicas e evolução das preferências do consumidor. Esta pesquisa teve como objetivo avaliar a produção e a comercialização de café no Brasil nos últimos anos. O trabalho foi realizado na Universidade

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Estadual da Região Tocantina do Maranhão Centro de Ciências Agrárias, Naturais e Letras no período de 2023 a 2024. Foram coletados dados de artigos, revistas e sites, como o Ministério da Agricultura, Pecuária e Abastecimento (MAPA), Companhia Nacional de Abastecimento (CONAB) e Organização Internacional do Café (OIC). As informações coletadas abrange o período de 2010 a 2023, permitindo uma análise das tendências e mudanças ao longo desses anos onde a produção de café no Brasil, mesmo com oscilações climáticas, tem se mantido estável, consolidando o país como o maior produtor mundial. A adoção de tecnologias agrícolas, como irrigação eficiente e agricultura de precisão, tem sido fundamental para aumentar a produtividade e a qualidade dos grãos. Economicamente, o café é indispensável, contribuindo de forma expressiva para a geração de emprego e receita de exportação. A região Sudeste do Brasil, especialmente o estado de Minas Gerais, destaca-se como a principal produtora e comercializadora de café no país. Minas Gerais, é responsável por mais de 50% da produção nacional de café.

Palavras-chave: Variedades. Processamento. Comercio.

RESUMEN
El mercado del café brasileño ha experimentado transformaciones significativas a lo largo del tiempo, reflejando cambios en la producción, estrategias de comercialización e impactos económicos. Como una de las bebidas más consumidas en el mundo, el recorrido del café desde el grano hasta la taza está determinado por una serie de factores, entre ellos el cambio climático, las innovaciones tecnológicas y la evolución de las preferencias de los consumidores. Esta investigación tuvo como objetivo evaluar la producción y comercialización de café en Brasil en los últimos años. El trabajo se realizó en el Centro de Ciencias Agrarias, Naturales y Literarias de la Universidad Estatal de la Región Tocantina de Maranhão, de 2023 a 2024. Los datos se recopilaron de artículos, revistas y sitios web, como el Ministerio de Agricultura, Ganadería y Abastecimiento (MAPA), Compañía Nacional de Abastecimiento (CONAB) y Organización Internacional del Café (OIC). La información recopilada abarca el período de 2010 a 2023, permitiendo un análisis de tendencias y cambios a lo largo de estos años donde la producción de café en Brasil, incluso con las fluctuaciones climáticas, se ha mantenido estable, consolidando al país como el mayor productor del mundo. La adopción de tecnologías agrícolas, como el riego eficiente y la agricultura de precisión, ha sido fundamental para aumentar la productividad y la calidad de los granos. Desde el punto de vista económico, el café es indispensable y contribuye significativamente a la generación de empleo y a los ingresos por exportaciones. La región Sudeste de Brasil, especialmente el estado de Minas Gerais se destaca como el principal productor y comercializador de café del país. Minas Gerais es responsable de más del 50% de la producción nacional de café.

Palabras clave: Variedades. Tratamiento. Negocio.

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1 INTRODUCTION

Coffee is one of the most important agricultural commodities worldwide, playing an essential role in global trade and income generation across several countries. In Brazil, its relevance transcends economic aspects, being also a central element of the country's cultural and historical identity. Introduced into Brazilian territory in the 18th century, coffee became the main export crop by the 19th century, contributing to the socioeconomic development of various regions (MARTINS et al., 2020). From a socioeconomic perspective, coffee occupies a strategic role in the Brazilian economy. Currently, Brazil is the world's largest producer and exporter of coffee, with major concentrations in the states of Minas Gerais, Espírito Santo, São Paulo, Bahia, and Rondônia. The country benefits from favorable climatic and topographical conditions for large-scale cultivation, accounting for approximately 35% of global production, thereby generating significant revenues for Brazil's trade balance (IBGE, 2023).

Historically, coffee has been a crucial commodity for many economies, especially in Brazil, where its production has played a vital role. According to Martins, Silva, and Oliveira (2020), coffee cultivation was a decisive factor for Brazil's economic and social progress, being responsible for job creation and for fostering improvements in infrastructure in producing regions. This advancement was enabled by the introduction of innovative agricultural technologies, such as efficient irrigation systems and sustainable management practices, which increased productivity and bean quality. Moreover, climate change has led producers to adopt more resilient practices, including the cultivation of coffee varieties more resistant to adverse conditions. Girotto (2019) emphasizes that adaptation to climate change is essential to ensure the sustainability of coffee production, requiring continuous investment in research and innovation (p. 50).

Despite Brazil's status as one of the largest coffee producers and exporters, the sector faces challenges due to fragmented information. According to studies by the Brazilian Coffee Industry Association (ABIC), data on production, exports, domestic consumption, and market trends are dispersed across multiple entities, such as producers' associations, government institutions, and research centers. The absence of a centralized system hampers producers' planning and decision-making, particularly for smallholders, who face challenges in mechanization and in adopting technologies that could increase efficiency and profitability (Luiz, Cervo Cabrera & Caldarelli, 2020).

The challenges in coffee production and commercialization in Brazil, especially those

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linked to the lack of reliable data, remain significant. The National Supply Company (CONAB) has begun reviewing its estimates and methodologies, seeking more precise information through collaborations with cooperatives, producers, and exporters. The aim is to improve the understanding of actual supply and demand, which is essential for more effective sector planning. The development of an integrated digital platform compiling data on markets, prices, climate, and management techniques emerges as an effective solution to address the challenges faced by Brazilian coffee production. Such a tool could be developed in partnership with institutions such as Embrapa and sectoral associations, further consolidating Brazil's leadership in the coffee industry. Initiatives such as the Coffee Observatory already demonstrate the feasibility of this model, though expansion and modernization are still required to meet current sectoral demands (BRASIL, 2024; EMBRAPA, 2024).

In recent years, the country has shown significant growth in coffee production, consolidating its position as the world's leading producer and exporter. In 2023, the area dedicated to coffee cultivation (arabica and conilon) totaled approximately 2.26 million hectares, with an estimated production of 54.94 million bags of processed beans (BRASIL, 2024; EMBRAPA, 2024). This growth is partly attributed to the adoption of advanced technologies and sustainable agricultural practices promoted by institutions such as Embrapa (EMBRAPA, 2024). However, continuous investment in technology, research, and infrastructure is essential to address future challenges and ensure the sector's sustainability (BRASIL, 2024; EMBRAPA, 2024).Thus, with the aim of consolidating information on coffee in Brazil, this study sought to evaluate the country's coffee production and commercialization.

2 MATERIAL E METHODS

The research was conducted at the State University of the Tocantina Region of Maranhão, Center for Agrarian, Natural, and Humanities Sciences, during the period from 2023 to 2024. Data from the past 13 years (2010–2023) were selected to build the foundation of this study, drawing on the SciELO electronic library database and Google Scholar, in addition to books, theses, dissertations, and monographs related to coffee production and commercialization in Brazil. Content analysis was carried out using a qualitative and exploratory approach, based on multiple scientific materials. Furthermore, data were consulted and extracted from governmental institutions, including the National Supply Company (CONAB), the Brazilian Agricultural Research Corporation (EMBRAPA), the

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Ministry of Agriculture, Livestock and Supply (MAPA), and the Brazilian Institute of Geography and Statistics (IBGE). Additional information was obtained from entities directly linked to the topic, such as the Brazilian Coffee Industry Association (ABIC) and the Brazilian Coffee Information System (SBICafé).

The results and data access were obtained through searches using keywords such as “coffee,” “history of coffee,” “coffee evolution,” “coffee commercialization,” and “coffee production.” The selected publications were then evaluated for the relevance of their information, considering the publication date and the objectives of this study. The research criteria included articles published between 2010 and 2023 that were electronically available, thematically relevant, written in Portuguese or English, and provided specific theoretical grounding. However, some classic works were included regardless of their year of publication. A critical analysis of the content was adopted, and the structure of the study was developed in accordance with these findings. Exclusion criteria comprised incomplete-access articles, duplicates across databases, publications in languages other than Portuguese and English, and opinion papers.

A total of 529 articles related to the topic were identified. Of these, 5 were duplicates or repeated across different search platforms. An initial screening was conducted by reading the titles and abstracts of 46 articles, excluding 6 publications for incompatibility with the proposed topic. From the remaining studies, 40 articles were retained for full reading and singular analysis. Ultimately, 35 articles met the inclusion parameters. To ensure the quality and accuracy of the research on coffee production and commercialization in Brazil, several software tools were employed, each playing a crucial role at different stages of the work. The primary software utilized included Microsoft Excel, which was extensively applied for data collection, organization and preliminary analysis.

3 RESULTS AND DISCUSSION

The economic impacts of coffee production extend far beyond the borders of producing countries, underscoring its crucial role in both local and global economies. Coffee constitutes a significant source of income for millions of farmers and their families, contributing substantially to the economies of countries such as Brazil, Colombia, and Ethiopia. The economic stability of these nations is often closely tied to coffee exports, making fluctuations in global prices a matter of serious concern for local farmers (Souza, 2022).

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In the Brazilian context, as the world's largest coffee producer and exporter, the area dedicated to coffee cultivation has undergone considerable territorial expansion and technological modernization. Initially, coffee production was concentrated in the Paraíba Valley. Over time, it expanded westward in São Paulo, later reaching Minas Gerais, Espírito Santo, and the Cerrado region. Data from IBGE (2023) indicate that Minas Gerais alone accounts for more than 70% of national coffee production, recognized for its high productivity and bean quality. This territorial expansion was facilitated by the development and implementation of advanced agricultural techniques, such as irrigation systems, integrated pest management, and harvest mechanization (SILVA et al., 2021). Moreover, Brazil has distinguished itself in the production of sustainable and certified coffees, meeting the growing demands of international markets. Certification enables producers to add value to their product and access new markets. Sustainable agricultural practices, such as intercropping and reduced use of agrochemicals, have significantly contributed to environmental sustainability (Ferreira & Oliveira, 2019).

The coffee market has experienced considerable price volatility, driven by factors such as climate change, supply chain disruptions, and shifts in demand. Such fluctuations can cause severe economic hardship for farmers, who may struggle to maintain their livelihoods during periods of low prices. In response to these challenges, the fair-trade movement emerged as a vital mechanism to promote equitable compensation for coffee producers, offering greater stability and improved negotiating conditions (Pires, 2021).

In Brazil, the evolution of coffee production and commercialization stands as a testament to the sector's adaptability and innovation. From its beginnings in the 18th century to its global leadership position in the 21st century, coffee remains a vital economic pillar for the country. The continuous adoption of advanced technologies and sustainable practices will be crucial to addressing future challenges and ensuring the long-term success of this important commodity (Silva & Oliveira, 2022).

Recent data from the National Supply Company (CONAB, 2023) show that Brazil produced approximately 54 million coffee bags in 2023, with a notable increase in the share of specialty coffees, which currently represent 20% of exports. This shift has been driven by technological advancements, such as drip irrigation systems, drone-based crop monitoring, and sustainable management practices. Furthermore, the impacts of climate change have compelled Brazilian producers to adapt. Traditional regions such as Minas Gerais, Espírito Santo, and São Paulo have implemented innovative techniques to mitigate the effects of

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climatic irregularities, including abrupt temperature variations and prolonged droughts. According to recent studies, agroecological management initiatives, such as plantation shading and the use of disease-resistant varieties, have been fundamental in ensuring the continuity of production under increasingly unpredictable climatic conditions (Silva & Oliveira, 2022).

Coffee commercialization in Brazil has played a pivotal role in shaping social, political, and economic aspects since its introduction in the 18th century. According to Silva (2020), coffee cultivation found ideal conditions in the Southeast, consolidating itself as Brazil's leading commodity in the 19th century through large-scale monoculture plantations oriented toward export and sustained by enslaved labor. In the 20th century, Brazil faced challenges such as overproduction and price declines. Santos (2018) notes that government policies, including stockpiling and supply control, were implemented to stabilize the economy and increase coffee value. Over time, the market modernized, diversifying the economy and strengthening domestic consumption. More recently, the focus on quality and sustainability, as highlighted by Almeida (2022), has driven the growth of specialty coffees, reinforcing Brazil's position as the global leader in coffee production and exports. The trajectory of coffee reflects the country's adaptability and its global relevance in the sector.

As shown in Figure 1, production fluctuated over the past 13 years, likely due to the biennial cycle of arabica coffee and climatic factors affecting conilon crops. In 2023, for instance, total production was estimated at approximately 54.9 million bags, representing a 7.9% increase compared to 2022. This growth observed in 2023 reflects a recovery trend following a low-yield cycle, similar to the years 2018 and 2020.

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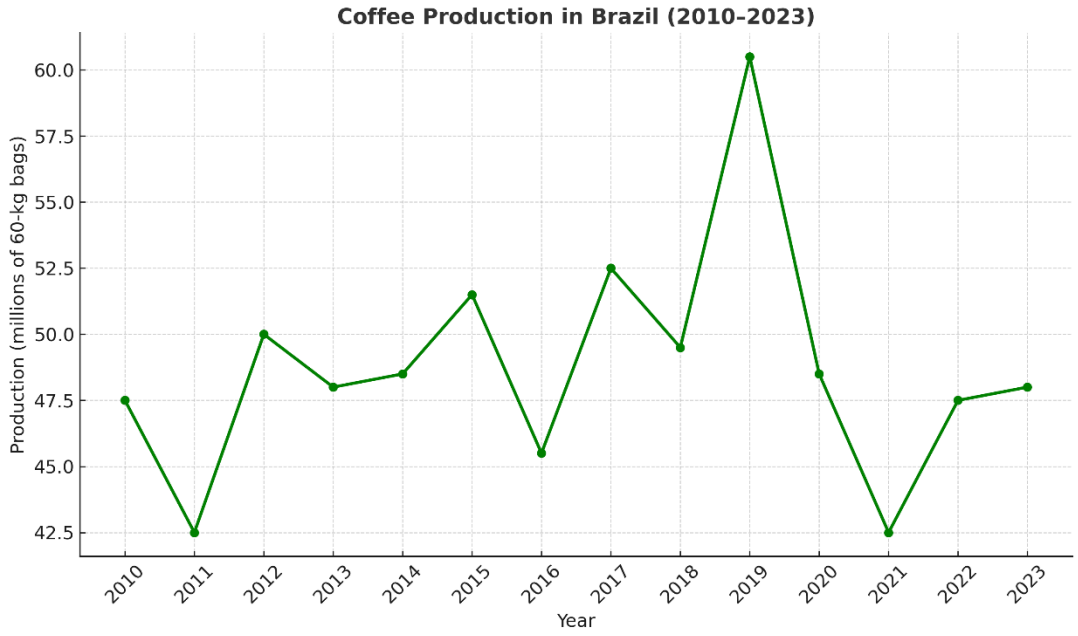
Figure 1

Coffee production in Brazil between 2010 and 2023



Source: Conab (2024).

According to Figure 2, the coffee production area in the Central-West, Northeast, North, and South regions of Brazil, from 2010 to 2023, reveals distinct patterns of variation. The Central-West shows the smallest production area, remaining below 20,000 hectares. In the Northeast, the area allocated to coffee production fluctuates between 120,000 and 160,000 hectares, with a declining trend due to climatic variability. The North, initially with the largest production area, experienced a reduction from 160,000 hectares in 2010 to 80,000 hectares in 2023, influenced by deforestation and changes in land use. The South began with 80,000 hectares and stabilized at 40,000 hectares, facing climatic challenges. These variations reflect climatic, economic, and technological factors, emphasizing the need for sustainable agricultural practices and innovative technologies to maximize productivity.

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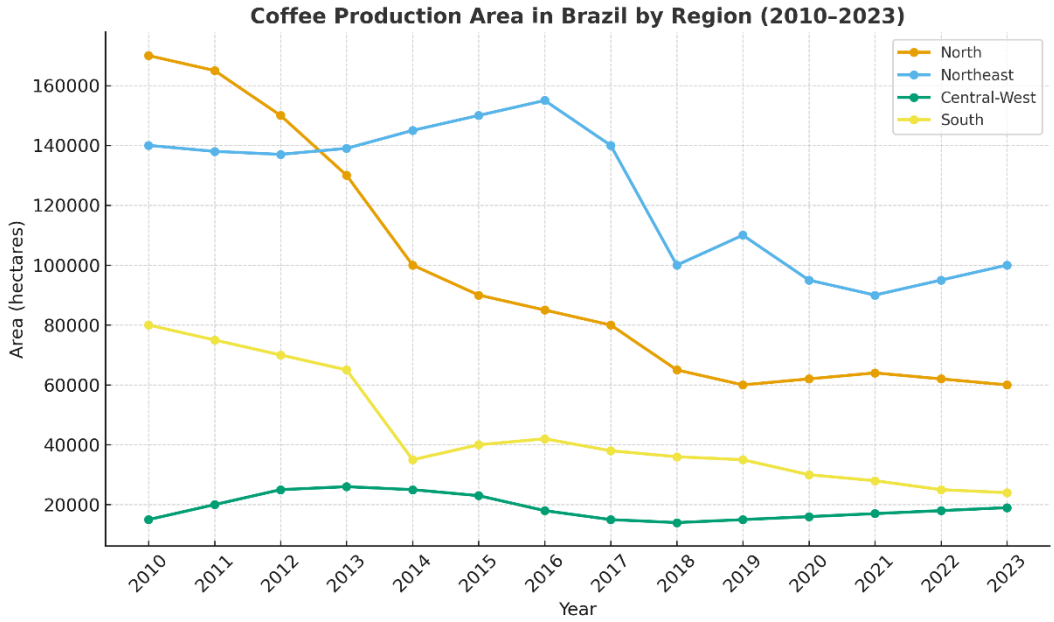
Figure 2

Area allocated to coffee production in four regions of Brazil



Source: Conab (2024).

A growth trajectory can be observed in the coffee production area in the Southeast region of Brazil between 2010 and 2023 (Figure 3). Initially stable, production began to increase gradually from 2015 onward, reaching a peak of 1,667,952 hectares in 2023. This increase is attributed to technological advancements, improvements in agricultural management, and the expansion of cultivated areas. Farmers' responses to market conditions and the adoption of precision agriculture techniques also contributed to this expansion. However, production faced challenges such as climatic variability, pests, and diseases. The graph illustrates the growth in agricultural production, emphasizing the importance of sustainable practices to maintain productivity.

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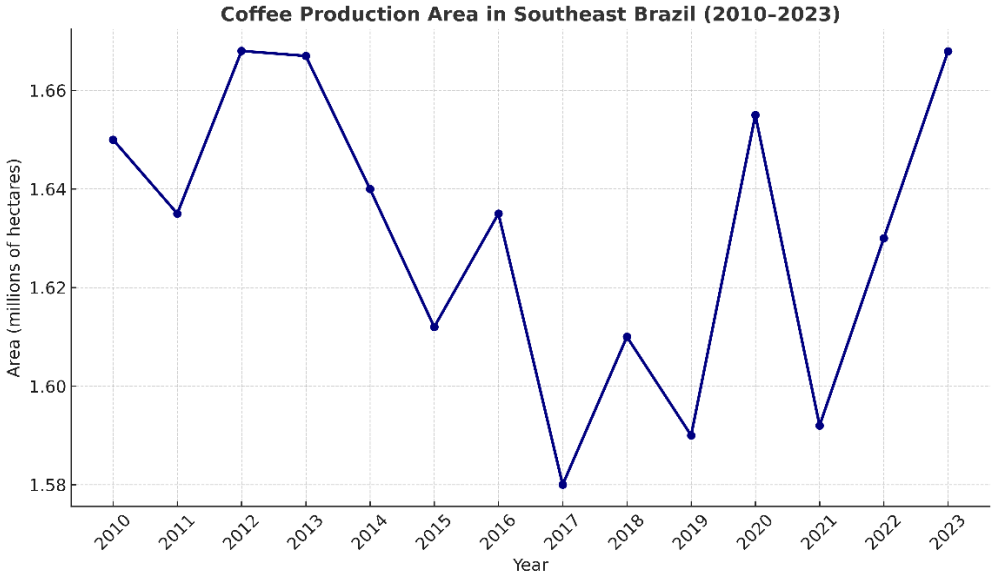
Figure 3

Area allocated to coffee production in the Southeast region of Brazil



Source: Conab (2024).

Coffee production in Brazil is diverse and distributed across regions, with certain states standing out for their strategic role in cultivation and commercialization. In the Southeast, which accounts for more than 70% of national production, Minas Gerais and São Paulo are the main highlights. Minas Gerais leads with its producing regions—such as Sul de Minas, Cerrado Mineiro, and Zona da Mata—renowned for the high quality of arabica coffee. São Paulo is notable for the Mogiana region, which enjoys international recognition. Espírito Santo is the largest producer of conilon coffee in Brazil, concentrated in the northern and northwestern regions of the state.

In the Northeast, Bahia plays a central role, producing both arabica in the Planalto da Bahia and conilon in the southern region. The use of irrigation technologies and modern agricultural practices has enhanced local quality and competitiveness, even though production volume remains lower compared to the Southeast. In the North, Rondônia leads production, with a strong emphasis on conilon coffee. Despite modest output, the state has invested in sustainable management practices to improve quality and expand its market relevance. In the South, Paraná is the leading producer, focusing on arabica coffee. However, climatic challenges such as frosts have limited production over the years, although the state continues to contribute beans with unique sensory profiles. Finally, in the Central-West, states such as Mato Grosso and Goiás have limited production but have invested in

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coffee through irrigated systems. Nonetheless, coffee competes with more profitable crops, such as soybeans and corn.

Domestic production remains a crucial factor for export performance. In 2023, the harvest was estimated at 54.9 million bags, representing a significant increase compared to previous years. For 2024, production is expected to exceed 58 million bags, which may boost exports to record levels (CONAB, 2023). The recovery of production, particularly arabica, reflects improved climatic conditions and productivity gains. International demand for Brazilian coffee remains strong, with the main markets being the United States, Germany, and Italy, which prefer arabica coffee, predominant in national production. Furthermore, the appreciation of the U.S. dollar in 2024 made Brazilian coffee more competitive in the international market, favoring exports even in a scenario of high supply (CONAB, 2023).

Despite challenges, such as the decline in exports in 2022 due to adverse climatic conditions, Brazil managed a rapid recovery. In 2023, export volumes increased, driven by the rebound in production and the growth in domestic supply (CONAB, 2023). Thus, Brazil continues to consolidate its leadership position in the global coffee market, facing climatic and economic challenges while seizing opportunities to expand exports and strengthen the production chain.

In recent years, coffee yield in Brazil has shown significant fluctuations, reflecting both challenges and advances in coffee farming. In 2021, for example, Brazil reached the highest productivity of the decade, with 30.1 bags per hectare, due to favorable climatic conditions and the use of new technologies in the field, such as irrigation and more resistant varieties. However, yield declined in 2022, with an average of 27.7 bags per hectare (Figure 4). In 2023, there was a recovery, reaching 29.4 bags per hectare, reflecting farmers' adaptation to climate change and the increased adoption of more efficient agricultural techniques (CONAB, 2023). These fluctuations demonstrate the complexity of coffee production, which depends on both climatic factors and innovations in agricultural management.

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Figure 4

Coffee yield over the last 13 years

Source: Conab (2024).

Coffee holds significant historical and socioeconomic relevance for Brazil, being one of the pillars of the national economy. The coffee industry not only sustains millions of direct and indirect jobs but also contributes substantially to the country's export revenues. In recent years, Brazilian coffee exports have shown a growth trend in both volume and value. In 2023, Brazil exported approximately 43 million 60-kg bags, representing a 15.4% increase compared to the previous year. This growth has been driven by high international demand and the continuous improvement in the quality of Brazilian coffee, which maintains its global reputation as a product of excellence.

The evolution of coffee exports also reflects technological advances in the agricultural sector, with the adoption of modern cultivation techniques, sustainable management practices, and investments in innovation. These factors contribute to more efficient productivity and a high-quality product. Beyond the economic impact, Brazilian coffee plays an important social role, supporting countless families in rural areas and fostering the socioeconomic development of these regions. Coffee exports, therefore, not only generate foreign exchange for the country but also promote growth and improvements in the living conditions of farming communities.

Figure 5 shows a general upward trend in coffee exports, with some fluctuations over the period. Between 2010 and 2017, exports increased consistently, driven by rising production and international demand. After a slight decline in 2018, the export volume

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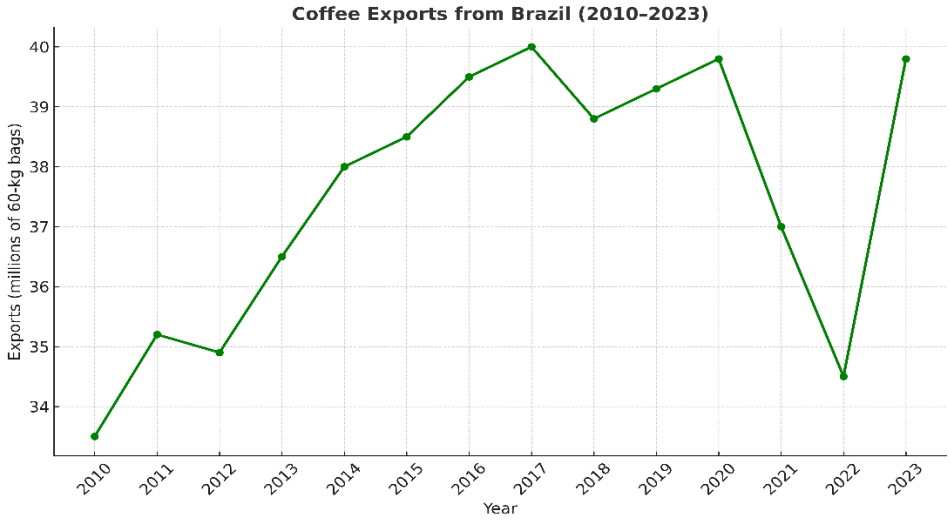
resumed its growth, peaking in 2020. In 2021 and 2022, there was a sharp decrease due to adverse climatic factors that affected production. However, in 2023, exports began to recover, reflecting increased domestic supply and more favorable conditions, consolidating Brazil's position as the global leader in coffee exports.

Figure 5

Evolution of Coffee Exports from Brazil (2010–2023)



Source: ABIC (2024).

By ensuring that farmers receive a fair price for their coffee, fair-trade initiatives contribute to economic stability and empower communities, enabling investments in education, healthcare, and sustainable agricultural practices. The interaction between global coffee prices, local economies, and fair trade illustrates the multifaceted economic landscape of coffee production, highlighting its importance both as a commodity and as a catalyst for development.

The landscape of coffee consumption has undergone remarkable transformations over the past decade, driven by evolving consumer behavior and preferences that reflect broader social trends. Globally, there has been a notable shift in coffee consumption patterns, with a growing number of consumers seeking premium experiences and unique flavors. This trend has fueled a rising market for specialty coffee, offering distinct varieties and artisanal preparation methods tailored to discerning palates. Moreover, the rise of sustainable and ethical consumerism has profoundly shaped coffee consumption, as more individuals prioritize products aligned with their values (Brainer, 2021).

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In recent years, the specialty coffee market in Brazil and worldwide has experienced significant growth, reflecting the increasing demand for quality and sustainability. Between 2010 and 2023, Brazil, the world's largest coffee producer, has also consolidated its position as a key producer of specialty coffees. Regions such as Minas Gerais, Espírito Santo, São Paulo, and Bahia have stood out by adopting sustainable agricultural practices and investing in technology and innovation, factors that have enhanced product quality. The prioritization of organic and sustainable practices has led many farms to pursue certifications that ensure social and environmental responsibility, such as those promoted by the Brazilian Specialty Coffee Association (BSCA). This certification guarantees that only coffees scoring a minimum of 80 points on the Specialty Coffee Association (SCA) scale are recognized as specialty coffees. Advanced technologies have also contributed to this progress. The use of drones for crop monitoring and the implementation of modern techniques, such as controlled fermentation and drying on suspended terraces, have helped create beans with more complex and distinctive flavor profiles. Globally, the demand for specialty coffees has grown substantially, with markets such as the United States, Europe, and Japan leading imports of Brazilian coffee. Emerging markets, including the Middle East and Southeast Asia, have also begun to value the quality of Brazilian beans.

The pursuit of sustainability is a trend reflected in both domestic and international markets, as consumers increasingly demand responsible agricultural practices. However, the sector faces significant challenges, such as climate change, which threatens both grain quality and productivity. To mitigate these impacts, producers have invested in strategies such as shaded cultivation, crop diversification, and coffee varieties more resistant to climatic variability. This panorama, from 2010 to 2023, demonstrates that the growth of specialty coffees in Brazil and worldwide has been driven by innovation, sustainability, and the growing consumer demand for high-quality products. These factors have consolidated Brazil's position as a global leader, not only in quantity but also in excellence in coffee production, reaffirming the importance of continuous investment in sustainable practices and modern technologies to ensure the sector's resilience against future challenges.

Consumers are increasingly drawn to brands that emphasize ethical sourcing, environmental sustainability, and social responsibility, which has led to a wave of certifications such as Fair Trade and Rainforest Alliance. These certifications not only guarantee consumers the ethical standards and quality of their coffee but also foster a sense of connection with the farmers who cultivate the beans. In addition, health trends have

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significantly influenced coffee product offerings, as consumers become more health-conscious and seek beverages that positively contribute to their well-being. This shift has resulted in the introduction of various health-oriented coffee products, including organic blends, low-acidity options, and functional coffees infused with vitamins or adaptogens (Silva, 2023).

Moreover, the past decade has witnessed profound evolution in coffee production, marketing strategies, and consumer behavior, each shaped by myriad factors reflecting broader social changes. Trends in coffee production highlight the challenges posed by climate change and geographic shifts, as well as the promise offered by technological advancements that enhance sustainability and yields. At the same time, the marketing landscape has adapted to meet the demands of a more discerning consumer base, with the rise of specialty coffee and the influence of social media playing key roles in shaping brand identities and consumer engagement. Finally, the economic implications of coffee production underscore its importance as a vital source of income for millions of farmers, while the fair-trade movement offers pathways for equitable compensation and community empowerment (Nishijima, 2012).

As consumer preferences continue to evolve, emphasizing sustainability and health consciousness, the coffee industry must navigate these complexities to thrive in an ever-changing global market. Ultimately, understanding these interconnected dimensions not only sheds light on the complexities of the coffee industry but also highlights its potential as a catalyst for positive change in both local economies and global consumer behavior.

Coffee, often regarded as the lifeblood of morning routines worldwide, encapsulates a multifaceted journey that begins long before it fills our cups. From its humble origins on plantations to its role in bustling global markets, coffee is not merely a beverage; it is a complex agricultural and commercial product that influences economies and cultures across the globe. Understanding the journey of coffee involves exploring its production process, examining its significance in international trade, and assessing its profound impact on local economies.

The production process forms the foundation of this aromatic industry, beginning with the cultivation of coffee plants, primarily *Coffea arabica* and *Coffea canephora* (commonly known as arábica and robusta, respectively). Coffee cultivation is no simple task; it requires specific climatic conditions, including a stable temperature range of 15–24°C, abundant rainfall, and well-drained soil to thrive effectively. These environmental factors contribute to

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the unique flavor profiles and qualities of coffee beans harvested from different regions. For example, Ethiopian coffee, often regarded as the birthplace of coffee, is celebrated for its complex fruity and floral notes, while Brazilian coffee is typically characterized by chocolate and nutty flavors due to the country's diverse climates and soils. Leading coffee-producing countries, including Colombia, Vietnam, and Honduras, each display unique characteristics influenced by their geographic locations. Colombia's high-altitude regions produce beans with bright acidity and smooth, well-balanced flavors, while Vietnam's robusta beans are known for their boldness and higher caffeine content. The cultivation process is labor-intensive, requiring skilled hands to ensure the health of coffee plants, underscoring the importance of traditional farming methods alongside modern agricultural practices in producing high-quality coffee.

Once harvested, coffee beans embark on a journey to global markets, where they play a central role in international trade. Coffee is one of the most heavily traded commodities in the world, second only to oil, underscoring its economic importance. The International Coffee Organization reports that coffee is consumed in more than 70 countries, with millions relying on it as a daily staple. Coffee trade is facilitated in major commercial hubs such as New York, London, and São Paulo, where beans are bought, sold, and shipped worldwide. The commodity's value fluctuates (Figure 6) depending on factors such as climatic conditions, economic stability in producing countries, and shifts in consumer preferences, which can significantly impact the economies of coffee-producing nations. For instance, when adverse weather conditions such as droughts or frosts affect harvests in Brazil or Colombia, coffee prices can surge, increasing revenues for farmers but also raising prices for consumers. Furthermore, coffee trade sustains a complex supply chain involving roasters, distributors, and retailers, each playing a vital role in delivering the product to consumers.

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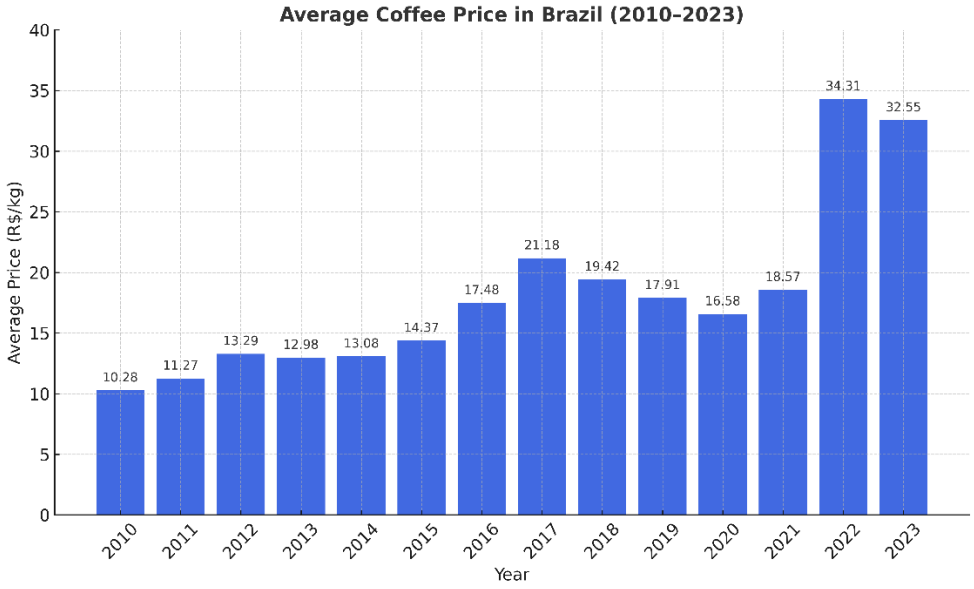
Figure 6

Coffee price fluctuations in Brazil over the last 13 years



Source: Conab (2024).

From 2010 to 2015, prices increased gradually, rising from R$ 10.28/kg to R$ 14.37/kg. In 2016 and 2017, there was a peak, reaching R$ 21.18/kg due to climatic factors and supply shortages (Fgiure 6). Between 2018 and 2020, prices fell, reflecting a recovery in production. In 2021, prices rose again, and in 2022 they surged to R$ 34.31/kg, driven by supply shortages and high demand. In 2023, the price stabilized at R$ 32.55/kg, remaining elevated.

The impact of coffee extends beyond the global market, permeating local economies in coffee-producing regions. The coffee industry provides vital employment opportunities, generating jobs for millions of people involved in various stages of the supply chain, from farming to processing and retail. In countries such as Ethiopia and Honduras, coffee cultivation is often the primary source of income for smallholder farmers, who rely heavily on the sale of their coffee to support their families and communities. Additionally, employment generated by the coffee sector includes positions in processing plants, where beans are hulled and roasted, as well as roles in cafés and retail outlets where coffee is served to consumers (Cordeiro, 2010). This job creation generates significant economic effects in local communities, as increased income allows families to invest in education, healthcare, and infrastructure. Moreover, initiatives promoting fair trade and sustainable practices are gaining momentum, further empowering local farmers and fostering a more equitable distribution of

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profits within the coffee supply chain. These developments highlight the profound social and economic impacts of coffee, demonstrating its ability to transform lives and uplift communities in coffee-growing regions (Melo, 2017).

In recent years, technology has played an increasingly vital role in improving coffee production processes and addressing some of the challenges faced by the industry. Innovations in agricultural practices have transformed traditional methods, enabling coffee growers to enhance efficiency and yields. For instance, the adoption of precision agriculture, a data-driven approach leveraging GPS technology and IoT devices, facilitates more accurate monitoring of crop health, soil conditions, and weather patterns. Farmers can now use sensors to collect real-time data on moisture levels and nutrient requirements, allowing them to optimize irrigation and fertilization practices. This targeted approach not only conserves resources but also improves the overall quality of the coffee produced. Furthermore, advances in pest management and disease control have become essential in combating threats to coffee plantations (Ribeiro et al., 2023).

Integrated Pest Management (IPM) systems, which combine biological, cultural, and chemical methods, enable farmers to effectively control pest populations while minimizing environmental impact. Technologies such as mobile applications and online platforms provide farmers with timely access to information about pest outbreaks and disease prevention strategies. The integration of these technological advances into coffee production is critical for ensuring a more sustainable future for the industry, ultimately leading to higher-quality coffee and improved livelihoods for farmers.

Automation and robotics, increasingly integrated into agribusiness operations, are being driven by AI-based technologies. Robots equipped with artificial intelligence are being used for various tasks, such as planting, harvesting, and crop processing, reducing reliance on manual labor and increasing efficiency. AI-powered automated systems are also being employed for irrigation management and fertilizer application, ensuring optimal resource use and crop health. This process, supported by AI-driven automation, not only boosts productivity but also significantly reduces labor costs for farmers, making agriculture more sustainable and economically viable in the long term (Ribeiro et al., 2023). Currently, these technologies enable targeted field interventions, optimizing resource use. Additionally, sustainable and high-quality production strengthens the competitiveness of Brazilian coffee in the international market, meeting the demand for products that value social and

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environmental responsibility. Almeida (2022) emphasizes that these practices have elevated the reputation of Brazilian coffee as a premium product.

The advancement of Brazilian agriculture on the global stage is the result of producers' dedication, rural labor, and scientific developments applied to agricultural activities. According to Mueller (2021), the sector has surpassed outdated uniform practices by recognizing variability in production and quality. Brazil, considered an agricultural giant, sets annual production records and exerts major influence in global trade and agricultural exports. However, as Beltran (2022) notes, the adoption of precision agriculture (PA) still faces challenges, such as the misconception that it offers magical, automatic solutions to field problems. Effective use of this technology requires specialized technical knowledge and investments in training, which are essential for its full benefits to be realized. Farmers, especially smallholders, must understand that PA is not limited to machinery but encompasses the entire production system, becoming indispensable for agribusiness competitiveness.

Casagrande and Torkomian (2021) highlight that implementing precision agriculture is fundamental to achieving superior results in a highly competitive market. This practice, once exclusive to large properties, is increasingly becoming accessible to small producers. Since the 1990s, PA has evolved with the digitalization of the agricultural sector. Bolfe et al. (2021) recall that, in the early 2000s, tools and consultancies already existed to use map-based technologies to optimize input application, accelerating the digital transformation of agribusiness.

4 CONCLUSION

Despite the advances in coffee production and commercialization in Brazil, the industry faces significant challenges, particularly due to climate change. Rising temperatures and climatic instability affect both productivity and coffee quality, increasing the vulnerability of plantations to pests and diseases such as coffee leaf rust. To mitigate these impacts, producers have adopted practices such as shaded cultivation and investments in more resistant varieties. The integration of technologies and collaborative efforts is essential to ensure the sustainability and competitiveness of the Brazilian coffee industry in the global market.

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REFERENCES

Aguiar, B. H., Romaniello, M. M., & Pelegrini, D. F. (2021). A influência do Fairtrade no desenvolvimento do capital social: O caso dos cafeicultores da Cooperativa "Dos Costas". Revista de Economia e Sociologia Rural, 60(1), Article e215439. https://doi.org/10.1590/1806-9479.2021.215439

Associação Brasileira da Indústria de Café. (2023). Indicadores da indústria de café 2023. ABIC. https://estatisticas.abic.com.br

Associação Brasileira da Indústria de Café. (2024). Sumário executivo do café. https://www.abic.com.br

Associação Brasileira de Cafés Especiais. (2024). Cafés especiais: Inovação e sustentabilidade no mercado brasileiro. https://bsca.com.br

Beltran, A. O. (2022). Plataformas tecnológicas en la agricultura 4.0: Una mirada al desarrollo en Colombia. Computer and Electronic Sciences: Theory and Applications, 3(1), 9–18.

Bolfe, É. L., Victoria, D. de C., Sano, E. E., Campos, S., & Ferreira, M. C. (2021). Tecnologias digitais na pecuária: Aplicações, desafios e expectativas [Brochure]. Embrapa Informática Agropecuária. https://www.infoteca.cnptia.embrapa.br/

Brainer, M. S. C. (2021). Produção e mercado do café. Escritório Técnico de Estudos Econômicos do Nordeste (ETENE).

Brasil. Ministério da Agricultura, Pecuária e Abastecimento. (2021). Projeções do agronegócio: Projeções de longo prazo, Brasil – 2020/21 – 2030/31. Secretaria de Política Agrícola, Secretaria de Inteligência e Relações Estratégicas, Departamento de Estatística.

Casagrande, D. J., & Torkomian, A. L. V. (2021). A servitização e sua influência no processo de difusão das tecnologias de agricultura tecnológica na produção canavieira. ALICE - Artigo em Periódico Indexado. Embrapa. https://www.alice.cnptia.embrapa.br/

Companhia Nacional de Abastecimento. (2023). 1º levantamento da safra de café 2023. Conab. https://www.conab.gov.br

Companhia Nacional de Abastecimento. (2023). Boletim de café – 2023. Conab. https://www.conab.gov.br

Cordeiro, A. T., Singulano Filho, G., & Ribeiro, M. F. (2010). Caracterização da propriedade, do cafeicultor e da atividade cafeeira. In P. S. Vilela & J. L. S. Rufino (Eds.), Caracterização da cafeicultura de montanha de Minas Gerais (pp. 33–98). INAES.

Embrapa. (2024). Observatório do café: Iniciativas e avanços. Embrapa Café.

Revista ARACÊ
ISSN: 2358-2472

Ferreira, J. R., & Oliveira, P. T. (2019). Sustentabilidade na cafeicultura brasileira. Revista Agrária, 14(2), 45–56.

Girotto, F. (2019). O impacto socioeconômico da cultura do café no Brasil. Revista Brasileira de Estudos Agrários, 10(3), 45–56.

Instituto Brasileiro de Geografia e Estatística. (2023). Produção agrícola municipal. IBGE. https://www.ibge.gov.br

Instituto Brasileiro de Geografia e Estatística. (2024). Produção agropecuária: Café. https://www.ibge.gov.br/explica/producao-agropecuaria/cafe/br

Luiz, A., Cabrera, L. C., & Caldarelli, C. E. (2020). Cadeia produtiva e mercado cafeeiro no Brasil: Desafios e potencialidades. Economia Ensaios, 36(1), 1–20.

Martins, A. P., Silva, R. C., & Oliveira, M. F. (2020). História e impacto econômico do café no Brasil. Revista Agropecuária Brasileira, 45(2), 123–132.

Melo, M. F. de S., Araujo, R., & Santos, J. (2017). Certificação sustentável para café: Revisão sistemática da literatura e lacunas de pesquisa. Revista Espacios, 38(31), 1–10.

Mueller, C. C. (2021). Os preços relativos de fatores e a adoção de tecnologias poupadoras de mão-de-obra na agricultura brasileira. Revista de Economia e Sociologia Rural, 15(3), 171–185. https://doi.org/10.1590/1806-9479.2021.231678

Nishijima, M. (2012). Análise de concorrência no mercado mundial de café verde. Revista de Economia e Sociologia Rural, 50(1), 85–102. https://doi.org/10.1590/S0103-20032012000100005

Oliveira, A. J., Silva, J. R., & Almeida, L. F. (2020). Potencialidades da utilização de drones na agricultura de precisão. Brazilian Journal of Development, 6(9), 64140–64149. https://doi.org/10.34117/bjdv6n9-051

Pires, M. M. (2003). Impactos do crescimento do consumo de cafés especiais na competitividade inter-regional da atividade cafeeira. Revista de Economia e Sociologia Rural, 41(3), 127–146. https://doi.org/10.1590/S0103-20032003000300004

Ribeiro, P. C. C. (2023). Agricultura sustentável, irrigação e transformação digital. Laboratório de Design, Gestão e Engenharia Industrial. https://www.laboratoriodegestao.com.br/publicacao/2023/04/11/agricultura-sustentavel-irrigacao-e-transformacao-digital

Rodrigues, L. N., Domingues, A. F., & Christofidis, D. (2017). Agricultura irrigada e produção sustentável de alimento. In L. N. Rodrigues & A. F. Domingues (Eds.), Agricultura irrigada: Desafios e oportunidades para o desenvolvimento (pp. 1–20). INOVAGRI.

Santos, J., & Silva, M. (2023). Crescimento do mercado de cafés especiais no Brasil e no mundo. Revista Brasileira de Agronegócios, 12(3), 45–62.

Revista ARACÊ
ISSN: 2358-2472

Silva, F. A. (2023). Normas voluntárias de sustentabilidade (NVS) e implicações sobre as exportações de produtos do agronegócio – Café. IPEA.

Silva, F. R. S. N. (2020). O impacto das tecnologias agrícolas na produção de café [Undergraduate thesis, Universidade Federal de Lavras]. Repositório Institucional da UFLA.

Silva, R. L., Santos, M. A., & Ferreira, J. P. (2021). Tecnologia e produtividade na cafeicultura brasileira. Cadernos Agrícolas, 33(1), 45–60.

Souza, G. H. (2022). O café das Matas de Minas: Tecnologia a serviço do agronegócio [Undergraduate thesis, Universidade Federal de Viçosa]. Repositório Institucional da UFV.

Specialty Coffee Association. (2023). Specialty coffee standards. https://sca.coffee