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ABSTRACT

The article characterizes who the cocoa-producing women of the Transamazon region, in the Brazilian Eastern Amazon, are by analyzing sociodemographic and land-tenure aspects based on primary data. The study is based on structured questionnaires applied to 49 cocoa production units managed by women in the municipalities of Altamira, Brasil Novo, Medicilândia, and Uruará between July and August 2023. The analysis considers variables such as age, educational level, migratory origin, and access to land. The results identify profiles marked by advanced age, basic formal education, and migratory trajectories, characteristics that reveal structural inequalities in access to land and productive resources. This characterization highlights gender inequalities that limit women's access to land, productive resources, and public policies, despite their central role in Amazonian family farming.

Keywords: Cocoa farming. Gender. Amazon. Rural women.

RESUMO

O artigo caracteriza quem são as mulheres cacauicultoras da região da Transamazônica, na Amazônia Oriental brasileira, analisando aspectos sociodemográficos e fundiários a partir de dados primários. A pesquisa baseia-se em questionários estruturados aplicados em 49 unidades produtivas de cacau administradas por mulheres nos municípios de Altamira, Brasil Novo, Medicilândia e Uruará, no período de julho a agosto de 2023. A análise contempla variáveis como idade, escolaridade, origem migratória e acesso à terra. Os resultados identificam perfis marcados por idade avançada, escolaridade básica e trajetórias migratórias, características que evidenciam desigualdades estruturais no acesso à terra e aos recursos produtivos. Essa caracterização configura desigualdades de gênero que limitam o acesso das mulheres à terra, aos recursos produtivos e às políticas públicas, apesar de seu papel central na agricultura familiar amazônica.

Palavras-chave: Cacauicultura. Gênero. Amazônia. Mulheres rurais.

INTRODUCTION

Brazil is one of the world's leading cocoa-producing countries, ranking sixth in area under cocoa (*Theobroma cacao* L.) cultivation. In 2024, national production reached 297,509 metric tons, with the states of Pará and Bahia accounting for approximately 92% of the total; the remaining 8% was produced in Espírito Santo, Rondônia, Amazonas, and Roraima (IBGE, 2024).

The Transamazon Region, located in southwestern Pará within the Altamira geographic microregion, is the state's leading cocoa-producing area and has been a major center of cocoa farming expansion in Brazil since the 2000s (Calvi *et al*., 2020; Santos *et al.*, 2023). It encompasses the municipalities of Altamira, Anapu, Brasil Novo, Medicilândia, Pacajá, Senador José Porfírio, Uruará, and Vitória do Xingu. In 2024, the region had more than 104,000 ha under cocoa cultivation and produced approximately 92,000 metric tons of cocoa beans, with an average yield of 883 kg/ha—well above the national average of 482 kg/ha (IBGE, 2024). Although the Transamazon Region and the Altamira geographic microregion cover the same area, this article uses "Transamazon Region" throughout because it is the established name for Pará's main cocoa-producing region.

Despite the region's rich biodiversity, vast territory, favorable soil and climatic conditions for cocoa production, and strong growth in both production and the cocoa market, women's role in the cocoa value chain has received relatively little attention. Data from the 2017 Agricultural Census show that hundreds of women manage agricultural establishments with permanent crops across these municipalities. Pacajá had the largest number of women managers (562), followed by Uruará

(524), Medicilândia (501), Altamira (442), Anapu (305), Senador José Porfírio (304), Brasil Novo (206), and Vitória do Xingu (161). Most of these women managed family-farming establishments (IBGE, 2017). Despite their substantial presence as managers of farms producing permanent crops such as cocoa, women remain underrepresented in formal leadership and decision-making spaces, including cooperatives and producer associations.

This disparity is particularly evident in Medicilândia, the largest cocoa-producing municipality in both the Transamazon Region and Brazil. Women's labor is essential at every stage of the cocoa value chain but remains underrecognized. In many cases, women are not formally recognized as rural workers, which can restrict their access to public policies, including labor and social security benefits (Lima and Garcia, 2023).

These constraints form part of a broader gendered pattern in rural economies. Rural labor has historically been organized along gendered lines, with men more closely associated with income-generating activities and formal employment, while women have typically combined productive activities with domestic responsibilities and production for household consumption (Butto and Dantas, 2011).

Women's productive and social contributions to rural areas have nevertheless received increasing attention in debates on rural development, both in empirical research and through the incorporation of gender concerns into public policy (Staduto; Nascimento; Souza, 2013). Lagarde (1996) argues that development processes that include women would improve living conditions and prospects for survival at community and national levels. Conversely, excluding half the population from access to goods, resources, and decision-making spaces reinforces a development model that prioritizes male interests and perpetuates inequality and poverty.

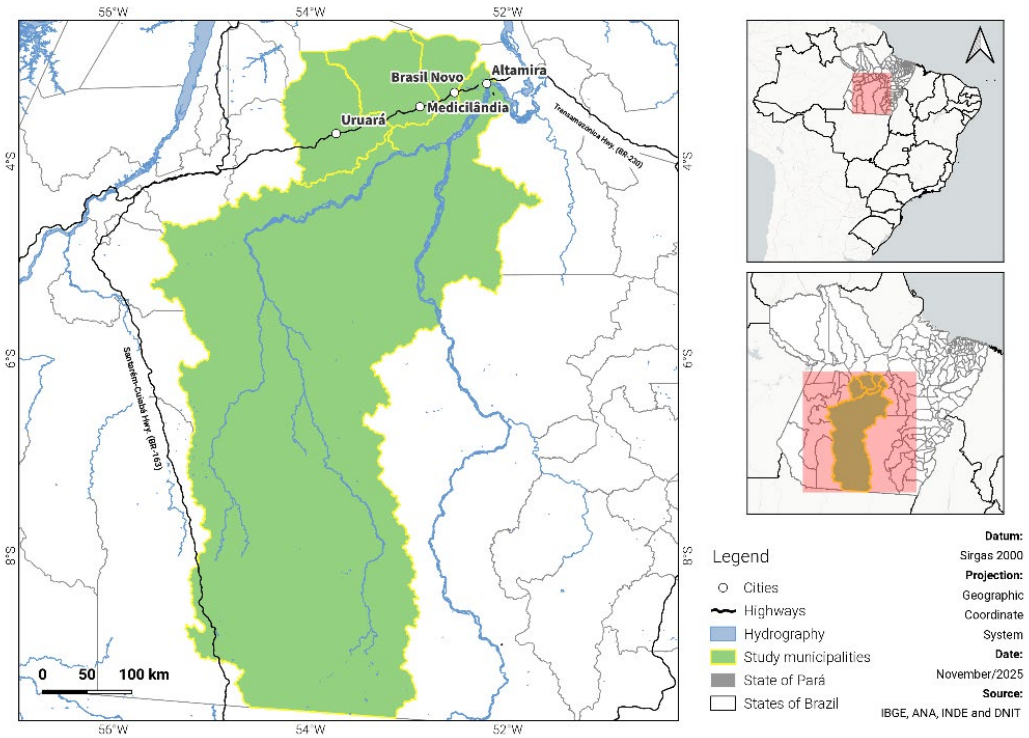
Evidence from initiatives designed to expand women's participation in agriculture, farm management, and decision making further underscores the importance of such inclusion. These initiatives have been associated with reductions in household poverty, greater sustainability and productivity of agricultural systems, and improved food security (FAO, 2011). In the Transamazon Region, strengthening women's participation in these areas may likewise increase their agency and influence throughout the cocoa value chain.

Identifying women who manage cocoa production units is an important step towards understanding their position within the region's agricultural economy. This study characterizes the sociodemographic profile of women managing cocoa production units in the Transamazon Region and examines how gender, age, and race intersect to shape inequalities in access to land and farm management. By documenting these characteristics, the study highlights women's contributions to Amazonian cocoa farming and broadens understanding of their role in the region's family-farming systems.

METHODS

Fieldwork was conducted in selected areas of the municipalities of Altamira, Brasil Novo, Medicilândia, and Uruará (Figure 1), encompassing rural establishments located along numerous local roads and the Transamazon Highway (BR-230), between km 15 and km 140 west of Altamira. Collectively, the four municipalities cover approximately 184,900 km^2 and accounted for approximately 52% of cocoa bean production in the state of Pará in 2024 (IBGE, 2024).

Figure 1 | Study municipalities.



Prepared by: Lucas Lima (2025).

The field data were derived from a long-term longitudinal panel survey investigating how major colonization programs and infrastructure projects have shaped changes in agricultural production systems in the Brazilian Amazon. The original sample comprised 402 rural properties covering 404,700 ha and encompassing 3,916 lots defined according to the original land tenure grid established by the National Institute for Colonization and Agrarian Reform (Incra). The properties were randomly selected and stratified into cohorts based on the timing of migrant settlement on the lots (Calvi, 2019).

The panel study collected data at four time points: 1997/98, 2005, 2015, and 2023. The present study draws on data from the most recent survey, conducted in 2023. Among the 402 sampled properties, 236 produced cocoa, and 49 were managed by women. These 49 establishments comprised the final analytical sample. Importantly, they represent the entire set of women-managed establishments identified within the original probability sample, rather than a separately selected subsample.

This stage of the study was funded by the São Paulo Research Support Foundation (FAPESP) (grant nos. 2012/51465-0 and 2019/17113-9). Fieldwork was approved by the Research Ethics Committee (CAAE no. 68628123.7.0000.8142).

Between July and August 2023, questionnaires were administered using tablets equipped with Survey 123 software integrated with ArcGIS for recording responses and geolocating rural properties. Whenever possible, interviews were conducted with both household heads or with individuals most knowledgeable about its productive and domestic activities. For the 49 properties included in the present study, the women themselves were interviewed.

The questionnaire covered land tenure, housing conditions, age, racial, identification, educational attainment, property size, economic activities, and other socioeconomic variables.

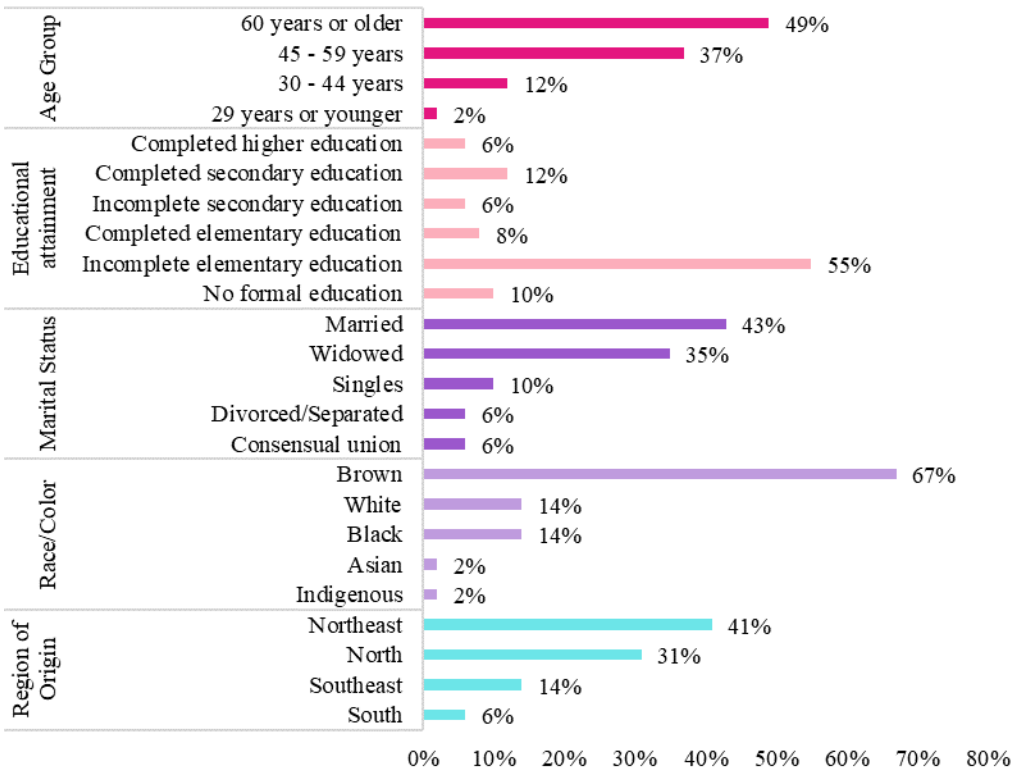
Data analysis focused on cocoa-producing establishments, with particular attention to those managed by women. The data were initially organized and cleaned in Microsoft Excel to ensure consistency and accuracy. Subsequently, the data were imported into Looker Studio, where charts and pivot tables were generated to identify patterns and trends related to women's participation in cocoa farming.

RESULTS AND DISCUSSION

SOCIODEMOGRAPHIC PROFILE

Figure 2 summarizes the sociodemographic profile of the women cocoa farmers interviewed, including age, educational attainment, marital status, self-identified race/color, and region of origin.

Figure 2 | Sociodemographic profile of women cocoa farmers in the Transamazon Region.



Source: Field survey (2023). Prepared by the authors.

Nearly half of the women interviewed were aged 60 years or older (49%), while 37% were aged 45–59 years and 12% 30–44 years, and only 2% were aged 29 years or younger. Educational attainment was generally low: 55% had not completed elementary education and only 12% had completed secondary education, while 10% had no formal education. Smaller proportions had completed elementary education (8%), higher education (6%), or secondary education (6%).

Regarding self-identified race/color, 67% of the women identified as Brown (parda), 14% as White, 14% as Black, and 2% each as Asian and Indigenous. These proportions are similar to those reported in the 2017 Agricultural Census, in which 62.6% of women managing family-farming

establishments in the study municipalities identified as Brown (IBGE, 2017). This close correspondence suggests that the racial composition of the study sample is broadly consistent with that of women family farmers in these municipalities.

The participants' origins reflect the region's history of migration and settlement. Most came from other parts of Brazil, particularly the Northeast (41%) and North (31%), followed by the Southeast (14%) and South (6%). Some participants, however, were born in the Transamazon Region to parents who had migrated from elsewhere in Brazil, which explains the relatively high proportion classified as originating from the North.

Married women accounted for 43% of the sample, followed by widows (35%). Single women represented 10% of the sample, 6% were divorced or separated and another 6% were in consensual unions. The high proportion of widows is noteworthy given that 49% of the participants were aged 60 years or older. Widowhood is more common among older women, and this age distribution is consistent with the feminization of aging, a demographic pattern associated with women's greater longevity and their predominance among Brazil's older population (Cepellos, 2021).

Older women may assume responsibility for family farms for several reasons, including preserving family assets, maintaining agricultural production, and exercising greater autonomy as traditional family roles change. Their increasing responsibility for farm management may therefore reflect not only changes in family structure but also broader structural constraints in rural areas, such as limited generational succession and the lack of effective policies to encourage younger people to remain in rural areas. Although farm succession was not directly examined in this study, the age profile of the women points to broader challenges for maintaining agricultural production and transferring farm management across generations.

A similar generational pattern has been reported in other cocoa-farming contexts. Trzeciak (2025) found that women managed 11% of properties among older farmers in the Transamazon Region, compared with 21% among younger producers. The higher proportion among younger producers points to greater female participation in farm management and a gradual reconfiguration of gender roles in rural areas. However, women remain a minority in leadership positions, suggesting that structural barriers to their participation in decision-making persist.

Age compounds the gender inequalities faced by older women cocoa farmers. Their experiences reflect the cumulative effects of belonging to generations with limited access to education and technical training, which continue to constrain their recognition and autonomy as agricultural producers. These overlapping inequalities illustrate how gender, age, and class can reinforce social hierarchies (Collins and Bilge, 2020).

Limited access to education has also shaped the opportunities available to these women. Pinheiro *et al.* (2022) found a similar pattern among women cocoa producers in Espirito Santo, where most had completed no more than elementary education. Limited schooling can restrict access to technology, farm management, public policies, and decision-making processes (Tirelli and Pedroso, 2017), while undermining the development of self-confidence and autonomy (Santos and Rios, 2023). Sen (2000) argues that education expands individual capabilities, giving people greater scope to make social and productive choices. At the same time, the present findings point to gradual progress across generations: 90% of the women had received at least some formal education, even though many had not completed it.

The predominance of Brown women in the sample is consistent with the racial composition of the Brazilian population. In the 2022 Demographic Census, 45.3% of Brazilians identified as Brown, compared with 43.5% who identified as White, making the former the largest racial group for the first time since 1991. The proportion is substantially higher in northern Brazil, where 67.2% of the population identified as Brown, rising to 69.9% in Pará (IBGE, 2023).

The women's racial self-identification reflects broader processes of racial identity formation in Brazil. The category "Brown" has historically been used to soften or distance identification from Blackness (Maio and Santos, 1996), which can make it difficult for women to identify as Black. Silva (2023) similarly found that many Black women did not identify as Black until adulthood, often after collective experiences prompted them to reconsider their physical characteristics and racial identity. These experiences can lead women to reinterpret their racial identity in response to racism and social stereotypes.

Understanding these experiences requires an intersectional perspective on race and gender, particularly because both shape the power relations that influence women's lives (Collins and Bilge, 2020). Among women cocoa farmers, difficulties in claiming a Black identity may reflect the broader social invisibility of Black women in Brazil. Structural racism and unequal power relations can delay the

development of a consolidated Black identity, contributing to what has been described as a delayed process of self-recognition across different social contexts in Brazil.

Household structure may also shape women's participation in agricultural production. The average household comprised only 2.9 people, indicating a predominance of small family units that may limit the family labor available for farm activities. Smaller households may therefore increase reliance on hired labor, while placing greater demands on women who combine agricultural work with unpaid domestic labor (Schneider *et al.,* 2020; Meus and Ethur, 2021).

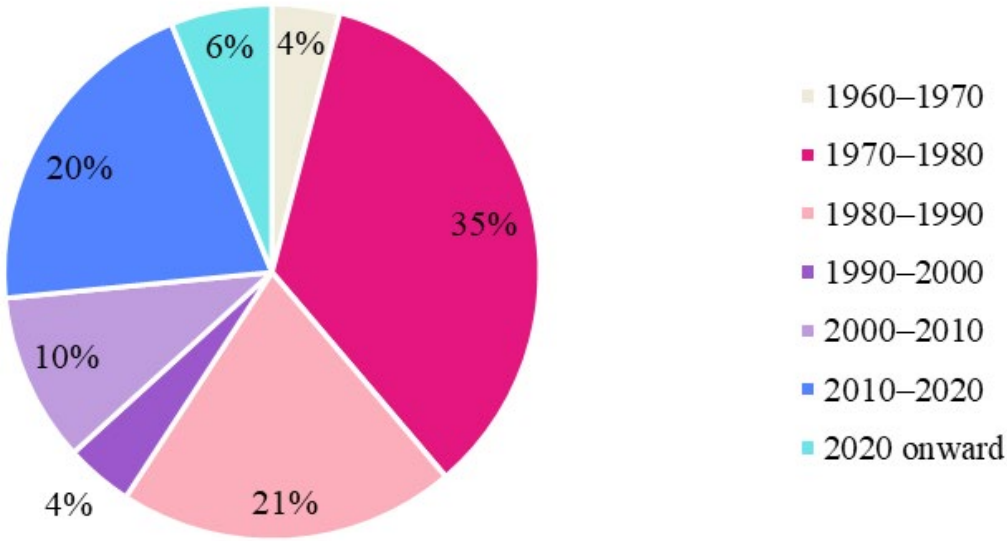
Marital status is likewise relevant to women's access to land and their recognition as farm managers. Historically, marriage has typically provided an important pathway to land access within a patriarchal system in which farming and property rights have been associated primarily with men (Tirelli and Pedroso, 2017; Paulilo, 2003). The women in this study, however, also described pathways to greater autonomy: some assumed responsibility for farms after separation, inherited land directly, or acquired land independently. These trajectories point to a gradual expansion of women's agency in Amazonian family farming, even as their opportunities remain shaped by intersecting gender, racial, and generational inequalities.

The women's migration histories reflect the broader settlement history of the Transamazon Region. Their geographic origins are closely linked to colonization policies implemented from the 1970s onward under the National Integration Program (PIN), which sought to settle the so-called "demographic voids" of the Amazon by attracting families from across Brazil with promises of land and economic opportunity (Silva Neto, 2001). These policies established the region as a major destination for migrants and contributed to the formation of a socially diverse population, with a large proportion originating from the Northeast.

Migration intensified again in the 2010s with the construction of the Belo Monte Hydroelectric Plant, which brought new settlement dynamics and further diversified the region's socioeconomic and cultural landscape (Freire; Lima; Silva, 2018; Johansen *et al.,* 2024).

Land acquisition histories also reflect these successive waves of migration and settlement. Of the women interviewed, 35% acquired their properties between 1970 and 1980 (Figure 3), when government efforts to expand access to land in the region were particularly strong.

Figure 3 | Property acquisition period.

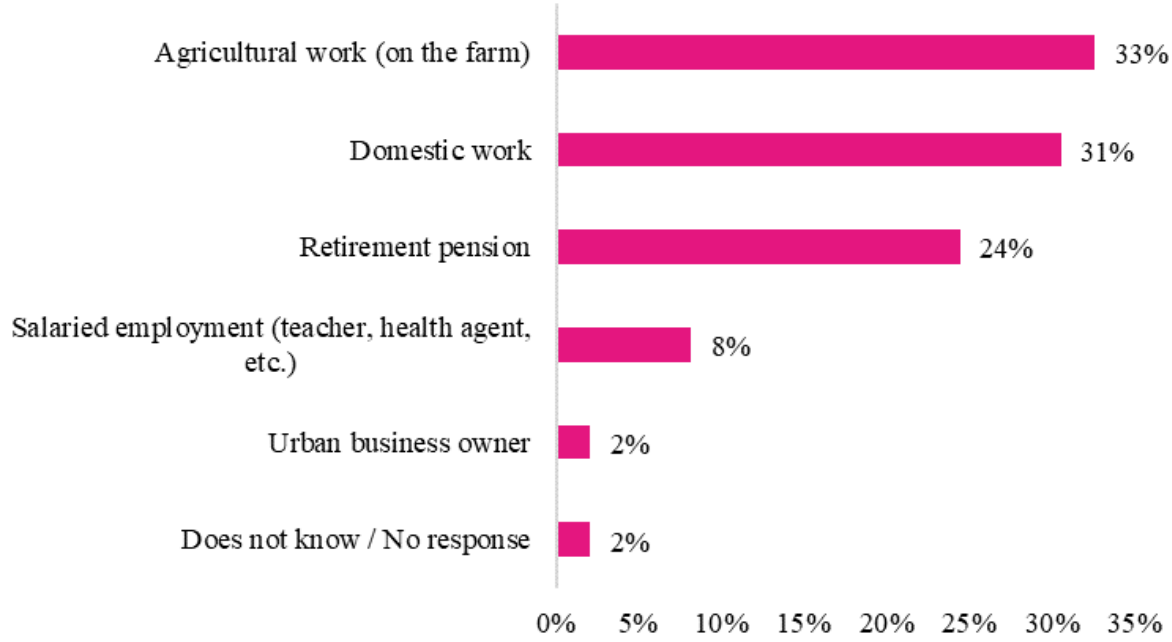


Source: Field survey (2023). Prepared by the authors.

The women's occupational profiles also reveal how migration history and family responsibilities shape their participation in agricultural production. Earlier migrants tend to be more closely involved in farm activities and property management, whereas women who arrived more recently show greater occupational diversification. Overall, 33% of the women reported activities related to the property, while 31% were engaged in domestic work, 24% received retirement pensions, 8% held salaried jobs—including positions as teachers, service workers, or health agents—and 2% were business owners in the city (Figure 4). For many women, these roles overlap rather than occur separately, combining agricultural work with unpaid domestic responsibilities and creating a substantial work burden.

This accumulation of responsibilities can restrict women's access to training and to opportunities for diversifying their economic activities, reinforcing reliance on family support networks and social security programs (Meus and Ethur, 2021; Schneider *et al*., 2020).

Figure 4 | Main occupation of the women interviewed.



Source: Field survey (2023). Prepared by the authors.

Social security benefits are an important source of financial support for these households, particularly given the relatively advanced age of many of the women interviewed. At least one person received a retirement or survivor's pension in 71% of households; 51% had one beneficiary, 18% had two and 2% had three.

Only 29% of households had no member receiving either type of benefit (Table 1). This high prevalence underscores the role of rural social security in supporting household income and providing financial stability as farming families age.

Table 1 | Social security and other benefits.

Type of benefit	No. of people	Percentage (%)
Retirement pension or survivor's pension	0	29
	1	51
	2	18
	3	2
Other benefits	0	84
	1	14
	2	2
Bolsa Família	Yes	22
	No	77

Source: Field survey (2023). Prepared by the authors.

Social security and other forms of public assistance played different roles in the households studies. Beyond retirement and pension benefits, 16% of households received at least one supplementary benefit, such as the Continuous Cash Benefit (Benefício de Prestação Continuada – BPC), maternity allowance, or other forms of assistance, whereas 84% received none. Bolsa Família was reported in 22% of households. This relatively low proportion may be related to the predominantly older age profile of the women interviewed: most were over 60 years old, and many had no direct dependents, factors that may limit eligibility for the program.

Retirement pensions, in particular, play an important role in the economic security of these households. They were the main source of income for 24% of the women interviewed, a finding closely tied to both the advanced age of the sample and the limited income generated by agricultural activities. In many cases, farm income was lower than the corresponding pension benefit, making retirement income an important source of financial stability. Its significance, however, extends beyond income: retirement pensions can provide women with greater financial autonomy, social recognition, and empowerment (Correia; Chies; França, 2020).

Income-generating opportunities outside the farm were uncommon. Only 8% of the women held salaried jobs, and 2% were urban business owners. This limited occupational diversification underscores the need for policies that expand rural women's access to training, paid employment, and entrepreneurship, particularly in settings where gender inequalities continue to constrain their economic opportunities.

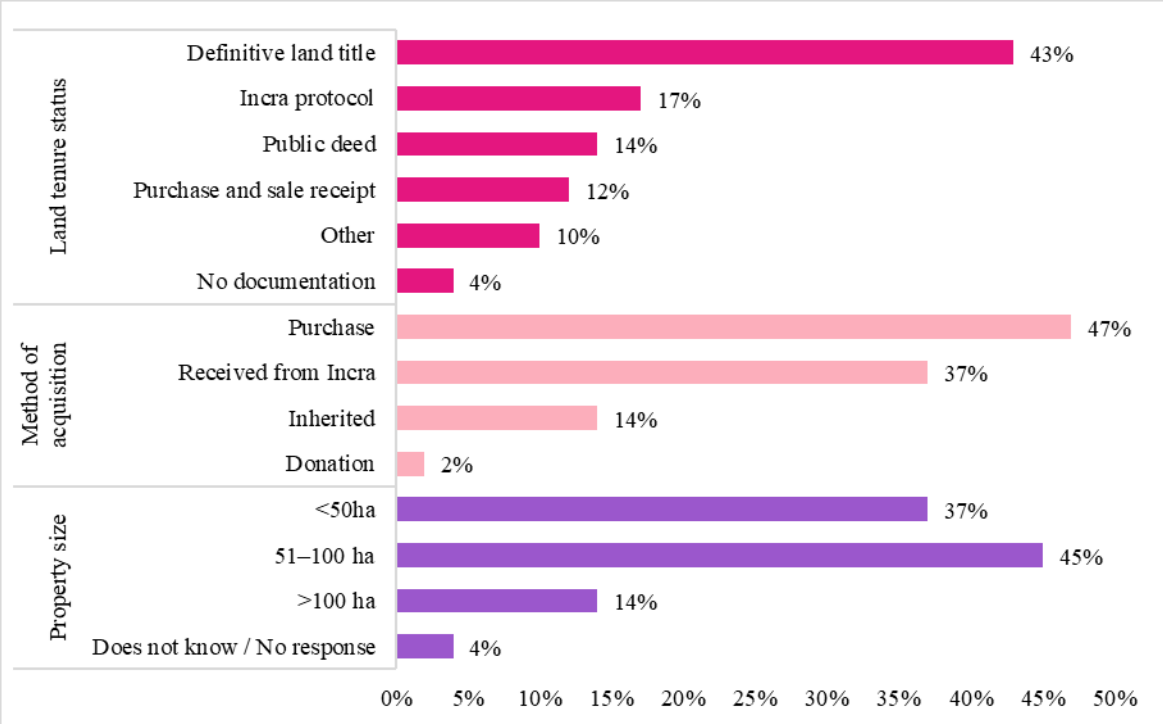
The limited participation of women in paid employment and other income-generating activities reflects the broader gendered division of labor in agriculture. Women's agricultural work has historically been undervalued and frequently regarded as an extension of domestic labor, despite its substantial contribution to sustainable rural development (Siliprandi, 2017).

Overall, the women cocoa farmers in the Transamazon Region were predominantly older, Brown-skinned, and had low levels of educational attainment. Most combined agricultural work with unpaid domestic responsibilities and remained economically vulnerable because of limited income-generating opportunities and the lack of well-established public policies. Nevertheless, their work remains fundamental to the productive base of family cocoa farming in the region.

RURAL PROPERTY PROFILE

Secure land tenure is a key issue for the women cocoa farmers in this study. Although many acquired their properties through purchase or government land-allocation programs, formal documentation remains uneven, potentially limiting their legal security and access to productive resources. Figure 5 summarizes land tenure status for the properties, along with acquisition methods and size.

Figure 5 | Characteristics of rural properties managed by women cocoa farmers in the Transamazon Region.



Source: Field survey (2023). Prepared by the authors.

Purchase and government land allocation programs were the main routes through which the women acquired their properties. Almost half (47%) had purchased their land, while 37% had received it from the National Institute for Colonization and Agrarian Reform (INCRA) through land tenure formalization programs. Inheritance accounted for 14% of acquisitions, and donations for the remaining 2%. Acquisition, however, does not necessarily mean secure legal ownership. Although 43% of the properties had definitive land titles and another 14% had public deeds, 17%

were documented only by an INCRA protocol indicating that land tenure formalization was underway. A further 12% had purchase and sale receipts, 10% had other forms of documentation, and 4% had no documentation at all. Thus, only 57% of the properties had one of the two forms of formal documentation identified in the study as evidence of land tenure: a definitive title or a public deed. The remaining properties had varying degrees of documentary uncertainty.

This gap has important implications because formal land tenure can provide legal stability and facilitate access to rural credit, technical assistance, and other agricultural support programs. For women managing family farms, secure land rights can also strengthen economic autonomy and help sustain household food security (Nascimento, 2023).

The persistence of properties with no formal documentation or only informal records highlights continuing obstacles to effective land tenure formalization. Such obstacles may be especially consequential for women, whose access to land has historically been constrained by cultural and institutional barriers (Rodrigues *et al*., 2021).

These difficulties persist despite the legal guarantees established by Brazil's 1988 Federal Constitution. Article 189 states that land titles and concessions of use shall be granted to men, women, or both, regardless of marital status (Brasil, 1988). Yet formal recognition of this right has not translated into equal access to land in practice. Nascimento (2023) suggests that one reason for this may be that the legal provision has been treated as an option rather than as a requirement.

Women's limited representation among farm managers further illustrates this inequality. According to the 2017 Agricultural Census, women managed 19.7% of family farming establishments (769,672) and 15.2% of non-family properties (176,403) nationwide (IBGE, 2017).

In the Transamazon Region, women managed 17% of family farms and 14% of non-family establishments (IBGE, 2017). These figures indicate women's underrepresentation in agricultural management both nationally and regionally, with a particularly pronounced disparity in non-family farming.

Land ownership represents another important dimension of this inequality. Hora, Nobre, and Butto (2021) found that 29.87% of women involved in Brazilian family farming did not own land. Moreover, inheritance and donation remain important pathways through which women access land (Spanevello *et al,* 2022), making the intergenerational distribution of family property particularly consequential for their

productive autonomy.

Farm succession reflects gendered dynamics, marked by inequalities in the transmission of family assets. Succession can reproduce gender inequalities when decisions regarding inheritance and farm management are shaped by assumptions about who is best suited to run a farm. In a study conducted in the United States, Liu, Maule, and Zhang (2023) found that traditional beliefs about women's suitability for farm management continued to influence succession decisions. However, daughters were more likely to be selected as successors when they had prior agricultural experience, held agriculture-related occupations, or participated in shared farm management. These findings underscore the importance of women´s experience and involvement in farming in shaping their opportunities to take over family properties.

In Brazil, family support, local infrastructure, identification with rural work, and social recognition all influence whether daughters are willing to continue family enterprises. Monteiro *et al.* (2023) identified these factors in a study of women engaged in family farming and artisanal fishing in three municipalities in Pará. The persistence of gendered expectations in farm succession presents an additional barrier. In the Transamazon Region, 81% of farmers surveyed by Trzeciak (2025) reported no gender preference regarding successor selection. Nevertheless, succession decisions continue to be influenced by patriarchal structures that associate land management and family leadership with male roles. This contrast between stated preferences and prevailing gender expectations suggests that succession practices may change more slowly than attitudes, thereby limiting women's participation in decision-making and the continuity of family production units.

Succession also involves the social and emotional ties that connect families to rural life. In Paragominas, Pontes *et al.* (2024) emphasized that successful succession requires not only continuity in agricultural production but also stronger family relationships, a sustained rural identity, and a sense of belonging. For women, remaining in agriculture therefore depends in part on being recognized as legitimate producers and successors. Together, these findings highlight how cultural expectations and structural barriers continue to constrain women's access to and control over land, in Brazil and elsewhere.

The properties managed by the women interviewed were generally moderate in size. Although 45% covered 51–100 ha and 37% were smaller than 50 ha, only 14% exceeded 100 ha; 4% of respondents did not know or did not disclose their property size. Because the fiscal module in the studied

municipalities ranges from 70 ha in Medicilândia and Uruará and 75 ha in Altamira and Brasil Novo, most of these properties qualify as small holdings, measuring up to 1.4 fiscal modules.

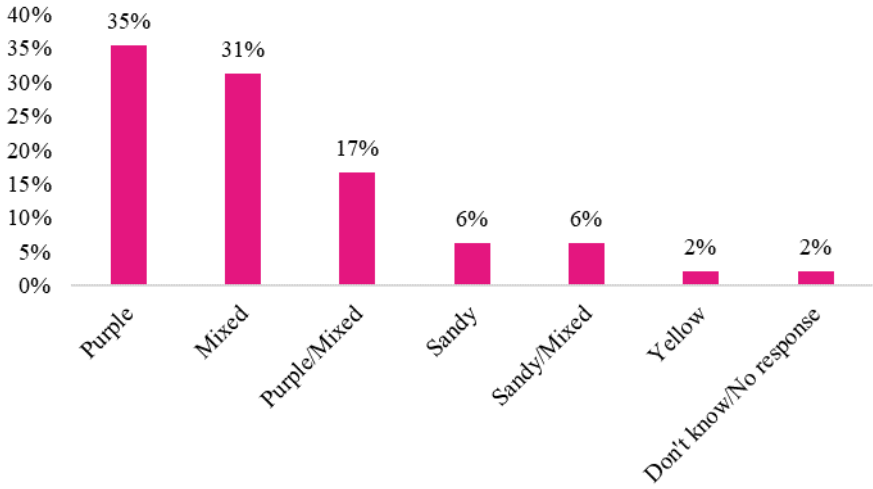
This size distribution is compatible with Brazil's legal definition of family farming, which includes a limit of four fiscal modules and requires that family labor predominate, among other criteria (Law No. 11.326/2006; Brasil, 2006). National data show a similar gender disparity in farm size: in 2017, family-farming establishments managed by women averaged 48.8 ha, approximately half the 94.9 ha average for those managed by men (IBGE, 2017). The smaller average size of women-managed establishments highlights inequalities in access to land and may reflect the historical, cultural, and socioeconomic barriers that shape women's opportunities to acquire and control agricultural property.

Environmental registration was widespread among the women-managed properties, although it was not universal. Overall, 75.5% were registered in the Rural Environmental Registry (CAR), while 18.4% were not registered and 6.1% of respondents did not know or did not answer. The CAR is a nationwide electronic public registry that consolidates information on rural properties and landholdings for environmental and economic planning and monitoring, environmental compliance, and efforts to combat deforestation (Brasil, 2021). Registration can also facilitate access to government incentives, agricultural credit, and land tenure formalization programs.

However, registration alone does not reveal whether women face equal opportunities to complete the process or benefit from it. Hora *et al.* (2021) report that rural women in Brazil encounter bureaucratic and institutional barriers to registering their land and accessing land tenure formalization programs, due to limited information, time, and technical support. For women managing rural properties, environmental compliance is therefore more than an administrative requirement: it is integral to their institutional recognition as agricultural producers and land managers.

Beyond land tenure, property size, and environmental registration, soil characteristics play an essential role in property productivity. Among the properties studied, soils locally classified as *roxo* (purple) and mixed were the most common, followed by combinations of these categories and sandy soils (Figure 6).

Figure 6 | Soil types reported for properties managed by women cocoa farmers in the Transamazon Region



Source: Field survey (2023). Prepared by the authors.

The predominance of purple and mixed soils suggests that many of the properties studied offer favorable conditions for cocoa cultivation. These soils are characterized by good moisture retention and the presence of clay, attributes that support root development and help maintain water availability throughout the growing season. Sandy soils, by contrast, have low water-retaining capacity, present significant management challenges and require management practices that reduce nutrient leaching and conserve soil moisture (Brasil, 2020).

Cocoa generally performs best in deep, well-drained soils with a sandy clay loam texture (Calvi *et al.*, 2025). The suitability of a particular soil also depends on local rainfall: greater water storage can benefit cocoa in drier regions, but clay-rich soils may increase the risk of waterlogging where rainfall is abundant, requiring effective drainage-management strategies (Menezes *et al.*, 2024; Silva Neto, 2001).

Access to favorable soils, however, should not be equated with equal access to productive resources or equal agricultural outcomes. Research in other settings suggests that women are often more likely to acquire land of lower agronomic value through inheritance or donation, reflecting gender inequalities within intra-household property arrangements (Spanevello *et al.,* 2022).

Evidence from broader agricultural research reinforces this distinction. The FAO (2023) reports that women can manage agricultural activities efficiently even when they operate at a smaller scale or have limited access to productive resources, particularly when technical assistance, training, and support networks are available. Similarly, Kilic, Palacios-López, and Goldstein (2015) found that, when women had adequate support, productivity on the plots they managed often matched or exceeded that of plots managed by men. Their findings suggest that productivity gaps are more closely linked to unequal access to inputs and productive assets than to differences in women's farming capabilities. Soil quality must therefore be considered alongside the institutional and social conditions that shape women's ability to manage their farms.

The distribution of soil types across the Transamazon Region may also reflect local geographic and environmental conditions. The region's suitability for cocoa cultivation was recognized in government initiatives as early as the 1970s (Moran, 1984), when the Brazilian Cocoa Program (PROCACAU) mapped approximately 100,000 ha of land considered suitable for cocoa production. Approximately 85,000 ha in Brasil Novo, Medicilândia, and Uruará were identified as having favorable conditions for the crop (Vegro; Assunção; Silva, 2014).

Taken together, the findings show that the women cocoa farmers in the Transamazon Region manage predominantly small properties, most of which were acquired through purchase or land tenure formalization programs. Yet formal documentation remains incomplete for a substantial proportion of these properties, leaving some women with insecure land tenure. Although insecure tenure is a broader regional problem, its consequences for women are compounded by historical inequalities in access to land and inheritance. Their stewardship of these properties underscores their central role in family cocoa farming, despite the institutional, technical, and legal constraints that limit their opportunities.

FINAL CONSIDERATIONS

This study provides an empirical profile of women managing cocoa farms in the Transamazon Region, a major center of cocoa production in the Amazon and a key area of cocoa farming expansion in Brazil. Most of the women interviewed were Brown (*parda*), over 60 years old, had limited formal education, and were married or widowed. They generally lived in small households and managed farms averaging less than 100 ha. Although land was commonly acquired through purchase or land tenure formalization programs, many properties lacked complete land tenure documentation.

These findings reveal a substantial female presence in cocoa farming alongside persistent structural barriers to women's access to land, education, and social recognition. Insecure land tenure and the limited scale of production leave many of the farms managed by these women vulnerable. The age profile of the participants also raises concerns about generational renewal in cocoa farming and the long-term sustainability of family production. Addressing these challenges requires support for land access, technical assistance, and training—measures that can help sustain agricultural production while strengthening women's autonomy.

This study makes na important contribution by mMaking these women visible as farm managers in a production system where women's labor has historically received insufficient recognition. The findings underscore the need for public policies that strengthen women's land rights, expand access to rural credit and technical assistance, promote gender equality in decision-making, and account for the diversity of women's experiences in Amazonian family farming. By documenting the experiences of women managing cocoa farms in the Transamazon Region, this study helps address a gap in the literature on gender and Amazonian agriculture. Its findings should not be extrapolated beyond the population or the data collected. Nevertheless, given importance of cocoa farming to the region and to Brazil's agricultural sector, the findings provide an empirical basis for informing initiatives to strengthen women's role in rural production and support socioeconomic development in the region.

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