

Seção Temática

Pronaf 30 anos: histórico e transformações socioeconômicas na agricultura familiar brasileira

## Women in family farming: An analysis of the Brazilian National Program to strengthen family farming for women

Mulheres na agricultura familiar: uma análise do Programa Nacional Brasileiro de fortalecimento da agricultura familiar para mulheres

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 [https://doi.org/10.36920/esa34-1\\_06](https://doi.org/10.36920/esa34-1_06)

**Abstract:** This study discusses whether the Pronaf Mulher credit, the main public program for family farms in Brazil, has helped increase the participation of women in family farming. A quantitative study was conducted with data from the Agricultural Census and the Pronaf Mulher by means of linear regression estimations using the ordinary least squares (OLS) method. Results revealed no relation between the Pronaf Mulher program and the participation of women in family farming. Control variables indicated that tertiary education negatively influenced the participation of women in family farming. In summary, as a family farm policy, Pronaf Mulher has not contributed to empower women

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in family farming, thereby underscoring the need for a more attentive approach to this policy to ensure an increased participation of women in rural enterprises.

**Keywords:** Gender. Public Policies. Entrepreneurship. Rural Family Business. Family Agricultural.

**Resumo:** Este estudo tem como objetivo identificar se o crédito do Pronaf Mulher, principal programa público voltado à agricultura familiar no Brasil, está relacionado ao aumento da participação das mulheres na agricultura familiar. Foi realizado um estudo quantitativo utilizando dados do Censo Agropecuário e do Pronaf Mulher, por meio da estimativa de regressão linear utilizando o método dos mínimos quadrados ordinários (OLS). Os resultados mostraram que não há relação entre o Programa Pronaf Mulher e a participação das mulheres na agricultura familiar. As variáveis de controle indicaram que o nível de educação correspondente à graduação teve uma influência negativa na participação das mulheres na agricultura familiar. Em resumo, como política de agricultura familiar, o Pronaf Mulher não tem contribuído para o empoderamento das mulheres na agricultura familiar. Isso demonstra a necessidade de uma abordagem mais atenta a essa política, com o objetivo de garantir um aumento da participação das mulheres nos empreendimentos rurais.

**Palavras-chave:** Gênero. Políticas Públicas. Empreendedorismo. Negócios Familiares Rurais. Agricultura Familiar.

## Introduction

Brazil's rural sphere consists of 5.07 million rural establishments, of which 4.1 million are managed by men and 947 thousand by women (19%). Additionally, 69% of women-owned establishments are located in the poorest Brazilian regions—the North and Northeast (Embrapa, 2017). Women's presence in rural areas is an important theme for the current moment (Elkafrawi *et al.*, 2022; Mora-Guerrero *et al.*, 2021; Sachs, 2023; Souza; Brandão, 2022), especially in Brazil where agriculture holds a prominent position on the international stage (De Jong Van Lier, 2023). Globally, improving women's participation in agriculture is expressed in Goal 5 of the Sustainable Development Goals, which foresees ending inequalities in the social and productive spheres (Kansanga *et al.*, 2024).

In Brazil, family farming is primarily responsible for the quantity and diversity of food production (Cunha Junior *et al.*, 2025; Rocha Junior; Cassuce; Cirino, 2017; Souza; Brandão, 2022). Fernandes (2013) highlights that the term ‘family farming’ encompasses a heterogeneity of lifestyles and survival strategies adopted by those engaged in this activity. Small producers in this category are smallholders, tenants, partners, settlers, sharecroppers, rural settlers, and landless individuals. Some small rural properties present an interrelation between property, work, and family, with the family both owning the means of production and working the land (Wanderley, 2001), thus associating family-work-production (Souza; Brandão, 2022). In this scenario, women play a crucial role in maintaining and diversifying agricultural production (Cunha Junior *et al.*, 2025)

One of Brazil’s support programs targeting these groups of family farmers is the National Program for Strengthening Family Agriculture (Pronaf), a complex program with national coverage (Rocha Junior; Cassuce; Cirino, 2017; Zani; Costa, 2014). Created in 1995, Pronaf has helped to increase income for family farmers and agricultural productivity (Scapin; Troian; De Oliveira, 2022). In 2001, as a development, the program instituted a policy of allocating 30% of its credit to rural women, originating the Pronaf Mulher program, currently present in every Brazilian municipality, focusing on combating rural poverty and targeting small farmers (Fernandes, 2013).

Previous studies have shown that women invisibility and barriers exist in rural contexts in various locations, including Brazil (Gomes *et al.*, 2022; Rabelo *et al.*, 2023), prompting the need for women studies in rural settings (Voss *et al.*, 2024). Policies and development assistance shape social dynamics to address the structural causes of gender and intersecting inequalities (Vercillo *et al.*, 2023).

Regarding Pronaf Mulher, we observed a need to assess the effectiveness of this Brazilian National Policy in terms of equal participation of women in the rural sphere, as policies seek equitable forms (Hernández, 2009; Mora-Guerrero *et al.*, 2021). As a nationally comprehensive public policy, Pronaf Mulher must undergo evaluations (Batista, 2012; OECD, 2021). Although studies have been conducted in some states, such as Santa Catarina, Espírito

Santo, Minas Gerais, Rio Grande do Sul and Rio de Janeiro (Fernandes, 2013; Moreira *et al.*, 2014; Silva; Ponciano; De Souza, 2021; Hernández, 2009; Spanevello *et al.*, 2021; Souza; Brandão, 2022), a comprehensive assessment remains important. Particularly because fragmented evaluations indicate that funding has been directed towards men, not resulting in the expected impact on women's position in terms of opportunities and equality (Henry *et al.*, 2017; Rocha Junior; Cassuce; Cirino, 2017).

As a minority group engaged in family farming in Brazil, public policies that facilitate greater participation of women in this space are needed (Pilgeram *et al.*, 2022; Rocha Junior; Cassuce; Cirino, 2017). Thus, Pronaf Mulher sought to improve agricultural productivity and empower women in the field (Hernández, 2009). Our research seeks to answer the following question: Does credit granted via Pronaf Mulher result in increased participation of women in Brazilian family agriculture?—identifying whether Pronaf Mulher credit has in fact improved women's participation in family farming.

This study contributes theoretically by evaluating a Brazilian public policy targeting women who engage in family farming, as studies on rural women are still necessary (Elkafrawi *et al.*, 2022). By focusing on Pronaf Mulher, geared toward small women farmers, this research also contributes to intersectionality studies in rural areas (Sachs, 2023).

As a practical contribution, we provide important insights for policymakers focusing on family agriculture and women, highlighting the limited effectiveness of the Pronaf Mulher policy. Policies targeting rural areas are especially important for Brazil, as agriculture remain its main economic activity, and the inclusion of women via public policies may influence territorial dynamics (Scapin; Troian; De Oliveira, 2022). Moreover, Pronaf was created to seek reconciliation between the inclusion of farmers and sustainable development, bringing social, environmental, and economic objectives into harmony (Silva; Bernardes, 2014). Although Pronaf consists of the most evaluated program for agriculture in Brazil (Pinto and Rocha, 2023), global evaluations of Pronaf Mulher, such as this research, are scarce.

In the sections below we present theoretical considerations about women policies and family farming, focusing on Pronaf Mulher, followed by the

detailed methodological procedures, results and analyses. Finally, concluding remarks along with suggestions for future research close the article.

## Women policies and family farming

According to Momo *et al.* (2013, p. 190), “public policies aimed at building equity must address the central axes that construct inequalities in the daily lives of women, namely, inequalities in the sexual division of labour in the private and public spheres.” Mora-Guerrero *et al.* (2021) add that countries with the highest levels of gender equality use it as an analytical category to design, implement, and evaluate their public policies, ensuring equal participation between genders. Latin America requires advancement in terms of women-related policies and programs, entrepreneurship, and rurality (Mora-Guerrero *et al.*, 2021), specifically Brazil, where agriculture configures one of the most relevant sectors for the country. Active participation of women in these spaces is therefore essential, especially as owners of rural enterprises.

In rural areas, women are immersed in a specific context and need to preserve, modify, and challenge its structure to operate within it (Elkafrawi *et al.*, 2022). In studying the case of a women engaged in family farming in Sweden, the authors state that “these women emerge not only as women but also as businesswomen, mothers, cheerleaders, and active members of the rural community to which they belong” (Elkafrawi *et al.*, 2022, p. 1034). In their role as women, domestic activities are strongly associated with responsibility (Hirata; Kergoat, 2007). In rural areas, women share both productive and family spaces and must challenge power structures (Elkafrawi *et al.*, 2022). Additionally, studies have highlighted the invisibility of productive and unproductive work, difficulty accessing technical knowledge, exclusion in family decision-making processes, patriarchy, and sexism (Rabelo *et al.*, 2023).

Patriarchy and masculinization have also been identified in studies conducted in Portugal (Gomes *et al.*, 2022). Similarly, Valverde, Mesías, and Peris-Blanes (2022) studied rural entrepreneurs in Guatemala and found that the decision-making process in rural family farming and communities remains dominated by male farmers. They emphasised that increased female participation is a long-term issue that requires understanding the cultural dynamics of each

family. On the other hand, collaborative alliances within communities are important strategies for increasing the participation of female farmers.

As owners or successors, rural women face challenges (Sutherland *et al.*, 2023) and income disparities (Conroy; Low, 2022). Rural family succession tends to prioritise male successors (Breitenbach; Corazza, 2020; Barbosa *et al.*, 2020; Breitenbach; Foguesatto, 2023). When women do inherit rural properties, these are generally smaller areas (Sutherland *et al.*, 2023). According to Conroy and Low (2022), due to inequalities and challenges, rural entrepreneurs need non-homogeneous policies and investments in programs for those with lower incomes to alleviate the challenges faced when undertaking in rural areas and to progress in this context, seizing opportunities and accessing resources (Conroy; Low, 2022; Pettersson *et al.*, 2017).

Lack of resources and priority in programs for rural women in Brazil has resulted in greater migration of potential successors from the countryside to cities since they find greater independence and job opportunities in the urban space (Breitenbach; Corazza, 2020; Valverde; Mesías; Peris-Blanes, 2022). This situation can be reversed with effective programs that focus on rural succession, as shown by Breitenbach and Foguesatto (2023).

Moreover, previous studies have shown that policies that favor credit to women in agriculture help improve the family's quality of life via increased production and, consequently, increase family income (Spavenello *et al.*, 2021). Women's access to credit in agriculture can also further improve self-esteem and empowerment (Hernández, 2009; Valério, Panzone, Siliprandi, 2024).

Nascimento and Mota (2020), analyzing women's participation in dendiculture in Pará state, also found that their participation in economic initiatives alone did not ensure autonomy, but encouraged it. Autonomy was associated with one's personal decision to sign a contract and assume management in different production stages of oil palm cultivation and was supported in obtaining financial resources, independent decision-making, participation in public spheres, access to different information, dialogue with technicians of the dendiculture company and with representatives of public institutions. In summary, the production contract represented for women a strategy to gain autonomy.

## **Women policy in family farming: the Pronaf Mulher program**

Brazil started implementing women policies more intensively after the 1988 constitutional reform. It granted female farmers legal recognition as rural producers, making them entitled to social security benefits. Also notable was the creation of municipal councils for women's rights focused on eliminating forms of discrimination (Martins; Conteratto, 2018), and the establishment of the Special Secretariat for Women's Policies and the National Plan for Women's Policies, favouring gender policies (Nascimento, 2016).

The primary Brazilian program for family agriculture is Pronaf, which is divided into three modalities: investment, operating costs, and infrastructure. The program adopts a classification into five income brackets, ranging from BRL 4.000.00 to BRL 110.000.00, for defining interest rates. Pronaf Infrastructure seeks to promote and support regional development policies, such as improvements in roads, support for projects related to family agriculture, and contributing to reduce social inequalities. Between 2003 and 2004, several lines of credit were created, including Pronaf Food, Pronaf Agroecology, Pronaf Youth, Pronaf Machinery and Equipment, Pronaf Women (Pronaf Mulher), Pronaf Fishing, Pronaf Semi-Arid, and Pronaf Rural Tourism.

An evaluation of Pronaf Mulher in Rio Grande do Norte found some barriers to credit access (Alves, 2007), such as: a) view of men as heads of households and consequent devaluation of women's activities; b) practice of male-centred technical assistance, as a devaluation of women's role in production; c) double working hours for women and, d) lack of support from trade unions and associations to women.

According to Hernández (2009), credit granting to women farmers in Rio Grande do Sul contributed to reconfigure the sexual division of labour but did not result in economic empowerment for women. For the author, Pronaf Mulher failed to improve women's position in the family hierarchy, since there are no mechanisms of organisation and construction of collective spaces to ensure this advancement.

Notably, Fernandes (2013) emphasises that property ownership in family farming is attributed to the head of the family, following guidelines from the Food and Agriculture Organisation and the National Institute for

Colonisation and Agrarian Reform (FAO/INCRA). Said direction neglects the dynamics of family relationships, generational changes, and regional and cultural specificities, including the issue of succession (Barbosa *et al.*, 2020). According to the author, this way of conceiving family farms has favoured the predominance of male succession.

In research with rural women benefiting from Pronaf Mulher in Santa Catarina state, Fernandes (2013) observed no significant advances for women who have a reduced credit quota. Additionally, the program includes family-related specificities such as maternity, childcare, and care for senior family members. Fernandes (2013) emphasises that these policies are subject to criticism, as they may be assimilated by machismo and place women in a higher degree of marginalisation than currently experienced. He notes that Pronaf Mulher is not perceived as a credit policy capable of meeting women's demands, which also includes credit policies capable of financing the preservation of gardens, housing improvements, and other domestic activities. Valuing such activities, according to research participants, would help restore women's self-esteem. They stated that credit finance activities are already profitable and included in male activities and demands; therefore, they do not consider Pronaf Mulher as a women-focused policy.

Similarly, Silva, Ponciano, and De Souza (2021), assessing Pronaf Mulher in Espírito Santo state, found that the program contributed to supplementing family income but did not emancipate or empower rural women. According to them, 52.7% of women did not participate in managing financial resources, delegating it to their husbands, fathers, sons, or brothers. Only single women who are not influenced by male opinions in their decisions fully engage in resource management. Additionally, the authors identified that the decision to access the program often depends on the husband's approval, highlighting the limitations of women's autonomy. In a study based on Pronaf Mulher data from Rio de Janeiro, Souza and Brandão (2022) also observed that women had lower incomes and greater difficulty accessing rural credit. Despite the increasing number of women in recent years, the rural landscape remains predominantly male.

Analysing the granting of Pronaf Mulher credit in Rio Grande do Sul, Spanevello *et al.* (2021) identified farmers lacked knowledge on the destination

of resources obtained in their behalf, placing them as intermediaries of resources. But the authors also identified women who applied the resources in previous agricultural activities and improved their quality of life.

Pronaf Mulher, as the main Brazilian program derived from a policy aimed at family farmers in Brazil, contributed to supplement family income but did not emancipate or empower women, according to the aforementioned research. Considering that these family farming programs, whether specific (Mora-Guerrero *et al.*, 2021; Valverde; Mesías; Peris-Blanes, 2022) or general (Scapin; Troian; De Oliveira, 2022; Zahaikevitch *et al.*, 2022), should enhance women's participation in family agriculture, a comprehensive evaluation of this policy, specifically the Pronaf Mulher, is warranted.

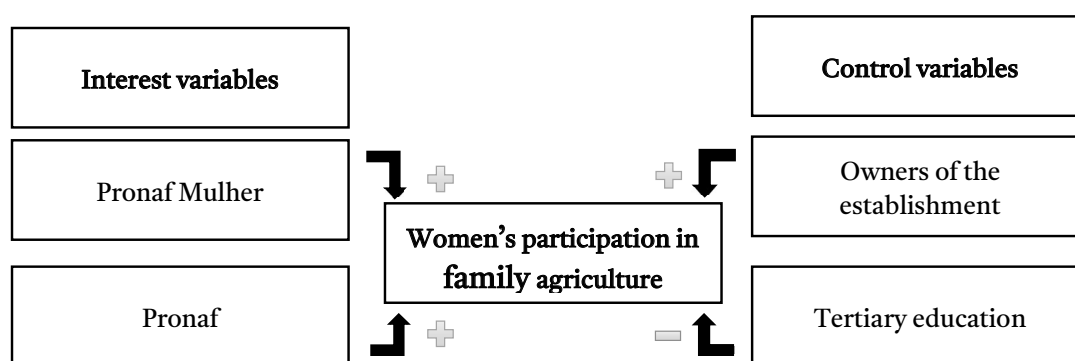
Valverde, Mesías, and Peris-Blanes (2022) argued that family farming policies specifically tailored for women can contribute to reduce women inequality in rural areas. However, Mora-Guerreiro *et al.* (2021) argue that although necessary, policies are not sufficient to enhance women's participation in family farming. Factors like ownership can also contribute to their involvement in family farming. Sutherland *et al.* (2023) revealed that women who owned farms were more likely to be identified as family farmers than those who were wives of farmers, as the latter were more inclined to perform household tasks. In Brazil, as the largest program formulated to encourage women's participation in the rural environment, Pronaf Mulher must play an important role in shaping a culture that values the participation of women in family farming.

The need for women policies in agriculture is also linked to the fact that tertiary education tends to reduce women's participation in family farming. Rabelo *et al.* (2023) evinced that the main reason for young women's migration from rural to urban areas is the devaluation of women in agriculture, given their limited involvement in decision-making and limited access to opportunities. Additionally, Tavenner and Crane (2022) emphasise the need for metrics to assess asymmetries in the rural environment. For this reason, we included "tertiary education" as a control variable in our analysis model.

Figure 1 illustrates the theoretical model to be tested in this research. 'Women's participation in family farming' is the dependent variable, whereas

the independent variable consists of funding granted by the Pronaf Mulher program. As control variables, we utilised data on educational attainment, specifically the completion of tertiary education, and whether they are owners of the rural establishment.

**Figure 1** – Representation of the research model.



**Source:** the authors (2025).

## Methodology

This descriptive, explanatory study involved estimating Pearson's correlation coefficient and linear regression using the ordinary least squares (OLS) method. Data on women's participation in family farming, female owners of rural establishments, and the schooling level of family farmers were obtained from the 2017 Agricultural Census by the Brazilian Institute of Geography and Statistics. Data were extracted from a family farming table which included the total number of family farmers, their gender, whether the producer owned the land, and whether they had tertiary education (IBGE, 2017).

Data on the Pronaf program and the Pronaf Mulher subprogram were extracted from the rural credit data matrix provided by the Central Bank of Brazil (BCB, 2023). By accessing the 'View by Program and Subprogram' tab, financing data on Pronaf and Pronaf Mulher were collected for each federative unit. Model data are from 2017, and the Pronaf Mulher data were collected annually from 2015 to 2022.

Descriptive analysis used descriptive statistical techniques to identify patterns and trends in the Pronaf Mulher credit evolution over time.

The analyses by region can be viewed in the appendix. Subsequently, linear regression analysis was performed using the ordinary least squares (OLS) method (Greene, 2003) to assess the causal relation between Pronaf credit and women's participation in family farming.

Dependent variable consisted of women's participation in family farming; independent variables were divided into variable of interest and control variables. Pronaf Mulher and total Pronaf credit composed the variables of interest, whereas the control variables included the legal status of family farmers' establishments and tertiary education. Figure 1 illustrates the research model. Frame 1 summarises the model variables, with the expected signs and references.

**Frame 1** – Independent variables of the model.

| Parameter                                   | Proxy     | Description                                                                                                                      | Expected sign | Source                                                                    |
|---------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------|
| Pronaf Mulher                               | PRONAF_M  | Percentage of Pronaf Mulher credit in relation to total Pronaf credit                                                            | +             | Mora-Guerrero <i>et al.</i> (2021); Valverde; Mesías; Peris-Blanes (2022) |
| Total Pronaf                                | PRONAF_T  | Total Pronaf credit divided by family farming area (in hectares)                                                                 | +             | Scapin; Troian; De Oliveira (2022); Zahaikévitch <i>et al.</i> (2022)     |
| Family farmers who own their establishments | AGR_M_PRO | Percentage of women family farmers who own their agricultural establishments in relation to total number of women family farmers | +             | Sutherland <i>et al.</i> (2023)                                           |
| Family farmers with tertiary education      | AGR_M_SUP | Percentage of women family farmers with tertiary education in relation to total number of family farmers                         | -             | Rabelo <i>et al.</i> (2023)                                               |

**Source:** the authors (2025).

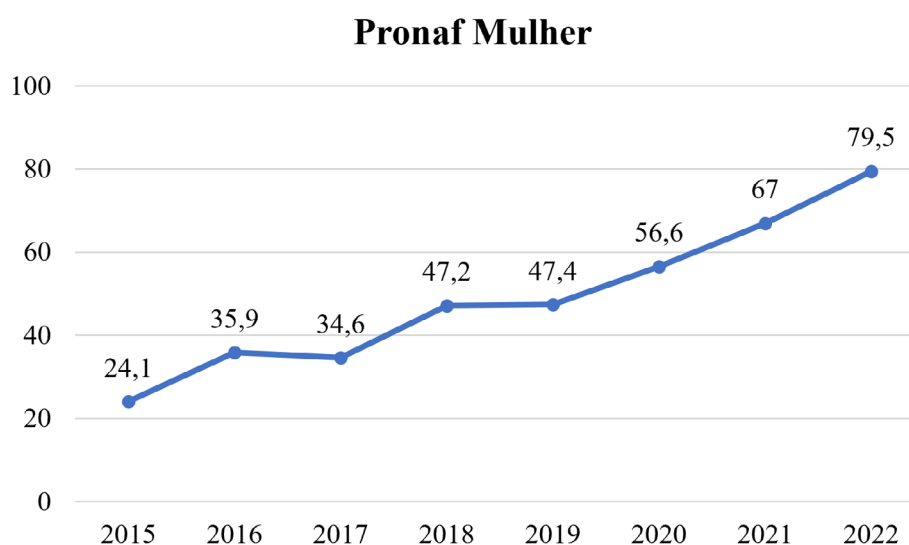
Regarding the Pronaf Mulher indicator, we expected that a higher percentage of credit allocated to women would contribute to increased female participation in family farming. Similarly, a larger volume of Pronaf credit was expected to increase women's participation in family farming. As for the control indicators, we anticipated a higher participation of female owners would elevate their participation in family farming. Additionally, higher qualifications through tertiary education were expected to result in increased female participation in family farming. Model quality was verified

by multicollinearity and heteroscedasticity tests conducted using the Variance Inflation Factor (VIF) and Breusch-Pagan tests, respectively. Additionally, a specification error test was performed (Greene, 2003).

## Results and discussion

After evaluating the time series for the credit value granted to women by Pronaf Mulher since 2015, we tested the individual correlation of each independent variable with women's participation in family farming, followed by an assessment of Pronaf's contribution to female engagement in family farms. Figure 2 shows the credit value in millions of Brazilian reais (BRL) allocated to female family farmers in 2015.

**Figure 2** – Graph of the Pronaf Mulher credit value evolution in Brazil, 2015–2022 (in BRL millions).



**Source:** the authors (2025).

These figures reveal that since the inception of Pronaf Mulher, the rural credit amount granted has been steadily increasing year by year (except between 2016 and 2017). From 2015 to 2022, the rural credit value for financing female family farming increased by approximately 230%, rising from BRL 24.1 million in 2015 to BRL 79.5 million in 2022.

Figure 3 (Appendix I) clearly shows that the evolution of credit during this period occurred heterogeneously across Brazil, evincing differentiation in policy between regions. Most regions saw no increase in Pronaf Mulher's rural credit amount. Each region followed its own dynamics in credit evolution from 2015 to 2022. Notably, the Northeast region closely aligned with the national trend, presenting year-on-year increases throughout the period—from BRL 5.2 million in 2015 to BRL 64.2 million in 2022, a growth of over 1.100%. This region significantly received resources from the national increase in Pronaf Mulher credit. Such growth is justified by data from the 2017 rural census, which showed that 69% of rural women's establishments are located in the North and Northeast (Embrapa, 2017).

Overall, study data show an increase in credit for women family farmers in Brazil albeit with variations across regions. To assess the influence of credit transfer on family farming, Pearson's correlation coefficient was initially estimated between two Pronaf variables (Pronaf Mulher and Pronaf Total) and two control variables (women family farmers with their own establishments and women family farmers with tertiary education) in relation to women's participation in family farming (Table 1).

**Table 1** – Correlation of women's participation in family farming with the independent variables

| Parameter | Pearson's coefficient | P-value |
|-----------|-----------------------|---------|
| PRONAF_M  | 0.0890                | 0.660   |
| PRONAF_T  | -0.5265               | 0.005   |
| AGR_M_PRO | -0.2826               | 0.153   |
| AGR_M_SUP | -0.5113               | 0.006   |

**Source:** the authors (2025).

These data reveal that among the variables of interest, Pronaf Mulher showed no correlation with women's participation in family farming. Conversely, Pearson's coefficient point out a negative association between Pronaf's credit value and women's participation in family farming. In other words, receiving credit from Pronaf Total negatively influenced women's participation in

family farming. Considering this result, we verified whether owning a rural establishment (control variable) influenced the relation between the variables.

Regarding the control variables, we observed no correlation between the percentage of female-owned rural establishments and women's participation in family farming. Conversely, the percentage of women family farmers showed a negative correlation with tertiary education and women's participation in family farming. Table 2 summarises the causal relationship between independent variables and women's participation in family farming.

**Table 2** – Multiple linear regression results

| Parameters               | Coefficient | P-value | VIF  |
|--------------------------|-------------|---------|------|
| PRONAF_M                 | -0.2235     | 0.868   | 1.16 |
| PRONAF_T                 | -0.0002     | 0.006   | 1.21 |
| AGR_M_PRO                | -0.0700     | 0.367   | 1.30 |
| AGR_M_SUP                | -0.8006     | 0.001   | 1.09 |
| Intercept                | 0.3161      | 0.000   | -    |
| Sample                   | 27          | -       | -    |
| R <sup>2</sup>           | 0.5631      | -       | -    |
| Breusch-Pagan test       | 0.1600      | 0.692   | -    |
| Jarque-Bera              | 2.4810      | 0.289   | -    |
| Specification error test | 0.6700      | 0.583   | -    |

**Source:** the authors (2025).

Results show that participating in Pronaf Mulher did not influence women's engagement in family farming. Conversely, the value of Pronaf financing credit negatively influenced women's participation in agriculture. In other words, the higher the Pronaf investment value, the lower the participation of women in family farms. For example, an increase of BRL 1,000.00 in Pronaf investment resulted in a reduction of 0.2 percentage points in women's participation in family farming.

Breitenbach and Corazza (2020) emphasise that the lack of recognition and appreciation of women's work, along with the challenges of rural work, professional opportunities and greater independence in urban centres, contribute to the migration of young women from rural to urban areas. Family encouragement is not the sole incentive for women to take on the role of rural producers. Breitenbach and Foguesatto (2023) also mention encouragement

from cooperatives and private agricultural organisations. Rabelo *et al.* (2023) add that public policies and projects should involve women in processes of territorial development, as sustainable rural development requires gender and age-inclusive participation and equity. This also applies to succession in rural areas, where the tradition of generational land transferring exists but parents resist passing it on to daughters, preferring sons as successors (Breitenbach; Corazza, 2020; Barbosa *et al.*, 2020; Breitenbach; Foguesatto, 2023).

Food security is an important issue, and the goal of gender and food security policy is to ‘close the gender gap’ in agriculture (Vercillo *et al.*, 2023). Valverde, Mesías, and Peris-Blanes (2022) suggested adopting policies specifically for women as one measure to reduce gender inequality in family farming. However, as observed in our results, the Brazilian policy for women family farmers does not influence their role as owners. Policies supporting family farming tend to benefit farmers (Scapin; Troian; De Oliveira, 2022; Zahaikevitch *et al.*, 2022) without paying attention to women (Mora-Guerrero *et al.*, 2021). According to our findings, resources allocated to Pronaf Mulher, as a women policy in rural areas, remained ineffective in increasing the participation of women in family farming. Considering that familiar agriculture is important to ensure food security, re-evaluating this policy and reducing this gap is necessary.

Moreover, women policies for family farming must consider the dynamics of family relationships, generational changes, and regional and cultural specificities (Barbosa *et al.*, 2020; Hernández, 2009). Increasing female participation in rural spaces is a long-term issue that requires understanding the cultural dynamics of all family arrangements (Valverde; Mesías; Peris-Blanes, 2022) and policies that encourage this perspective. For example, Gomes *et al.* (2022) showed that promoting a culture focused on valuing women in rural areas of Portugal contributed to women staying in family farming. Similarly, Sutherland *et al.* (2023) underlined the effectiveness of policies focused on retaining women in family farming in Scotland and the UK. In this regard, our results evinced that credit alone has not been sufficient to increase women’s participation in family farming. Moreover, women with tertiary education tend to migrate from rural to urban areas, as indicated by the negative influence of education on their engagement in family farming. For example, a 1 percentage point increase in the

percentage of women family farmers with tertiary education decreases women's participation in family farming by 0.8 percentage points.

This phenomenon, related to female qualification in rural settings, can be explained by the culture of devaluing rural areas in favour of urban centres. Rabelo *et al.* (2023) emphasise that the main factor behind youth migration from rural to urban areas, especially female migration, is the lack of appreciation for family farming by highly qualified individuals. As women with tertiary education find more job opportunities in urban areas, their participation in rural enterprises decreases. A 2017 Higher Education Census data showed that, regardless of the field of study, 48% of students completing courses in Agricultural Sciences were women (INEP, 2017), which would justify the presence of women in rural areas.

Regarding female owners of agricultural establishments, this variable had no influence on their participation as family farmers, thus maintaining an unequal power relation within family farming, as evinced by other studies (Andersson *et al.*, 2022). Previous research has shown that in places with a culture of valuing women in rural areas, being an owner tends to have a positive effect (Sutherland *et al.*, 2023). Our results reveal that the resources allocated by Pronaf Mulher to family farming are associated with male-owned family land, thereby hindering women empowerment by the program resources. This result corroborates the findings by Hernández (2009), who identified lack of economic empowerment among women benefited by Pronaf Mulher resources in Rio Grande do Sul

Our results evince that Brazil's family farming policy focused on women does not contribute to their participation in this context. The credit offered to family farmers is undoubtedly an important resource for rural investment (Gomes *et al.*, 2022); however, women inequality in the rural environment, traditionally a male-dominated space, can make it challenging for them to stay in rural areas, even in agricultural families (Breitenbach; Foguesatto, 2023).

In this regard, female heirs on rural properties are less inclined to continue with family businesses, especially if they have tertiary education. Arends-Kuenning *et al.* (2021) highlighted factors that reduce the likelihood of heirs to rural properties continuing in the field, including being female and farmers with tertiary education. According to the 2017 Agricultural Census data, 20%

of women participate in Brazilian agricultural establishments, and among rural producers, only 3% have tertiary education. A lack of actions to empower women in rural areas continues the trend of male succession, as already observed (Breitenbach; Foguesatto, 2023). Moreover, their participation in family farming may be reduced, a matter which has prompted European countries in discussing gender policies for this context (Sutherland *et al.*, 2023). As such, Brazil must adopt a political perspective on women equality in the context of family farming as an end, and not just a means, as suggested by Andersson *et al.* (2022). This is in line with Vercillo *et al.* (2023) who, under an intersectional feminist approach, stressed that underlying social norms and political and economic structural barriers—such as disproportionate challenges in accessing land and education—remain largely unaddressed by policies.

## Conclusion

Our study assessed the contribution brought by the Family Farm Strengthening Program (Pronaf) to women's participation in family farming, focusing on the Pronaf Mulher subprogram. We covered all 27 Brazilian federative units. Employing the ordinary least squares (OLS) method for model estimation proved suitable for our purpose by highlighting the influence of the credit amount granted by Pronaf for family farmers. Model robustness confirmation used heteroscedasticity, multicollinearity, and specification error tests.

Model results suggest that the conditions for women's participation in family farming go beyond transferring credit to family farmers via Pronaf Mulher resources, as it alone does not ensure their increased participation in rural areas and might even impact their permanence in rural contexts. As a control variable, tertiary education evinces that university-level qualifications negatively influenced women's permanence in family farming.

Our findings reveal an inverse relation between the total credit amount invested in Pronaf and women's participation in family farms. In other words, the higher the resources invested in Pronaf, the lower the participation of women in family farming. Such phenomenon may be associated with the characteristics that underpin the devaluation of women in rural areas, further accentuating their vulnerability in rural contexts.

As a theoretical contribution, this study addresses a gap highlighted by Mora-Guerrero *et al.* (2021) and Elkafrawi *et al.* (2022) in evaluating the contribution of Brazilian national policy to women's participation in family farming. As with other studies on Pronaf Mulher (Fernandes, 2013; Hernández, 2009; Spanevello *et al.*, 2021; Silva; Ponciano; De Souza, 2021; Souza; Brandão, 2022), we identified crucial elements for assessing women public policy in the rural context, given the scarcity and infrequent evaluation of policies in this sphere (Borges *et al.*, 2018; Natividade, 2009). Said evaluation aligns with the policy process (Smallbone, 2017) and can help make its objective more effective. Additionally, as our results evaluate women in family farming, it brings contributions to intersectional studies.

As a practical contribution, this study provides significant insights for Brazilian public policymakers, focusing on family farming and women and highlighting the need for greater attention to the Pronaf Mulher policy. Women policies in rural areas are particularly crucial for greater sustainable agriculture capable of influencing territorial dynamics (Scapin; Troian; De Oliveira, 2022). Moreover, policies could be devised to increase women's participation in Brazil's rural context (Marques, 2017), which is currently limited to 19% of properties. Considering the relevance of Brazilian family farming to the local and international context, this study raises an important question about women inequality in national and international policies within family farming.

Finally, we emphasise evaluating the evolution of Pronaf Mulher credit at the national and regional levels revealed a regional heterogeneity. Only the Northeast region closely followed the national trend, indicating different Pronaf contexts among Brazilian regions. Goldszmidt *et al.* (2022), when analysing micro credit in Brazil, found similar regional differences. Hence the relevancy of more in-depth investigations into different regions concerning women's participation in family farming encouraged by public policies.

Considering that rural female farmers do not constitute a homogeneous group (Zhang, 2020), future studies should explore the effects of Pronaf Mulher on different segments of female farmers such as owners, heirs, successors, tenants, and landless individuals.

This study's main limitation lies in using cross-sectional data. Thus, longitudinal studies based on future rural censuses can contribute to enhance our results. However, the evolution analysis of Pronaf Mulher is longitudinal.

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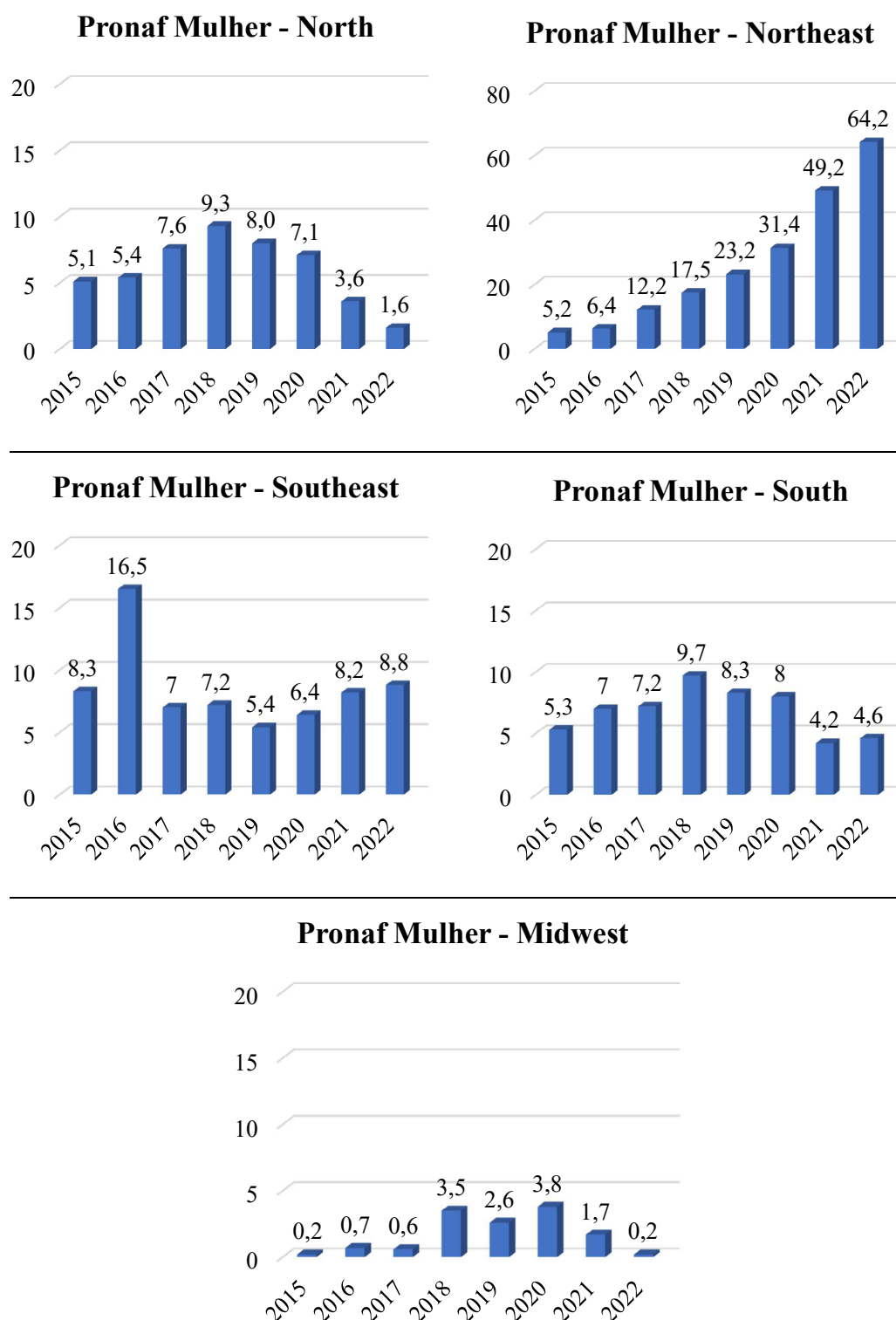
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## Como citar

MACHADO, Hilka Pelizza Vier; BRAMBILLA, Marcos Aurélio. Women in family farming: An analysis of the Brazilian National Program to strengthen family farming for women. *Estudos Sociedade e Agricultura*, Rio de Janeiro, v. 34, n. 1, 2026, e2634106, DOI: [https://doi.org/10.36920/esa34-1\\_06](https://doi.org/10.36920/esa34-1_06)

## APPENDIX I

**Figure 3** – Evolution of the Pronaf Mulher credit value across Brazilian regions, 2015–2022 (in BRL millions).



**Source:** the authors (2025).