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Women in Brazilian Agribusiness Value Chains

Unlocking Potential, Advancing Performance

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About the Authors

This report was prepared by Cecília Gonçalves Simões and Fabiana Servantes Munhoz with financial support from the AGRI3 Technical Assistance Facility (TAF). The analyses and conclusions presented in this publication are those of the authors and do not necessarily reflect the views of AGRI3 or its partners.

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Introduction

Brazil is one of the main producers and exporters of food and agriculture commodities in the world, which makes its agribusiness sector an important lever for socioeconomic development. According to data from the agricultural census in 2017[1], agricultural establishments occupy an area of 351 million hectares, equivalent to 41% of the national territory, generating a value of 465 billion reais and employing more than 15 million people.

Brazil is the world's largest producer and exporter of coffee and sugar, and an important exporter of grains and meat. According to a report from Embrapa[2], in 2020 Brazil was the 4th largest producer of grains (rice, barley, corn, soybeans and wheat) in the world, being the second largest exporter, with 19% of the world's total traded, with the volume targeted for exports corresponding to 51% of the total volume produced in the country. Among grains, soybean production stands out, as Brazil was the largest producer and exporter of this commodity in 2020, with 50% of the world trade and 66% of the national production destined for export. The country also occupies a prominent position in relation to livestock farming: in 2020, Brazil had the largest cattle herd in the world, being the second largest producer and largest exporter of beef, with 14,4% of global trade. The country is also the largest producer and exporter of coffee and sugar and the third largest producer of fruit, being the leading orange producing country worldwide. The scenario is quite different in relation to cocoa, as Brazilian production has decreased considerably over the last 40 years. Currently, the country is the seventh producer worldwide and cocoa beans produced in the country are mainly targeted for the domestic market.

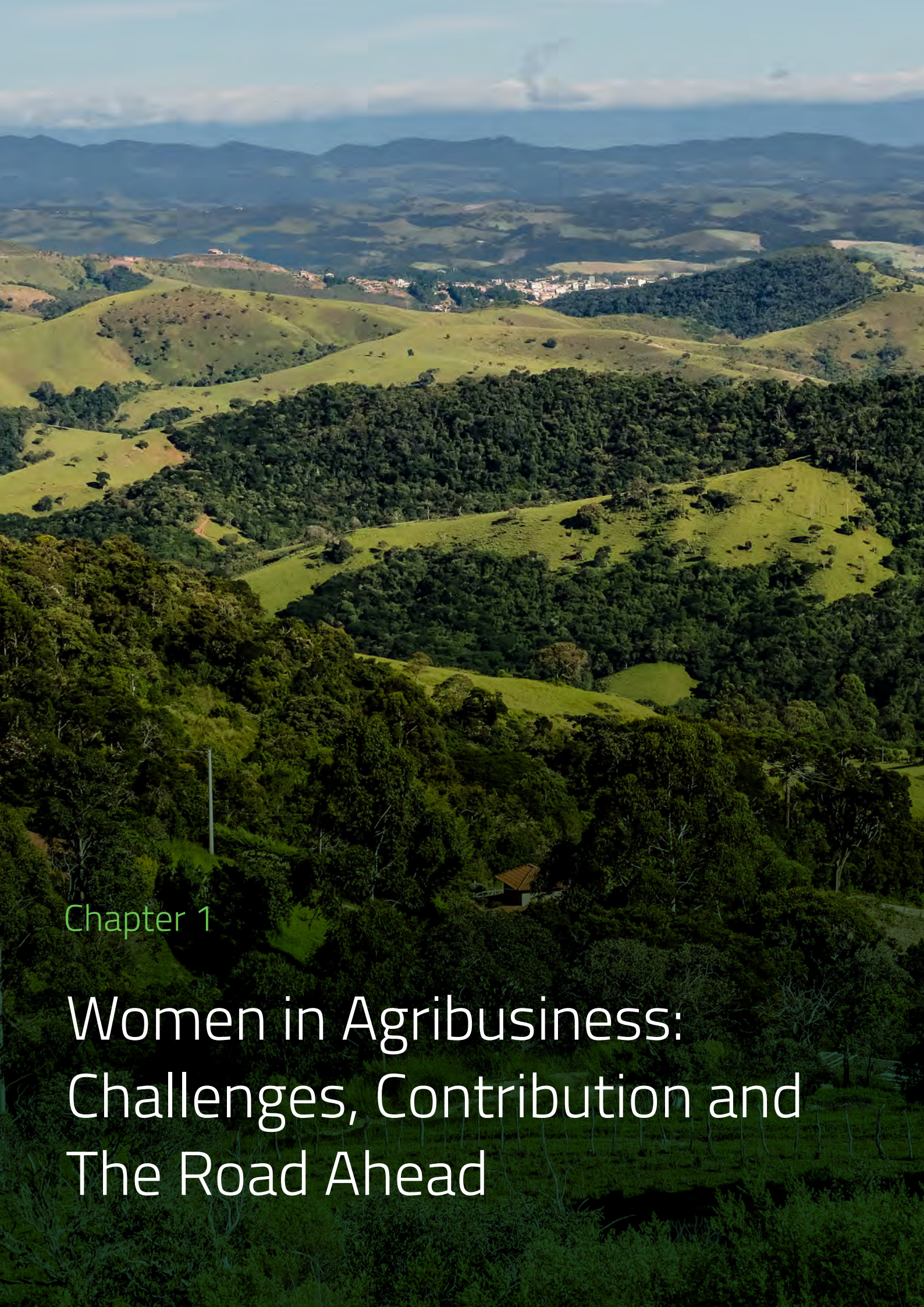
Despite being a global powerhouse in agriculture, Brazil's agricultural sector provides disproportionately fewer benefits to women, whose contributions remain largely invisible and undervalued. Women play essential roles at every stage of agricultural production, from planting to harvesting, yet face systemic barriers that limit their access to economic resources, confining them to lower-paid and less secure roles. Structural inequalities also exclude women from leadership and decision-making spaces, such as cooperatives and unions, reducing their ability to influence policies that directly affect their livelihoods.

The invisibility of women in Brazilian agriculture is deeply tied to societal norms and the lack of gender-disaggregated data, which prevents the development of effective policies to address these disparities. While their unrecognized labor, including caregiving and household management, is essential to the sector's success, women continue to face exclusion from its economic and political benefits. By fostering greater inclusion and recognizing their contributions, Brazilian agriculture could unlock even greater potential for innovation, productivity, and equity.

Assessing value chains in Brazil under the perspective of gender dynamics is an important task to identify specific barriers to gender equality and to propose interventions that address these disparities and suggests pathways for more inclusive public policies, specific training programs for rural women, greater access to credit and technology, and efforts to promote greater female representation in decision-making processes and leadership roles within Brazilian agribusiness, only to mention a few possibilities.

The objective of this report is to present a thorough gender analysis of **soy, sugarcane, citrus, cocoa, coffee and beef value chains in Brazil**. The analysis aimed to uncover gender-based disparities, barriers, and opportunities within these sectors to inform and guide equitable and inclusive development interventions. Through a comprehensive methodology that includes data analysis, interviews, and value chain assessments, the study provided an evaluation of the current gender context, including roles, relations, and dynamics within these value chains, particularly how they impact access to and control over resources, benefits, and decision-making for men and women. It allowed us to identify systemic barriers hindering women's participation and benefits and to highlight opportunities for integrating gender considerations into value chain development to promote gender equality and women's empowerment. The identified barriers and opportunities were organized in a framework including six material topics to be addressed as a priority in policies and projects that seek to promote gender equality in Brazilian agribusiness chains. **These six hot topics identified were: family succession, employment / job offer, remuneration, access to resources, leadership and representation**.

This study also provides actionable recommendations for private sector entities in Brazil to address gender inequalities and support gender-responsive value chain development and what role investors can take on to stimulate the implementation of these recommendations. By addressing these issues, the study offers a roadmap for transforming Brazilian agribusiness into a more inclusive and powerful sector, leveraging the untapped potential of women to drive resilience and innovation.



Chapter 1

Women in Agribusiness: Challenges, Contribution and The Road Ahead

Agriculture has long been regarded as a male-dominated industry, especially in Brazil, where agribusiness has been a key pillar of the economy. This is evident in the fact that only in the Constitution of 1988 rural women received the status of rural producers, which allowed their access to labor rights[3].

However, recent data highlights a growing presence of women in rural areas, illustrating their significant role in agricultural production, sustainability, and food security. Despite this, the sector remains fraught with challenges such as gender inequality, limited access to resources, and wage disparities. This study delves into the contributions of women in agribusiness, their ongoing struggles, and the urgent need for actions that support and empower female farmers.

Women's Growing Presence in Brazilian Agriculture

According to a study by Marielly Biff, co-author of the book *Mulheres no Agro (Women in Agro)*, approximately 30 million hectares of rural land in Brazil are managed by women, which represents 8,5% of the total 351 million hectares of the Brazilian rural land, according to the Censo Agropecuário from IBGE. The 2017 Agricultural Census[4], the most recent available data from the Brazilian Institute of Geography and Statistics (IBGE), reveals that 947.000 of the 5,07 million rural establishments in Brazil (19%) are managed by women. The Northeast region stands out, with 57% of these establishments, highlighting the concentration of small-scale, family-run farms where women are increasingly taking the lead. Interestingly, 77,8% of female-managed family farms are up to 20 hectares in size, and 88% of larger farms managed by women are up to 500 ha, a trend that reflects the predominance of small rural properties in Brazil's Northeast.

Women's involvement extends beyond production for market sales; they also play a critical role in self-consumption. This is particularly evident in small female-owned properties where the focus on subsistence farming helps ensure family food security. Despite these contributions, only 20% of rural establishments report shared management between couples, with a higher percentage in family farming. This demonstrates that women are integral to the day-to-day operations of rural businesses, although their contributions often remain undervalued.

Land Ownership and Agricultural Activities

The 2017 Census also indicates that 81% of women in agribusiness are landowners, with the majority involved in livestock farming (50%), followed by temporary crops (32%) and permanent crops (11%). Among non-owners, livestock farming and temporary crops are also predominant, with 42% and 39% of women involved in these areas, respectively. Despite their land ownership, women's participation in larger, commercial farms remains limited, and their access to land is often restricted to smaller areas, typically inherited or acquired through agrarian reform programs. This lack of access to larger properties reinforces the structural challenges women face in the agribusiness sector.

Gender Disparities in Social Organization and Technical Assistance

Although women manage a significant portion of rural establishments, their representation in social organizations, such as cooperatives, is still minimal. In the 2017 Census, only 8,6% of cooperative members were women, and while 5,3% of women are cooperative members, nearly double that percentage (12,8%) of men participate. This disparity indicates that women continue to face obstacles in organizing and advocating for their interests within the industry.

In terms of technical assistance, the gap between men and women remains wide. While women generally obtain technical information from seminars (9,6%) and the internet (8,8%), a striking 31% report having no access to such support. This lack of access to technical knowledge further hampers their ability to improve productivity and sustainability on their farms. The fact that many women remain excluded from this crucial resource highlights the need for more inclusive agricultural education and outreach.

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Economic Disparities and Work-Life Balance

Despite their increasing presence in the sector, women in agribusiness continue to face significant economic disparities. Data from 2019[5] indicates that the majority of female workers earned between one and two minimum wages (40,1%), with a smaller proportion earning more than three minimum wages (17,4%). In contrast, a larger percentage of men (29,8%) earned more than three minimum wages, reflecting the persistent wage gap between men and women in the sector. These findings are consistent with research from Cepea in 2019, which revealed that women, despite having higher educational levels on average, tend to earn lower salaries than their male counterparts.

Moreover, women in agribusiness are faced with the challenge of balancing work and family responsibilities. According to a survey by the Brazilian Agribusiness Association (ABAG)[6], women expressed a desire to improve their skills in business management, negotiation, and leadership. The study also found that women are particularly concerned about finding time for themselves and managing the demands of both work and family life. These challenges highlight the need for policies that support work-life balance and promote greater gender equity in the workplace.

The Road Ahead: Empowering Women in Agribusiness

In recent years, efforts have been made to address some of these challenges. The Brazilian National Rural Learning Service (SENAR), for example, offers programs like *Mulheres em Campo (Women in the Field)* to empower women through courses on entrepreneurship, financial management, and strategic planning. These initiatives are essential for equipping women with the skills necessary to take on leadership roles in agriculture. Furthermore, the growing participation of women in decision-making roles in rural enterprises, as reported by the Brazilian Association of Rural Marketing and Agribusiness (ABMRA), reflects a positive shift toward gender equality in agribusiness.

However, much work remains to be done. **Studies show that gender inequality persists, with 64% of women in agribusiness acknowledging its presence, despite improvements over the past decade**. Policies and strategies must be designed to provide better access to land, technical assistance, and markets for women, especially those in family farming. Public and private initiatives should also address the wage disparities that continue to plague the sector, ensuring equal pay for equal work.

Women have long been the backbone of Brazilian agriculture, contributing to food security, sustainability, and rural development. While their presence in agribusiness has increased, gender disparities in land ownership, economic opportunities, and social participation persist. Addressing these disparities requires a concerted effort from policymakers, industry leaders, and educational institutions to ensure that women have equal access to resources, training, and leadership opportunities. Only through these changes can women's invaluable contributions to the agribusiness sector be fully recognized and leveraged for the benefit of all.

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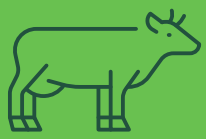
Chapter 2

Value Chain Analyses

The analysis of women's participation in the six priority value chains outlined in this study was carried out through a comprehensive desk research, and interviews with representatives from various sectors linked to each value chain (Table 1).

Table 1: List of women interviewed for the present study.

Supply Chain	Interviewee Position
Soy	2 Farm owners/producers 1 Director - Grains Trader
 **Cattle / Beef**	2 Farm owners/producers 1 President - Round Table on Sustainable Beef 1 Director - Slaughterhouse
Sugarcane	1 Farm/Mill owner and producer 1 Director - Rum industry
Cocoa	2 farm owners (one leading cocoa agribusiness farmer and one family farmer) 1 Manager - Cocoa processor industry 1 Manager - Chocolate manufacturing
Coffee	1 Manager - Leading cooperative with focus in export 1 Technical employee - Family farming cooperative 1 CEO - Farm agribusiness 1 Farm owner 1 Manager - Agriculture and livestock Federation
Citrus	3 Farm owners (mother and daughters from the same family-business) 1 Manager - Orange juice processing industry

Cocoa

The global production of cocoa beans reached 5,87 million tons in 2022, with Brazil being the seventh largest producer, with only 4,7% of the global share[1]. Côte d'Ivoire is the largest worldwide producer, with 38% of the shares, followed by Ghana, with 19%.

Brazil reached the peak of cocoa production in 1986, with 459 thousand tons and remained the world's second largest producer during the 1980s. The national production dropped dramatically in the following decade, due to the rapid spread of a disease that ravaged cocoa trees in southeastern Bahia, the country's main producing region at the time.

[1]According to data from FAOStat from 2022[7].

In 2023, Brazil produced 296 thousand tons of cocoa beans in 613 thousand hectares, generating a value of R$ 4.6 billions[8]. The main producing states are Bahia, with 51% of the national production in value and Pará, with 43%. Both states are responsible for 47% of the production in volume, each. The production systems are significantly different in Pará and Bahia, with the latter being known for the wide spread of the cabruca system, a sustainable method of cacao cultivation, which involves growing cacao trees under a canopy of native trees, helping to preserve biodiversity and maintain the ecological balance of the region. As a result, the area dedicated to cacao farming in Bahia is 2,6 times larger than in Pará. Bahia also produces a larger amount of specialty cocoa beans, leading to better prices paid to the producer.

Sustainable agriculture standards are becoming increasingly important for the cocoa global market: in 2022, Rainforest Alliance certified cocoa accounted for 36,7% of the global production, highly driven by Côte d'Ivoire, which has 60,8% of the total produced volume certified[9]. In Brazil, rainforest alliance is still very incipient, with only 2.692 tons of its production certified, which is less than 1% of the national production.

According to the last agricultural census (2017)[1] there are 93.314 cacao farms in Brazil, of which 74% are located in Bahia and 80% are classified as family farms. Family farming is even more important in Pará, accounting for 87% of the cocoa farming establishments in the state. Family farms account for 57% of the national cocoa production in volume, reaching 69% in Pará and 49% in Bahia, with comparable percentages in terms of production value. There are 160.237 people employed in cocoa farming establishments, with 71% of workers being employed by family farming.

Studies conducted in major cacao-producing areas of Brazil reveal similar socioeconomic conditions among producers, despite distinct regional contexts. On the southern coast of Bahia, a survey of 2,443 rural establishments was carried out from 2015 to 2018[10], while in Medicilândia, within the Transamazônica cacao hub, a separate survey of 360 rural establishments was performed between 2021 and 2022[11].

It is important to highlight that the cocoa production contexts of Medicilândia, within the Transamazônica cacao hub, and the southern coast of Bahia differ significantly. The southern coast of Bahia has a long history as Brazil's primary cocoa-producing region, traditionally using the cabruca system, which integrates cacao cultivation with native forest conservation. In contrast, cocoa production in the Transamazônica region began in the 1970s with the National Integration Program but only gained momentum in the 2000s, primarily through monoculture systems. These contrasting histories highlight the distinct socio-environmental and economic dynamics shaping each region's cacao production.

In southern Bahia, the profile of cocoa producers reveals an aging workforce, with most being men averaging 62 years old, as younger generations migrate to urban areas for work or study. Educational attainment varies significantly by property size: while 53% of producers have completed only elementary school or less, 38,5% of those owning properties larger than 100 hectares have higher education. Economically, most producers face financial precarity, heavily relying on supplemental income such as pensions. In 2015/2016, the average monthly household income was R$ 3.585, but three-quarters of producers earned between R$ 800 and R$ 3.010, with an average of R$ 1.680. Smaller properties (under 50 hectares) depend mainly on pensions, while larger farms generate most of their income from cocoa, illustrating significant income disparities tied to property size. Producers primarily sell their cocoa through local warehouses (71%), receiving lower prices (R$ 128,83 per arroba on average in 2018/2019) compared to direct sales to processors R$ 138,05). This reliance on intermediaries underscores the limited market power of smallholders, with only 34% of producers associated with cooperatives or unions, reflecting a weak collective organization in the sector.

In Medicilândia, a similar aging demographic emerges, with 65% of producers over 60 years old and 82% having no more than elementary education. The average individual income is R$ 2.170, with pensions received by 33,6% of producers and 15% benefiting from government programs like Bolsa Família. Income distribution shows that 32% earn up to one minimum wage, 45% earn between one and two, and 21% earn more than three minimum wages. The studies carried out in both regions revealed an aging population of cocoa producers, a predominance of low educational levels, and modest incomes, with a high reliance on pensions,

emphasizing the vulnerability of cocoa producers in both regions.

In southern Bahia, land acquisition and documentation underscore the socioeconomic challenges faced by rural cocoa producers. Nearly half of the producers (48%) acquired their land through purchase, while 43% inherited or received it as a donation. However, land tenure security remains a significant issue, as 19% of producers lack proper documentation, and only 21,6% have fully regularized land titles. This lack of formal documentation limits access to credit and formal markets, creating barriers to economic growth and stability in the region.

In Medicilândia, land tenure insecurity is also evident. Among the 360 producers surveyed, only 9,4% hold both a sales contract and a public deed for their land. 51% of the producers possess public deeds but no sales contract and alarmingly 14,4% lacking any form of land documentation, leaving them highly vulnerable and excluded from financial incentives or support. Additionally, 25% hold only a sales contract, which provides limited ownership rights. These challenges in land regularization highlight systemic barriers that restrict the socioeconomic advancement of cocoa farmers in both regions.

Cocoa supply chain and stakeholders

The global cocoa bean market is characterized by complex production, demand and trade dynamics. Global cocoa production has shown remarkable growth, but the sector faces risks and opportunities that impact both the main producing countries and niche specialty cocoa markets. Between 1961 and 2019, global cocoa production increased by 372%, reaching 5,141 million tons[12]. Africa dominates the market, accounting for 67% of global production. However, this region is highly vulnerable to climate events and political issues, which poses a significant risk to supply stability. The Americas produce around 17% of the world's cocoa, with Ecuador standing out as the fifth largest producer, whose production increased by 60% between 2016 and 2019 due to the introduction of a more resistant and productive cocoa variety.

The cocoa supply chain spans multiple stages from production to retail, involving diverse actors, as shown in Figure 1. The main stakeholders within the supply chain are:

Producers
Cocoa production is primarily carried out by smallholder farmers, with over 5.5 million involved globally across more than 50 countries. Producers cultivate, harvest, and, in some cases, ferment and dry the cocoa beans. They may operate independently or within Farmer-Based Organizations (FBOs) or cooperatives, allowing them to sell cocoa beans directly to intermediaries, agents, or exporters.

Intermediaries
These actors, often termed “collectors” or “aggregators,” play a crucial role by collecting and combining cocoa beans from multiple small-scale producers to create volumes suitable for export. Intermediaries do not typically have export licenses and instead sell to FBOs or exporters. They can also provide informal credit to producers, which is especially significant in countries where formal financial support structures are limited.

Farmer-Based Organizations (FBOs)
FBOs, including cooperatives, unions, and associations, are essential for aggregating and processing cocoa beans, enabling producers to achieve better prices and access certifications. Some FBOs may also engage in exports and provide services such as training, inputs, and advocacy. These organizations vary in size and influence based on the country and structure, with a notable presence in Latin American countries where cooperatives often handle post-harvest processing.

Exporters
Exporters are commercial firms that handle the logistics of exporting cocoa beans and products. They may be independent local companies or subsidiaries of international firms, such as Barry Callebaut or Cargill. Exporters purchase cocoa directly from producers, FBOs, or intermediaries and sell to importers or manufacturers. In some cases, large exporters are vertically integrated, enabling them to control the supply chain from sourcing to processing.

Traders (Importers)
Traders, often international importers, operate across multiple origins and supply chains. They manage logistics, customs, and quality control and cater to specific markets, such as organic or fair-trade cocoa. Traders serve end-buyers including chocolate manufacturers, food industries, and other companies in the cosmetics and pharmaceutical sectors, and are generally independent of multinational corporations.

Grinders (Processors)
grinders are typically large multinational firms that process raw cocoa beans into derivatives like cocoa liquor, butter, and powder. These processed products are distributed to industries such as confectionery, cosmetics, and pharmaceuticals. Key companies in this sector include Barry Callebaut, Ofi, and Cargill, with some grinders controlling significant portions of the market through vertically integrated supply chains.

Manufacturers

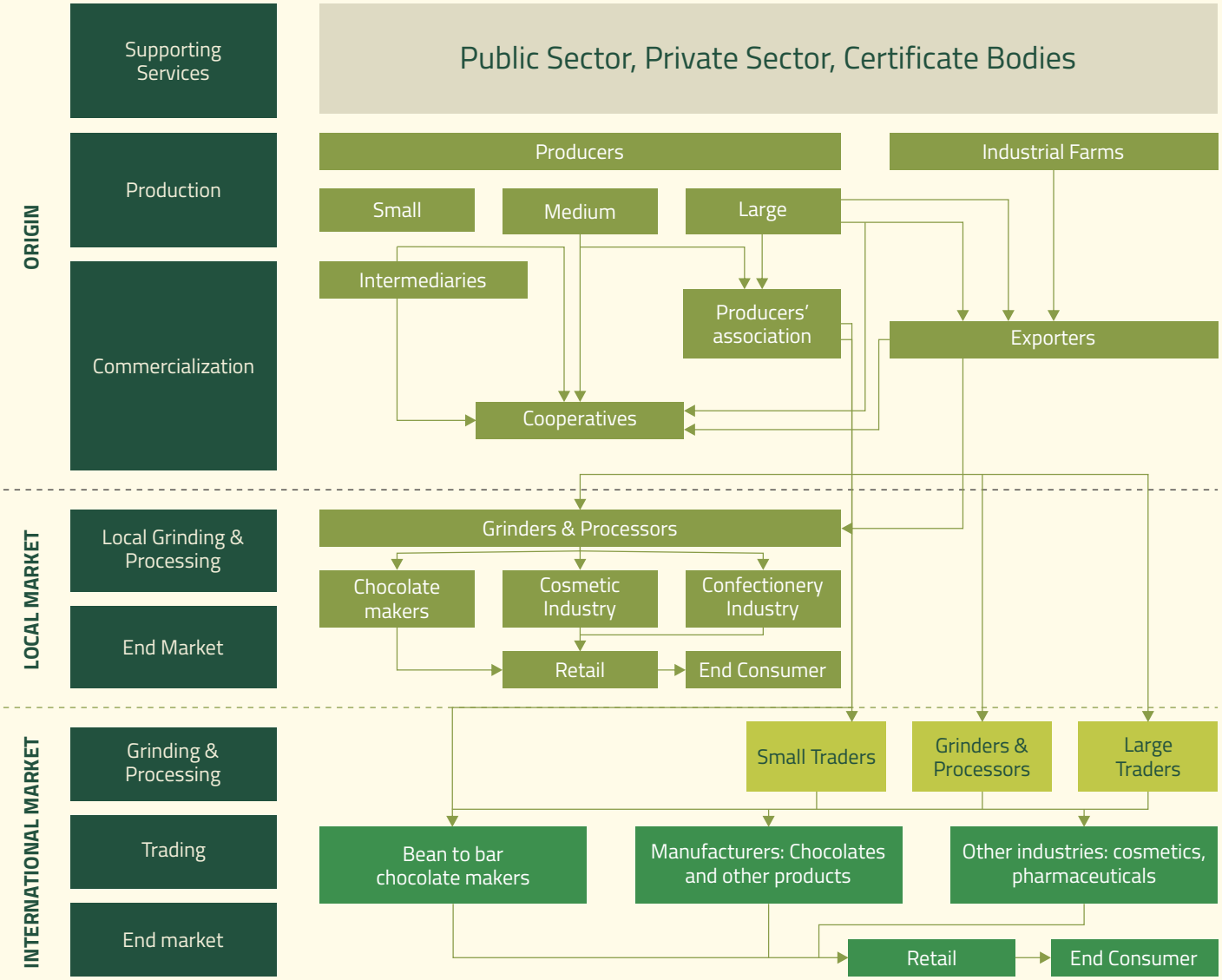
These are companies that use cocoa derivatives to produce chocolate and other cocoa-based consumer goods. Some manufacturers integrate grinding activities to directly process cocoa beans into finished products. Manufacturers also supply intermediates such as cocoa butter and powder to other industrial buyers. These companies can range from large global brands to smaller specialty chocolate makers that often engage in direct trade relationships with producers.

Other End-Use Industries

In addition to confectionery, industries like cosmetics and pharmaceuticals use cocoa derivatives. The cosmetics industry mainly demands cocoa butter, often processed and refined in consumer markets due to the technical requirements. The pharmaceutical industry, too, primarily utilizes cocoa butter for its applications. The animal feed sector has explored the use of cocoa by-products, though its application remains limited due to adverse effects at higher dietary concentrations.

Retailers

Retailers, including supermarkets, hypermarkets, and discount stores, provide the final link in the supply chain by making cocoa-based products available to consumers. They often have significant bargaining power over manufacturers, influencing pricing dynamics across the supply chain due to their direct access to end consumers.



Brazil is, at the same time, an important player in the production of cocoa beans, ranking seventh in the world, and also a major processor of intermediates, a chocolate manufacturer and has a very significant domestic consumer market.

Brazil's cocoa processing industry is robust, utilizing both domestic production and imports to meet significant internal demand. Leading processors, Cargill, Barry Callebaut, Ofi, and IBC are organized through the Association of the National Cocoa Processor Industries (AIPC) and are responsible for 93% of the total cocoa processing in the country[13] with an installed processing capacity of 275,000 tons per year[14]. Nearly all domestically produced cocoa beans are locally processed, supplemented by imports to address a 19% shortfall in supply. In 2020, the main product categories traded by the processing industry were cocoa powder (48%), cocoa paste (28%), cocoa butter, fat and oil (22%) and residues (2%). Brazil is an exporter of cocoa processed derivatives, but imports have increased 149% over the past decade (between 2011 and 2020), while exports dropped 17% in the same period. Despite this trend, exports exceeded imports by R$ 128 million in 2020.

The Brazilian chocolate industry produced 757.000 tons in 2020, with most of it consumed domestically. There are 635 chocolate producing establishments in the country, including global players and local brands. ABICAB, the Brazilian Association of Chocolate, Cocoa, Peanut, Candy and Derivatives Industry, has 20 associated chocolate industries that represent 92% of the national chocolate industry[15]. Brazil is the fifth largest chocolate consumer market in the world, with domestic consumption reaching an estimated 743.000 tons in 2020, with an average per capita consumption of 3,5 kg. Recently, the market has seen growing interest in gourmet and high-cocoa content chocolates, reflecting shifting consumer preferences towards healthier options.

In 2020, Brazil exported chocolate products to 145 countries, primarily to South American markets and the United States, totaling 30.000 tons and generating $101 million in revenue. Brazil’s chocolate imports came from 39 countries, with Argentina, Europe, and the U.S. as main suppliers, reaching 16.000 tons at a cost of $114 million in 2020, resulting in a R$ 13 million deficits in the trade balance. Exports accounted for about 4% of Brazil's chocolate production, while imports represented only 2% of apparent domestic consumption in 2020.

The cocoa sector in 2024 faced a significant crisis, marked by a precarious balance between shrinking supply and soaring global demand. Persistent challenges such as climate change, deforestation, and aging plantations in major producing countries like Ivory Coast and Ghana have contributed to reduced yields. Simultaneously, the growing appetite for chocolate in emerging markets, particularly in Asia and Africa, has intensified demand. This imbalance has driven cocoa bean prices to record highs, exceeding USD 12.000 per ton, exacerbating economic pressure on manufacturers and consumers alike. In Brazil, where there has historically been a deficit in cocoa bean production compared to domestic chocolate production, this global crisis puts even more pressure on the industry. On the other hand, there is a huge opportunity to increase the domestic supply of cocoa beans by growing cocoa crops on degraded land. Brazil can play an important role in ensuring long-term stability in the global cocoa industry, provided there are collaborative efforts across different sectors to invest in large scale sustainable cocoa farming practices.

The cocoa processing industry employed 4.000 people in 2020 and generated a gross production value of R$ 2,1 billion. There are 635 chocolate producing establishments in the country, employing around 39.000 people, including temporary workers during the Eastern season. The gross production value of the chocolate industry is estimated at R$ 12,2 billion. Altogether, the cocoa processing and chocolate industry paid around R$ 2 billion in salaries and contributed R$ 1,2 billion in social and labor charges.

Women in the cocoa sector

There is very little information about the situation of women in cocoa farming worldwide. An extensive literature review from 2024 was able to find only 14 scientific papers on women's representation in cocoa agriculture in international scientific literature over the past five years[16]. Most of the literature is dedicated to the situation in West African countries, where most of the cocoa is produced worldwide. In Brazil, the lack of data about women in cocoa farming is even more alarming. Very little information regarding specifically cocoa production and gender can be found in the 2017 agricultural census. **Women manage 22% of rural establishments dedicated to cocoa farming in the country , reflecting their significant yet limited presence in this sector**. This percentage varies regionally, rising to 24% in Bahia and dropping to 18% in Pará, indicating regional disparities in gender representation. However, when considering the size of the properties, establishments led by women account for only 13% of the total area, with 14% in Bahia and just 10% in Pará. These figures highlight not only the underrepresentation of women in cocoa farming but also the smaller scale of the land they manage, underscoring persistent gender inequalities in agricultural resource distribution. The agricultural census also shows that women correspond to 27% of the workforce in cocoa farming and that the majority of employed women (93%) are family members of the producers. When it comes to contract work, women's contribution drops to just 8% of the hired workforce (including permanent and temporary labor and partners).

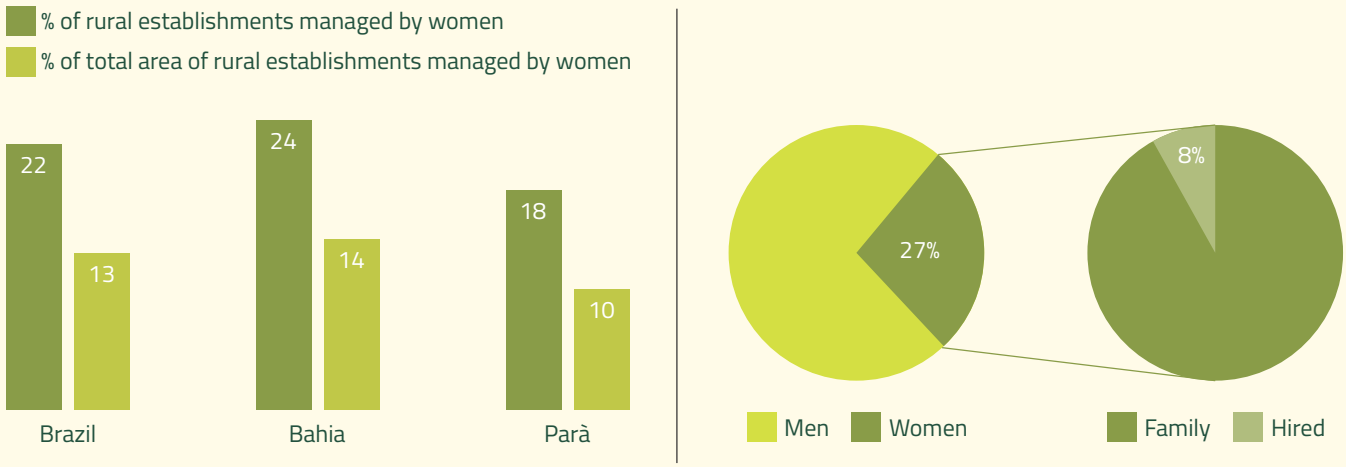


Figure 2: Contribution of women in cocoa production in Brazil and leading producing states. (a) Proportion of rural establishments managed by women and proportion of the total area of those establishments. (b) Proportion of women in workforce in rural establishments dedicated to cocoa production and type of contract.

The survey performed between 2015 and 2018[10], confirmed the gender disparities observed in the agricultural census. While women represent 47% of the population in rural areas of the Bahia south coast, they participate in management in only 20% of the establishments. Properties managed by women also show slightly lower productivity (10,6 arrobas per hectare) compared to those managed by men (12,69 arrobas per hectare). The study performed in Medicilância[11], showed similar results: out of the 360 producers responsible for rural cocoa establishments who participated in the survey, 74 (20,6%) were women. In Medicilândia, the study also showed that more women rely on government pensions and aid: 39% of women receive a pension and 19% receive resources from income transfer programs (Bolsa Família), while this percentage for men is 32% and 14% respectively.

[2] These data were extracted from the table 6883 - Number of agricultural establishments with area and area of agricultural establishments, by type, land use, sex of producer and groups and classes of activity. It considers only 55509 rural establishments that have cocoa farming as main class of activity. IBGE - Censo Agropecuário 2017.

Although the cocoa supply chain is a sector historically dominated by men, a growing number of women are stepping into leadership roles, driven by efforts from corporate initiatives, community programs, and the resilience of women themselves. Major cocoa processing companies, Barry Callebaut, Cargill, and Ofi, have implemented significant diversity and inclusion programs, though gender balance remains a challenge.

Barry Callebaut employs 13,423 people globally, of which 31% are women[18]. However, women occupy only 16,7% of executive committee positions and 11,1% of board seats. Despite this, the company advanced in its leadership pipeline, with 31% of its directors being women. Their #oneBC initiative includes training on inclusive skills and flexible work policies. In the supply chain, 15% of the 594,608 sustainable ingredient producers supported by the company are women.

Cargill has over 160,000 employees globally, with 35,7% of leadership positions[19] held by women; a figure they aim to increase to 50% by 2030. Their diversity and inclusion program tackles unconscious bias and includes affirmative policies, gender pay equity measures, and robust monitoring. In 2023, Cargill was recognized by Forbes as one of the Best Employers for Women. On the ground, 244,364 farmers have been trained in gender awareness, with over 50% of women reporting increased decision-making power in their households and communities[20].

Ofi is a subsidiary of Olam Group, which employs 92,500 people worldwide[21]. The group's policies focus on fair employment and gender equity, though they do not yet disclose gender-disaggregated workforce data. Although Olam aims to have 30% of women on its board of directors by 2030, they currently only have one woman appointed. On the other hand, women represent 42% of Ofi's board of directors' positions. The company implemented a fair employment policy, which includes prevention of sexual harassment and discrimination, training of management on the subject and reporting of the number of discrimination or harrassment incidents, as well as their status. A mentorship and reverse mentoring program were established, aiming to accelerate women's career growth. In the cocoa supply chain, 16,5% of smallholder producers in the group's sustainability program are women. 42% of all cocoa farmers were trained on gender and women's rights and 80,5% of female farmers were trained on good agricultural practices[22].

All three cocoa processor companies have established ethical codes of conduct, combined with grievance mechanisms and zero-tolerance policies for harassment, providing women with safer and more supportive work environments. Such progress observed in gender inclusive policies in the three major worldwide cocoa processors is driven by their large multinational clients, such as Mars, Mondelez and Nestlé. These leading chocolate manufacturers have established, together with the non-profit organization Oxfam[22], the campaign *Behind the brands*, taking actions in five socioenvironmental themes: women, land, climate, small-scale producers and transparency and accountability. All three processor companies have adhered to the UN Women's Empowerment Principles, and they are implementing gender-inclusive actions in their living income strategies, such as the establishment of Village Savings and Loans Associations (VSLAs) playing a pivotal role in enhancing women's financial resilience. Such initiatives, however, are more advanced in African countries, where most of the cocoa beans are produced worldwide.

Despite these efforts, there are notable gaps, including a lack of transparency in pay equity reporting. None of the three major processors have yet published their gender pay gap reports, as required under Brazil's Equality in Pay Law (14.611/2023). This is a critical area for improvement to ensure accountability and meaningful progress.

Women's roles in chocolate manufacturing companies are somewhat more prominent, with companies like Mondelez, Nestlé, and Cacau Show demonstrating stronger female representation in leadership.

Cacau Show boasts 64% women in its workforce, with 62% of women in operational leadership roles[23], while Mondelez has 42% of its global management positions filled by women, with pay gaps between men and women reported to be less than 1%[24]. Nestlé reports 39,8% women in its total workforce, with 46,4% in management positions and 51,7% of all promotions in the last going to women[25]. Regarding salaries, their 2023 report showed a global gender pay gap of 6,7%. In Brazil, Nestlé was the only of the three companies to have published the transparency pay report, as requested by Brazilian law. According to the report, women earn an average of 79% of men's wages . From the three chocolate manufacturers analyzed, the Brazilian Cacau Show was the only one that did not adhere to the UN Women's Empowerment Principles.

Table 2: Gender representation and inclusion efforts in major cocoa processing companies and chocolate manufacturers.

Company	% of women in workforce	% of women in leadership	Gender pay gap reporting	Key gender initiatives
Barry Callebaut	31%	16,7% (Exec.) 11,1% (Board) 31% (Directors)	Not published	#oneBC initiative, inclusive skills training, flexible work policies, support for female farmers (15%)
Cargill	N/A	35,7% (target 50% by 2030)	Not published	Diversity & inclusion programs, gender pay equity measures, Forbes Best Employer for Women, 244,364 farmers trained in gender awareness
Ofi (Olam Group)	N/A	42% (Ofi board) 1 woman in Olam's board (target 30% by 2030)	Not published	Fair employment policy, mentorship programs, 16,5% of cocoa suppliers are women, gender training for cocoa farmers
Cacau Show	64%	62% (operational leadership)	Not published	Did not adhere to UN Women's Empowerment Principles
Modelez	N/A	42% (Global management)	Pay gap < 1% reported. The company did not report the Brazilian pay gap.	Gender equity measures, leadership initiatives
Nestlé	39,8%	46,4% (management)	Global gap: 6,7% Brazil: women earn 79% of men's wages (only company to publish pay report)	Transparency in pay reporting, gender-inclusive policies

[3] This average was calculated based on the reports from the 25 local subsidiaries with more than 100 employees, totalling 18,752 employees. In general, companies are criticizing the methodology adopted by the Ministry of Labor and Employment, claiming that it does not correspond to reality, since it does not take into account seniority and other important aspects of salary payment.

Barriers for women in the cocoa sector

In order to better understand the practical aspects related to gender barriers faced by women, qualitative interviews were carried out with 4 female leaders that excelled in different segments of the cocoa industry, from farming to multinational companies. These women bring innovation, resilience, and a transformative approach to an industry that faces both structural and cultural barriers.

The women interviewed come from diverse backgrounds within the sector. Among them is a director of a major cocoa farming enterprise overseeing multiple farms in Brazil, who has faced challenges in production and workforce management while advancing sustainable practices. Another is a leader in a family farming cooperative that focuses on value addition and technical improvements in cocoa quality, where she has championed women's inclusion in the cooperative's operations. A sustainability leader at a global processing company shared insights into how corporate programs address gender bias and empower women across the supply chain. Finally, a leader in a chocolate manufacturing company has worked to bridge the gap between cocoa producers and premium chocolate markets while promoting affirmative actions for women.

In cocoa farming, women contribute significantly to various stages of production, but mainly harvesting, post-harvesting (fresh cocoa pod breaking, beans extraction and fermentation), and diversification of household income. However, their contributions often go unrecognized. Many women lack formal land ownership or access to contracts, which are typically in their husbands' names, limiting their access to credit and decision-making authority, despite their significant involvement in daily operations.

The cultural expectation for women to balance domestic responsibilities with farming work exacerbates their challenges. Limited access to childcare and educational facilities further restricts women's ability to participate fully. One interviewee highlighted the urgent need for full-time schools in rural areas to enable women to join the workforce or improve productivity on their farms.

The interviews highlighted significant barriers to gender equality in the cocoa sector, many of which are deeply rooted in cultural norms and systemic biases. Women are often expected to seek validation from male counterparts, both on farms and in leadership roles, which undermines their autonomy and slows decision-making processes. This dynamic reinforces a culture where their contributions are undervalued, limiting their ability to take independent actions and assert authority. Additionally, women must overcome subtle gender biases. For instance, they frequently encounter dismissive comments or do not have their voices heard in decision-making spaces.

Many women lack formal land ownership or access to contracts, which are typically in their husbands' names, limiting their access to credit and decision-making authority, despite their significant involvement in daily operations.

Limited access to childcare and educational facilities further restricts women's ability to participate fully.

One interviewee described how women in professional settings continue to face objectifying comments or skepticism about their competence, highlighting the need for greater sensitivity and inclusion. She also noted that, as some companies are starting to do, developing training courses on unconscious biases could be an effective way to promote a more respectful and inclusive environment. Implementing secure, anonymous, and efficient reporting mechanisms that are promptly and effectively addressed could also help tackle these issues.

In addition to cultural challenges, structural limitations create significant obstacles for women. In many farms, for instance, women don't have access to adequate or exclusive restrooms. Access to land ownership and credit remains out of reach for many due to bureaucratic hurdles and systemic inequities. Without proper financial resources or ownership rights, women face significant challenges in building economic independence.

Socioeconomic pressures further constrain women's participation in the cocoa sector. Many women in rural areas are discouraged from engaging in formal temporary work due to fears of losing government benefits or social welfare programs, which often form a crucial part of household income. Household responsibilities and childcare also disproportionately fall on women, further limiting their ability to pursue opportunities in farming or leadership. These intersecting barriers demonstrate the complexity of the challenges women face and underscore the need for targeted interventions to dismantle systemic inequalities in the cocoa industry.

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Opportunities for women in the cocoa sector

Despite these barriers, opportunities for women are expanding, since they are taking on leadership roles in cooperatives and family-run farms. These roles allow them to implement innovations, improve production quality, and influence decision-making processes. For example, a family farming cooperative in Pará developed a chocolate made by women, a successful initiative where women contributed cocoa for a specialty chocolate product, both increasing their income and promoting their visibility in the market.

The population of cocoa farmers is aging, since in general, the youth are not interested in taking over their parents' activities. Historically, cacao farming is a low profit activity, leaving farmers vulnerable to market price fluctuations. However, this situation could be reversed in the next few years, with the increase in the demand for cocoa beans over supply. In this scenario, women's involvement is critical in family succession and ensuring the next generation of cocoa farmers. Training programs focused on leadership, technical skills, and farm management are essential to preparing women to manage farms and mentor younger producers.

Women leaders also bring a more inclusive and empathetic management style. Their ability to listen, provide feedback, and adapt to challenges fosters a collaborative environment that benefits both employees and stakeholders. They are also more attentive to details and more likely to test innovation that can bring resilience, increased productivity and quality.

Developing innovative gender-inclusive financial mechanisms is key for the sustainability of the cocoa supply chain in Brazil. Such mechanisms can include small-scale credit initiatives addressed to women that do not require land ownership, such as the use of purchase contracts as a means of guarantee. One interviewee reported that in one experiment with loans for farmers, women were the first to repay, demonstrating financial responsibility and commitment.

Interviews confirmed some of the corporate affirmative actions, with a chocolate manufacturing company and a cocoa processing company introducing affirmative hiring policies for women, extended parental leave, and targeted training programs. These efforts are designed to foster an inclusive environment and support women in leadership. One company established a hotline for reporting workplace discrimination and embedded its code of ethics into supplier contracts to extend these principles across the supply chain. Another emphasized the importance of collecting and analyzing disaggregated gender data to inform decisions and measure progress toward gender equity.

The interviews underscore the immense potential of women to transform the cocoa industry when given the tools and opportunities to thrive. Women's ability to adapt, innovate, and foster collaboration is evident in their roles as farm owners, cooperative leaders, and corporate executives. However, achieving true gender equality requires addressing deeply rooted cultural and structural barriers. Key actions for progress include expanding access to credit and land ownership for women; investing in education and childcare infrastructure in rural communities; continuing and scaling corporate programs focused on diversity and inclusion; advocating for policy changes to ensure formal work does not jeopardize social benefits for rural women.

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Coffee

Brazil is the largest world producer of coffee, with 29% of the global production[4]. In 2023, the total planted area in the country was 1,9 million hectares, generating a production volume of 3,4 million tons (56,75 million bags) and value of R$ 44 billion.

The main producing states, in value, are Minas Gerais, with 55% of the country's production value, followed by Espírito Santo (21%) and São Paulo (10%). The average yield in Brazil is 30 bags per hectare, with the productivity in Minas Gerais and São Paulo (27 bags/ha) being lower than in Espiríto Santo (33 bags/ha).

[4]According to data from FAOStat from 2022.

Coffee is the main permanent crop in Brazil and reached seventh position in the ranking of the main agricultural and livestock products in the country, corresponding to 4,16% of the total gross production value in 2023[26]. The crop is even more important in the states of Minas Gerais and Espírito Santo, where it occupies the first position in the ranking of agricultural and livestock products, with 21,7% and 57,9% of the gross production value, respectively.

The country produces two species of coffee: Coffea arabica and Coffea Canephora, the first one corresponding to 69% of the national production in volume and 74% in value. In Minas Gerais, arabica is the main species, accounting for 99% of the production whereas in Espírito Santo, robusta stands for 79% of the state production (in volume).

Sustainable agriculture standards are becoming increasingly important for the coffee global market: in 2022, Rainforest Alliance certified coffee accounted for 14,5% of the global production[27]. This certification is important in Brazil, where the volume of certified coffee reached 518,5 thousand tons in 2023, which corresponds to 15% of the national production (the country holds a 30,7% share of world's production of Rainforest Alliance certified coffee). It is worth mentioning that, even though production and sales of certified coffee are increasing, the supply of RA certified coffee is still higher than the demand: in Brazil, only 84% of the RA certified coffee produced in 2023 was sold as such.

According to the last agricultural census (2017) there are 264.361 coffee farms in Brazil, of which 78% are classified as family farms. However, the 22% non-family farmer establishments account for 62% of the national production in volume and 64% in value. On the other hand, family farmer establishments employ most of the personnel occupied in primary coffee production: from all the 554.212 employees in the sector, 56% are employed by family farmers establishments.

Coffee supply chain and stakeholders

The coffee supply chain in Brazil is composed of four main aggregate categories: inputs, green coffee agricultural production, coffee industry (processed coffee) and distribution. A scheme of the supply chain is represented in Figure 3.

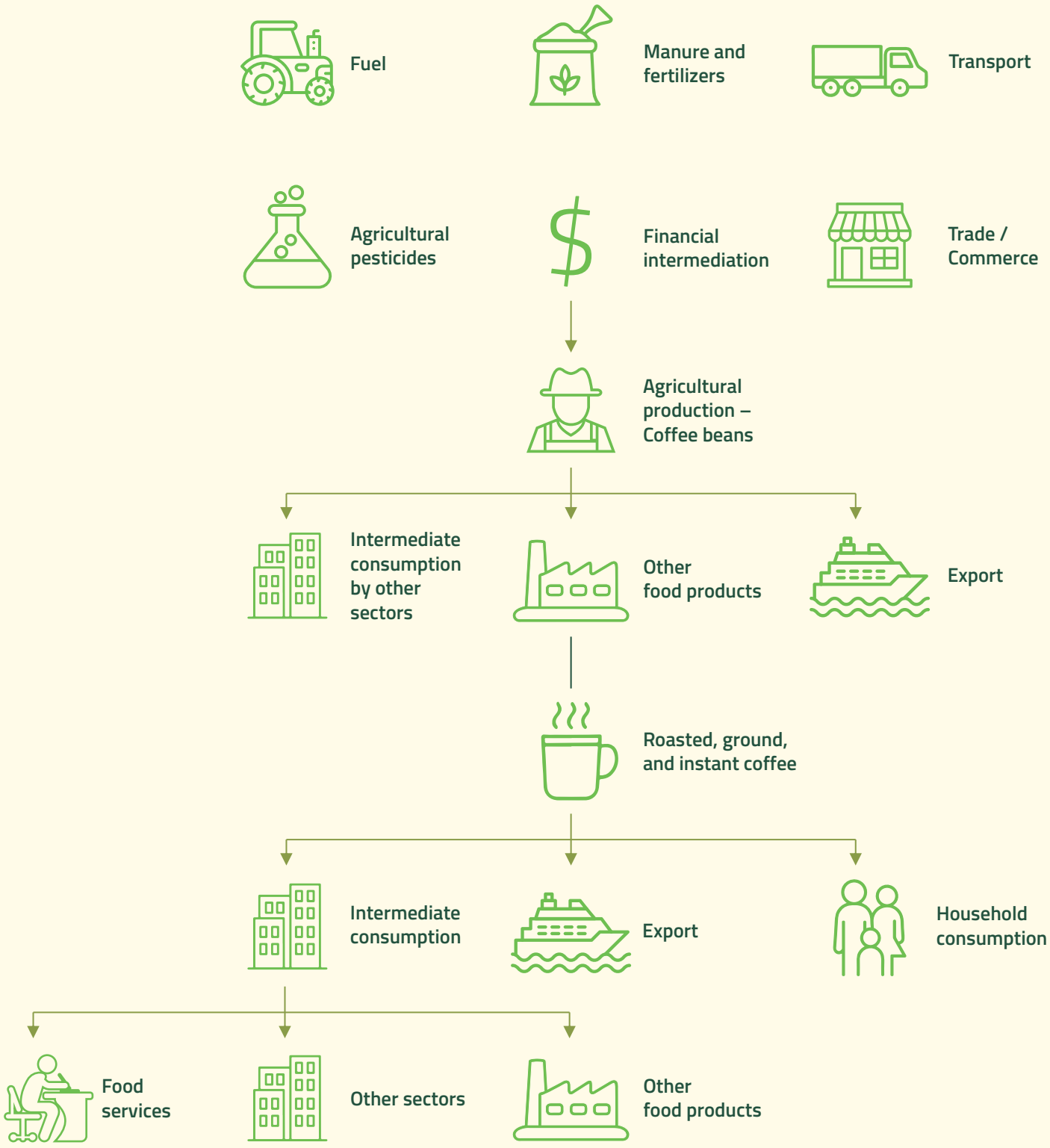

Figure 3: Schematic diagram of the coffee supply chain in Brazil. Extracted from Pereira et al. 2021[28].

Coffee inputs and production

Agricultural inputs play a crucial role in maximizing coffee yields and ensuring crop quality. Fertilizers are vital in providing essential nutrients such as nitrogen, phosphorus, and potassium, which are critical for healthy coffee plant growth. Due to Brazil's diverse coffee-growing regions, soil conditions vary significantly, necessitating a tailored approach to fertilization that takes local soil deficiencies and coffee variety requirements into account. This customized use of fertilizers, often guided by soil tests, helps maintain soil fertility, improve yield, and boost the resilience of coffee plants against environmental stresses. According to a study from Conab, the use of fertilizers accounts for 18,45% of the operational costs, on average, in coffee farming[29].

Pesticides are also integral in Brazilian coffee farming and represent an important fraction of crop costs, although smaller than fertilizers. In the country, coffee is susceptible to pests like the coffee borer beetle and diseases such as coffee leaf rust. However, the use of pesticides remains a point of environmental concern, leading many farms to explore integrated pest management (IPM) practices. These methods combine biological control agents with selective pesticide use, reducing chemical inputs and fostering a more sustainable approach to pest management.
Brazil is one of the few countries where mechanized harvesting is widely feasible. The relatively flat terrain in major coffee-growing regions allows for the use of advanced harvesting machines that can quickly and efficiently strip coffee cherries from the plants. This mechanization significantly reduces labor costs and time, especially during peak harvest seasons, while allowing for large-scale production. Additionally, machinery is used for processing tasks such as depulping, drying, and grading, enhancing the speed and consistency of post-harvest operations. Although mechanization poses challenges in quality control, since machines may harvest both ripe and unripe cherries simultaneously, ongoing innovations and selective hand-picking practices in specialty coffee segments help address these issues, enabling Brazil to maintain a high standard of quality in both mass-produced and premium coffee varieties. A survey of 1058 coffee farmers conducted by the Brazilian Agriculture and Livestock Confederation (CNA) showed that 30,2% of producers perform mechanized harvesting and 33,6% carry out manual harvesting with some equipment attached to the body[30]. All this initial processing, until the green coffee bean is obtained, is carried out on the farm or cooperative scale.

Coffee roasters and local market

Brazil is an important market for coffee consumption, being the second largest country in the world. According to ABIC (Brazilian Association of Coffee Industry)– , the internal consumption of coffee between November 2022 and October 2023 corresponded to 39,4% of the total national production. The internal coffee consumption in the period was 21,72 million bags of coffee, corresponding to a per capita consumption of 5,12 kg of roasted coffee per year, an increase of 7,47% compared to the previous year. The corresponding sales of roasted coffee reached 22,89 billion BRL.

Companies associated with ABIC are responsible for 71,1% of the national production of roasted coffee and represent 86,5% of the market share in supermarket retail. There are 2937 certified products in ABIC's database, the traditional and extra strong categories of coffee representing 85,5% of the sales. 51% of the companies associated with ABIC are small, which means that they produce between 51 and 1000 bags of roasted coffee by month; 30% are nano and micro (up to 50 bags/month); 13% are medium (between 1001 and 5000 bags/month) and 6% are big (more than 5000 bags/month). Big companies accounted for 87,08% of the total volume of coffee produced by the group of companies associated with ABIC. Table 2 below shows the 10 largest coffee companies in Brazil in 2023.

Table 3: Leading coffee companies in Brazil in 2023 (extracted from ABIC).

Ranking	Location	Company
1	CE	Café Três Corações S.A.
2	SP	Jacobs Douwe Eberts Br Com. de Cafés Ltda.
3	SP	Melitta do Brasil Ind. e Com. Ltda.
4	SE	Inds. Aliments. Marata Ltda.[5]
5	MG	Camil Alimentos S.A.
6	PB	São Braz S_A Ind. e Com. de Alimentos S.A.
7	MG	Coop. Regional de Cafeicultores em Guaxupé Ltda. – COOXUPE
8	GO	Café Rancheiro Agro Indl. Ltda.
9	SP	Massimo Zanetti Beverage Brasil Ltda.
10	MG	Foods Ind. e Com. Ltda.

It is important to mention that multinational companies are the most relevant players in Brazil's domestic coffee market. The largest company, 3Corações, is a joint venture between a Brazilian family business and the Israeli company Strauss. JDE, the Dutch giant and owner of popular brands like L'Or, Pilão, and Senseo, recently expanded its footprint in Brazil by acquiring Café Maratá, the coffee division of the former fourth-largest Brazilian company. Germany's Melitta, ranking third in the national market, further exemplifies the importance of foreign investment in Brazil's coffee industry. Together, these multinationals enhance Brazil's coffee market by adding robust global distribution channels, branding power, and technology that reinforce Brazil's position as a leader in the world coffee trade.

[5] The coffee division of the Maratá group was sold to Jacobs Douwe Eberts. The transition was only concluded in January 2024 (data from ABIC correspond to 2023).

Exports

International trade is also very important for the Brazilian coffee market. In the 2022/203 season, Brazil exported 35,3 million of coffee bags[32], being responsible for 32% of the global exports (according to ICO - International Coffee Organization, the global exports in the period were 110,7 million bags[33]). Coffee exports reached 7,315 billion USD in the period, corresponding to 2,15% of shares in the total country exports, being 11th in the ranking of most exported products. Within the agricultural and livestock segment, coffee is the third most exported product, with 9% of the export market share in the sector. The United States and Germany are the main destinations of Brazilian coffee, contributing with 15% of the export shares each. Minas Gerais is responsible for 75,6% of the national exports, followed by Espírito Santo (12,5%) and São Paulo (8,46%).

Exports correspond to more than 60% of the national green coffee national production. Therefore, traders have an important role in the coffee segment. There are 126 companies associated to Cecafé, the Brazilian Coffee Exporters Council, including big multinationals such as NKG Stockler, Olam and Louis Dreyfus, and local companies and cooperatives, such as Cooxupé, a cooperative of more than 20 thousand members (97% of which are smallholder farmers), which is responsible for 14% of the national production of arabica coffee and 12% of the country's exports[34].

Brazilian coffee exports play a crucial role in both the country's economy and the global coffee market. In 2024, Brazil's coffee exports reached record levels, with the first nine months of the year showing a remarkable 38,7% increase in volume and a 51,9% rise in turnover compared to the same period in 2023. This growth reflects the efforts of Brazilian exporting companies that, despite facing logistical challenges in Brazilian ports, such as inadequate infrastructure, limited space, and container shortages, managed to drive significant international sales. Notably, 18,2% of Brazil's coffee exports during this period were specialty or certified coffees, representing a 51,6% increase over the previous year, underscoring the global demand for premium Brazilian coffee. Santos Harbor, Brazil's primary export hub, handled 67,8% of the country's coffee export volume, reinforcing its central role in Brazil's coffee trade. In 2020, there were 1050 coffee companies in the country, employing 20,1 thousand people and the total paid in personnel expenses was 1,23 billion BRL. Minas Gerais is the state with the most unity productions (35%) and accounted for 21% of the employment, followed by São Paulo. The expenses with personnel were higher in São Paulo, corresponding to 39% of the total expenses.

Coffee exports are a cornerstone of Brazil's economy, generating over USD 7,315 billion and positioning the country as the world's leading exporter.

With 35,3 million bags exported, Brazil accounted for 32% of global coffee exports, reinforcing its central role in international coffee trade.

Women in the coffee sector

In Brazil, the situation of women in coffee farming also reflects significant inequalities and gender barriers, even though it highlights an increasingly relevant and necessary presence in the sector. **The agricultural census of 2017 shows that women correspond to 24% of the workforce in coffee farming and that the majority of employed women (63%) are family members of the producers**. When it comes to contract work, women's contribution drops to 19% of the hired workforce. Among rural establishments producing coffee, only 13,2% are managed by women[35], underscoring the male dominance in leadership roles within coffee farming. Additionally, the total area occupied by these establishments accounts for just 9,1% of Brazil's coffee cultivation area, a figure that underscores the limitations in scale and resources that female coffee producers face.

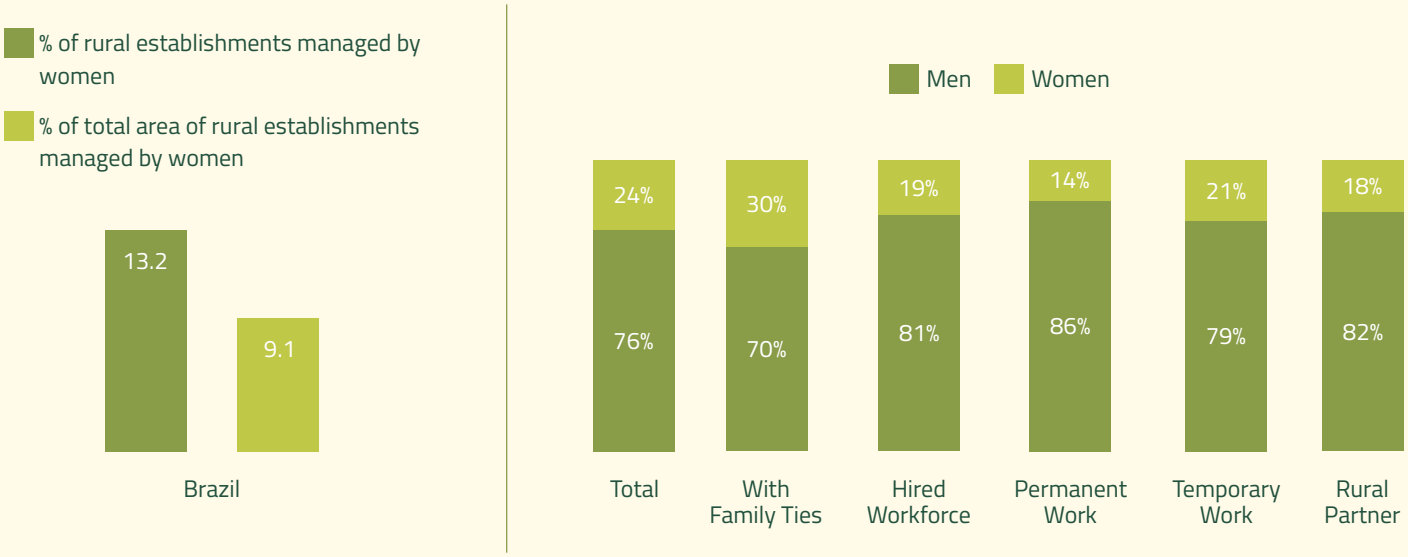

Figure 4: Contribution of women in coffee production in Brazil. (a) Proportion of rural establishments managed by women and proportion of the total area of those establishments. (b) Proportion of women in workforce in rural establishments dedicated to coffee production by type of contract

Even when women are in charge, they often operate under more vulnerable conditions, with less access to resources and infrastructure than establishments managed by men. This disparity is evident in the limited availability of machinery and farming equipment: only 9,5% of establishments run by women have tractors, compared to 20,8% of those run by men. Women face additional challenges regarding productive infrastructure.

Establishments managed by women account for only 8,5% of the establishments with vehicles for agricultural activities and 6,5% of establishments with implements and machines, essential tools for optimizing productivity and scaling up operations. These figures, provided by the 2017 Census, illustrate how limited the capacity for investment in technology and modernization is among women coffee producers, restricting their productivity potential and business competitiveness.

Another critical issue is the difficulty women coffee farmers face in integrating into networks of cooperation and gaining access to technical information. Only 7% of cooperative members in the coffee sector are women, and only 11,2% of female-managed coffee farms are associated with cooperatives, whereas this percentage rises to 22,5% among men. This gap indicates that women not only receive less institutional support but also face greater challenges in accessing technical knowledge: 23,6% of female coffee farmers do not obtain this kind of information, compared to 17,9% of men. The lack of access to knowledge networks and technical support directly impacts the productivity and sustainability of establishments managed by women.

However, coffee farms run by women show a more gender-equitable scenario in workforce distribution. Among the employees in these establishments, 43% are women, while in establishments led by men, this participation drops to 24%. This figure suggests that women coffee farmers not only play a crucial role in coffee production but also promote more inclusive and equitable management, creating opportunities for other women in a sector that has historically been male-dominated.

A study conducted by the International Women's Coffee Alliance (IWCA) and Embrapa between July 2016 and April 2017 sheds light on the participation, roles, and socioeconomic conditions of 737 women working in coffee farming across Brazil[36]. The survey largely included responses from the primary coffee-producing regions: 50% from Minas Gerais, 23% from Espírito Santo, and 9% from São Paulo.

This disparity is reflected in access to resources. Only 9,5% of women run establishments have tractors, compared to 20,8% of those run by men.

Women remain underrepresented in cooperatives. Just 7% of coffee cooperative members are women, and only 11,2% of female managed coffee farms are cooperative members, compared to 22,5% among men.

By contrast, women run coffee farms show a more gender equitable workforce. Women account for 43% of employees in these establishments, versus 24% in male led farms.

Of the women surveyed, 57% are involved directly in coffee production, and among those, 88% own the property they work on. However, only 18% of these female producers dedicate themselves exclusively to managing their coffee farms, indicating that most are balancing multiple responsibilities or other sources of income. Historically, women have been primarily responsible for housework and family care, including preparing for farm labor (clothing, food etc.). The remaining respondents are distributed across education, research, and extension (12,5%) and market and commercialization roles (10%).

In terms of education, 58% have attained higher education degrees, including undergraduate and postgraduate qualifications, which is significantly higher than the national average educational attainment for rural workers. Despite the high levels of ownership and educational attainment, income levels among these women reveal economic challenges. About 35% earn between two to five times the Brazilian minimum wage, which provides some financial security. However, 30% earn only up to one minimum wage, and 9,4% report having no income. This financial disparity points to an economic vulnerability, as a significant portion of these women are either near or below the poverty line. This reflects a cultural heritage in which women's labor, although always present, mainly in roles such as picking and drying coffee, is marginalized and unpaid. The concentration of income in the lowest income scales illustrates the persistent economic hurdles facing women in Brazilian agriculture, where factors such as market access, resource limitations, and socio-cultural barriers impact their financial stability.

Additionally, women involved in coffee farming are generally embedded in a family context, where professional and family choices are deeply intertwined: for 77% of these women, at least one other family member also works in coffee.

The coffee industry in Brazil has increasingly embraced diversity and gender equity as part of its operational efforts. This transformation is evident in major companies like JDE, Brazil's second largest coffee industry, which leads the way in fostering women's representation and implementing comprehensive policies for gender equity and inclusion. JDE has adopted a range of activities to support these goals, including a talent acquisition playbook that ensures balanced candidate lists by gender and nationality, backed by an Applicant Tracking System (ATS) to minimize biases. For retention, JDE Peet's emphasizes an inclusive onboarding process and integrates 360° feedback in performance reviews to promote diverse leadership. Additionally, they adopt a Diversity, Equity and Inclusion (DE&I) Maturity Model and Activation Toolkit that provides a structured approach in four stages: start, embed, expand, and integrate, focusing on raising awareness and implementing organizational changes monitored through KPIs. Key activities include awareness campaigns on commemorative dates, with more than 270 DE&I champions driving these initiatives locally to reflect the unique social and legal contexts of each market. Leadership plays a crucial role, with over 80% of local managers completing inclusive leadership training and directly participating in DE&I campaigns.

Women constitute a significant portion of the workforce in Brazil's coffee industry, with companies gradually increasing their focus on gender balance. **At JDE, women represent 42,6% of the total workforce[37], reflecting a commitment to inclusivity. Notably, 41,3% of leadership roles within JDE are held by women, surpassing the company's diversity target of 40% by 2025.**

About 35% earn between two to five times the Brazilian minimum wage, which provides some financial security. However, 30% earn only up to one minimum wage, and 9,4% report having no income.

In Brazil specifically, women occupy 54% of senior leadership positions, setting a national benchmark for gender parity.

In comparison, other prominent coffee companies lag behind. For instance, 3Corações, Brazil's largest coffee brand, reports that women constitute 31,24% of its workforce, with only 31% of management roles occupied by women . Similarly, Cooxupé, a leading export cooperative, shows even lower participation rates, with women making up only 24,28% of employees and an even smaller percentage in leadership (15% of women in management positions and no women in the director board).

JDE's leadership in gender equity is rooted in its robust policies and strategic goals. The company's global agenda emphasizes eliminating barriers for women aspiring to leadership positions and fostering an inclusive culture where employees feel empowered to express their authentic selves. JDE's gender pay gap analysis reveals a disparity of less than 1%, showcasing its commitment to equitable compensation. In 2023, JDE also aligned with the UN Women's Empowerment Principles, further solidifying its stance on gender equality. To promote awareness and action against workplace harassment, JDE has implemented a global campaign addressing moral and sexual harassment. Furthermore, over 80% of the local management team in Brazil has completed Inclusive Leadership training, ensuring that diversity and inclusion principles are embedded across all levels of the organization.

JDE's commitment to gender equity extends beyond its internal operations to its supply chain. The company integrates gender and youth inclusivity into its responsible sourcing principles. Suppliers are encouraged to promote gender equality through internal management systems, ensuring that women in farming communities are empowered and supported. While JDE leads in implementing gender-focused policies, other Brazilian coffee companies have also taken steps toward inclusion. For example, 3Corações has initiated affirmative action practices to increase female representation and launched programs like Florada Premiada, which rewards women coffee producers. In 2023, 1.168 women registered for the contest. The program consists of the purchasing of coffee from over 5.900 registered women and supports the creation of special microlots under the "Rituais Florada Premiada" brand, highlighting the women behind the production and providing them visibility. Additionally, the project offers a training platform on special coffee production, with 100% of the profits from coffee sales directly benefiting the participating women, amounting to over 283 tons of coffee produced . Cooxupé, on the other hand, although having limited female representation in leadership, has introduced events like Donas Café, aimed at recognizing women producers. Yet, the absence of gender-specific committees or robust inclusion metrics highlights the need for more systemic approaches and reinforces that such efforts, while commendable, lack the comprehensive reach and measurable outcomes demonstrated by JDE.

The publication of gender pay gap reports by Brazil's four main coffee industry players, as mandated by the Equality in Pay Law (14.611/2023)[6] , reveals persistent disparities. While JDE stands out with a variable but relatively narrower gap—women's pay ranging from 82,4% to 121,9% of men's salaries across its business units, Melitta and Cooxupé report important gaps, with women earning as little as 52% of men's pay in some divisions and averaging only 69% overall. Despite companies arguing that the Labour and Employment Ministry's methodology fails to consider factors like job position, tenure, and experience, the data underscores the importance of robust and transparent gender policies. Companies with more structured and consistent approaches to gender equality, such as JDE, tend to show better results, emphasizing the need for targeted strategies to close the gap and foster a more equitable workplace in the coffee sector.

[6] Reports were extracted from companies' websites

Table 4: Gender representation and inclusion efforts in leading coffee companies in Brazil.

Company	% of women in workforce	% of women in leadership	Gender pay gap reporting	Key gender initiatives
JDE	42,6%	41,3% (global) 54% (senior leadership in Brazil)	Reported < 1% gender pay gap. In Brazil, reporting varies between 82,4% and 121,9% (average 108%)	UN Women's Empowerment Principles, DE&I policies embedded in company's strategy, inclusive leadership training, gender pay gap analysis, anti-harassment campaign, gender-inclusive supply chain policies
3Corações	31,24%	31% (management)	Reporting varies between 65,8% and 104,7% (average 80%)	Affirmative action for women in supply chain, such as Florada Premiada (supporting women producers) and "Junte-se a Elas" campaign (reinvesting in female producers)
Cooxupé	24,28%	15% (management) 0% board	Reporting varies from 55,2% to 105,1% (average 69%)	Donas Café event (recognizing women producers)

Barriers for women in the coffee supply chain

In order to gain insights on the roles women play in coffee culture and the systemic barriers they face, qualitative interviews were conducted with five women with extensive experience in the coffee sector and varying career trajectories. The women interviewed bring inspiring and diverse stories, showcasing their leadership and dedication in the agribusiness and coffee industries. One is an agronomist with a doctorate, now managing ESG initiatives at a major cooperative, where she combines her technical expertise with a passion for sustainability. Another, a philosopher and daughter of a coffee farmer, works with a socio-environmental department in a family farmers cooperative, ensuring verification processes in participatory guarantee systems.

Among the pioneers is a woman who broke barriers as the first female technical instructor in a major agricultural organization, now leading programs for women, youth, and innovation in a statewide federation. Another owns a farm renowned for its regenerative agricultural practices, setting an example of how productivity and environmental care can go hand in hand. Similarly, a CEO who grew up influenced by her mother's work in coffee has gained expertise across every sector of the industry, blending technical knowledge with practical experience to lead her agribusiness.
According to the interviews, women in the coffee sector face a complex web of barriers that reflect both historical inequalities and the persistence of structural and cultural discrimination.

These challenges are deeply rooted in societal norms, economic structures, and the traditional dynamics of rural communities. While women have always played essential roles in coffee production, from harvesting to post-harvest processes, their contributions remain largely unrecognized, and they often struggle to gain visibility, credibility, and influence.

One of the most pervasive barriers is the lack of recognition for women as producers. Many women are perceived merely as "helpers" in the roles performed by men, such as fathers or husbands, and are often identified by these relationships rather than as autonomous economic actors. This invisibility extends beyond their work to their identity within the coffee sector, reinforcing a false perception that men are the primary economic contributors. Even when women influence decisions or actively participate in farming processes, they are rarely involved in formal decision-making, and their economic autonomy is hindered by limited access to resources such as bank accounts or direct involvement in sales.

The structural nature of gender inequality is reinforced by discriminatory practices and societal attitudes. Women face significant hurdles in accessing leadership positions, both because of systemic biases within cooperatives and agricultural organizations and the lack of training to prepare them for such roles. In Brazil, for example, women represent only a small fraction of union presidents, and leadership programs for women are scarce. This lack of representation perpetuates the idea that leadership is a male domain, making it harder for women to envision themselves or be seen by others as capable leaders. Even initiatives aimed at supporting women often miss the mark, focusing on motivational themes rather than practical agricultural training, thereby failing to equip them with the skills needed to thrive in technical or managerial roles.

Social expectations compound these challenges. Women are expected to balance domestic responsibilities with their work in coffee production, but the lack of childcare options in rural areas forces many mothers to prioritize their families over professional development. Additionally, the independence of women in rural environments is often met with suspicion, requiring careful narratives to avoid alienating communities. For example, women-led movements that frame their goals in terms of collaboration

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Gender inequality is structurally reinforced by discriminatory practices and societal attitudes. Women face persistent barriers to leadership due to systemic biases within cooperatives and agricultural organizations and limited training opportunities.

Opportunities for women in the coffee supply chain

Despite these barriers, progress is being made in raising awareness about gender issues in the coffee sector. However, efforts remain superficial, with few companies implementing clear policies to address diversity and inclusion. The lack of data on women's contributions and the impact of gender-focused programs further limits the ability to create effective, evidence-based policies. If meaningful change occurs, it will require addressing these systemic inequities, amplifying women's voices, and recognizing their indispensable role in coffee production and leadership.
The coffee sector is increasingly recognizing and fostering opportunities for women, offering pathways for growth, representation, and empowerment. These opportunities arise from the collective efforts of women's movements, technical programs, and cooperative initiatives that not only highlight their contributions but also equip them with the skills and tools needed to thrive. Through targeted actions, women in coffee are redefining traditional roles, improving production practices, and gaining greater influence in decision-making processes.

In regions such as Matas de Minas, organized efforts have revolutionized the role of women in coffee. Informal gatherings that began in 2003 evolved into more than 200 structured meetings, where women voiced their needs and initiated exclusive technical training led by female agronomists. This access to knowledge empowered them to enhance production systems, enter international markets, and take on leadership roles in decision-making. Similarly, initiatives such as the MOBI movement (Women Organized for Equality) have provided women with verification labels for female-produced coffee, bolstering their visibility in the market and driving related projects, such as sustainable food production through poultry and vegetable farming.

The coffee industry is also seeing a shift in gender inclusion through broader initiatives. Programs like Donas do Café encourage women to recognize their value in the production process and assert their economic independence by opening bank accounts and participating actively in cooperatives. Financial institutions and cooperatives have begun developing projects that support women's entrepreneurship, while gender-inclusive practices, such as training on harassment prevention and sustainable certifications, are gaining traction. Women are also excelling in technical roles, with around 50% of agronomists now being women in Minas Gerais, whose efforts often result in higher productivity and quality outcomes. These achievements highlight the transformative power of education, networking, and collaboration, which have inspired a new generation of women to lead, innovate, and succeed in the coffee sector.

Collectively, these initiatives not only provide women with the tools to overcome structural barriers but also showcase the broader benefits of their involvement in coffee production. Women-led farms exhibit superior risk management and meticulous planning, while their active presence strengthens family engagement and youth participation in cooperatives. Networks of women continue to grow, reducing costs and fostering collaboration, which in turn inspires more women to join and thrive in the industry. As women gain greater visibility through contests, certifications, and targeted leadership programs, their role in advancing coffee production is increasingly undeniable. The future of coffee is being shaped by these efforts, demonstrating that empowering women benefits not only their communities but the industry as a whole.

Family succession plays a crucial role in the insertion and ascension of women in the coffee culture, often serving as a gateway for their active participation in the sector. When women take on leadership roles through succession, especially after the loss of a family patriarch, they frequently bring innovation and holistic management skills to farming practices. This not only enhances productivity and sustainability but also reinforces their presence as key contributors in the coffee value chain. Furthermore, the active involvement of women in coffee production has a profound impact on youth retention and future family succession. Women's ability to organize, plan, and manage risks creates a stable and inspiring environment that engages younger generations, encouraging them to participate in cooperatives and continue the family legacy. Their influence fosters a sense of community, ensures knowledge transfer, and sustains the coffee culture across generations.

The case of Coopfam, a cooperative in Poço Fundo, Minas Gerais, showcases how grassroots efforts can transform gender dynamics in agriculture. This journey began with the story of Dona Maria José, a widow who inherited her late husband's membership in the cooperative despite initially lacking financial independence or formal recognition of her role in coffee production. Her active participation in every stage of production inspired other women to organize and form MOBI—Mulheres Organizadas Buscando Independência, later renamed Mulheres Organizadas Buscando Igualdade to highlight their pursuit of equality rather than separation from their male counterparts. This movement laid the foundation for the cooperative to implement gender-focused initiatives, leading to greater representation and opportunities for women to lead.

Today, Coopfam has 545 members, 141 of whom are women, making up 26% of its membership. Their participation is reflected in leadership, with women holding four out of seven positions on the board of directors (57%) and playing key roles as nucleus leaders and decision-makers. The cooperative has established clear gender inclusion guidelines, including a certification process for female-produced coffee that evaluates crop management, post-harvest practices, commercialization, and management. This certification requires women to demonstrate autonomy in decision-making and participate in technical training, empowering them as leaders in the coffee value chain. These efforts have culminated in the creation of a female coffee label, which celebrates their contributions while promoting equality and sustainability. Coopfam's success demonstrates the transformative power of organized women and their vital role in shaping a more inclusive future in agriculture.

Based on the interviews, several key recommendations have emerged to promote greater gender equality. These insights reflect the challenges faced by women and offer practical solutions to support their inclusion and advancement. One of the most pressing needs is technical and leadership training adapted to the realities of women, especially mothers. Flexible schedules for training and work are essential, as they allow mothers to balance family responsibilities while participating fully in the sector. Providing targeted support for maternity, such as flexible working arrangements, ensures that women do not have to choose between their roles as caregivers and contributors to the coffee industry.

Mentorship and learning opportunities also play a vital role in fostering gender equality. Organizing technical visits to model farms and offering leadership exchange programs help women gain hands-on experience and develop skills needed for advancement. Commercial partners can support these efforts by financially backing women's initiatives, which can create opportunities for greater visibility and inclusion. Sharing success stories is another powerful tool, as it inspires other women and demonstrates the potential for growth and equality in the industry. In addition, conducting thorough diagnostics to understand the specific needs and motivations of women in coffee is essential for tailoring programs that address systemic barriers.

Education and structural change are equally important for long-term progress. Encouraging youth to embrace gender equality by challenging traditional notions of male superiority fosters an environment where men and women can grow together in the agricultural sector. Companies and cooperatives should actively promote women's participation in high-level management and decision-making roles, ensuring their voices are heard at every level. Supporting statutory changes in unions, such as automatically registering women when their husbands are members, can also increase female representation. Together, these recommendations form a comprehensive strategy for building a coffee sector where women can thrive, contribute equally, and achieve leadership in meaningful ways.

Sugarcane

Brazil is the world's largest producer of sugarcane, contributing to over a third of global output. The sugarcane supply chain in Brazil is multifaceted, encompassing everything from planting and industrial processing to transforming sugarcane into various commodities such as sugar and ethanol, and finally, the distribution of these products. This extensive chain underscores the critical role sugarcane plays in Brazil's agricultural and economic landscape.

The main purpose of sugarcane cultivation is the extraction of sucrose, which is processed into white, liquid, or refined sugar, ethanol, and brandy. Secondary products, such as rapadura and brown sugar, are typically produced through family labor and are predominantly consumed in the Northeast Region of Brazil. Another important by-product of sugarcane production is bagasse, a fibrous residue that is utilized for energy generation within the sugar mills. Surplus energy from bagasse is sold to thermoelectric plants, adding to the sector's sustainability and economic viability.

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In 2023, sugarcane production drove the growth of agricultural production value in Brazil, reaching 782.6 million tons and generating a gross value of R$ 102 billion. This marked an 8,5% increase compared to the previous harvest[42]. The rise in sugar prices played a pivotal role in this growth, with most of the sugarcane produced being directed toward sugar production. Brazil's dominance as the global leader in sugar exports was further solidified by a 14,7% increase in sugar export volumes, according to data from the Foreign Trade Secretariat[43] (SECEX). Ethanol, another crucial derivative, also saw increased production despite facing growing competition from corn-based ethanol. The rise in global oil prices boosted demand for ethanol, directly benefiting the sugarcane mills through higher market prices.

Sugarcane also plays a significant role in Brazil's renewable energy matrix. According to the National Energy Balance 2024[44], the consumption of sugarcane bagasse in the energy sector grew by 11,3% in 2023 compared to 2022. Sugarcane biomass accounted for 16,9% of the national energy matrix, making it the most utilized renewable energy source. Furthermore, bagasse was responsible for 63,3% of the bioelectricity generated from renewable sources, showcasing the sector's contribution to sustainable energy production.

Such a big industry also plays an important role in job creation, since a significant portion of the labor in sugarcane planting and harvesting is still manual, despite the increasing mechanization of the process. The sugarcane supply chain has, therefore, become a major contributor to employment and economic development in Brazil. According to the Brazilian Sugarcane Industry Association (UNICA), over 730.000 formal jobs are generated directly within the production sector. When indirect employment is included, the sugarcane chain provides jobs for approximately 2,2 million people. The sector also contributes around 2% to Brazil's GDP, emphasizing its economic significance[45].

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The sugarcane supply chain in Brazil

The sugarcane production chain refers to planting, industrial processing and transformation into ethanol and, especially, into the sugar commodity, ending with the flow of these products. This chain involves a variety of stakeholders, including farmers, cooperatives, mill operators, and large corporations, each playing a unique role in transforming raw sugarcane into consumable and exportable goods. Here's an overview of how this supply chain operates in Brazil:

Planting and Harvesting

The sugarcane supply chain begins with the cultivation of the crop. Brazil has diverse climatic conditions that make it suitable for sugarcane cultivation, with major growing regions in the Southeast, Northeast, and Central-West. Sugarcane is typically planted using a combination of manual and mechanized labor, with large plantations employing sophisticated machinery, while smaller farmers may still rely on more traditional, manual methods.

Small, medium, and large farmers contribute to the sugarcane supply chain, with many smallholders forming cooperatives to pool resources, share knowledge, and access financial support. These cooperatives help farmers gain better access to the market and improve their farming techniques. The cultivation process involves careful management of soil, water, and pest control to ensure high-quality cane that will result in higher yields. After planting, the next phase in the supply chain is the harvesting of sugarcane. The harvesting process in Brazil has become increasingly mechanized, but in some regions, manual labor is still widely used. The harvested cane is then transported to sugar mills for processing.

Processing

Sugarcane processing in Brazil primarily takes place in large-scale mills that are located close to the cultivation areas. These mills play a crucial role in transforming raw sugarcane into valuable products like sugar, ethanol, and molasses. Brazil's "dual-output" mills allow for flexibility, enabling the industry to shift production based on demand and price fluctuations. The process typically involves crushing the sugarcane to extract its juice, which is then processed into sugar or fermented to produce ethanol.

Brazil's sugar mills are highly integrated, meaning that many mills also have ethanol distilleries, allowing them to maximize the use of their raw material. This is an essential part of Brazil's energy matrix, as ethanol is a key component of the country's biofuel production. Sugarcane bagasse, a by-product of the crushing process, is often used for energy production, making Brazilian mills an important source of renewable energy.

Sugar, Ethanol and Molasses production

One of the key stages in the sugarcane supply chain is the transformation of sugarcane into its various products. Sugar, produced as either white, brown, or liquid sugar, is a primary commodity, exported to various global markets, and consumed domestically. Ethanol, a biofuel produced from sugarcane, is another critical product, positioning Brazil as one of the world's leading ethanol exporters. Brazil's flex-fuel vehicles, which run on ethanol or gasoline, have made the country a model for sustainable energy solutions.

Molasses, a by-product of sugar production, has its own market and is used in animal feed, as well as in the production of rum (cachaça) and other alcoholic beverages. The versatility of sugarcane in producing a wide range of products adds value throughout the supply chain, ensuring that each part of the plant is used efficiently.

Distribution and Exports

For both sugar and ethanol, the supply chain includes an extensive distribution network that ensures products reach domestic and international markets. Ethanol distribution benefits from a unique infrastructure for storage and blending, as it needs to be blended with gasoline at various proportions depending on regional fuel regulations. Sugar exports are largely facilitated through Brazil's southeastern ports, particularly the Port of Santos, with efficient systems for bulk handling and shipping to meet international demand. The ethanol produced is primarily for the domestic market, though some is also exported, especially to the United States and Japan. Sugar, on the other hand, is largely exported, with significant markets in Asia, the Middle East, and Africa.

Research and Development

Brazil's leadership in sugarcane production and processing is also a result of its investment in research and development (R&D). Universities, research institutions, and private companies play a vital role in innovating new sugarcane varieties, improving farming practices, and developing more efficient production methods.

The country's focus on R&D has led to the development of sugarcane varieties that are more resistant to pests and diseases and can withstand environmental stresses like drought. These innovations have not only helped increase productivity but have also contributed to the environmental sustainability of the sugarcane industry. Additionally, research institutions are focused on improving the efficiency of bioenergy production, making sugarcane-based ethanol one of the most sustainable biofuels in the world.

Government Policies and Industry Regulations

Government policies and industry regulations are also key factors shaping the sugarcane supply chain in Brazil.

Through the creation of favorable policies for biofuels, including the Proálcool program (the Pro-Alcohol Program) and the more recent RenovaBio initiative, the Brazilian government has incentivized the production of ethanol and other sugarcane-derived energy products.

These policies have helped Brazil become a global leader in biofuels, as they support both production and consumption of ethanol. The government also provides regulations and incentives for sustainable farming practices, encouraging producers to reduce environmental impacts while maximizing yields. As sustainability becomes increasingly important in global trade, these policies have helped Brazil maintain its competitive edge in the sugarcane industry.

Women in the sugarcane sector: barriers and opportunities

Women's participation in the sugarcane industry remains notably low, as evidenced by data from Cepea[46], which shows that only 2,63% of women engaged in agricultural activities are involved in sugarcane production. From 2000 to 2016, women's participation in the sugar-energy industry's workforce remained relatively stable, ranging from 7,6% to 8,8%. However, this stability was disrupted by the mechanization of sugarcane production, which began accelerating in 2008. The mechanization process significantly reduced the demand for manual labor, leading to a decline in female employment in the production chain. While the sector expanded between 2000 and 2008—providing opportunities that temporarily boosted female employment—this growth was not sustained, and opportunities for women diminished as the industry evolved toward mechanized practices. While mechanization has reduced overall employment, women have gained greater access to administrative and industrial roles and have seen improvements in education levels and salaries within the industry. For instance, between 2008 and 2016, the average salary for women in the sector grew by 48%.

In 2016, approximately 70.000 (8,8%) women were employed in the sugarcane sector out of a total workforce of nearly 795.000. A closer look at the employment trends reveals positive changes in certain areas. Between 2008 and 2016, there was a notable increase in women occupying administrative and industrial positions. Furthermore, there was a rise in the proportion of women with higher educational qualifications, with more women possessing over 13 years of education and fewer women with only up to 5 years of schooling. These changes reflect a gradual shift toward roles that require specialized skills and education, indicating progress in professional development opportunities for women.

The book "Women in Sugarcane[47]", produced by CanaOnline, presented in its first edition of 2023 a vast list of cases featuring women who excel in different links of the value chain, ranging from production to various industries. Additionally, it showcases a study conducted with 34 companies in the sector, including production units, rural producers, and companies supplying products and services. These companies represent 60% of the sugarcane produced in Brazil, employing approximately 20.000 women, who account for about 16% of the workforce in this segment. The study found that the areas most occupied by women in the sugarcane sector are agriculture, administration, and industry, with only 5,4% of women holding leadership positions.

As in other supply chains, female leadership inside producing farms is usually related to family succession and a strong drive for knowledge. One of our interviewees reported that she took over the ownership of the farm and the sugarcane mill when her father passed away. At the time, she was working as a doctor, so her husband initially took on the management of the farm. Over time, the agricultural aspect of the farm started to deteriorate because he did not have the necessary expertise. She then decided to take courses in the field so she could help and began participating in the mill's meetings. In 2016, she closed her medical practice, and in 2019, she partnered with a consultant who introduced innovations in agricultural practices.

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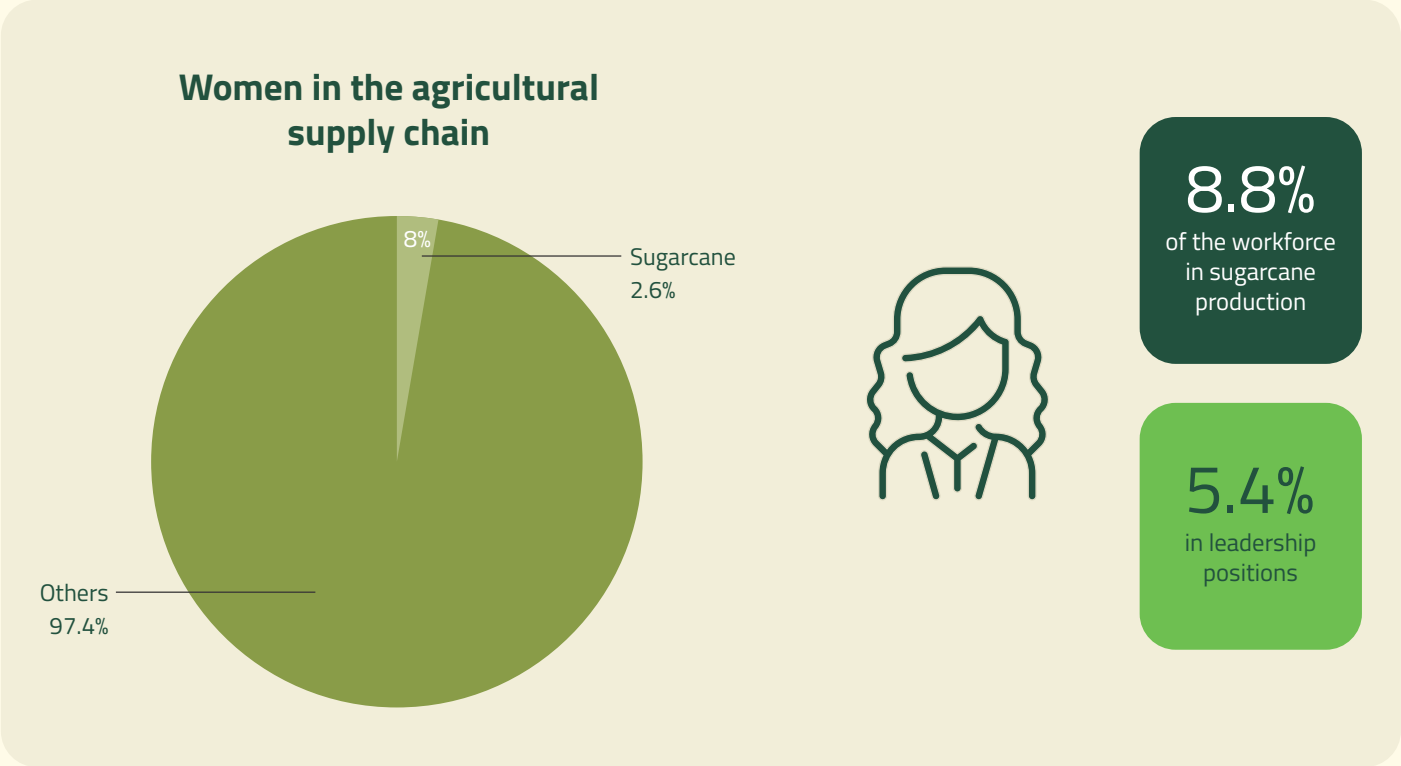

Figure 5: Presence of women in the sugarcane supply chain. Source: Cepea 2018, Women in Sugarcane 2023.

The Women in Sugarcane research also found that most women are not represented in professional associations, and that it is common to find cases of women who are unaware of their role, particularly within sugarcane-producing farms.

Economic indicators further highlight the complexities of gender equity in the sector. **Between 2008 and 2016, the average salary for women in the sugarcane industry increased by 48%, a positive step forward. However, despite this growth, significant disparities persist. SEBRAE[48] data from 2022 shows that only 10,2% of the female workforce received an average remuneration of R$ 2.107,73 per worker, compared to the 89,8% male workforce, which earned an average of R$ 2.638,60 per worker.**

The study developed in the Women in Sugarcane book presents an analysis of the main barriers for greater gender equality in the sector, which were divided into four groups: 1. knowledge, skills, and abilities, 2. beliefs and assumptions, 3. personal matters, 4. others.

Within the "knowledge" group, they found barriers such as lack of training courses, and simultaneously, women with low qualifications and limited access, such as to driver's licenses that would allow them to operate tractors and trucks. Within "beliefs and assumptions", the most common barriers are connected to unconscious biases present in society, cultural beliefs that determine that women are not capable of performing certain jobs, and male leaderships that are insensitive to gender issues. The research found, however, that the larger the mill, the greater the female participation, as the company tends to have well-established governance rules. "Personal matters" include balance between personal and professional life, many activities that require extreme physical strength, and logistic issues characteristic of rural areas. Finally, in the "Others" group they found issues such as lack of adequate infrastructure to accommodate women and lack of partnerships with schools to provide education for children.

The research highlights several initiatives developed by companies in the sugarcane sector that have significantly contributed to increasing female participation. These efforts start with recruitment and selection processes, where companies run campaigns to attract female workers, implement affirmative hiring programs, and, in some cases, publicly commit to the United Nations Women's Empowerment Principles (WEPs).

One interviewee, co-owner of a bioenergy plant and sugarcane farms, shared that since assuming a managerial position in 2016, she has set clear goals for increasing women's inclusion in operations. The company currently aims for 30% female representation, with the expectation of reaching 50% in the coming years. However, she noted that labor the Brazilian workers legislation (CLT), in its article 390, prohibits women from lifting more than 20 kg often limit their access to certain roles. As a result, inclusion targets are tailored per department, with higher goals set for administrative areas compared to operational sectors. This strategy ensures that the company's overall inclusion target of 30% remains achievable.

To further expand opportunities for women, the company has introduced initiatives such as a tractor driver training program and sponsorship of driver's licenses. More recently, they launched a mechanics training program specifically for women in the local community, further promoting inclusion and skill development. Men and the local community often hold the belief that "working as a tractor driver is a man's job." To combat this mindset, the company started sharing videos of its female tractor drivers sharing their experiences. These videos, along with the training programs, have proven to be the most effective tools in breaking down stereotypes.

The interviewee believes, however, that when it comes to fostering female leadership, a deeper internal effort is required. It is crucial to build a foundation of support within the organization, which often needs to be driven by top-down pressure from senior leadership. A commitment from the executive team to promote the hiring of women in managerial positions is essential to achieving meaningful progress.

Other companies have also implemented diversity and inclusion policies, with one even creating a Women's Committee to focus on valuing women. According to the study, 70% of responding companies prepare the physical or emotional environment to welcome women, nearly 50% conduct organizational climate studies to assess men's reactions to the presence of women, and 94% have a secure communication channel for reporting moral and sexual harassment.

The CanaOnline website also hosts an annual event called "Cana Substantivo Feminino" (Sugarcane as a Feminine Noun), aimed at women, with the goal of highlighting their positive impact on the sugar-energy chain. The event is now in its twelfth edition.

"We women have an eye for detail, firm and humanized management, resilience, determination, and we value harmony between production and the environment—attitudes that make a difference and deliver results."

- Sugarcane Producer

Livestock

Livestock is one of Brazil's most vital economic sectors, serving as a cornerstone of the country’s agribusiness and playing a pivotal role in both domestic and international markets.

With rising global demand for beef, the sector is poised for substantial growth in the coming decades. This expansion underscores the importance of balancing increased production with sustainable practices and efficient resource management.

Since the 1950s, the expansion of cattle farming has been a major driver of rural land use in Brazil. Initially, this growth was concentrated in historically occupied zones like Rio de Janeiro, São Paulo, and Minas Gerais, where crop cultivation areas were reduced to accommodate beef cattle farming. Over time, the expansion shifted to agricultural frontier areas, particularly the Cerrado biome in the Midwest[49]. This region, with its vast grasslands, encompasses the states of Mato Grosso, Mato Grosso do Sul, and Goiás, and became a focal point for the cattle industry, solidifying its status as the largest cattle-producing region in the country.

Despite hosting just over 10% of the country's cattle-producing properties, the Midwest accounts for over 30% of national beef production. In 2022 alone, Brazil slaughtered nearly 30 million cattle, with Mato Grosso leading the sector with over 4,6 million head. This concentration of production reflects the region's role as a powerhouse in the livestock industry.

According to the 2017 IBGE Agricultural Census, cattle farming in Brazil remains highly fragmented. While properties larger than 1.000 hectares represent only 2% of all agricultural establishments, they account for 33% of the total cattle population. Conversely, smaller properties, many with fewer than 50 head of cattle, make up the majority of establishments. This dichotomy highlights the diverse production structures within the sector, ranging from small family-run farms to large-scale commercial operations.

To meet rising demand while addressing sustainability concerns, the livestock sector has increasingly turned to modern technologies. Innovations in genetics, animal health, and farm management have enabled producers to enhance productivity while reducing the land area required for cattle farming. This focus on efficiency has contributed to significant growth in beef production, which increased by 11,23% in 2022 compared to the previous year.

Brazil's position as the world's second-largest beef producer, trailing only the United States, reflects its robust agricultural infrastructure and global competitiveness. In 2022, the beef production chain contributed USD 198,12 billion to Brazil's GDP, representing 41,6% of the agribusiness GDP and 10% of the country's total wealth generation. Over the past decade, the sector has experienced a remarkable 187% increase in total revenue, with a 12% rise in 2022 alone. These figures underscore the sector's importance not only to agribusiness but also to Brazil's overall economy.

This huge industry primarily serves domestic markets, with 72% of the output consumed locally. However, exports also play a critical role in the sector's growth. In 2022, 28% of beef production was exported, with China accounting for 62,39% of fresh beef exports, followed by the U.S., Egypt, and Chile. Although there was a decline in export values in early 2023, the ongoing expansion of international demand has increased the volume of Brazilian beef shipped abroad, solidifying the country's reputation as a leading global supplier.

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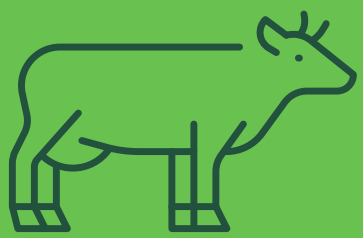


Efficient logistics are crucial for Brazil's beef industry, particularly for exports. Meat transport within the country relies heavily on highways and ports, with key export hubs including the ports of Santos (SP), São Francisco do Sul (SC), and Paranaguá (PR). These ports collectively handle the majority of Brazil's beef exports, connecting beef-producing states in the Midwest, South, and Southeast to international markets. The concentration of exports through these corridors highlights the critical role of infrastructure in sustaining the sector's growth.

Additionally, as Brazil's livestock sector continues to expand, it faces several challenges, including the need for sustainable land use, environmental conservation, and equitable distribution of economic benefits. The reliance on the Cerrado biome for cattle farming raises concerns about deforestation and biodiversity loss, necessitating strategies to balance productivity with environmental stewardship. Furthermore, investments in infrastructure and technological innovation will be essential to maintaining Brazil's competitive edge in global markets.

Despite these challenges, the livestock sector offers immense opportunities for economic development, job creation, and international trade. By leveraging its strengths in technology and production efficiency, Brazil is well-positioned to meet growing global demand while promoting sustainability and inclusivity within the industry.

The beef supply chain in Brazil

According to the Brazilian Association of Meat Exporting Industries (ABIEC)[50], the segments that make up the cattle supply chain in Brazil include: slaughterhouses, farm production, animal health, equipment, animal reproduction, and seeds, as shown in Figure 6.

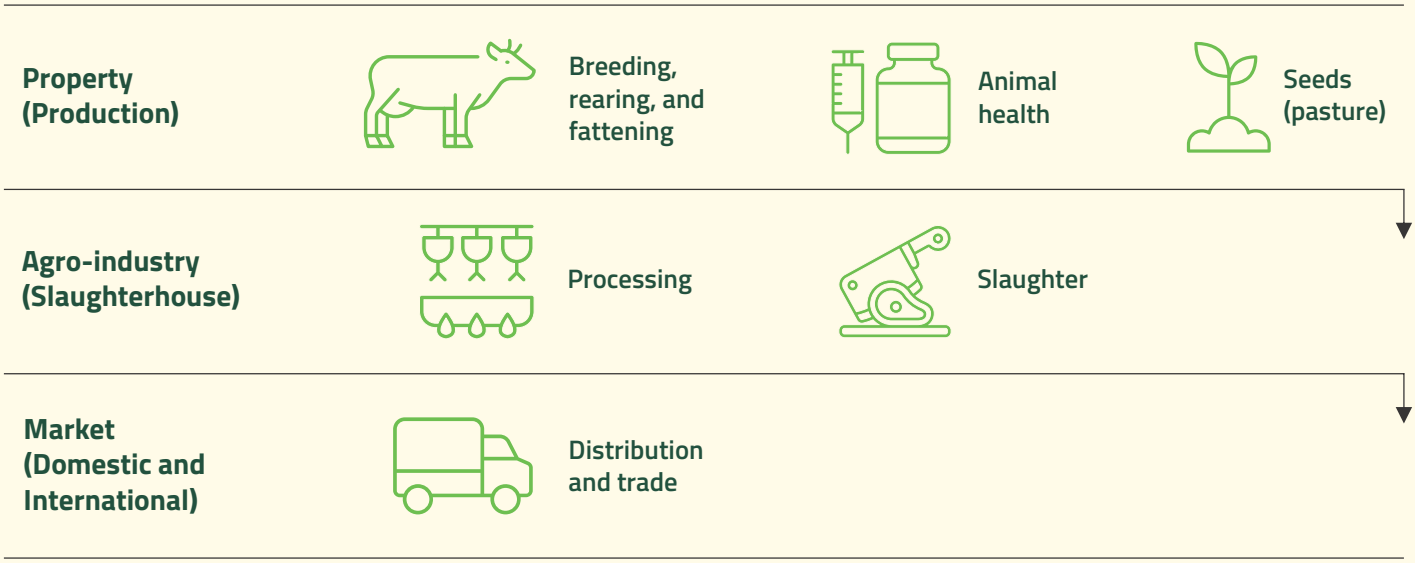


Figure 6: Segments of the Brazilian beef supply chain. Source: ABIEC.

Slaughterhouses

Three major companies dominate this segment. They are publicly traded Brazilian companies operating in both domestic and international markets: JBS, Marfrig, and Minerva. Despite this market concentration, there are 1.334 slaughterhouses registered with the Federal Inspection Service at the Ministry of Agriculture, Livestock, and Food Supply (MAPA), excluding those authorized by state or municipal inspection (MAPA, 2020).

Farm Production

Beef cattle production systems are divided into different phases:

(i) Calf-Breeding is the phase encompassing the reproduction and growth of the calf until weaning, which occurs between six to eight months of age.

(ii) Rearing is the phase occurring from weaning until the onset of reproduction in females or the fattening phase for males.

(iii) Fattening is the final phase for beef cattle, involving the fattening of animals until they reach finishing.

Animal Health

This segment is dominated by multinational groups, although the Brazilian industry includes domestic companies with significant market shares, including Ourofino, UCBVET, Calbos, Agener União, Real H, Agroquima, and JA.

Equipment

Two tools stand out - containment systems and scales. Brazil's containment and scale industry are marked by high company participation and low market concentration due to the use of relatively simple technology and low initial investment requirements. In addition to these tools, new technologies are emerging rapidly, even in traditionally Communication and information technologies are advancing into rural areas, giving rise to "smart farms." This new context of digital agriculture incorporates innovations like robotics, drones, autonomous vehicles, and nanotechnology. Alongside Big Data management, cloud computing, and artificial intelligence are expected to bring greater precision and agility to field operations [51].

Animal Reproduction

Multinational companies hold the majority of the semen market in Brazil, largely due to acquisitions of Brazilian companies. The market also benefits from numerous national and international companies supplying equipment, laboratory analysis, technical training, and research development, with support from organizations like Embrapa and universities.

Seeds

This segment is composed of the forage seed industry, which produces seeds for the pastures that feed cattle. Like the equipment industry, the pasture seed market is characterized by a high number of companies, low market concentration, and significant participation by domestic companies, estimated at 95% of the market (ANPROSEM, 2020).

Technical assistance

Technical assistance can be provided by both public and private entities, supporting producers from small to large scales. The Federal Government, for instance, offers technical assistance through the Family Agriculture Harvest Plan, which includes credit lines, rural extension support, insurance, and training to promote sustainable food production. The FAESC/SENAR-SC system (Federation of Agriculture and Livestock of Santa Catarina State and National Rural Learning Service) launched the Technical and Managerial Assistance Program (ATeG) in 2016.

Furthermore, the National Rural Learning Service (SENAR), a non-governmental entity linked to the Brazilian Confederation of Agriculture and Livestock (CNA), provides rural professional training, technical education, technical assistance, and social promotion. SENAR's Technical and Managerial Assistance (ATeG) program offers free support to Brazilian cattle ranchers to improve production, rural management, and income generation.

Among private companies, technical assistance services are also provided by meatpacking companies, such as JBS and Minerva. JBS, for example, has 19 Green Offices at its facilities in Brazil, offering free technical assistance to cattle suppliers through in-person, remote, and consultative support. Minerva Foods offers ranchers services and products such as the Minerva Rancher app, the Efficient Carcass Program, and the Speaking about Cattle Ranching Program.

In the past decade, there has been a rise in private companies and NGOs focusing on technical assistance for more sustainable and deforestation-free production. Notable here is PECSA (Amazon Sustainable Cattle Ranching), a technical assistance and management firm that provides ranchers with technology, financing, and market access for sustainable beef production. NGOs such as The Nature Conservancy, Imazon, and Solidaridad also offer notable programs aimed at increasing cattle production while reducing deforestation.

Women in the beef supply chain in Brazil

In recent decades, the role of women in Brazil's beef value chain has expanded significantly, signaling a transformative shift in an industry traditionally dominated by men. Women are increasingly occupying leadership roles across various segments of the chain, from farm management to supply chain operations and even within the corporate structures of major slaughterhouses.

Unlike commodities such as soy, sugarcane, or coffee, beef cattle production requires minimal labor, with farms typically operating with around two to three employees for most of the year. In many cases, women are both the owners and directly involved in handling the livestock. Therefore, in cattle farming, increasing women's participation is directly tied to facilitating their access to property leadership and equipping them with skills for both management and production practices.

According to data from the Rural Women's Observatory of Embrapa[52], over 1 million women currently manage agribusiness properties in Brazil, nearly half of whom are involved in agriculture agriculture and cattle ranching. Between 2006 and 2017, the number of women managing cattle farms increased by 55%, reaching 450.700, while the number of men in similar roles remained constant at approximately 2 million.

This progress is supported by women's growing decision-making power in key areas of cattle management.

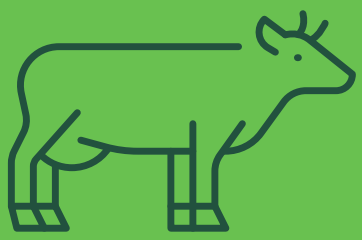
Research[53]conducted in 2020 with 70 women across the beef supply chain in Brazil, where half of them were married and **94% had a higher education degree**, revealed that 52% of them independently make decisions regarding input and animal purchases, 56% oversee health management, and 60% manage reproductive strategies and genetic choices. When analyzing the management of establishments, it is clear that women are the main managers in 33% of cases while the father figure appears in 38% of decisions. Our interviewees shared that, from their perspective, women in the cattle supply chain are more commonly found working on farms in administrative roles. They are often responsible for payments and purchases but tend to carry out these activities without recognizing that they are part of the farm's management.

One of our interviewees in this study reported being the only one among her four siblings to graduate in the agricultural field, and after several experiences leasing land for cattle production with her husband, she was invited to manage her father's property in partnership with him and her spouse. In this case, prior experience was crucial to prove her managerial capability to her father, a mandatory requirement, especially in family succession cases where the father is still alive.

As represented by this case, succession has become a hot topic among women in the cattle supply chain. According to the Agroligadas research, 78% of women are concerned about family succession. An initiative called As Fazendeiras[54] Group, aimed at supporting and empowering women to become managers and leaders in livestock farming, offers mutual support among women, especially for those undergoing succession, whether still during the father's or husband's lifetime or after their passing.

In recent decades, women's participation in Brazil's beef value chain has expanded significantly, marking a shift in a traditionally male dominated industry. Women are increasingly taking on leadership roles across the chain, from farm management and supply chain operations to corporate positions within major slaughterhouses.

Between 2006 and 2017, the number of women managing cattle farms rose by 55% to 450.700, while the number of men in similar roles remained stable at around 2 million.



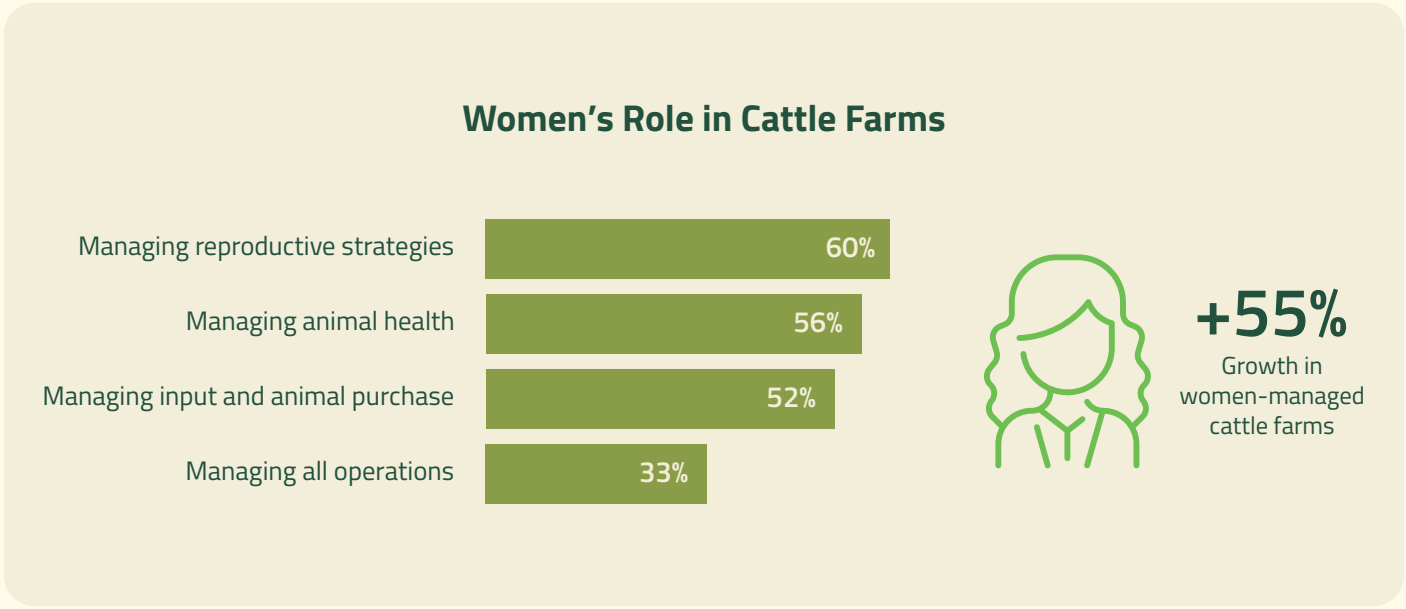


Figure 7: Women's role in cattle farms.

Mutual support can be highlighted as a crucial action for the increased presence of women in the agricultural value chains. As pointed out by our interviewees, women find it crucial to seek greater representativeness, and through connections and women's networks, develop a sense of belonging in the agricultural sector. Mirrored in that, the Federation of Agriculture of the State of Paraná (FAEP) founded the State Women's Commission, formed to strengthen communication among women in the state's agricultural and livestock industry. "One of our goals is to make women feel that they are part of the rural environment. One woman can inspire another to form a great women's organization," explains the group's president. She believes that the group made a difference to increase even more the female contingent in the union, as well as in the courses and training offered by SENAR. To increase female representation in the field, the Commission is also offering personal and professional training to women, so that they can acquire more self-knowledge, and develop better relationships with suppliers, clients, and collaborators.

"The feminine perspective has always made a big difference in my life. The feminine outlook has the ability to unite, adapt, and call on others for support. If I don't know something, I will learn it. Women adapt more easily."

Ana Doralina Menezes,
Farm owner, and President of the Sustainable Livestock Brazilian Table.

Key organizations in Brazil's agricultural sector are actively working to promote gender equity through specialized programs. The Women in the Field program by SENAR - one of the main players in the technical assistance segment - is one such example. Designed to spark interest in management and, thus, enhance women's leadership in the administration of rural enterprises, the program develops entrepreneurship and management skills, guides participants in discovering their potential and that of their properties, and teaches how to plan and transform an activity into a business.

It is important to note, however, that despite initiatives like "Women in the Field" gaining visibility, access to technical assistance in the cattle supply chain remains generally limited, especially for women. Initiatives that specifically address the qualities and skills of women, using these as a foundation to propose productive and management practices, are even more scarce, if not absent.

To build that foundation, knowledge about the role played by women is key. In that sense, EMBRAPA, one of the most important agents of technical assistance and rural extension, and rural research to improve production, created the Observatory of Rural Women in Brazil, which provides data for research, development, and innovation actions, as well as for the formulation and improvement of public policies that have gender balance and equity as the foundation for the sustainable development of Brazilian agriculture.

JBS, on the other hand, has introduced an entrepreneurship program called “Mulheres SuperAgro”, which offers comprehensive training in people management, financial management, legal issues, sustainable practices, and animal welfare. By equipping women with the skills needed to succeed in agribusiness, JBS is helping to close the gender gap in leadership and entrepreneurship. The corporation itself, however, currently does not have an affirmative policy for their employees.

When it comes to inclusions inside corporations in the cattle supply chain, women can be found in administrative positions, and often in leadership positions mostly tied to socioenvironmental responsibility or quality control. Two ESG or Sustainability Directors were interviewed, and both shared that they have been occupying these positions for years, and are well respected as so. Still, sexist comments and jokes are still common in meeting rooms, especially among middle-aged men.

When it comes to wage disparities, the cattle supply chain performs better than other agricultural sectors. However, a concrete example of wage inequality was identified in one of the slaughterhouses interviewed. It was reported that male sales representatives earn higher bonuses on their sales, not because they close more deals, but because they negotiate higher rates with their superiors, whereas women typically do not negotiate their bonuses.

Beyond farms and rural communities, major corporations in the beef value chain are also taking steps to foster gender inclusion. Companies like Marfrig and JBS have launched targeted initiatives to empower women and celebrate their achievements in the industry. Marfrig, for instance, maintains a dedicated platform named "women in cattle raching" (Mulheres na Pecuária), which showcases female leadership, achievements and innovation in cattle ranching. Marfrig has several women on its staff, including Norma Cordones, the first woman to be the coordinator of the boning department, and Carina Apolinário, who is currently the inventory supervisor in the hamburger section.

“Men don't believe that new technologies will work at first, but then they see women doing things differently and start testing it themselves. On my local road, there are already two other male producers using rotational grazing, after learning it from me.”

- Female cattle producer

Opportunities for women in the beef supply chain

The increasing participation of women in Brazil's beef value chain represents a crucial step toward a more equitable and innovative industry. Women bring diverse perspectives and unique strengths to the sector, from enhanced decision-making in livestock management to a greater focus on sustainability and community development.

Interviews and literature review suggest that that pathway for more inclusion in beef production should be based on three main action pillars:

I) Training: due to the growing role of women as property owners and leaders, while also participating in the management of animals, two types of training were recommended for women in the cattle sector by our interviewees. The first would focus on getting women to see themselves in their abilities and capacities, recognizing their strengths and embracing who they are. This would help them identify the most adequate place for them in the industry, and facilitate greater performance. Following that, training must be frequently offered to develop these identified skills. The other type of training would target technical knowledge, sharing the best production practices in the field. A small producer interviewed in this study further recommended that training courses for women should address how to adapt the farm's production system so that they can do most tasks on their own, hiring labor only when greater strength or an extra pair of hands is mandatory. This is a very common scenario at the family farming scale, where women must take care of the property all by themselves.

II) Fostering Connections: women's willingness to dive into tasks, combined with their ability to engage with others, enables them to build networks of support and gather insights from those who can offer guidance. Through this process, women continually grow, adapt, and inspire those around them to contribute their skills and knowledge, creating a culture of shared learning and collective success.

III) Providing platforms for women to lead: Platforms such as industry conferences, women's leadership forums, and professional associations can help women build the necessary connections and skills to advance in their careers. Mentorship programs, specifically designed for women, offer valuable guidance from experienced leaders who can share insights, challenges, and strategies for success.

> "When women come together, the energy is powerful."
>
> *Ana Doralina Menezes*
> *Producer and President of the*
> *Sustainable Livestock Brazilian Table*

Three Main Action Pillars for Inclusion in Beef Production

Empowering women in cattle farming

Focus on Training

Training empowers women to recognise their strengths and manage cattle farming tasks independently.

Support Networks

Building connections helps women share insights and strengthen collective growth in the cattle sector.

Leadership Roles

Leadership platforms enable women to connect, learn, and access mentorship for career growth.

Figure 8: The main action pillars for inclusion in beef production

Citrus (Oranges)

Brazil stands out as the largest producer of oranges in the world, accounting for about 20% of global production, in addition to leading global orange juice exports.

According to the FAO[7], in 2022, the country exported 1,72 million tons of orange juice, representing 43% of global exports, and 768 thousand tons of concentrated orange juice, equivalent to 57% of the global total. These figures reinforce Brazil's strategic position in the international citrus market, meeting global demand with its significant production.

In 2023, Brazilian orange production reached 17,6 million tons, generating a value of R$ 20 billion[55]. Orange is the eleventh agricultural and livestock product in Brazil, accounting for only 1,74% of the national gross production value[26]. The harvested area for orange production in Brazil is 575.437 hectares, with an average yield of 30,6 tons per hectare. São Paulo is the leading producing state, accounting for 77% of national production in volume, followed by Minas Gerais and Paraná, with 6% and 4% of the country's production, respectively. The main producing region in the country is the so-called "Cintruão citrícola", an area that covers 350 municipalities across SP and south of MG[56]. In 2023, orange reached the third position in the ranking of the main agriculture and livestock products in SP, with 9% of the state gross production value. São Paulo's high performance is evident, with an average yield 22% higher than the national average.

Despite its importance for orange production, the state of São Paulo houses only 9% of rural establishments, highlighting a concentration of production in large properties. This intensive production model contributes to the state's high efficiency but also underscores challenges related to land distribution and the inclusion of small producers. Orange production in the Cinturão Citrícola goes from May until January, with most of it (55%) between the months of October and January[56].

Orange farming plays a pivotal role in generating employment and income in Brazil's agricultural sector. According to the latest agricultural census, the country has 55.912 rural establishments dedicated to orange farming, of which 75% are small-scale family operations. This underscores the sector's significance in supporting rural livelihoods, especially in regions with high levels of family-based agriculture.

Even if SP dominates Brazil's orange production, with 77% of the national output, it accounts for only 9% of the rural establishments, corresponding to 69% of the harvested area. This reflects a significant concentration of production in large-scale, corporate farming, with 47% of establishments in SP being employer-driven operations. By contrast, states like Bahia (BA), Sergipe (SE), and Rio Grande do Sul (RS) collectively contribute only 7,6% of national production but host 56% of the country's citrus-growing establishments. BA alone accounts for 26% of establishments but only 7% of the harvested area and 3% of the total production volume, with yields less than half the national average. In RS, family farms dominate, producing 87% of the state's orange output, highlighting a stark contrast in production models across the country.

Orange farming employs 102.200 people nationwide, with São Paulo alone accounting for 45% of the workforce (46.155 workers)[4]. Employment in the sector is diverse, comprising family members of producers (42%) and hired labor (58%). Among hired workers, 47% hold permanent positions, while 51% are employed temporarily. SP, where citrus farming primarily supports the processing industry, exhibits a distinct employment structure: only 13% of workers are family-related, while 87% are external hires, evenly split between permanent and temporary contracts.

In 2023, orange harvesting created 54.232 jobs[57], accounting for 35% of all agricultural support service hires in Brazil during the year. SP generated 76% of these new jobs. Citrus farming has a notable employment intensity, creating one job for every 8,6 hectares under cultivation.

Citrus farming provides formal employment opportunities with competitive wages and benefits. The baseline salary for workers during the 2018/2019 harvest was R$1.163 for 220 hours per month[57], 16% above Brazil's minimum wage at the time. Average monthly earnings ranged between R$1.400 and R$1.800, supplemented by additional benefits such as meal subsidies, breakfast, maternity support, childcare assistance, overtime pay at a 60% premium, life insurance, and union support. These benefits contribute to the sector's appeal as an important source of employment. Despite annual fluctuations in productivity due to variations in harvest yields, the number of citrus trees remains relatively stable, ensuring a consistent demand for labor.

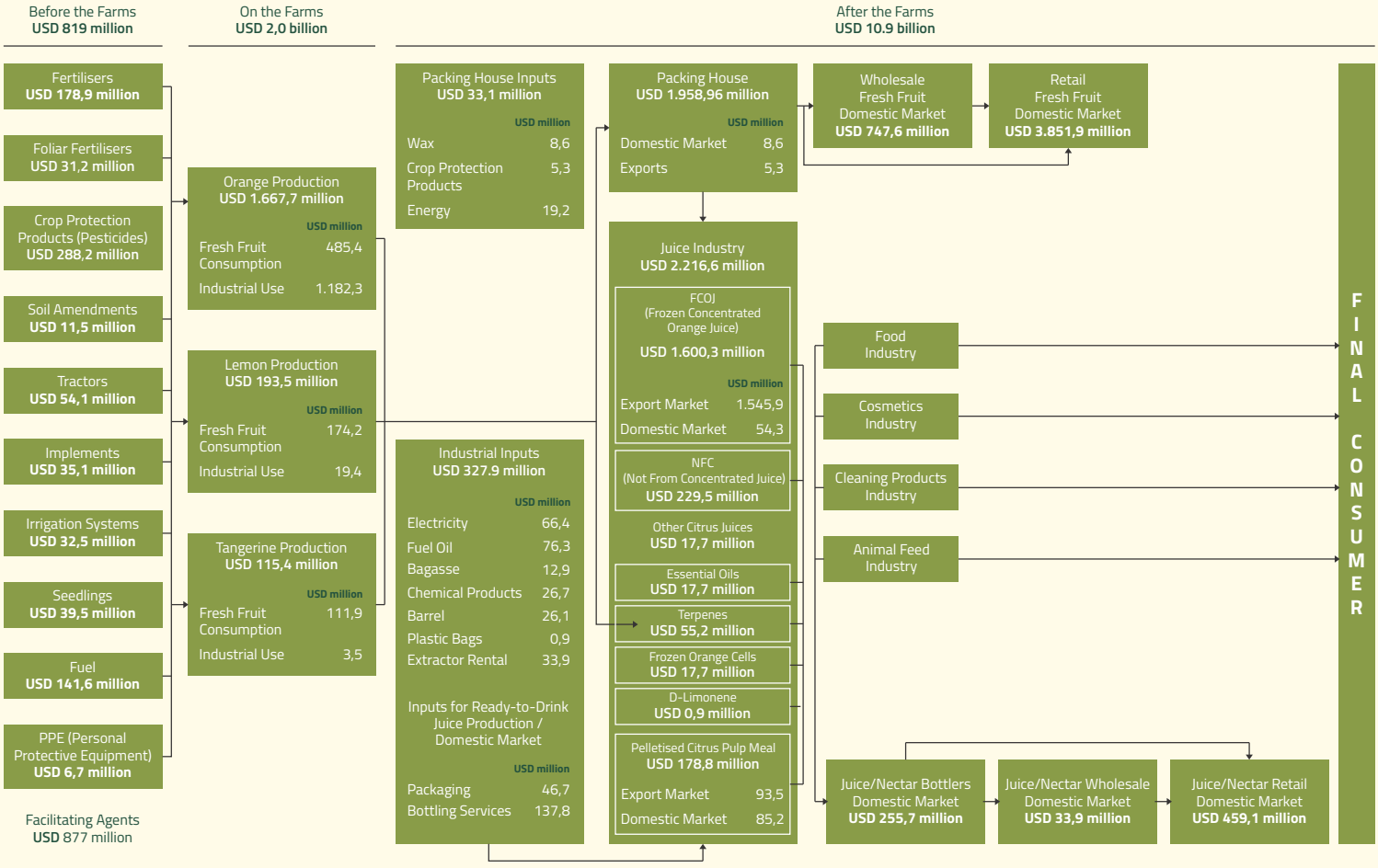
Orange supply chain and stakeholders

Brazil's orange value chain exemplifies a dual system optimized for both fresh fruit consumption and industrial processing. While the fresh citrus market serves domestic needs, the industrial sector dominates globally, cementing Brazil's role as a leader in orange juice production.

Figure 9 represents the citrus agroindustrial system in Brazil, which generated a GDP of USD 6,5 billion with gross income of USD 14,6 billion in the harvest season of 2008/2009. The main stages in the value chain are: agricultural inputs and production supply fruit for either industrial processing (juice) or fresh consumption (table citrus). For table citrus, distribution flows through packing houses, wholesalers, and retailers to final consumers. For juice, fruits move to processing plants that produce concentrated and non-concentrated juices, with exports or fillers supplying wholesalers, retailers, and consumers globally. By-products, including essential oils and pulp, are directed to other industries, such as fragrances, cosmetics, household cleaning, and animal feed. Figure 9 also shows the distribution of gross income across the different links of the supply chain.

FIGURE 7: CITRUS AGRO-INDUSTRIAL SYSTEM IN BRAZIL

Citrus Value Chain in Brazil – GDP: USD 6,5 billion – Gross Revenue 2008/09: USD 14,6 billion



Facilitating Agents (do not buy or sell, only provide services) – USD million

Primary Transport – From Farm to Packing House or Industry: 171,4	Highway Concessions: 18,3	Juice Storage Companies: 2,9
Secondary Transport – From Packing House to Wholesale or Retail: 136,8	Port Costs: 71,0	Payroll: 352,7
Secondary Transport – From Industry/Packing House to Port: 87,5	Diesel: 37,0	Taxes: 188,7

Figure 9: Citrus supply chain Brazil. Extracted from CitrusBR.

Orange production in Brazil has achieved significant productivity gains through innovative practices such as high-density planting, with an average of 450 trees per hectare, but reaching up to 800 trees per hectare, allowing increased output without expanding cultivated areas. Irrigation is also important, with 15% of orchards in São Paulo having access to irrigation. Research and innovation are driven by institutions like Fundecitrus, Centro Apta Citros Sylvio Moreira, Esalq, and Instituto Agronômico de Campinas (IAC), with Fundecitrus alone managing an annual budget of R$23 million funded by growers and juice processors. However, the sector faces the critical challenge of greening, a bacterial disease transmitted by the insect Diaphorina citri, which affects 44,35% of orchards on average in the Cinturão Citrícola area, particularly in older groves in central São Paulo. Currently, this is the main challenge faced by producers in São Paulo, putting the Brazilian orange production at risk.

According to data from 2009, 70% of the national oranges production serves the juice processing industry, which supplies mainly to the global market: approximately 98% of Brazilian production of orange juice is exported, primarily to the United States and the European Union. At São Paulo's citrus, the percentage of oranges supplying the processing industry is even higher: nearly 86% of citrus grown in this region is destined for industrial use, with 85% of the output processed into frozen concentrated orange juice (FCOJ) and the remaining 15% into not-from-concentrate (NFC) juice.

Producers supplying the industrial chain tend to operate on a larger scale, with significant concentration in supply. A mere 5% of producers account for 65% of the fruit delivered to processing plants, and the processing companies themselves own 35% of the orchards. This integration ensures consistent volume and quality, crucial for maintaining Brazil's competitiveness in international markets. Upon harvest, fruits are transported to processing facilities under various contract arrangements, which may include long-term agreements or spot purchases with fixed or variable pricing.

At the processing plants, the fruit undergoes a highly mechanized operation. Following initial reception and quality analysis, the oranges are washed, sorted, and extracted. The juice is then either concentrated by removing water or pasteurized for NFC production. FCOJ undergoes evaporation processes that not only reduce its volume for transport but also facilitate the recovery of volatile compounds, which are sold to the fragrance and cosmetics industries. NFC, on the other hand, is stored in large aseptic tanks near export ports, reflecting its premium quality and higher logistical demands due to its volume, which is five to six times that of FCOJ.

Brazil's dominance in the orange juice market is not without challenges. From 2004 to 2014, global demand for orange juice in 40 key markets declined by 20%, with per capita consumption falling significantly in major markets. In the United States, the largest consumer of orange juice globally, per capita consumption dropped from 20,6 liters in 2004 to 13,8 liters in 2014. Similarly, the European Union experienced a decrease from 9,1 liters to 6,1 liters during the same period. Although emerging markets like China and India show potential, their absolute consumption remains low, with per capita intake below one liter annually.

The fresh fruit supply chain prioritizes quality and minimal processing to deliver oranges to the consumer in their natural form. Distributors and packing-houses consolidate production, performing essential tasks such as sorting, coating, packaging, and logistics management. Most oranges for consumption are treated with wax coating for increasing durability and shine. Rigorous quality control processes are applied to ensure the fruit meets retail standards, with evaluations based on appearance, BRIX levels, and the absence of visible damage.

Once processed by intermediaries, the fruit reaches retail outlets, including street markets, supermarkets, and wholesalers. In 2018, CEAGESP, Brazil's largest fresh produce distribution center, traded 218.000 tons of oranges, which represented 8,82% of its total sales in volume and a market value of R$ 392 million. The fruit and vegetable sector also makes an important contribution to supermarket retailers' income, with bananas and oranges being the most consumed fruits by Brazilian consumers, highlighting the economic significance of citrus to the national retail market.

Key actors in the Brazilian citrus supply chain include Associtrus, the Brazilian Citrus Growers Association, which represents the interests of citrus producers and advocates for the development of the sector. The ABCM (Brazilian Association of Table Citrus) comprises 108 companies, including citrus growers, input producers, machinery suppliers, nursery operators, packaging providers, and other stakeholders essential to the table citrus chain. Meanwhile, CitrusBR, the National Association of Citrus Juice Exporters, represents major juice producers and exporters like Citrosuco, Cutrale, and Louis Dreyfus, playing a critical role in the industrial processing chain and ensuring Brazil's leadership in the global citrus juice market. These organizations collectively contribute to innovation, market access, and the coordination of activities across the citrus value chain. Additionally, the CitrusBR reports that the broader citrus supply chain generates 200.000 direct and indirect jobs, with an annual payroll exceeding USD 600 million.

Women in the citrus sector

The participation of women in Brazil's citrus farming reveals significant disparities, highlighting both challenges and opportunities for gender equity in the sector. Data on women's involvement is very limited, but existing figures suggest their roles are less prominent, particularly in leadership and land management. According to the agricultural census, only 18% of citrus farms are led by women, with a notable regional disparity: 24% in Bahia but only 8% in São Paulo, the country's primary citrus-producing region. Furthermore, women-led farms account for just 8% of the total land area, dropping to 7% in São Paulo and rising slightly to 14% in Bahia. Not only do men manage larger properties, but citrus farming is also dominated by areas that are under the management of industrial groups. In Brazil, 31% of the area of the agriculture establishments dedicated to orange farming is managed by industrial groups, rising to 43% in São Paulo.

In terms of labor, women represent 23% of the 102.200 workers in orange production, though their participation varies by employment type. Among employees with familial ties, women account for 30%, but this drops to 17% among workers without such ties, regardless of whether they are temporary or permanent hires. In São Paulo, women comprise 20% of the total citrus workforce, a figure that slightly increases to 23% among temporary workers. Notably, during the 2009/10 harvest, CitrusBR reported that 35% of harvesting teams were women.

These statistics underscore the gender imbalance in Brazil's citriculture, particularly in leadership, land management, and formal employment. While women play an important role, especially in harvesting and family-based labor, systemic barriers limit their broader participation.

The global citrus industry has made slight progress in adopting sustainable practices, yet its approach to gender inclusion and diversity remains incipient. The representation and participation of women in workforce and leadership positions across leading citrus companies, Louis Dreyfus Company (LDC), Citrosuco, and Cutrale, reflect varying levels of commitment to diversity and inclusion policies. Women continue to face significant barriers to equality. Among the three major players, Citrosuco has made notable advancements in increasing female participation.

As of 2022/2023, women represented 26,7% of its workforce, with 18% holding management positions[58]. The company has also reached 26% representation of women and Black individuals in leadership positions, close to the 2030 target of 30%, and boasts a board of directors that is 40% female.

Women lead just 18% of citrus farms, with marked regional disparities, 24% in Bahia compared to only 8% in São Paulo. Their share of total land area remains limited at 8%, reflecting constrained access to productive assets.

Women account for 23% of the citrus workforce, with stronger representation in family-linked roles and during harvest periods, but significantly lower participation in non familial and permanent employment.

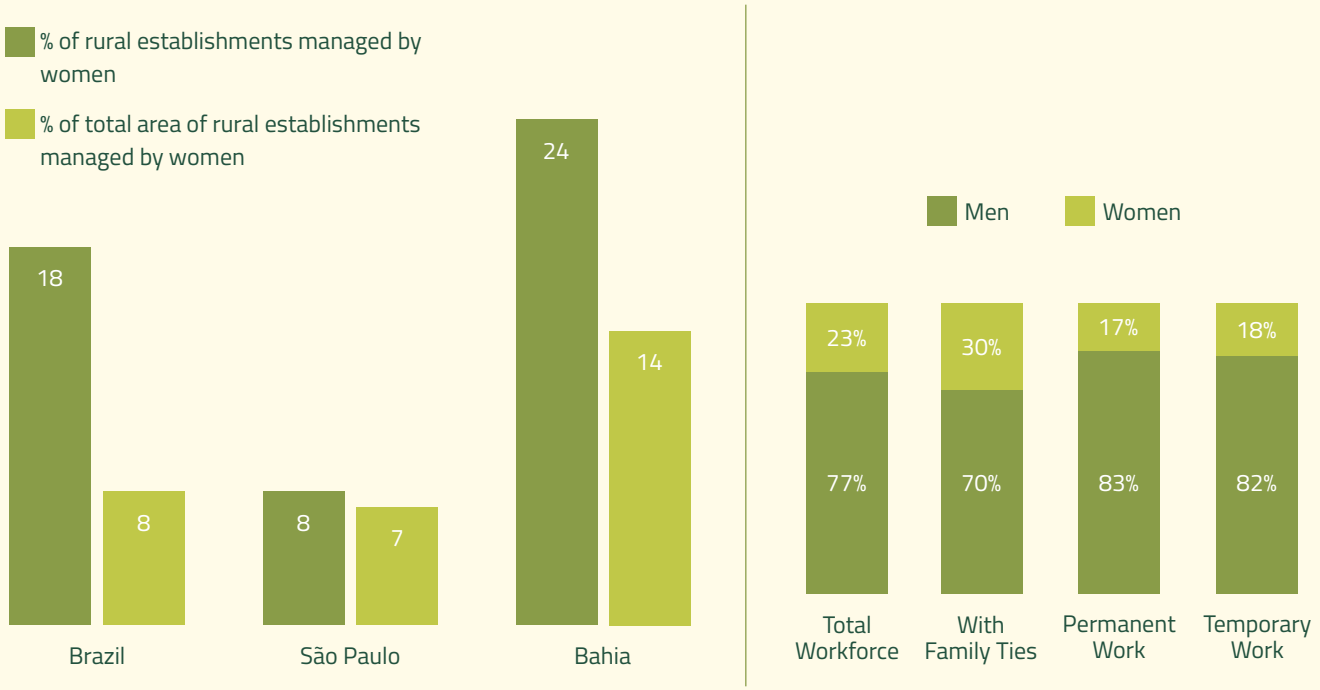


Figure 10: Contribution of women in orange production in Brazil. (a) Proportion of rural establishments managed by women and proportion of the total area of those establishments in Brazil, São Paulo and Bahia. (b) Proportion of women in workforce in rural establishments dedicated to orange production by type of contract.

The increase in female participation in Citrosuco is the result of structured initiatives like the ESG committee and the association to "Movimento Mulher 360," an independent, non-profit association formed through the collaboration of 100 leading Brazilian companies. The movement is committed to promoting gender equity and increasing female participation in corporate environments. It advocates for the attainment of basic rights, such as the elimination of violence and harassment, the establishment of equal conditions, including equal pay for men and women in the same roles, and fostering greater female representation in leadership positions, which remain predominantly male-dominated spaces.

Louis Dreyfus Company (LDC) also demonstrates a commitment to diversity but lags behind in implementing transformative policies globally. Women constitute 28% of LDC's workforce worldwide, but the figure drops to 17% in South America[59]. Furthermore, women occupy only 6% of executive roles and 19% of senior management positions. While the company has implemented gender and inclusion training programs and developed a global diversity policy, its efforts remain concentrated in Europe, North America, and Asia.

While Citrosuco and LDC have made progress in formalizing diversity and inclusion policies, their initiatives still fall short of comprehensive gender structuring. Citrosuco's diversity policy includes aligning leadership compensation with ESG targets, providing accountability for gender equity goals. However, despite such measures, the representation of women in operational and senior roles remains low. Similarly, LDC's gender training programs and ethical conduct codes signify a positive direction, yet the company remains one of the lowest ranked in women's inclusion according to Oxfam's "Behind the Brands" report.

In contrast, Cutrale has no structured policies either on sustainability or diversity and inclusion. The company's engagement with sustainability, in general, and diversity, in particular, is limited to sporadic social projects, underscoring a lack of institutional commitment to advancing socioenvironmental commitments. Cutrale's absence of a structured ESG framework and diversity policy is a glaring gap in an industry increasingly defined by sustainability and inclusivity.

This minimal approach places Cutrale behind both LDC and Citrosuco in fostering workplace inclusion.

None of these three companies have adhered to the UN Women's Empowerment Principles, highlighting the citrus sector's overall lag in adopting globally recognized standards for gender equity. Only Citrosuco and Cutrale have published their transparency and equal pay reports, in compliance with Law 14611/2023. The reports reveal persistent disparities, with women's salaries at Citrosuco ranging from 57,8% to 116,7% of men's salaries across different business units, averaging 82%. At Cutrale, the gap is even more pronounced, with women earning between 43,4% and 90,9% of men's salaries, resulting in an average of 79%.

Table 5: Gender representation and inclusion efforts in orange juice processing companies.

Company	% of women in workforce	% of women in leadership	Gender pay gap reporting	Key gender initiatives
Citrosuco	26,7%	18% Management 26% women and black individuals in leadership 40% Board	Reporting varies from 57,8% to 116,7% (average 82%)	ESG committee, Movement Women 360, diversity policy aligning leadership compensation with ESG targets
LDC	28% (Global) 17% (South America)	6% (Executive) 19% (Senior Management)	Not published	Gender training programs, global diversity policy, ethical conduct codes, with a focus on North America, Europe, and Asia
Cutrale	N/A	N/A	Reporting varies from 43,4% to 90,9% (average 79%)	No structured diversity or sustainability policies, limited engagement through sporadic social projects

Barriers for women in the citrus sector

Interviews were conducted with women from different segments of the citrus farming value chain to exemplify the data presented and provide deeper insight into the current situation of gender equality in the sector. The participants included a woman in a leadership position at a leading orange juice company and women who manage a family-run agricultural business. These women hold diverse roles, from overseeing strategic corporate operations to managing technical and administrative aspects of rural citrus farming. Despite their accomplishments, the interviews revealed significant barriers to gender equality, alongside promising opportunities for progress.

According to the interviews, one of the central barriers for women in citrus farming lies in the lack of corporate policies for talent acceleration and diversity. In many companies, human resources departments are still viewed as administrative rather than strategic, limiting their ability to implement initiatives that promote gender equity. Moreover, the seasonal nature of the citrus harvest, which lasts six to nine months, leaves little room for structured discussions about inclusion. This short cycle also complicates efforts to address the needs of female seasonal workers. About half of the workforce in industry citrus farming is made of seasonal workers and women in these positions lack essential support such as maternity accommodations and breastfeeding facilities. The absence of proper infrastructure for pregnant women further restricts their participation, as they are often removed from operational roles during the harvest without adequate alternatives.

In family-owned agricultural businesses, societal norms and entrenched family dynamics often dictate the division of labor, which naturally occurs with a gender bias: while men typically occupy roles tied to immediate financial returns, such as commercial negotiations, women are assigned to governance, sustainability and internal operation roles, which, although critical for long-term success, are less visible and not immediately profitable. In hired labour, women are generally less represented, as data from agricultural census confirm, and they occupy administrative or operational roles that are often limited to specific functions, which require a higher level of care but less technical expertise, relegating them to lower paying field positions. For example, hiring women for technical positions like tractor operators remains a challenge due to the historical absence of training and encouragement in these areas.

Interviews identify the absence of corporate policies for talent development and diversity as a major barrier for women in citrus farming. Human resources is often viewed as administrative rather than strategic, while the six to nine month harvest cycle limits inclusion efforts. As nearly half the workforce is seasonal, women frequently lack maternity accommodations, breastfeeding facilities, and basic infrastructure, resulting in their exclusion from operational roles during harvest.

Opportunities for women in the citrus sector

Despite these barriers, opportunities for women in citrus farming are beginning to take shape, driven by both corporate and grassroots efforts. Leading companies like Citrosuco are spearheading initiatives to attract, retain, and promote female talent through diversity-focused policies. Citrosuco has adopted a dual strategy, hiring women at entry levels, such as internships, to build a pipeline of talent, while also recruiting women into leadership positions through affirmative action. Notable successes include the company's new business unit, Evera, a division that produces specialty ingredients from citrus coproducts that has achieved gender parity in its leadership team. Furthermore, performance metrics also demonstrate the positive impact of female leadership, as units managed by women have consistently shown superior results in areas like safety and efficiency. Highlighting these achievements to company leadership helps build the case for further gender-inclusive policies. A recently established mentorship program for talent acceleration within the company indicates that women have been preferred by employees when selecting as mentors.

In family farms, women appear to be playing a growing role in innovation and modernization efforts. The interviews suggest that they may be instrumental in introducing digital management systems and securing sustainability certifications like the SAI Platform, which requires meeting 180 criteria[7] . These certifications not only improve efficiency but also foster a culture of shared responsibility among workers, who begin to take ownership of tasks and processes. Women's holistic and human-centered management styles are often credited with driving these improvements, bringing both resilience and sustainability to family-run operations.

International clients are also playing a pivotal role in advancing gender equity in citrus farming. Many of these clients are reinforcing their Environmental, Social, and Governance (ESG) policies with diversity and inclusion criteria, leading suppliers to implement actions on the topic. One interviewee reported the case of a producer who lost an export opportunity due to the lack of female representation in leadership roles, demonstrating that this can be a criterion for supplier exclusion, depending on the voluntary sustainability commitments of certain clients. However, these efforts are not universal, and many companies and farms in the citrus sector still lack structured policies for gender inclusion. To achieve meaningful progress, gender equality initiatives must transition from voluntary efforts to strategic priorities, supported by leadership sponsorship, clear objectives, and robust governance.

In addition to corporate and market-driven efforts, collaborative spaces like the Women in Agribusiness Congress are vital in empowering women in citrus farming. With over 3.000 participants from all Brazilian agribusiness supply chains, these events provide a platform for knowledge exchange, inspiration, and access to tools that help women navigate the challenges of agribusiness. They also highlight examples of successful female leaders, offering a roadmap for others to follow.

[7] Interviews with company representatives and female farm owners from different supply chains suggest that the task of introducing certifications, often linked to process and management improvements, is more commonly assigned to roles predominantly held by women. Meanwhile, various voluntary sustainability standards addressing human rights require actions to combat discrimination and promote women's inclusion, driving long-term change. However, it is important to note that this study does not provide a quantitative analysis of the relationship between certification and gender inclusion.

Soybean

As of 2023, soybean production represents a dominant 42,8% of Brazil's agricultural output, a clear indication of the crop’s importance.

Data from the IBGE’s PAM (2023)[8] highlights the eight largest soybean-producing states in Brazil, with Mato Grosso leading the pack with a production value of R$ 98,91 billion. Other prominent states include Paraná (R$ 51,32 billion), Goiás (R$ 38,85 billion), and Mato Grosso do Sul ®$ 33,96 billion), among others. Soybean cultivation is especially concentrated in the Central-West and South regions, with significant production also taking place in the Northeast, particularly in Bahia.

The expansion of soybean production has been driven by both an increase in the planted area and improvements in agricultural productivity. In 2023, PAM showed that the area dedicated to soybeans expanded by 3,2 million hectares, reaching a total of 46,03 million hectares. This increase has more than doubled the soybean cultivation area over the past two decades, with average yield growing by an impressive 48,9%. The growth of soybean farming is a result of technological advances and research investments, which have substantially enhanced the productivity of Brazilian farms.

In 2023, Brazil set a new record for soybean production, reaching 152,1 million tons, a 25,4% increase compared to the previous year1. The country's soybean production accounted for R$ 348,7 billion in 2023, solidifying soybeans as the highest-value crop in Brazil's agricultural sector. These gains not only have a profound impact on Brazil's domestic agricultural economy but also influence global markets, as Brazil is the world's largest soybean producer.

According to the Brazilian Association of Vegetable Oil Industries[60] (ABIOVE), soybean production in 2024 is expected to reach 153 million tons, ABIOVE also reports that, as of July 2024, export volumes reached 97,8 million tons of soybeans, with significant contributions from soybean oil and meal. As of 2023, soybeans led the ranking of export-generated value among Brazilian products, contributing to approximately 11% of the country's total exports. Notably, China is Brazil's largest export market for soybeans, accounting for 34,5% of exports in the first half of 2024, followed by the European Union (13%) and the United States (6,7%) [61].

The revenue generated from these exports is substantial. In 2024, the soybean complex, including soybeans, soybean meal, and soybean oil, is expected to bring in approximately USD 52,1 billion. This underscores the significant role that soybeans play in Brazil's economy, both in terms of agricultural production and as a source of foreign exchange.

The soy value chain in Brazil

The primary by-products of soybeans include cooking oil, biodiesel, soybean meal (largely used as animal feed), flour (for human consumption), and lecithin. These by-products can be further processed into food products such as seasonings, margarine, tofu, textured protein, and ready-to-drink beverages like milk and fruit juices. Additionally, they are utilized as raw materials in various industries, including cosmetics, paints, pharmaceuticals, and textiles. According to the National Energy Balance 2024[62], soybean oil accounted for 62,2% of biodiesel production in 2023.
The report "The Soybean Production Chain and Economic and Regional Development in Brazil[63]" (Ipea, 2024) underscores the significant role of soybean production in Brazil's economy. It reveals that soybean cultivation not only drives substantial exports but also fuels domestic consumption, creating high added value and contributing to income generation, employment, and overall economic growth.

The soybean complex can be understood as an agro-industrial system (SAG), comprising several key stages. The list below outlines the various links within these stages, highlighting female participation in each based on qualitative data gathered through desk research and interviews conducted for this study:

Agricultural Input Industry

This stage includes the suppliers of essential inputs for soybean cultivation, such as seeds, fertilizers, pesticides, agricultural machinery, and various goods and services that support grain production. Women play a significant role at this stage, particularly as sales consultants. In this capacity, they also provide technical support as part of the sales process, creating opportunities for female contributions to the technical management of crops.

Technical Assistance

Predominantly delivered by private companies, although the contribution of input companies is becoming increasingly important. Additionally, class organizations offer technical assistance programs, such as the Agro Plus Program (formerly known as Soja Plus), coordinated by the Brazilian Association of Vegetable Oil Industries (Abiove) in partnership with various entities, as well as through producer cooperatives. Women play a significant role at this stage, either working for private companies, input companies or technical assistance programs. Their participation is tied to a higher level of qualification, which increases their acceptance and allows them to stand out among men.

Research

Soybean production is significantly enhanced by technological advancements stemming from research and extension programs, especially by the Brazilian Agricultural Research Company (Embrapa). For example, the soybean seed market in Brazil now offers over 1.300 cultivars, with more than 59% being genetically modified, which has significantly contributed to increased productivity and sustainability in the sector. Female researchers still represent a small portion of the research workforce in the sector.

Grain Production

At this initial stage, farmers cultivate soybeans, which marks the beginning of the production process. At this stage, women are involved both as landowners and employees. However, they still constitute a small proportion of the predominantly male workforce and are primarily engaged in administrative roles. This topic is explored in greater detail in the next section.

Lenders and Originators

Cooperatives, brokers, storage companies, and trading firms are crucial actors in this stage. They engage directly with rural producers to purchase, store, and distribute soybeans as raw materials for further processing. Here, women are also primarily engaged in administrative roles, with still a few only ascending to management positions.

Crushers/Processors/Refiners

Private companies and agro-industrial cooperatives initiate the industrialization process at this stage. They process soybeans into crude oil and soybean meal, which serve as inputs for various downstream industries. Here, women are also primarily engaged in administrative roles, with still a few only ascending to management positions.

Derivative Industries

- **Oil:** Soybean oil is refined and supplied to a wide range of industries, including food (margarine, cooking oil, mayonnaise, biscuits, creams), chemicals (coatings, paints, lubricants), and cosmetics and detergents.

- **Meal:** Soybean meal is predominantly used in the animal feed industry (for swine, poultry, and aquaculture), as well as in the chemical industry (plastics, cosmetics, paints) and food industry (soy sauce, tofu, flours, meat substitutes, desserts, etc.).

Distributors

These agents operate within wholesale and retail markets, managing the delivery of soybean-based products to end consumers. They oversee the entire transport network, including waterways, railways, highways, and ports.

End Consumer

The final link in the chain, where consumers purchase processed soybean products for various uses.

Soybean production is a vital source of employment in Brazil. In 2022, the soybean industry generated 502.100 jobs, making it the fourth-largest employer in Brazilian agriculture. Soybean farming alone contributes approximately 1,5% to Brazil's GDP, emphasizing its importance not just for agriculture but for the national economy as a whole[64].

While the soybean sector generates significant employment, it is important to note that the workforce is predominantly male. In 2020, men accounted for the vast majority of those working in soybean production, with 420.651 men employed compared to 83.566 women[64]. This gender disparity reflects broader trends in the agribusiness sector, where men dominate on-farm labor. However, there has been a notable increase in the number of women working in the sector, especially in areas such as technical assistance and direct handling of soybeans.

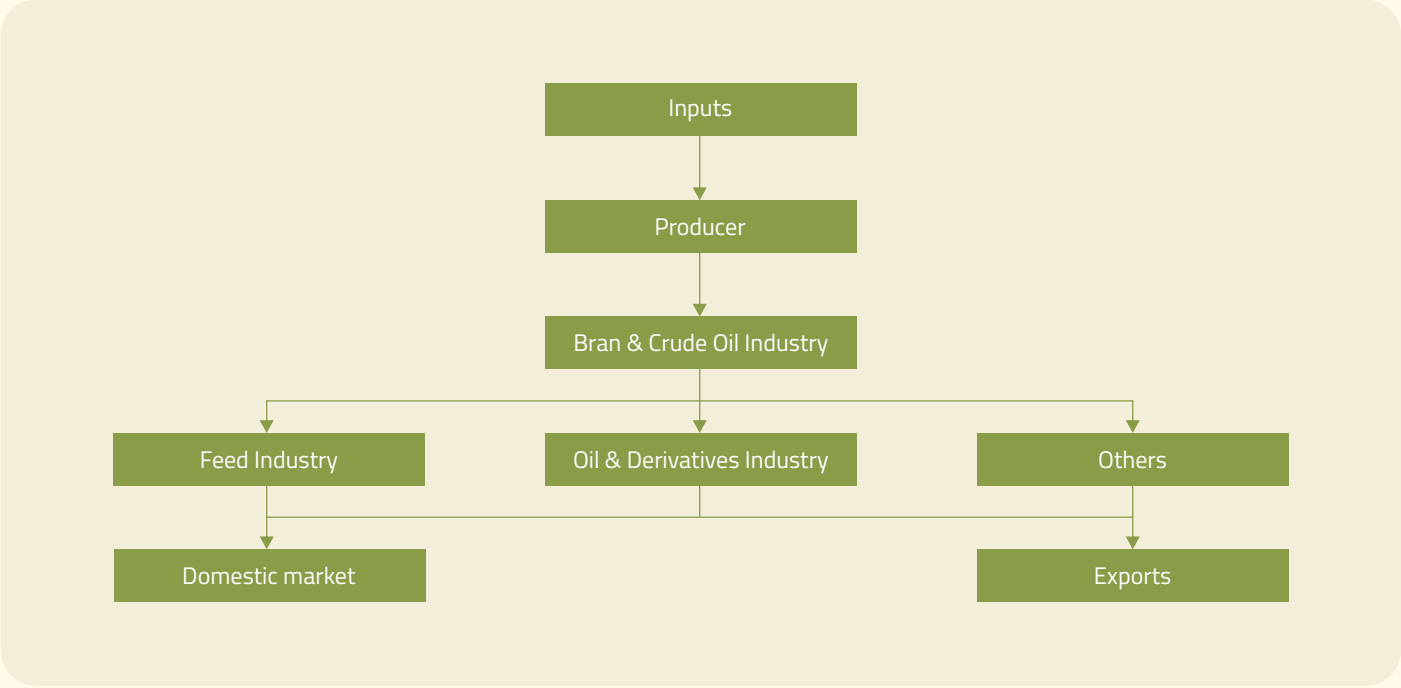


Figure 11: Simplified diagram of the soy agro-industrial system. Source: Lemos et al., 2017.

Women in the soy sector: barriers and opportunities

The role of women in Brazil's soy supply chain has been evolving in recent years, marked by significant changes in their participation and influence. While women have historically been marginalized in this predominantly male-dominated industry, they have increasingly moved toward leadership positions, particularly in administrative roles. However, despite their growing prominence, challenges related to gender inequality and infrastructure continue to persist.

Recent studies, such as the one conducted by Conservation International (2021) in the Matopiba region[5], highlight the shifting roles of women in the soy supply chain. Traditionally, women were relegated to secondary roles, often confined to family farms and working within the domestic sphere. Over time, however, many women have gained autonomy and prominence in decision-making processes, moving from passive participants to active leaders in agricultural enterprises.

Family succession has been the primary pathway for women to rise to leadership positions within farms. Among the women interviewed for this study, succession occurred after the death or illness of their fathers but often led to shared management of the property with other siblings. In this scenario, the brothers usually lead the technical aspect of the farm management, while the sisters are in charge of the administrative management. One interviewee from a trading company noted that when there is a woman ahead of the management, the farm functions remarkably better. She believes that happens because: A) Women prefer organized environments, so they tend to improve the administrative work area; B) they evaluate suppliers empirically and objectively, removing friendship from the equation; C) they can keep up with more data, and finally D) men are always competing for productivity, while women do not compete, they just want to manage the property well.

In general, women's involvement in soy production remains largely concentrated in administrative functions. According to our interviewees, women tend to oversee financial management, personnel, and marketing where their skills are growing in recognition.

Table 6: women and men participation in the soybean supply chain. Source: CEPEA and ABIOVE, based on continuous PNAD data (IBGE).

Segments	Gender	2012	%	2020	%
Inputs	Men Women	52.575 17.648	75 25	88.467 29.330	75 25
Primary (soy)	Men Women	178.141 36.675	83 17	420.651 83.566	83 17
Agro-industry	Men Women	45.187 12.060	79 21	52.501 19.832	73 27
Agroservices	Men Women	458.500 334.894	58 42	779.952 572.400	58 42
Total supply chain	Men Women	734.403 401.277	65 35	1.341.572 705.129	65.5 34.5

One of the most significant findings of the study carried by Conservation International is that women's skills in communication, leadership, and conflict resolution are highly valued in the soy supply chain. Seventy-three percent of respondents agreed that women possess superior skills in managing people, which is crucial for the smooth operation of agricultural businesses.

Among the farm labor force, management positions remain predominantly male, and the encouragement of female presence mainly takes place within large soybean-producing companies that have established solid internal policies. One of the interviewees, however, reported that women's access to management roles still faces social barriers, even with the company's support. It is common for their husbands/partners to feel judged for holding lower positions and receiving lower wages, pressuring them to ask their wives to resign, especially when they become pregnant. Thus, even though farm managers recognize women's better performance in management roles and support their advancement, women often give up this path to meet societal and family expectations.

However, when it comes to operational and hands-on aspects of farming, which are seen as more physically demanding, women are often excluded. In an experience reported by one of the interviewees, the inclusion of women in operational work led to surprising results. To increase the household income of employees living on the farm, training was provided for the wives to become combine operators. When the women started receiving their salaries, 50% filed for divorce. It then became the responsibility of the farm managers to relocate the men to the common dormitories, leaving the women to live in the houses with their children. The men were dissatisfied with the situation, and most ended up resigning. Despite this, the managers maintained their preference for women operating the combines, stating that they are more careful and generate lower maintenance costs for the machines.

When it comes to work hours and remuneration, data from PNAD[65] (2015) indicate that women in the soy supply chain generally worked fewer hours per week compared to their male counterparts. While 39,4% of women worked between 15 and 39 hours per week, another 23% worked between 40 and 44 hours, and 21,9% worked more than 49 hours per week. In contrast, the majority of men (33,1%)

Women's participation in soy production remains largely concentrated in administrative roles, particularly in finance, personnel, and marketing, where their skills are increasingly recognized.

Despite company support, women's access to management roles continues to face social barriers. Husbands or partners may feel judged for holding lower paid positions, leading to pressure on women to resign, especially during pregnancy. As a result, even when managers acknowledge women's stronger performance and support their advancement, many women abandon management paths due to societal and family expectations.

worked between 40 and 44 hours per week. This difference in work hours reflects broader gender norms, where women often juggle professional responsibilities with domestic duties, a situation that influences both their work hours and career progression.

When it comes to remuneration, significant disparities remain. In 2015, the majority of female workers in the soy supply chain earned between one and two minimum wages (40,1%), while a notable proportion earned between half and one minimum wage (25,5%). In contrast, men were more likely to earn higher wages, with 29,8% earning more than three minimum wages compared to just 17,4% of women. These figures highlight a persistent gender wage gap in the soy sector, despite women's increasing involvement in various aspects of agricultural work.

Even though the agricultural industry has been long dominated by traditional practices and male leadership, it is undergoing a significant transformation with the increasing involvement of women. In soybean farming, this shift is particularly noteworthy. According to various interviewees, women are not only stepping into leadership roles but are also becoming champions of innovation, introducing transformative practices that go beyond mere productivity. While men in the sector often prioritize technological advancements that directly enhance productivity, women tend to adopt a broader perspective. They seek solutions that balance economic gains with environmental stewardship and social responsibility. They are often the ones advocating for crop rotation, soil conservation techniques, and the use of eco-friendly inputs, ensuring that agricultural practices are not only profitable but also regenerative. An interviewee reported that she is creating a 7-kilometer ecological corridor on her property with the goal of attracting pests and reducing the use of pesticides. The producer shared that she got the idea after exchanging experiences with another producer in the coffee sector, where the practice of planting forest corridors between coffee rows is common.

Additionally, women's focus on sustainability often extends to their involvement in community-based initiatives. They work to integrate local communities into the agricultural value chain, promoting fair labor practices and supporting social development. This contrasts with a narrower productivity-focused approach, which can sometimes overlook the broader social and environmental consequences of agricultural expansion.

This approach aligns with growing global concerns about the sustainability of agricultural practices and highlights the potential of women to lead the industry toward a more balanced and responsible future.

The gender disparities in the soy supply chain are further compounded by the physical and infrastructural challenges that women face. Many women working in rural areas experience isolation, inadequate infrastructure, and a lack of essential services such as healthcare and accommodation. According to the study by CI, 92% of women surveyed indicated that improving infrastructure in rural areas is crucial to enhancing women's participation in agribusiness. Infrastructure limitations are seen as a barrier to both attracting and retaining women in the sector, particularly in remote farming regions where accessibility and safety are major concerns.

Physical safety is another significant concern for women in the agricultural sector. Forty percent of respondents in the CI study cited concerns for women's physical safety as a factor contributing to their underrepresentation in agribusiness. These challenges are compounded by the societal expectations placed on women to balance work and family responsibilities. The unequal division of domestic labor and the pressure of motherhood present additional hurdles for women in the soy supply chain, limiting their ability to fully participate in the workforce.

A study by Solidaridad[66] in the Balsas microregion of Matopiba also examined the role of women in the soy supply chain across three segments: before the property (e.g., machinery, seeds, and inputs), inside the property (including soil preparation and harvest), and after the property (grain marketing and industrialization). It was found that women face the most barriers to inclusion inside the property. These barriers include social values that associate strength and pioneering with masculinity, gender-based role segregation, and prejudice from family members and other individuals across the chain.

They also found that of the 273 workers on the 17 farms in the microregion of Balsas analyzed in the study, only 40 are women. Among them, 75% are engaged in domestic services,

17,5% in administrative tasks, and only 7,5% in fieldwork. Also, only 1 property was owned by a woman.

Common challenges across all segments included workplace harassment, wage inequality, difficulty balancing work with motherhood, low representation of women in leadership roles, and the absence of public policies or affirmative actions promoting gender equity. Furthermore, women's membership in key agricultural organizations was minimal, with less than 5% participation in the Brazilian Soybean Producers Association of Maranhão (Aprosoja) and only 9,5% in the Rural Producers Union of Balsas (Sindibalsas).

To overcome barriers and promote gender equality in the soy sector, it is essential to increase the visibility of women in agribusiness, particularly in leadership roles. Solidaridad's research indicated that 90% of respondents believe that seeing more women in agribusiness would inspire others to enter the sector. Additionally, 88% agreed that expanding women-focused networks within agribusiness would foster greater female inclusion in the industry.

Developing skills and acquiring knowledge is another key element for women inclusion in the soy supply chain. All interviewees agree that technical validation is the main gateway for women, either in administrative or technical roles. Men are far more accepting of women who present themselves with technical qualifications. As a result, when a woman applies for a position on soybean farms, her resume often includes a degree, a master's degree, and additional specialization courses. This technical validation helps break down barriers, enhances women's competitiveness, and has contributed to a noticeable increase in hiring rates.

> "When a woman doesn't know how to do something, she seeks knowledge."
>
> *Soy producer and landowner interviewed*

Women in the Soy Supply Chain

Challenges

Societal expectations
Double journey
Wage gap
Infrastructure issues
Worklace harassment
Lack of leadership role models
Lack of affirmative actions

Opportunities

Family succession
Administrative roles
Diversity policies
Technical validation

Benefits

Improved people management
More careful with machinery
Champions of innovation and sustainability
Support to local social development

Figure 12: Barriers, opportunities and benefits of women in the soy supply chain.

Chapter 3

Barriers and opportunities for women inclusion in the Brazilian agribusiness sector

Hot topics for gender inclusion

The inclusion of women in Brazil's agribusiness sector presents a complex landscape of challenges and opportunities. Gender disparities persist across the six studied major supply chains: citrus, cocoa, coffee, livestock, soy, and sugarcane, manifesting in unequal access to employment and resources, limited representation in leadership, and significant pay gaps. Societal norms and entrenched cultural biases further compound these barriers, restricting women to less visible and lower-paying roles, often tied to family labor or additional household activities. However, the sector is also witnessing encouraging signs of progress. Women's increasing participation in leadership roles, driven by corporate diversity initiatives and women empowerment networks and programs, showcases their potential to drive innovation, sustainability, and resilience in agribusiness, leading to higher efficiency in the long term.

The analysis of these supply chains has led to the identification of six critical topics essential for promoting gender inclusion:

I) Family succession
II) Employment / job offer
III) Remuneration
IV) Access to resources
V) Leadership
VI Representation

These topics were chosen based on their recurring relevance across different agricultural contexts and their potential to address systemic inequities.

Addressing these material topics is not only a matter of social equity but also an economic imperative. Women bring diverse perspectives and management styles that contribute to more inclusive and sustainable agricultural practices. By focusing on these six interconnected themes, a series of recommendations for key stakeholders is presented in the final chapter of this report, outlining how stakeholders can design targeted interventions that unlock the full potential of women in agribusiness, creating a more equitable and innovative sector.

I) Family Succession

Barriers

Family succession presents numerous barriers for women in agribusiness, rooted in deep-seated cultural norms and gender biases. In Brazil, women manage only a fraction of agricultural establishments, and their properties are often smaller and less productive due to unequal investment and resource allocation. Women often face skepticism from male family members when taking on management roles, requiring constant validation of their capabilities. Even when women inherit properties, the legal and financial complexities associated with succession, such as costly documentation and extended timelines, can delay their ability to assume leadership. Many women only assume management after a family transition, such as the retirement or death of a male relative, which reflects systemic inequities in farm inheritance practices. Additionally, women generally lack prior exposure to farm management, leaving them unprepared to navigate the operational and strategic demands of agricultural enterprises. In cases where male leaders remain involved, the division of labor can also present a gender bias: men take on positions more related to immediate financial return, such as those responsible for commercial negotiations, while women mainly deal with internal management.

Opportunities

Despite these barriers, family succession remains a critical avenue for women's inclusion and advancement in agribusiness. Women who step into leadership roles through inheritance often bring transformative changes, such as introducing sustainable practices, streamlining operations, and fostering a more human-centered approach to management. Women have pioneered initiatives such as introducing digital management tools and securing sustainability certifications, which increase both profitability and market access. Similarly, women's leadership has been linked to improved risk management and higher product quality, making their role indispensable for family succession. By fostering a culture of shared responsibility and inclusivity, women contribute to building resilient farming operations that can thrive across generations.

Women's active engagement in family businesses has proven instrumental in retaining younger generations and ensuring the long-term sustainability of these supply chains. By modernizing farming practices and emphasizing quality and innovation, women not only enhance productivity but also inspire the next generation to remain committed to agriculture. This dynamic is especially significant in sectors like cocoa, where the aging population of farmers poses a risk to the continuity of production.

II) Employment / Job Offer

Barriers

Women in Brazilian agribusiness face multiple challenges that limit their professional growth and access to job opportunities. One of the most pressing issues is the overload of responsibilities, as many women juggle double or triple shifts, balancing professional work, household duties, and caregiving. This burden leaves them with limited time to pursue career development or technical training, further perpetuating their marginalization. The absence of adequate childcare infrastructure in rural areas further prevents many mothers from engaging in agricultural work. Without public equipment or facilities to support childcare, women have even more difficulty accessing formal jobs.

A pervasive lack of visibility compounds this issue. Women play vital roles at every stage of agricultural production, from planting and harvesting to post-harvest processing. However, their work often remains invisible or undervalued, as they are commonly regarded as "helpers" rather than legitimate producers. This lack of recognition denies women access to leadership roles and decision-making processes, reinforcing traditional gender hierarchies.

Persistent gender discrimination also limits women's opportunities. Unconscious biases, entrenched cultural beliefs, and discriminatory hiring practices undermine trust in women's abilities, both from male counterparts and sometimes from other women. These biases manifest in subtle but damaging ways, such as dismissive comments or skepticism about women's competence in roles historically dominated by men. Structural barriers, such as limited access to technical training and specialized resources, exacerbate the problem. Male-dominated environments often discourage or exclude women, leaving them without the tools or support needed to advance their careers.

Quotas intended to improve female representation in agribusiness have also faced challenges. When implemented

without comprehensive diversity and inclusion strategies, quotas can backfire, fostering resistance from male colleagues and reinforcing negative stereotypes. True progress requires transformative policies that integrate gender equity into a company's core business strategy, with active participation from leadership.

Finally, women remain underrepresented across all functions in agribusiness, from manual labor in the fields to corporate leadership. In field work, women are often limited to roles tied to family connections rather than formal employment, being underrepresented in hired labour, in particular when they require specific technical training (such as tractor drivers). This exclusionary dynamic further restricts their access to professional growth opportunities, perpetuating inequality in the sector.

Opportunities

Despite these barriers, women in Brazilian agribusiness have demonstrated resilience and adaptability, seizing opportunities to overcome systemic challenges. One of the most significant drivers of progress has been education. Many women pursue higher education degrees to combat gender biases and prove their competence in an industry that often doubts their capabilities. This emphasis on education has enabled women to access roles in sustainability, quality control, and administration, areas increasingly vital to modern agriculture.

The growing focus on sustainability and higher quality products presents another significant opportunity. Women have taken on roles at various levels of seniority in aligning agricultural practices with environmental goals, which are key for preventing deforestation, adapting to climate change, and promoting regenerative farming. Their detailed and meticulous work has proven invaluable, particularly in specialty segments like cocoa and coffee, where women play a critical role in harvesting and post-harvesting processes, ensuring higher-quality products, even though their contributions often remain invisible.

Women's natural attention to detail and care in executing tasks further sets them apart. This quality has been linked to reduced maintenance costs and improved operational efficiency, making women valuable assets in various agribusiness roles. Corporations have also started recognizing the strategic importance of human resources, creating new pathways for women to excel. Performance-based talent development initiatives, often led by women, are gaining traction, as women consistently deliver strong results.

Moreover, companies are beginning to implement anti-discrimination policies, accompanied by appropriate training and grievance mechanisms. These initiatives create safer, more inclusive workplaces, enabling women to thrive professionally. Successful examples of capacity-building programs exclusively designed for women highlight the untapped potential in the sector. When provided with targeted training, women frequently outperform their male counterparts, applying acquired knowledge with greater rigor and precision.

The increasing presence of female agronomists and field technicians further illustrates the potential for gender equity in agribusiness. These women are not only breaking stereotypes but also contributing to higher productivity and innovation in the sector. Their increasing participation creates a dual benefit: it opens new career paths for women while also enabling them to mentor and train others, fostering a cycle of female empowerment in the field. Moreover, as women tend to follow protocols more rigorously, farmers, regardless of gender, who receive technical guidance from female agronomists may achieve better results.

III) Payment/Remuneration

Barriers

Wage inequality persists as a major barrier for women in agribusiness. Women consistently earn lower salaries and average incomes compared to men, even when performing the same roles or contributing equivalent value. This wage gap is further exacerbated by the disproportionate burden of unpaid work, such as household responsibilities, childcare, and subsistence activities, which are traditionally seen as women's domain. These duties limit women's ability to engage in paid work or negotiate for better pay, reinforcing the economic disparity. Additionally, despite often having higher levels of education, women's contributions are undervalued, perpetuating financial dependency and limiting their economic empowerment.

Another obstacle is women's limited ability, driven by cultural discouragement, to negotiate wages and bonuses.

For example, in slaughterhouses and other corporate roles, male employees are often more assertive in advocating for higher bonuses, whereas women typically accept the initial offers made to them. This trend perpetuates unequal earnings and reduces women's financial independence and bargaining power.

A lack of transparency in salary reporting also hinders progress toward equitable remuneration. Many companies fail to disclose pay gaps or comply with the national equal payment legislation, Law 14.611/2023, that was recently enacted, leaving wage disparities unchecked. Without accountability, the systemic undervaluation of women's work continues across agribusiness supply chains.

In some regions or industries, women's financial vulnerability is compounded by their reliance on government aid. Seasonal work, which characterizes much of agribusiness labor, poses a particular challenge: many women fear that accepting such employment could jeopardize their eligibility for social benefits. This fear deters them from pursuing temporary job opportunities, further restricting their earning potential and economic autonomy.

Opportunities

Addressing wage disparities requires enforcing equal pay laws and recognizing the value of women's contributions. Opportunities for addressing remuneration inequality in Brazilian agribusiness are gradually taking shape. The increasing presence of women in leadership positions, particularly in human resources and administrative management, is paving the way for transformative changes in payment structures. Women in these roles can advocate for and implement policies that promote equal pay, ensuring that wage practices are more inclusive and aligned with gender equity goals.

Corporations are also beginning to adopt fair payment policies, including salary audits and pay gaps reporting, recognizing the importance of addressing gender wage gaps. These policies often form part of broader diversity and inclusion strategies, reflecting a growing awareness of the economic and social benefits of gender equity.

Certification schemes represent another powerful tool for promoting equitable remuneration. Programs that require proof of equal pay for certification compel companies to adopt fairer practices to maintain their market access and reputation. These initiatives not only enforce compliance with international standards but also encourage broader cultural and structural shifts within the industry.

Furthermore, women's involvement in specialty markets, such as high-quality coffee and fine chocolate, presents a valuable opportunity for economic advancement, as these markets reward sustainable and quality-driven practices. Women stand to benefit in two key ways: first, they often occupy roles directly linked to quality control and sustainability, and second, they are actively driving the adoption of these processes. Supporting women farmers in obtaining certifications can help them gain access to corporate programs that require certified suppliers, allowing them to secure better remuneration and greater financial stability. At the same time, introducing certifications at the farm level can also improve working conditions and wages for women, as many voluntary sustainability standards include gender equality criteria that must be met and verified.

IV) Access to Resources

Barriers

Women in agribusiness face restricted access to essential resources like land, credit, machinery, and technical assistance, leaving them in a more vulnerable position than their male counterparts. One key challenge is the smaller size of properties managed by women. These smaller farms tend to operate under less favorable conditions and often have lower productivity due to fewer resources and limited access to infrastructure. This disparity further entrenches gender inequality, as women must work harder to achieve comparable outcomes.

Access to credit poses another significant obstacle. Women often lack land ownership, which is traditionally required as collateral for loans, making it difficult for them to secure financing for agricultural investments. Additionally, the demands of managing both professional and household responsibilities leave many women with insufficient time to navigate bureaucratic processes or advocate for their financial needs, further limiting their ability to access capital.

Opportunities

Emerging initiatives and innovative practices offer promising opportunities for improving women's access to resources in Brazilian agribusiness. One such innovation involves loan mechanisms that use purchase contracts as collateral rather than requiring property titles. These mechanisms have proven highly effective for women, who have consistently demonstrated greater commitment to loan repayment. This approach not only expands access to credit but also challenges traditional gender biases by highlighting women's reliability and financial discipline.

Corporate efforts to improve resource accessibility are also creating opportunities for women. Some companies are investing in technologies and innovations that reduce the physical strain of agricultural work, making it more accessible to women. By adopting equipment and practices that mitigate the need for heavy labor, these initiatives enable women to participate more fully in all aspects of agribusiness, leveling the playing field in traditionally male-dominated areas.

V) Leadership

Barriers

Gender biases and societal norms continue to undermine women's participation in leadership, particularly in rural areas. Even when women share land management with their husbands, their role often remains secondary, confined to influence rather than authority. Men are typically the ones making final decisions and signing agreements, further perpetuating the perception that leadership is a male domain.

A lack of targeted leadership training further exacerbates the issue. While women are gaining technical skills and knowledge in agribusiness, they are often excluded from leadership programs that could prepare them for higher-level responsibilities. As a result, they must work significantly harder than their male counterparts to prove their capabilities. Many women who achieve leadership roles have outperformed their male peers, but this unequal effort reinforces systemic inequities.

Leadership opportunities for women are often limited to specific areas such as quality control, ESG (environmental, social, and governance), sustainability, and human resources. These roles, though vital for long-term business resilience and sustainability, are typically perceived as less influential in driving immediate profitability compared to commercial roles often dominated by men. This division reinforces gender stereotypes and sidelines women from high-impact decision-making positions.

Societal expectations also pose a significant barrier. In some cases, women face pressure to avoid earning more than their husbands, leading to resignation or reluctance to pursue leadership opportunities. These cultural pressures create an additional layer of complexity for women navigating career advancement in agribusiness.

Opportunities

The pursuit of higher education has proven to be a powerful tool for women in overcoming discrimination and accessing leadership roles. By attaining advanced degrees, women demonstrate their qualifications and expertise, challenging traditional biases and positioning themselves as competent leaders in the sector.

Businesses and farms led by women frequently adopt a more humanized approach to management. Attention to detail, inclusivity, and strong employee engagement are hallmarks of female-led operations, which foster collaborative environments and better working conditions. Rural establishments under women's leadership are often more inclusive, setting examples of equitable and people-centered management practices.

The corporate commitment to diversity and inclusion is also creating pathways for women to assume leadership roles. Companies that prioritize gender equity are implementing robust policies and governance frameworks, including specific targets for women in leadership, diversity training for executives, and programs focused on talent acquisition, retention, and acceleration. Targets, metrics and indicators ensure that these initiatives are tracked and enforced, creating more structured opportunities for women to advance.

Female leaders often excel in risk management, a skill increasingly critical in the face of climate change and extreme weather events. Their data-driven decision-making enables more resilient and adaptive strategies, highlighting their value in addressing emerging vulnerabilities in

agribusiness. This ability positions women as essential contributors to the sustainability and growth of the sector..

VI) Representation and Recognition

Barriers

Persistent lack of self-recognition among women in the agricultural sector undermines their confidence and visibility. Many women fail to acknowledge their abilities or the vital roles they play, which hinders their willingness to advocate for themselves or seek leadership opportunities. This internalized underestimation of their value perpetuates their marginalization.

Women remain largely underrepresented in strategy-setting institutions, limiting their influence on key decisions. Their presence in political organizations such as unions, as well as professional and productive associations, is minimal. Even within these organizations, few women hold decision-making roles. This lack of representation prevents them from shaping policies or driving systemic change, leaving crucial decisions in the hands of male-dominated committees.

In rural areas, efforts by women to organize or advocate for independence often face societal pushback. Women-led movements are sometimes viewed with suspicion by their communities, especially if they are perceived as challenging traditional gender norms. Without an "appropriate narrative" that aligns with community expectations, these movements risk being misunderstood or dismissed. This stigma not only discourages women from participating in collective efforts but also limits their visibility as agents of change.

Opportunities

Dedicated spaces for women in agribusiness are gaining traction, providing platforms to enhance their representation and recognition. Groups such as "Women in Agribusiness" and technical conferences tailored to female professionals offer opportunities for networking, knowledge sharing, and skill development. These initiatives create environments where women can showcase their expertise and collectively advocate for greater visibility and influence.

Social media and traditional media are playing a pivotal role in highlighting the accomplishments of women in the sector. Campaigns and features, such as Lista Forbes: As 50 Mulheres que Levam o Agro do Brasil para o Mundo, shine a spotlight on female leaders, breaking stereotypes and inspiring others to pursue similar achievements. These platforms amplify the contributions of women, bringing their stories to wider audiences and challenging the perception that agribusiness is a male-dominated field.

Specialty segments like cocoa and coffee are also opening new doors for recognition. Quality contests and initiatives dedicated to female producers are emerging, providing women with opportunities to brand their products and showcase their skills. These contests not only elevate the visibility of women in these industries but also create tangible economic benefits, empowering them to take greater control over their roles in the value chain.

Applying the Gender-Based Constraints (GBCs) Framework

The analysis presented in this report highlights that gender-related challenges across agricultural supply chains are not isolated or incidental, but instead reflect systemic patterns of disadvantage affecting women's participation, remuneration, access to resources, and decision-making power. To synthesize these findings in a structured and comparable way, the report concludes by applying the Gender-Based Constraints (GBCs) framework.

The concept of Gender-Based Constraints is widely used in gender and agricultural development research and is defined by the Food and Agriculture Organization (FAO)[67] as factors that systematically disadvantage women relative to men due to entrenched social norms, institutional biases, and unequal power relations within agricultural and agribusiness systems. These constraints operate across multiple dimensions, including employment conditions, income and remuneration, access to productive resources, leadership opportunities, and representation.

Applying the GBCs framework allows the diverse issues identified in the preceding sections to be analytically consolidated, moving beyond descriptive findings toward a clearer understanding of their underlying structural drivers.

In this section, the constraints identified throughout the report are therefore organised according to the key thematic areas analysed above, enabling a consistent assessment of both barriers and entry points for change.

By concluding with this framework, the report aims to support the development of targeted and strategic responses that address root causes rather than symptoms, thereby contributing to gender equity, women's economic empowerment, and more sustainable and inclusive agribusiness systems.

Table 6: Gender-Based Constraints to Women's Family Succession

Family Succession				
Stakeholder	**GBCs**	**Cause/factors leading to GBCs**	**Consequences for Women**	**Actions to address GBCs**
Producers / farmers	Lack of formal land title	The lack of formal land ownership affects both men and women in rural areas of Brazil; however, excessive bureaucracy and high costs disproportionately impact women. Many women, who were not formally involved in property-related decisions, face additional burdens when attempting to secure legal ownership. This situation makes them more vulnerable to external pressures, including from other producers who may push them to sell their land.	Without formal land titles, women face additional difficulties accessing financial resources.	Development of financial mechanisms that do not require land title as collaterals. Establishment of supply contracts that include other family members (husband and wife, for example), in order to secure the continuity of the agreements in the event of the passing of the land owner.
	Delayed succession	Cultural norms favoring male succession, complex legal processes, costly documentation	Women inherit land later, face delays in leadership, and struggle with ownership rights	Provide legal assistance, and support female successors through family engagement initiatives
	Skepticism toward women's management abilities and lack of leadership training	Deep-seated gender biases, lack of exposure to farm management, and absence of female mentors	Women struggle to gain credibility among male family members, face higher scrutiny, and remain in secondary roles	Leadership training, mentorship programs, and equal access to agricultural education

Table 7: Gender-Based Constraints to Women's Employment and Job Offer

Employment and Job Offer				
Stakeholder	**GBCs**	**Cause/factors leading to GBCs**	**Consequences for Women**	**Actions to address GBCs**
Women Workers	Overload of responsibilities (balancing work, household duties, and caregiving)	Lack of childcare infrastructure, cultural expectation that women manage domestic tasks	Limited time for professional growth, reduced career mobility, and exclusion from training opportunities	Expand rural childcare facilities, promote shared household responsibilities, and implement flexible work policies
Producers / farmers and value chain companies	Gender bias in hiring and promotion	Unconscious biases, male-dominated workplaces, lack of women in leadership roles	Women receive fewer job offers, are confined to lower-paying roles, and have limited career advancement opportunities	Implement gender-inclusive hiring policies and unconscious bias training
Producers / farmers	Limited access to technical training and career development	Male-dominated training environments, lack of female mentors, and limited outreach to women in rural areas	Women lack qualifications for technical and leadership roles, leading to underrepresentation in skilled agribusiness jobs	Expand training programs targeted at women, promote female leadership in cooperatives, and provide scholarships for women in agriculture

Employment and Job Offer

Stakeholder	GBCs	Cause/factors leading to GBCs	Consequences for Women	Actions to address GBCs
Producers / farmers	Women's contributions remain invisible or undervalued	Perception of women as "helpers" rather than producers, exclusion from decision-making spaces	Women have less bargaining power, lower recognition, and limited access to leadership roles	Increase visibility of women's contributions through data collection and representation in industry forums
Value chain companies	Challenges in implementing gender quotas and inclusion strategies	Resistance from male colleagues, lack of structured diversity strategies, and negative stereotypes	Quotas alone do not create an inclusive environment, and women face workplace hostility	Adopt comprehensive diversity and inclusion strategies alongside quotas

Table 8: Gender-Based Constraints to Women's Payment / Remuneration

Payment / Remuneration

Stakeholder	GBCs	Cause/factors leading to GBCs	Consequences for Women	Actions to address GBCs
Women Workers	Lower wages compared to men for equal work	Gender biases in pay structures, undervaluation of women's contributions, and lack of transparency in wage reporting	Reduced financial independence, economic insecurity, and limited career progression	Strengthen equal pay policies and implement wage transparency initiatives
Value chain companies	Women struggle to negotiate fair wages and bonuses	Cultural discouragement from wage bargaining, lack of collective representation, and fear of retaliation	Women accept lower salaries, lack confidence in financial negotiations, and remain economically vulnerable	Provide negotiation training and legal support for wage-related grievances
Certification Bodies & Market Regulators	Companies lack incentives to address wage gaps	Weak market demand for fair pay certification, voluntary rather than mandatory compliance	Wage equity remains a secondary concern, limiting women's earning potential	Introduce certifications that require wage equity
Producers / farmers	Women's financial vulnerability in seasonal work and informal labor	Fear of losing social benefits, lack of formal employment contracts, and exclusion from financial planning opportunities	Women avoid seasonal jobs, reducing their economic participation and income stability	Provide financial planning resources, and adjust policies to protect social benefits

Table 9: Gender-Based Constraints to Women's Access to Resources

Access to Resources

Stakeholder	GBCs	Cause/factors leading to GBCs	Consequences for Women	Actions to address GBCs
Producers / farmers	Difficulty securing loans and credit	Lack of land ownership as collateral and complex loan application processes	Limited ability to invest in technology, infrastructure, and business expansion	Alternative credit mechanisms using purchase contracts or cooperative models
	Smaller farm sizes, limited access to modern machinery and technical assistance	Women land owners are mainly family farms and land ownership is primarily obtained mainly by inheritance, cultural barriers and lower access to financial resources	Reduced productivity and total production volumes, leading to lower income and financial vulnerability	Promote low cost and sustainable techniques that increase added value of agriculture products

Table 10: Gender-Based Constraints to Women's Leadership

Leadership				
Stakeholder	**GBCs**	**Cause/factors leading to GBCs**	**Consequences for Women**	**Actions to address GBCs**
Producers / farmers	Limited leadership opportunities; exclusion from decision-making	Deep-rooted gender biases; perception that leadership is a male domain	Women remain in secondary roles with little authority or recognition	Leadership training and mentoring programs for women
Producers / farmers and value chain companies	Lack of structured diversity & inclusion strategies to support women's advancement	Absence of specific targets and policies for gender equity in leadership	Fewer women in executive roles and key decision-making positions	Foster networking and establish corporate diversity, equity, and inclusion (DEI) targets
Rural Communities	Societal expectations discourage women from pursuing leadership roles	Cultural pressures; gender norms emphasizing male authority	Women hesitate to advance or resign due to family/social pressures	Mentoring programs; foster the creation and strengthening of women's associations

Table 11: Gender-Based Constraints to Women's Representation and Recognition

Representation and Recognition				
Stakeholder	**GBCs**	**Cause/factors leading to GBCs**	**Consequences for Women**	**Actions to address GBCs**
Producers / farmers	Lack of self-recognition, internalized underestimation of value, lack of visibility.	Cultural norms, gendered expectations, lack of role models, low media representation.	Marginalization, decreased confidence, limited career advancement, exclusion from leadership roles.	Self-empowerment programs, mentorship networks, media campaigns to increase visibility.
Rural Communities	Societal resistance to women-led movements and organizations, stigma against non-traditional roles.	Traditional gender roles, lack of support for women's leadership.	Limited participation in community decision-making, stigmatization of women leaders.	Awareness campaigns, community workshops promoting female leadership and breaking stereotypes.
Specialty Markets (e.g., Cocoa & Coffee)	Limited recognition of women's contributions, especially in production and quality.	Gender norms in recognition of value, market discrimination, and visibility challenges.	Women's contributions underappreciated, less market access, lower income potential.	Quality contests, women's recognition awards, certification programs that highlight women's work.

Conclusion

The women in Brazilian agribusiness value chains highlight both the persistence of structural inequalities and the transformative potential of inclusive practices across sectors. This study has uncovered the significant, though often invisible, role of women in six key agricultural chains, cocoa, coffee, sugarcane, livestock, citrus, and soy, while identifying systemic barriers to their full participation and leadership. Through bibliographic research, interviews, and data analysis, six critical dimensions emerged as strategic for promoting gender inclusion in agribusiness: family succession, employment and job offer, remuneration, access to resources, leadership, and representation and recognition.

At the same time, the study reveals clear opportunities for transformation. These include the emergence of women's networks and associations, the presence of female-led enterprises, and increased engagement by women in sustainable production practices. Notably, across all chains, women demonstrate a strong commitment to environmental stewardship and community development, positioning them as key actors in sustainable land use strategies. Based on these findings, targeted actions can be defined for private sector actors and investors. These include: adopting inclusive procurement policies that value products from women-led farms; ensuring gender-sensitive labor policies and grievance mechanisms; supporting technical training and market access for women; designing financial products adapted to women's realities and constraints; strengthening partnerships with grassroots women's organizations.

The intersection of gender and climate is particularly relevant in this context. Addressing gender dynamics within sustainable land use finance can simultaneously strengthen social inclusion and environmental performance. For example, in cocoa and soy-producing regions, women play essential roles in soil conservation, diversified cropping, and water management, yet are often excluded from climate-related decision-making and benefit-sharing. Integrating gender perspectives into sustainable finance frameworks promoted by investors in the sector can therefore enhance both the inclusivity and the long-term impact of land use investments.

There is also a strong business case for addressing gender barriers. Companies that foster gender equality in their operations and supply chains benefit from increased productivity, improved reputation, better risk mitigation, and stronger employee retention. In value chains with high labor intensity and growing sustainability demands, inclusive practices are not only ethical but strategic.

In short, closing gender gaps in Brazilian agriculture is both a moral imperative and a lever for economic and environmental resilience. By embedding gender equity in business models and financial strategies, private sector actors and investors can contribute to more inclusive, productive, and sustainable value chains—unlocking benefits for women, communities, ecosystems, and the economy at large.

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