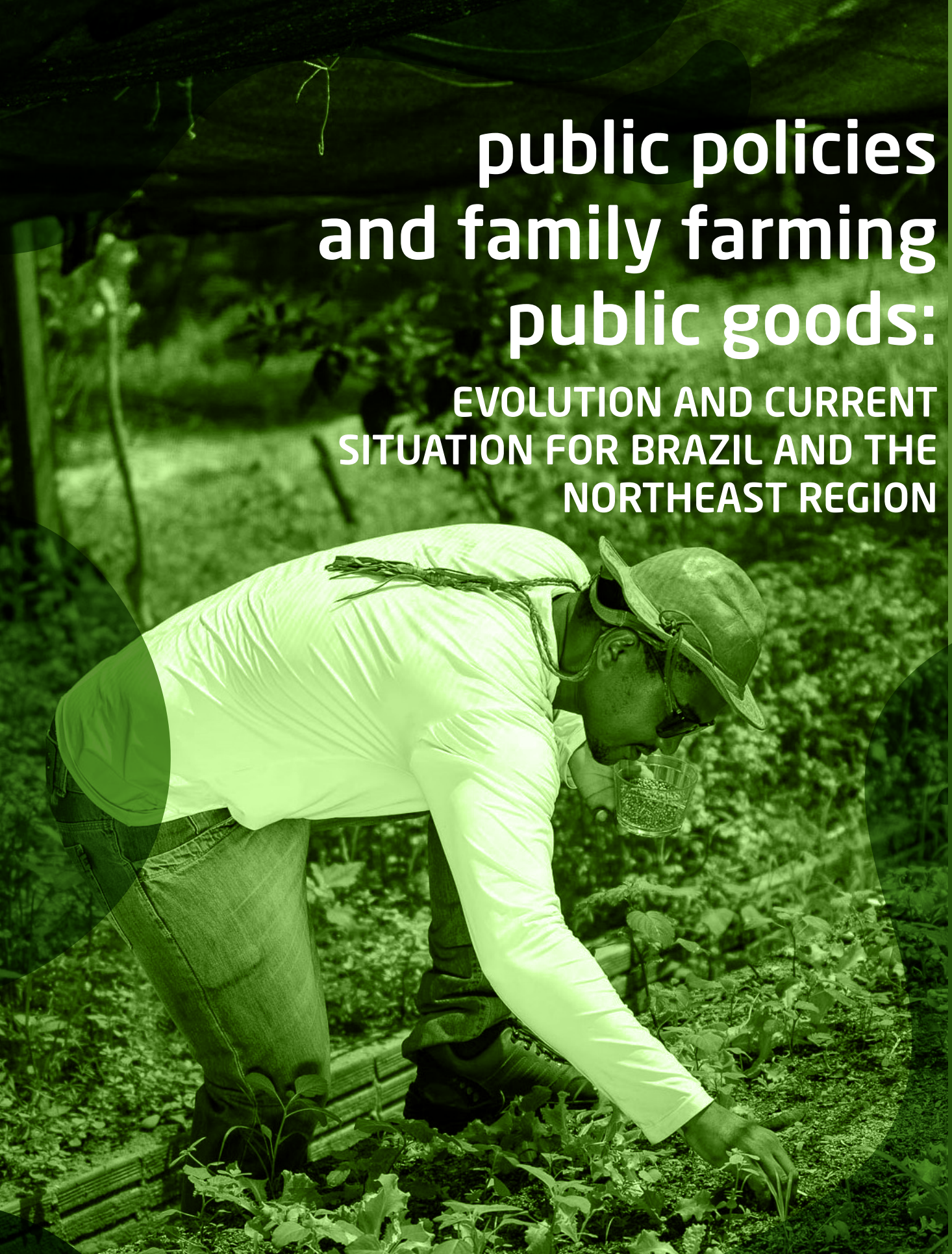
public policies and family farming public goods:

EVOLUTION AND CURRENT SITUATION FOR BRAZIL AND THE NORTHEAST REGION



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[abstract]

Family farming makes up a diverse socio-productive segment that is dispersed throughout the Brazilian territory and whose activities assume multidimensional values for a sustainable and inclusive development strategy. In addition, it is responsible for maintaining a large contingent of job positions in rural areas, for producing food for families' self-consumption, and for supplying weekly street markets and supermarkets. Family farming also has an important relationship with environmental resources. In order to strengthen family farming activities, the Federal Government of Brazil has long been developing public policies aimed at meeting the different demands of such public. Financial resources from programs aimed at supporting family farmers' production and the offering of Technical Assistance and Rural Extension (TARE) play a key role in the reproduction of family farming throughout the country. In the particular case of the Northeast region, family farmers contribute to nutrition and food security and to the economy of small and medium-sized municipalities, even more so because it is a geographical space historically marked by the incidence of poverty and the occurrence of prolonged droughts. Therefore, it is extremely important to maintain, expand and integrate social and productive inclusion policies, in order to overcome the multiple needs that these farmers face in their daily lives and provide them with means to enhance their participation in the sustainable regional development process. Therefore, this study aimed at contributing to the debate around the current universe of family farming and its dynamics of social reproduction in Brazil. To this end, we analyzed both its characteristics in terms of multifunctionality, production of public goods and productive capacity, as well as the state of the art of public policies targeting family farmers. The main focus of analysis is the Northeast region, but whenever possible, regional particularities were verified in a broader context, making comparisons with other regions as well as with aggregate national averages.

Keywords: Family farming; public policies; sustainable regional development

1 Introduction

Brazilian family farming comprises a very diverse range of rural collective groupings, whose main structural characteristics, although closely linked to the territorial context in which they are inserted, can be summarized in the following defining elements of their peasant condition: small-scale production conditioned to the capabilities and needs of the household; diversified production basis, including production for self-consumption; stable relationship with the rural property, which is both a domestic and a productive unit; more organic relationship with available natural resources, which gives it relative autonomy with regard to markets[1].

Although family farming originates from traditional socio-productive forms, its regulation for public policy purposes is relatively recent. The Law N. 11,326/2006, which was regulated by the Decree N. 9,064/2017, established the guidelines for the formulation of the National Policy for Family Farming and Rural Family Enterprises. This Law defines that family farmers and rural family entrepreneurs are those who simultaneously present the following characteristics: i) the area used for production must have up to four fiscal modules[2]; ii) economic activities and the productive and income-generating process must be mainly composed of family labor; iii) a minimum percentage of household income must be derived from the activities of the establishment or enterprise; and iv) the management of the production unit must be made exclusively by the family. According to the aforementioned Law, the following populations also fall within the legal scope of fa-

1 For more information on the characteristic dimensions of the family farming concept, see Ploeg (2006), Silva (2015), Valadares and Alves (2020), and Veiga (1996).

2 "A fiscal module is a unit of measurement defined in hectares whose value is stipulated by the National Institute of Colonization and Agrarian Reform (Incra) for each municipality according to the type of land use, the income obtained, other types of income-generating activities existing, and the concept of family property" (Sambuichi et al., 2016, p. 11).

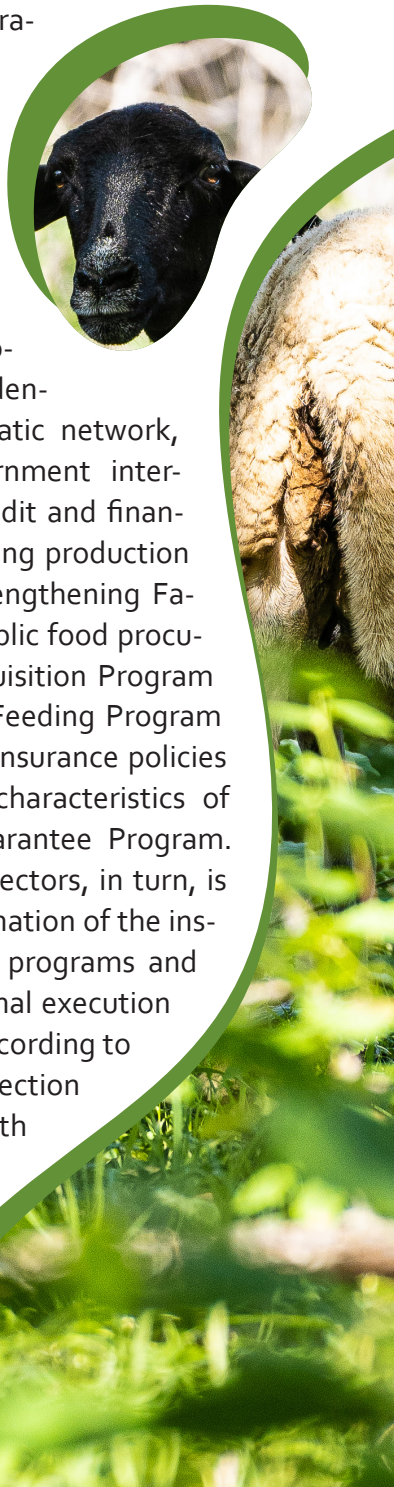
mily farming: foresters, extractive fish farmers, artisanal fishers, indigenous peoples, members of remaining quilombo communities and other traditional peoples and communities that meet specific criteria.

Even before the Law N. 11,326/2016 was passed, the kick-off for the insertion of this important Brazilian socio-productive segment in the political agenda came with the National Program for Strengthening Family Farming (Pronaf), launched in 1995 by the Federal Government. Pronaf came with the intention of providing subsidized credit lines for family farmers, which were historically excluded from the traditional financial system. Since then, a series of new programs have emerged, including Pronaf's special credit lines such as Pronaf Woman, Pronaf Youth, Pronaf Agroecology, and Pronaf More Food, which focus on the productive inclusion of this public and on the fight against rural poverty, covering several production stages and the commercialization of family farming products[3].

Another key feature refers to the great regional heterogeneity of Brazilian family farming, whose social reproduction strategies are directly rooted in the territorial contexts in which it operates. Understanding such asymmetries is an essential factor for formulating, adapting and improving public policies aimed at meeting the needs and multiple potentials of this vast population contingent.

Faced with such challenges, this study aimed to contribute to the debate around the current universe of family farming and its dynamics of social reproduction in Brazil. To this end, we sought to analyze both its characteristics in terms of multifunctionality, production of public goods and productive capacity, as well as the state of the art of public policies aimed at this sector. The main focus of analysis is the Northeast region, but whenever possible, regional particularities were verified in a broader context, making comparisons with other regions as well as with aggregate national averages.

Accordingly, this report is organized in other sections besides this Introduction. In section 2, the main concepts guiding the debate on family farming and its multiple interactions with the Brazilian territory are briefly presented. Section 3 uses data from the last two IBGE's Censuses of Agriculture (2006 and 2017) to show a quantitative overview of Brazilian family farming in general, and of Northeastern agriculture in particular, with a series of tabulated indicators and graphic illustrations aimed at promoting a more thorough understanding on the subject. In section 4, there is a discussion on public policies aimed at meeting the socio-productive demands of Brazilian family farmers. As these policies currently consist of a dense and complex programmatic network, three dimensions of government intervention were stressed: i) credit and financing policies for family farming production – National Program for Strengthening Family Farming (Pronaf); ii) public food procurement policies – Food Acquisition Program (PAA) and National School Feeding Program (PNAE); and iii) agricultural insurance policies adapted to the structural characteristics of family farms – Harvest-Guarantee Program. Each of these intervention vectors, in turn, is subdivided into a brief explanation of the institutional framework of the programs and an analysis of their operational execution in the most recent period, according to the available data. Finally, Section 5 concludes the document with final considerations.



3 For further information on and analyzes of support programs for family farming in Brazil, see: Sambuichi et al. (2014; 2022), Perin et al. (2021), Silva (2019; 2020), Valadares et al. (2019), and Valadares (2021).

2 Family farming, territory, multifunctionality and public goods

In Brazil, recent studies on rurality focusing on the socio-productive dynamics of family farming have sought to understand the different social interrelations that are expressed in an environment of different levels of complexities, composed of rural and urban spaces that maintain a constant exchange relationship and dependency. These spaces merge into a territory, a space that constitutes a flexible base on which various endogenous and exogenous forces act, continually subjecting it to pressures of change, conflicts and power relations.

In this context, the notion of territory makes it possible to visualize and respond to complex social demands through policies and strategies aimed at managing economic, cultural and environmental resources, thus giving it a multidimensional character. **Figure 1** illustrates some features of the main dimensions of a territory pointed out in the literature and which have a close relationship with the universe of Brazilian family farming.

Based on the relationships illustrated in **Figure 1**, the notion of **multifunctionality** of family farming is associated with the official recognition that it plays a role whose importance transcends the production of agricultural products themselves, intended for human and animal food and raw material for industry. Given its decisive role in the territory and in the perpetuation of certain practices, agricultural activity plays an essential role in territorial organization and in the preservation of cultural assets and traditions. Under this understanding, family farming moves away from the focus on the property itself and begins to encompass a more holistic view of the rural, as a "territory in

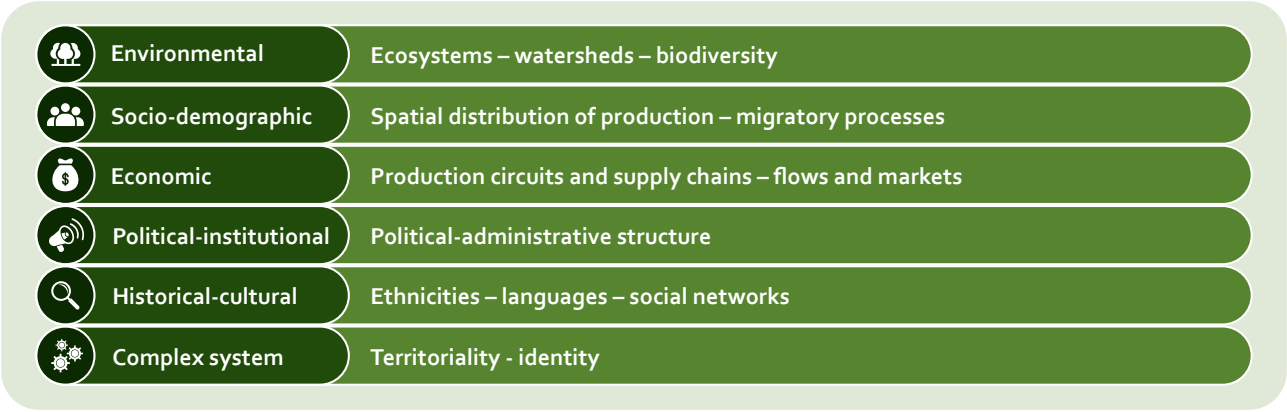


FIGURE 1. General scheme of territorial multidimensionality.
Source: Silva (2015).

use" (Santos and Silveira, 2008), understood as a physical and symbolic space of production of material and immaterial goods necessary for social reproduction[1].

In Brazil, although the debate has gained traction in the 2000s, the 1988 Federal Constitution already brought the concern with the so-called "social function of rural properties". This legal instrument is based on a multiple concept that impel to properties a regulation based on the public interest (Silva and Silva Junior, 2013). Pursuant to Article 186, properties that meet the following conditions are considered in compliance with its social function: i) have a rational and adequate use of the establishment; ii) rational use of available natural resources and preservation of the environment; iii) observe the normative devices of work reports; and iv) the establishment must concomitantly promote the well-being of rural landowners and workers[2].

In addition to a constitutional norm, the multifunctionality of agriculture also has a direct relationship with the type of agricultural exploitation adopted in a given territory. In this sense, family farming is much closer to a multifunctional notion than corporate farming, as the latter tends to be more specialized. Therefore, the combination of the concepts of multifunctionality, family farming and territory entails the simultaneous presence of commercial and non-commercial dimensions, which are expressed through forms of exchange and reciprocity around agricultural products, access to natural resources (e.g., land and water) and of social work and neighborhood relations (Bonnal and Maluf, 2007; Carneiro and Maluf, 2003; Favareto, 2007; Silva, 2015; Wanderley, 2000), in addition to enabling direct impacts on tackling rural poverty (Bullor, 2019).

The combination of this complex set of territorialized interventions in family farming allows one to state that its multifunctional nature can thus be conceived "as a set of ideas capable of reorienting agricultural policies and agricultural activity towards another model of development" (Gavioli and Costa, 2011, p. 452).

Another point to be highlighted concerns the classification of the aforelisted functions as **public goods**, insofar as their importance transcends the perimeter of the farmland itself. That is, it goes beyond its primary function of producing basic foodstuffs for human consumption, and can also shape the landscape and provide diverse environmental benefits,

1 The concept of multifunctionality emerged from this questioning and gained greater dimension when entering the debates from major international organizations on rural development and the environment, especially after Rio-92 (Silva, 2015).
2 It should be noted that, in the event that a rural property does not meet the established criteria for the social function of the land, the Government may expropriate it for social interest or for agrarian reform purposes, through compensation in agrarian debt bonds, preserving itself the real value of land.

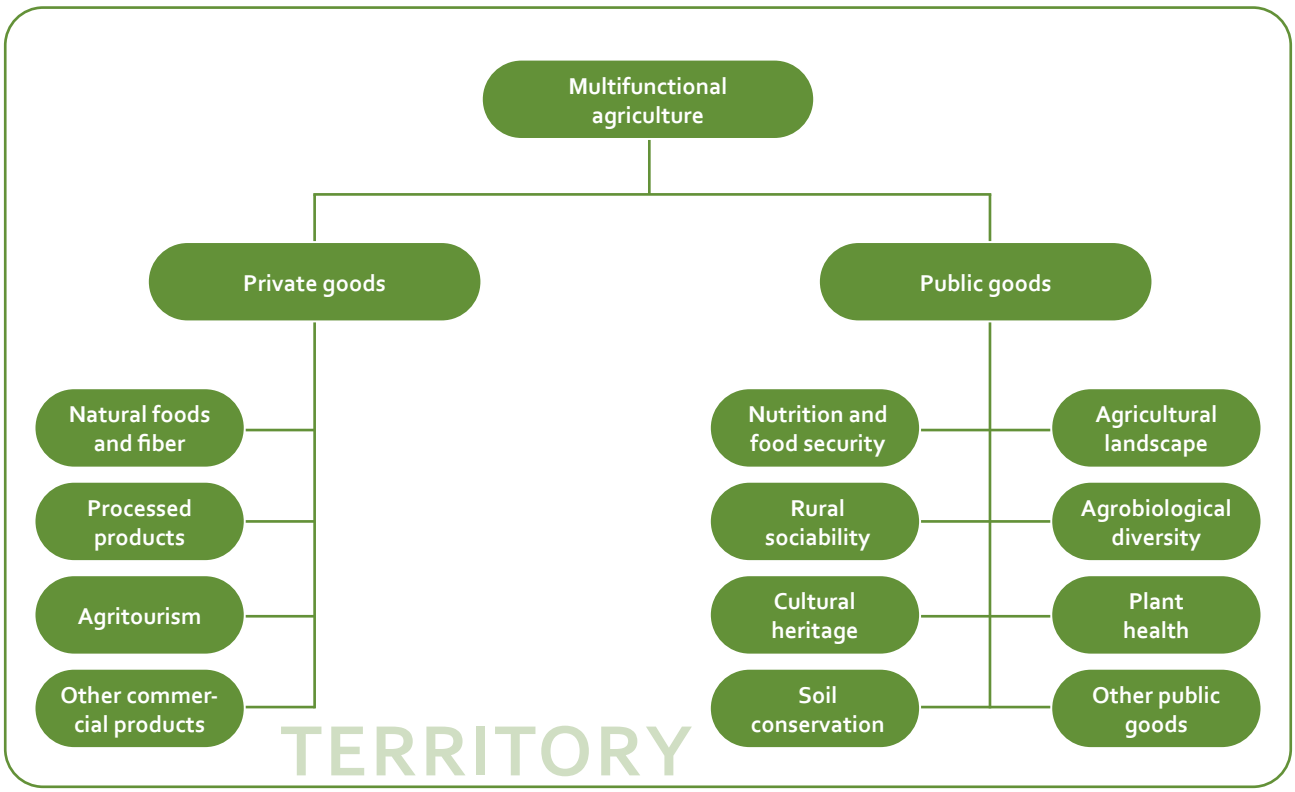


FIGURE 2. Analytical framework of agricultural multifunctionality.
Source: Silva (2015).

such as soil conservation, sustainable management of renewable resources, and preservation of biodiversity. Figure 2 outlines the idea of agricultural multifunctionality based on the conception of public goods.

In summary, the concept of family farming multifunctionality can be understood as an instrument for analyzing agricultural systems and their relationships with other sectors of the economy and the society as a whole, with a view to producing public goods, i.e., not being oriented merely in terms of market relations. It also favors the introduction of innovations that enable the transition to development models that are more coherent with the ideal of sustainability, especially in a context of global concerns with climate changes, which poses so many risks to the future of the human race.

However, the functioning of these dimensions of analysis in the universe of family farming depends on a series of historical, structural and political factors. The great geographic diversity of Brazil denotes an even greater complexity in favoring this conception of socio-productive organization. In this sense, a greater and better understanding of the conditions and relevant characteristics of the diverse territorial contexts faced by Brazilian family farmers become necessary. In this case, the Census of Agriculture arises as an important source of information. Being carried out by the Brazilian Institute of Geography and Statistics (IBGE) every ten years, the survey provides information on the main land and socioeconomic dimensions of the Brazilian agricultural sector in general and family farming in particular, enabling comparisons between different levels of aggregation (e.g., municipalities, regions and states). The following section deals precisely with this, presenting information on the socio-productive structure of the Brazilian family farming, with emphasis on the Northeast region.

3 Family farming in the Northeast Region of Brazil: social, structural and productive characteristics

The characterization of family farming in the Northeast region of Brazil is closely connected not only to historical-political aspects of the formation of the Brazilian State, but also takes into account a series of other factors inherent to its territorial configuration, such as climate, vegetation, water resources and forms of occupation. However, since Brazil is a Federative Republic where decision-making power is strongly centralized at the Federal level, it is necessary to analyze the characteristics of family farming in the Northeast in comparison to other regions, in order to check asymmetries and convergences between diverse realities.

It is also known that, even within a given region, there are considerable differences according to the particularities of the states that comprise it. Even so, this section sought to verify regional patterns and average values of aggregated indicators, highlighting those considered essential for the theme of nutrition and food security, leaving aside possible points that should be addressed in future studies. That is, such patterns were analyzed in the light of the national composition of family farming, stressing the contributions of each region to the panorama of relative changes in land use, with emphasis on the Northeast region, the main object of analysis of this study. To this end, we sought to accumulate evidence from the comparison of data from the last two Censuses of Agriculture (2006 and 2017).

The Northeast region of Brazil is made up of nine states and occupies approximately 18% of the national territory, with an area of 1,560,000

square kilometers. A large part of this area (64.8%) comprises the semi-arid region, whose predominant edaphoclimatic characteristics are as follows: low and irregular rainfall with periodic occurrence of droughts; high temperatures with high evapotranspiration rates; poorly permeable soils subject to erosion; and predominance of caatinga vegetation[1]. **Figure 3** shows the boundary of the Northeast region overlapped by the boundary of the semi-arid region of Brazil[2].

In population terms, according to the more recent demographic data, the Northeast region has approximately 60 million inhabitants, with Bahia being the most populous state (14.8 million) and Sergipe the least one (2.3 million).

Agricultural activity is spread throughout the northeastern territory, with a high incidence of smallholders (family farmers). According to data from the last two Censuses of Agriculture (2006 and 2017), a large portion of agricultural establishments in the Northeast region are characterized as family farms. Moreover, the region houses almost half of Brazilian family farming establishments. For this reason, family farming contributes significantly to job opportunities[3], food production and the supply chains that make up region's GDP, especially in small towns from the countryside (Aquino, Alves and Vidal, 2020; Guilhoto, Azzoni and Ichihara, 2012).

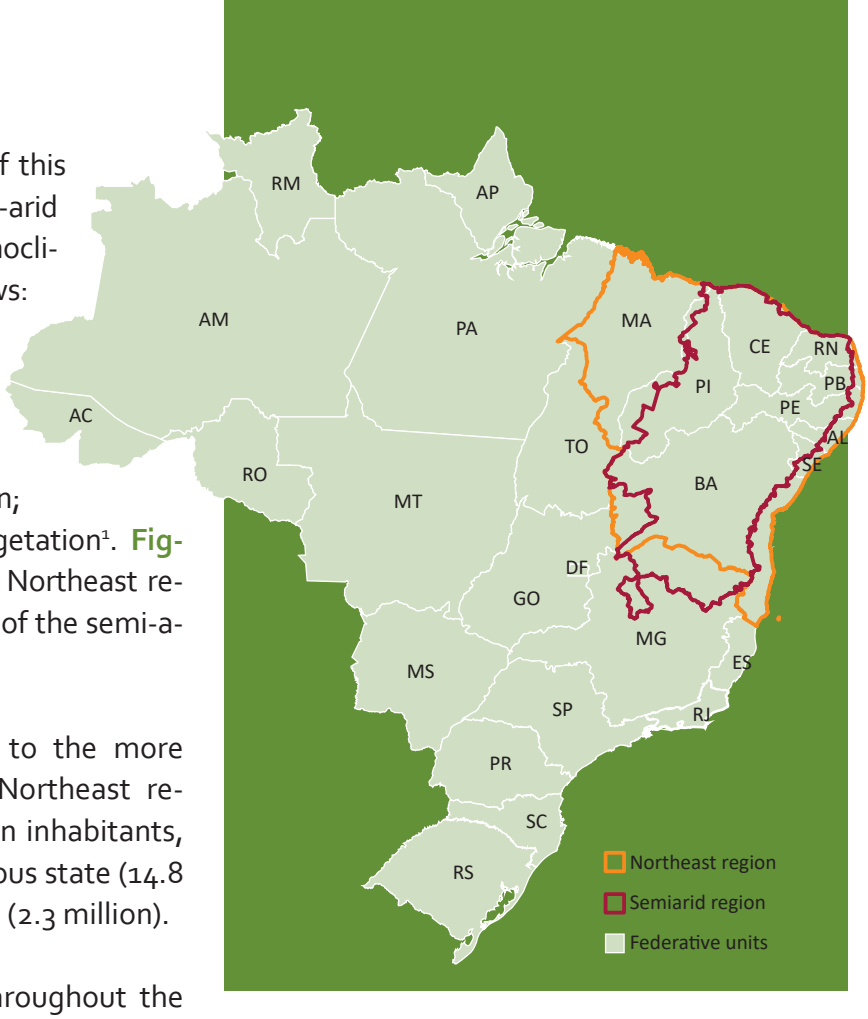


FIGURE 3. Geographical location of the Northeast Region in the Brazilian territory and the legal delimitation of the Semiarid Region.
Source: Aquino, Alves and Vidal (2020).

Table 1 details the aforementioned information by region. As a matter of comparison, **Graph 1** depicts the participation of each region in the total number of agricultural establishments and in the number of family farming establishments in Brazil. Data are presented for the last two Censuses of Agriculture (2006 and 2017).

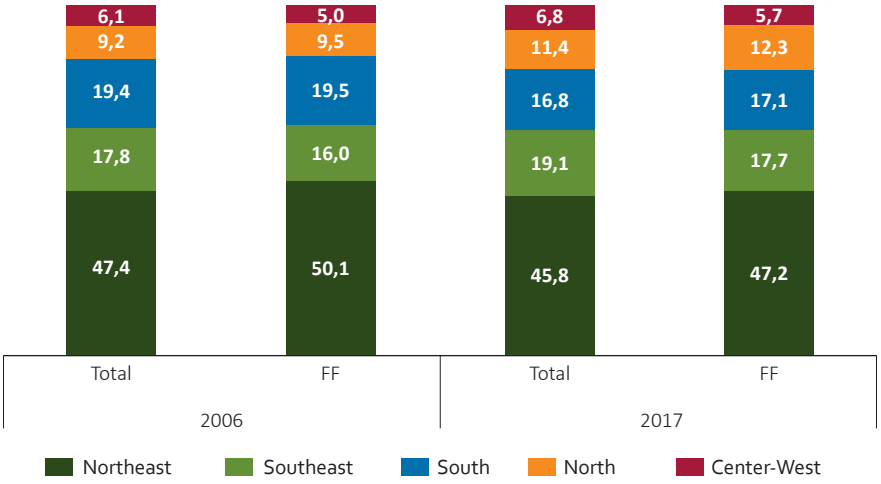
The analysis of **Table 1** evidences a 2% decrease in the total number of agricultural establishments in Brazil. Among family farming establishments, the decline was even greater (-10.7%). However, it is important to stress the fact that the relative participation of each region also varied. The Northeast was the second region with the biggest drop (-15.9%), behind only the South region (-21.6%). In other words, the reduction in the total number of family farming establishments was concentrated precisely in the regions where, historically, family farming was more structured in the country, although they maintained strong structural di-

1 The northeastern semi-arid region covers two municipalities in Maranhão and several municipalities in the other states of the region. According to the official delimitation currently in force, four of these states have more than 80% of their territories located in the semi-arid region, namely Ceará (98.7%), Rio Grande do Norte (93%), Paraíba (90.9 %) and Pernambuco (87.8%) (Aquino, Alves and Vidal, 2022).
2 It is important to note that, even though the caatinga biome predominates in the Northeast region, there are also areas characterized by Amazon Forest vegetation (Maranhão) and Atlantic Forest vegetation (southern Bahia).
3 Family farming establishments generate more than 4.7 million occupations in northeastern states, which represents 73.8% of the total number of people employed in agricultural activities in the region (Aquino, Alves and Vidal, 2020).

TABLE 1. Number of agricultural establishments (total and family farming) and relative share of family farming (FF) over the total – Brazil and Macro-regions (2006 and 2017)

Region	2006			2017		
	Total	FF	FF/total (%)	Total	FF	FF/total (%)
Northeast	2,454,060	2,187,131	89.1	2,322,719	1,838,846	79.2
Southeast	922,097	699,755	75.9	969,415	688,945	71.1
South	1,006,203	849,693	84.4	853,314	665,767	78.0
North	475,778	412,666	86.7	580,613	480,575	82.8
Center-West	317,498	217,022	68.4	347,263	223,275	64.3
Brazil	**5,175,636**	**4,366,267**	**84.4**	**5,073,324**	**3,897,408**	**76.8**

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo



GRAPH 1. Relative share in the number of agricultural establishments (total and family farming) - Macro-regions (2006 and 2017).

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo

fferences between them. Only the North and Center-West regions, with a modest participation of family farming in their agrarian structure, showed a growth in the number of family farming establishments.

It is worth mentioning that this reduction is explained, at least in part, by changes of institutional nature – normative changes on the family farming framework[4] – as well as methodological adjustments in the application of research between the Censuses of Agriculture (Valadares e Alves, 2020; Valadares, 2022). Obviously, these modifications condition the other tabulations on the changes in the Brazilian agrarian structure during the period.

It is also noteworthy that, in 2017, 77.8% of farmers that are the head of their household declared themselves owners of the establishments where they live and work, a fact that favors both the livelihood of families and the access to public rural development policies[5]. It is also important to stress that 84.3% of family farming establishments from the Northeast are within the semiarid region, as shown in **Figure**

4 Law nº 11,326/2006, responsible for the legal characterization of family farming for the purposes of public policies in Brazil, was amended by Decree nº 9,064/2017.

5 Although it is common knowledge that the majority of small family farmers do not have legal documentation of land ownership, the number presented indicates that they are more "free" from old relationships of employer dependency, such as the condition of "resident" within the large farms in the region (Aquino, Alves and Vidal, 2020).

3. This information is relevant since it expresses the structural conditions of these farms due to the climatic conditions that characterize the region, which do not favor the development of agricultural activities without the use of adequate production practices. Regarding irrigation, for example, data reveal that only 9.4% of northeastern family farmers are able to adopt this practice in their establishments, of which 71% are concentrated in the states of Ceará, Pernambuco and Bahia, which have better water infrastructure (water mains, canals and large reservoirs) (Aquino, Alves and Vidal, 2020).

Given this structural limitation, an alternative that has been worked on, mainly by non-governmental organizations, is the adoption of technologies for coexistence with the semi-arid region (concrete cisterns, reuse of domestic water in the production of vegetables and fruit trees, productive backyards, mandalas etc.), which are low-cost and lead to increased family production. On this point, 43.2% of family farming establishments claimed to have cisterns, as individual structures for storage and access to drinking water and for productive activity, followed by conventional wells (19.5%) and deep wells (12.9%). However, the Northeast region, when compared to the other regions, still has a high number of rural establishments with difficulty in accessing adequate water sources, a fact that can be evidenced by the aforedescribed data on the low proportion of family farmers with access to irrigation techniques in its productive activities.

In addition to the recent variation in the total number of agricultural establishments in the country, it is worth checking what they represent in terms of total agricultural land, as this is a central indicator of the production potential of these establishments. As shown in **Table 2**, Brazilian family farming, although representing about 80% of all agricultural establishments, account for only 23% of agricultural land, i.e., less than ¼ of the total.

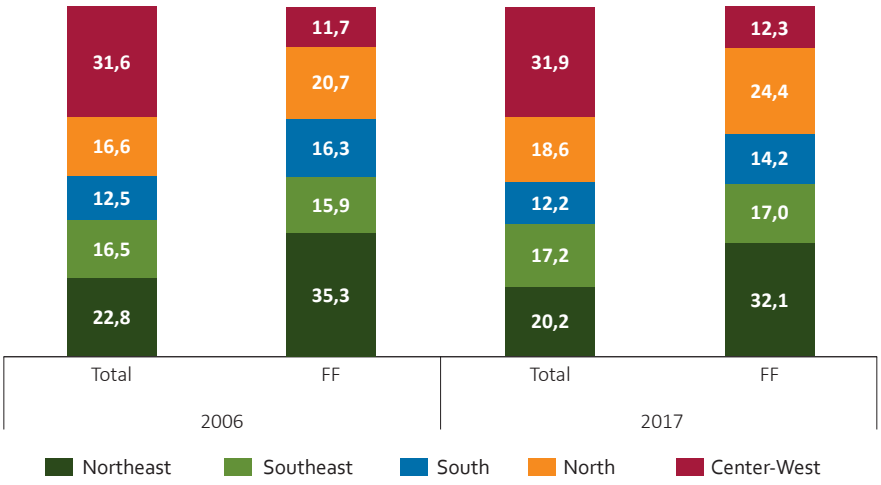
In regional terms, the Northeast region accounts for the highest percentage of family farming establishments in the total area, 37.2%, largely because it is the region with the highest share of total establishments, as shown in **Table 1**. However, the region faced a decrease of 8,4% in the total area of family farming establishments in the last two Censuses of Agriculture, while a small increase of 1% was registered at the national level. **Graph 2** shows that the Northeast also has the highest relative weight in the total area occupied by family farming establishments across the country, accounting for about 1/3 of the total, despite showing a small reduction between censuses (from 35.3% in 2006 to 32.1% in 2017). **Graph 3** brings this information to the Northeastern states.

Among the states from the Northeast region, a relevant particularity in the 2017 data is that Maranhão has the highest share of family farming in total agricultural establishments, with 85.1%. However, it has the lowest share in terms of agri-

TABLE 2. ea occupied by agricultural establishments (total and family farming) and relative participation of family farming (AF) over the total – Brazil and macroregions (2006 and 2017)

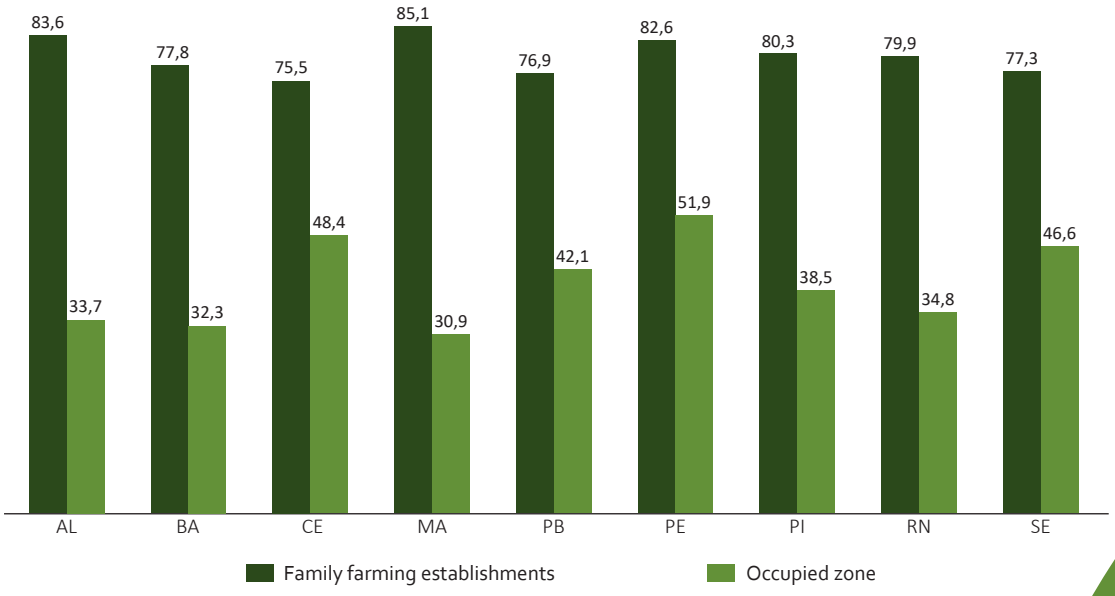
Brazil and macroregions	2006			2017		
	Total (ha)	FF (ha)	FF/total (%)	Total (ha)	FF (ha)	FF/total (%)
Northeast	76,074,411	28,315,052	37	70,893,865	25,925,743	37
South	41,781,003	13,054,511	31	42,875,310	11,492,520	27
Southeast	54,937,773	12,771,299	23	60,302,969	13,735,871	23
North	55,535,764	16,611,277	30	65,213,349	19,767,199	30
Center-West	105,351,087	9,350,556	9	112,004,322	9,969,750	9
Brazil	**333,680,037**	**80,102,694**	**24**	**351,289,816**	**80,891,084**	**23**

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo



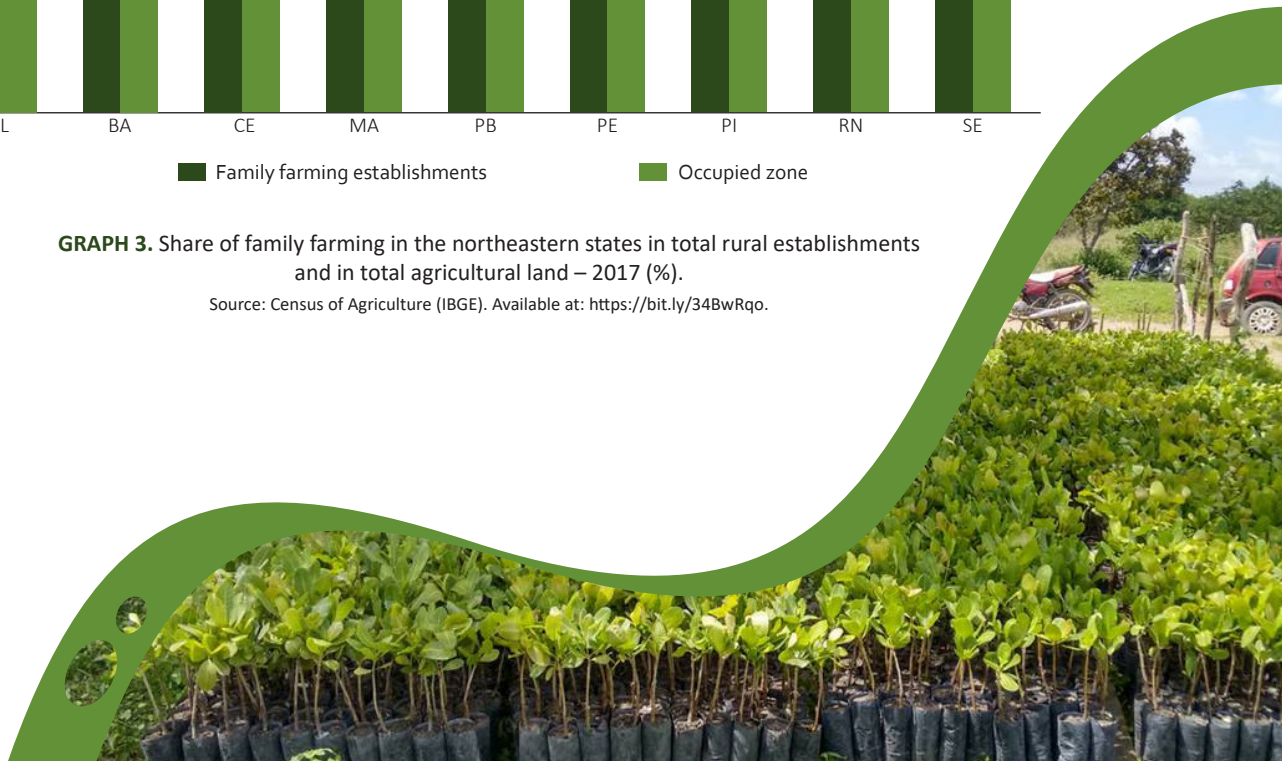
GRAPH 2. Relative share of the total area occupied by agricultural establishments (total and family farming) - Macroregions (2006 and 2017).

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.



GRAPH 3. Share of family farming in the northeastern states in total rural establishments and in total agricultural land – 2017 (%).

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.



cultural land, with only 30.9%. Other states with high shares of family farming establishments are Alagoas (83.6%), Pernambuco (82.6%), Piauí (80.3%) and Rio Grande do Norte (79.9%). Pernambuco has the largest share in terms of the area occupied by family farming, with 51.9%, followed by Ceará (48.4%) and Sergipe (46.6%).

With data on the total number of agricultural establishments and the total agricultural land, it is possible to identify their average size in hectares for the two years of analysis. **Graph 3** shows that, as expected given the drop in the total number of family farming establishments and their stability in terms of occupied area, the average size of these establishments increased by 13.6% in the period, with the national average rising from 18.3 hectares in 2006 to 20.8 hectares in 2017. All regions recorded increases. In the Northeast, the average increased from 12.9 to 14.1 hectares. However, the region continued with the smallest average size of family farms in Brazil, which strongly limits the productive potential of these establishments, especially when taking into account the fact that they are in an area with edaphoclimatic conditions relatively less favorable to various agricultural activities. One cannot forget that the bulk of such properties are also the place of residence of the respective families, whether they are owners or squatters[6].

It should also be noted that, even with the average growth recorded between Censuses, there is still a large discrepancy with regard to non-family farming establishments, whose national average size in 2017 was 69.2 hectares[7]. In the Northeast, the average size of non-family farming establishments was 30.5 hectares.

The prevailing inequality in the distribution of land assets is a factor that explains the precarious condition experienced by a significant portion of family farmers from the Northeast compared to producers in other areas of the country, with a strong impact on other social variables, such as poverty, a theme that is recurrent in academic literature (Aquino, Alves and Vidal, 2020; Helfand, Moreira and Figueiredo, 2011). Due to the fact that the vast majority of establishments are smallholdings, this situation hinders the productive development of farming families, resulting in problems related to, on the one hand, rural succession and maintenance of new generations of farmers, and, on the other hand, rural exodus and consequent population density in urban centers (Ipea, 2023).

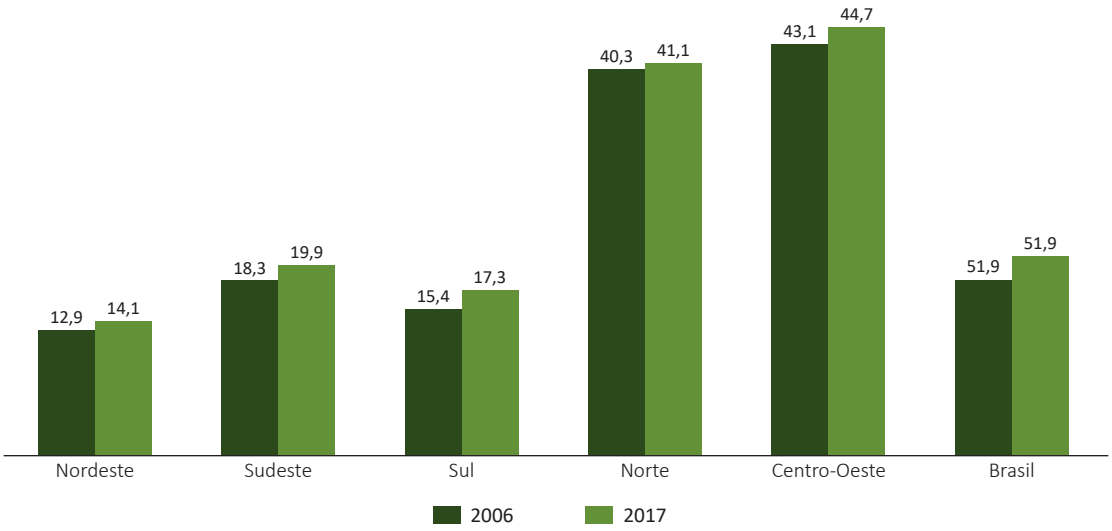
Therefore, the return of agrarian reform and land regularization actions in the country, practically paralyzed since 2016, emerge as urgent options to be considered to face this scenario of inequalities in the Brazilian countryside. Such measures are justified as a stimulus to the maintenance of families in rural areas, producing several primary products relevant to the consumer basket of Brazilians[8].

In summary, as highlighted by Valadares (2009, p. 9), the information tabulated points to a displacement of the family farming "axis". This can be explained, on the one hand, by the reduction in the number of family farming establishments in the region where agriculture is more consolidated or traditional (Northeast and South), in which the measure of the fiscal module is smaller. On the other hand, there is an advance in the regions where the agricultural activity was more recently intensified (North and Midwest), in which the measure of the fiscal module is higher. According to the aforementioned author, this difference is relevant due to the fact that the size of agricultural establishments, one of the criteria for the classification of establishments as family farms, is measured by fiscal modules. For this

6 Of all family farmers surveyed in the Northeast region, 74.7% reported that they lived in the rural establishment itself (Aquino, Alves and Vidal, 2020).

7 That is, almost three and a half times the average of family farming establishments.

8 As highlighted by Ipea (2023), a land access policy must involve measures of land recognition and regularization (considering the particularities related to traditional peoples and communities) and the implementation of settlements, in addition to assuming the following guiding principles: equitable distribution of land, preservation of the environment, and promotion of beneficiaries' socioeconomic well-being.



GRAPH 4. Average size of family farming establishments - Macroregions (2006 and 2017).
Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

reason, despite family farming having lost more than 500,000 establishments between censuses, there was some stability in its total occupied area, with marked differences between regions.

Moreover, since the measure of the fiscal module[9] itself reflects the type of land use predominating at the local level, being greater for livestock than for crops, the regional repositioning of family farming does not only correspond to a replacement of small family farming establishments in the Northeast and South by large family farming establishments in the North and Center-West, but also indicates changes in land use. This is evident, for example, with the significant growth of pasture areas on family farms in the Center-West and North regions (around 1 million and 3 million hectares, respectively), compensating for the loss of the total area of family farming in the Northeast and South regions under the advance of livestock to the detriment of crop areas.

Such evidence is reinforced when observing the profile of these establishments by area groups. Data show that family farming establishments with more than 50 hectares, which in 2006 covered 51.1% of the total area, increased their share in 2017, reaching 53.2%. Although, at first, there is not a very significant variation, regional comparison shows relevant elements to be considered. With the exception of the Northeast, all other regions had a significant increase in family farming establishments with more than 50 ha in this period, including the South region, which, despite been historically characterized by small-scale family farming, showed a drastic fall in family farming establishments smaller than 50 hectares. Therefore, the decrease in the total number of family farming establishments observed in **Table 1** was mainly concentrated among those with smaller areas. **Table 3** systematizes this set of information.

Specifically in the Northeast region, it is observed that, in spite of the absolute drop in the number of family farming establishments, the proportions between area groups have changed little, so that the region remains largely anchored in smaller establishments. That is, even with the drop in relative participation, family farming establishments of up to 10 hectares still account for about 2/3 of the regional total. When considering the national average, as shown in **Graph 5**, it is possible to note that the main relative variations refer to the decrease among establishments with up to 10 hectares and the growth among those with more than 20 hectares.

9 The fiscal module measures are defined by the National Institute for Colonization and Agrarian Reform (Incra) for each municipality.

TABLE 3. Number of family farming establishments by area groups and rate of change - Brazil and Macroregions (2006 and 2017)

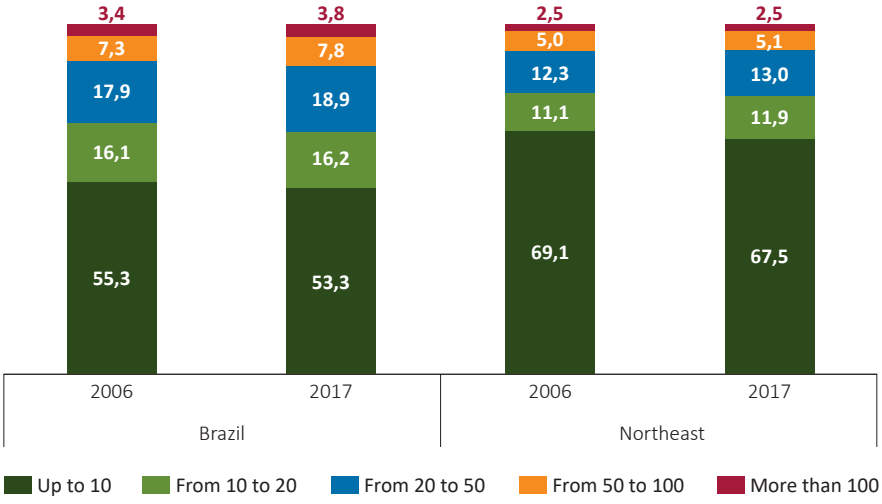
	2006					
	Up to 10	From 10 to 20	From 20 to 50	From 50 to 100	More than 100	Total
Northeast	69.1	11.1	12.3	5.0	2.5	100
Southeast	51.3	19.2	20.2	7.3	1.9	100
South	44.7	28.1	22.7	4.3	0.2	100
North	31.2	11.0	25.2	19.0	13.6	100
Center-West	21.8	16.1	32.4	18.7	11.0	100
Brazil	**55.3**	**16.1**	**17.9**	**7.3**	**3.4**	**100**
	2017					
	Up to 10	From 10 to 20	From 20 to 50	From 50 to 100	More than 100	Total
Northeast	67.5	11.9	13.0	5.1	2.5	100
Southeast	48.3	20.3	21.1	8.0	2.2	100
South	41.5	27.8	24.7	5.6	0.3	100
North	37.4	10.2	23.7	16.4	12.3	100
Center-West	22.7	16.4	31.5	17.8	11.5	100
Brazil	**53.3**	**16.2**	**18.9**	**7.8**	**3.8**	**100**
	Variation 2017/2006 (%)					
	Up to 10	From 10 to 20	From 20 to 50	From 50 to 100	More than 100	Total
Northeast	-12.8	-4.0	-5.7	-10.0	-10.5	-10.8
Southeast	-5.2	6.6	5.5	9.6	13.6	0.7
South	-25.7	-21.0	-12.9	3.9	10.5	-20.1
North	48.3	14.3	16.3	7.0	11.1	23.6
Center-West	8.8	6.1	1.4	-0.7	8.9	4.2
Brazil	**-10.1**	**-6.2**	**-1.9**	**0.3**	**3.3**	**-6.8**

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

When such changes are analyzed as a function of the total area occupied by the same groups of establishments, the concentration trend becomes more evident. As shown in **Table 4**, the relative participation of establishments of up to 20 hectares, which together corresponded to 34% of the total area of Brazilian family farming in 2006, fell to only 19% in 2017 (8.2% for those up to 10 hectares and 10.8% for those from 10 to 20 hectares). On the other hand, rural establishments over 50 hectares, which corresponded to 34.5% of the total area in 2006, increased their share to 53.2% in 2017 (25% for those with 50 to 100 hectares and 28.2% for those over 100 hectares). This was reflected in the participation of each area group in the total area occupied by family farming in Brazil, as illustrated in **Graph 6**. For the Northeast region, in line with previous analyses, the composition between area groups did not change significantly. The increase in relative participation was driven by intermediate groups (from 10 to 20 hectares and from 20 to 50 hectares).

So it remains to know about the productive destination of the areas occupied by family farming in Brazil, from a regional perspective. Based on the data tabulated in **Table 5**, it can be noted that, as previously highlighted, pastures accounted for most (in absolute terms) of the increase in the area occupied by family farmers, especially in the North and Center-West regions, which ratified the domain of livestock in family farming establishments[10]. Due to the land tenure characteristics of these two regions, partly highlighted

10 As Valadares (2022) had already pointed out, the expansion of pastures in the North region alone represented almost 60% of the total gain in area of family farming in the country between 2006 and 2017.



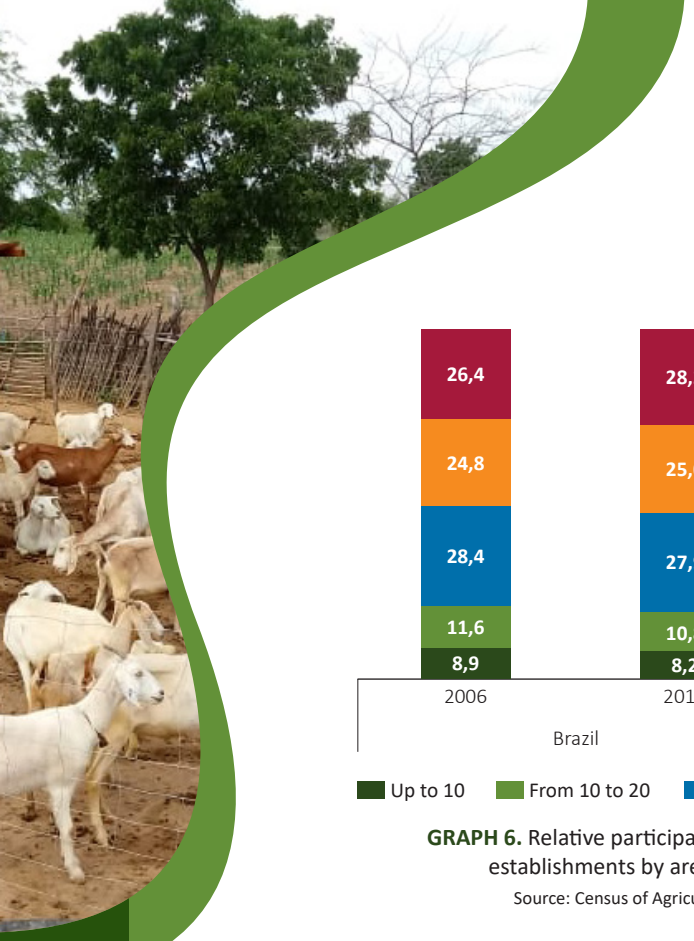
GRAPH 5. Relative participation in the number of family farming establishments by area – Macroregions (2006 and 2017).

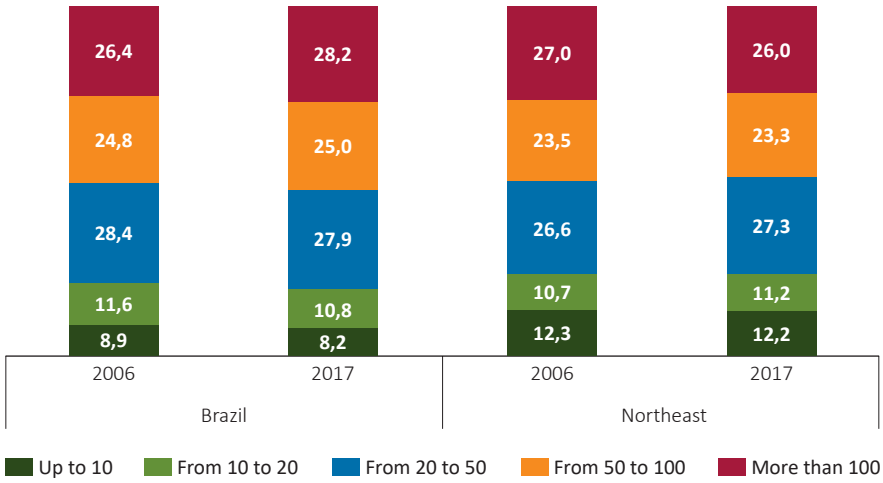
Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo

TABLE 4. Relative participation of family farming establishments in the total occupied area by area groups and rate of change - Brazil and Macroregions (2006 and 2017)

	2006					
	Up to 10	**From 10 to 20**	**From 20 to 50**	**From 50 to 100**	**More than 100**	**Total**
Northeast	12.3	10.7	26.6	23.5	27.0	100
Southeast	10.8	14.7	33.6	26.5	14.4	100
South	13.0	25.1	42.9	17.2	1.8	100
North	2.0	3.5	18.9	29.1	46.4	100
Center-West	2.3	5.5	23.6	28.8	39.8	100
Brazil	**18.8**	**15.2**	**31.5**	**20.1**	**14.4**	**100**
	2017					
	Up to 10	**From 10 to 20**	**From 20 to 50**	**From 50 to 100**	**More than 100**	**Total**
Northeast	12.2	11.2	27.3	23.3	26.0	100
Southeast	10.2	14.5	33.1	27.2	14.9	100
South	11.4	22.8	43.0	20.5	2.3	100
North	2.5	3.3	18.8	26.9	48.5	100
Center-West	2.4	5.5	22.8	27.5	41.8	100
Brazil	**8.2**	**10.8**	**27.9**	**25.0**	**28.2**	**100**
	Variation 2017/2006 (%)					
	Up to 10	**From 10 to 20**	**From 20 to 50**	**From 50 to 100**	**More than 100**	**Total**
Northeast	-9.0	-3.7	-6.0	-9.4	-11.6	-8.4
Southeast	1.7	6.6	5.8	10.4	11.8	7.5
South	-23.1	-20.3	-11.8	4.8	11.9	-12.1
North	44.5	13.6	18.2	9.8	24.4	19.0
Center-West	10.1	4.4	2.5	1.4	11.3	6.0
Brazil	**-7.2**	**-6.0**	**-1.0**	**1.7**	**7.8**	**0.9**

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.





GRAPH 6. Relative participation in the total occupied area of family farming establishments by area group - Macroregions (2006 and 2017).

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

TABLE 5. Area of family farming establishments by land use – Macroregions (2006 and 2017)

	2006									
	Crops	(%)	Pasture	(%)	Forest	(%)	Others	(%)	Total	(%)
Northeast	6,412.6	22.6	11,768.4	41.6	6,638.2	23.4	3,495.8	12.3	28,315.1	100
South	5,702.4	43.7	3,972.6	30.4	2,396.3	18.4	983.2	7.5	13,054.5	100
Southeast	2,652.8	20.8	7,294.7	57.1	1,867.9	14.6	955.9	7.5	12,771.3	100
North	2,021.4	12.2	7,138.0	43.0	6,391.4	38.5	1,060.4	6.4	16,611.3	100
Center-West	831.5	8.9	6,077.8	65.0	2,029.9	21.7	411.3	4.4	9,350.6	100
Brazil	**17,620.7**	**22.0**	**36,251.6**	**45.3**	**19,323.7**	**24.1**	**6,906.7**	**8.6**	**80,102.7**	**100**
	2017									
	Crops	(%)	Pasture	(%)	Forest	(%)	Others	(%)	Total	(%)
Northeast	3,684.4	14.2	10,809.1	41.7	6,116.6	23.6	5,315.7	20.5	25,925.7	100
South	4,560.1	39.7	3,623.4	31.5	2,457.5	21.4	851.6	7.4	11,492.5	100
Southeast	2,310.0	16.8	7,760.0	56.5	2,505.7	18.2	1,160.1	8.4	13,735.9	100
North	1,245.6	6.3	9,816.2	49.7	7,216.4	36.5	1,489.0	7.5	19,767.2	100
Center-West	697.1	7.0	6,969.6	69.9	1,786.3	17.9	516.8	5.2	9,969.8	100
Brazil	**12,497.1**	**15.4**	**38,978.3**	**48.2**	**20,082.5**	**24.8**	**9,333.2**	**11.5**	**80,891.1**	**100**

	Variation 2017/2006 (%)				
	Crops (%)	Pasture (%)	Forest (%)	Others (%)	Total (%)
Northeast	-42.5	-8.2	-7.9	52.1	-8.4
South	-20.0	-8.8	2.6	-13.4	-12.0
Southeast	-12.9	6.4	34.2	21.4	7.6
North	-38.4	37.5	12.9	40.4	19.0
Center-West	-16.2	14.7	-12.0	25.6	6.6
Brazil	**-29.1**	**7.5**	**3.9**	**35.1**	**1.0**

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

Obs.: The "others" item includes uses that are not directly, not exclusively or not currently used on the farm – water depths, tanks, lakes, dams, built-up areas, improvements, roads and degraded or unusable land.

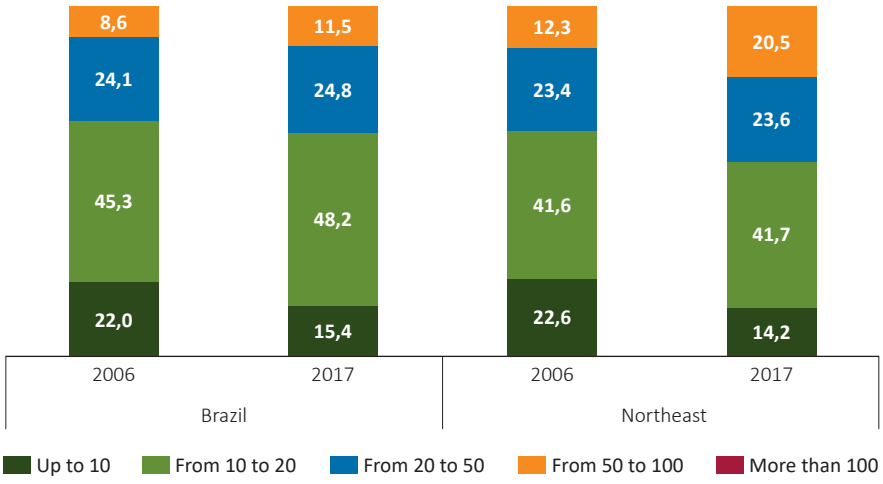
above, the growth of the pasture area was driven by larger family farms (over 50 hectares and over 100 hectares), although it increased in all groups of areas, with the exception of establishments with less than 10 hectares. As a result, pasture areas in family farming establishments had their relative share increased from 45.3% in 2006 to 48.2% in 2017, which represented a net increase of 2.7 million hectares across the country. By way of illustration, this increase alone represents ¾ of the entire area of family farming destined for crop production in the Northeast region in 2017. In fact, the areas destined for agricultural crops (temporary and permanent) were the ones that fell the most in the period, with a drop of 29.1%, which represented, in aggregate terms, a decrease of 5.1 million hectares. This decrease was offset by the increase of 5.9 million hectares in other activities[11]. Contrary to what was observed in terms of pastures, the proportional participation of crop areas was reduced in all area groups, while forests remained stable. As a result, although the total area of Brazilian family farming remained the same over the period, its composition in terms of land use showed sensitive changes that require more accurate and more disaggregated studies, including the detection of possible causal relationships regarding effects on nutrition and food security and the protection of environmental resources in the country.

In the specific case of the Northeast, the region maintained the largest area destined for pastures, with 10.8 million hectares in 2017. However, this allocation decreased in relation to 2006 (-8.2%). What most draws attention in these data is the drop in crop areas. The region presented a reduction of 42.5% in the period, being the one that decreased the most in relative terms in this item, followed by the North region with a decrease of 38.4%. It is also worth mentioning the growth of the item "others" in the Northeast. Thus, according to the analysis made by Valadares (2022), there are two points to be considered. On the one hand, this growth may indicate a conversion of land from agricultural to non-agricultural use or an increase in degraded or unusable areas. On the other hand, one cannot disregard the severe drought that devastated all states in the Northeast between 2012 and 2017, which is considered the most severe in the last hundred years (Lima and Magalhães, 2018; Peixoto, 2022). In other words, "the reduction of family farming establishments in the region may be the expression of a conjunctural effect, whose long-term consequences cannot yet be seen" (Valadares, 2022, p. 21). **Graph 7** compares the relative shares by type of land use among family farming establishments in the Northeast and the national average.

By identifying the expansion of pasture areas in Brazilian family farming, it becomes relevant for the present analysis to verify the evolution of animal production in the country during this period. The aggregated data presented in **Table 6** show that family farming maintained an expressive participation in livestock production, especially in terms of herd size, with an increase in the number of cattle, buffaloes, goats and sheep. In contrast, the relative participation of family farming decreased for swine and poultry herds (chickens, roosters), although there was a significant increase in terms of headcount in national family farming.

Table 7, in turn, allows comparing the participation of livestock in family farming establishments in 2006 and 2017 by macroregion. It is observed that the South region remained at the forefront in the production of pig (64%, in 2017) and poultry (67%, in 2017), while the Northeast region continued to be responsible for the highest percentage of donkeys, mules, goats and sheep in Brazilian family farming. In the case of cattle herd, its regional distribution was more balanced, although there was a reduction in the participation of family farming establishments in the Northeast and South vis-à-vis the growth in the Center-West regions (a net increase of 2 million heads) and North (a net increase of 1 million heads). In the Northe-

11 Of this total, pastures contributed with 46%, "others" with 41% and woods and forests with 13%.



GRAPH 7. Relative participation in the total occupied area of family farming establishments by land use - Macroregions (2006 and 2017).

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

TABLE 6. Size of herds and participation of family farming - Brazil (2006 and 2017)

Herd (heads)	2006			2017		
	Total	AF	(%)	Total	AF	(%)
Cattle	176,147,501	52,374,292	30	172,719,164	53,607,594	31
Buffaloes	885,119	234,504	26	950,173	266,034	28
Equines	4,541,833	2,227,105	49	4,236,062	1,980,001	47
Donkeys	654,714	538,453	82	376,874	287,780	76
Mules	750,529	369,338	49	615,498	277,804	45
Goats	7,107,613	4,939,244	69	8,260,607	5,796,067	70
Sheep	14,167,504	7,065,570	50	13,789,345	7,853,184	57
Swine	31,189,351	18,411,976	59	39,346,192	20,237,925	51
Poultry	1,143,455,814	584,943,083	51	1,362,253,509	620,066,215	46
Other birds	30,661,874	17,977,379	59	34,711,592	14,858,292	43
Rabbits	294,584	201,038	68	200,345	140,504	70

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

TABLE 7. Participation of family farming establishments in the size of herds, by macroregion (2006 and 2017) - (%)

Herd (heads)	2006					2017				
	NE	S	SE	N	CW	NE	S	SE	N	CW
Cattle	23	18	20	23	16	19	17	20	24	20
Buffaloes	11	3	5	80	1	12	4	9	74	2
Equines	33	17	22	17	11	30	12	23	21	15
Donkeys	94	1	2	3	0	91	0	4	4	1
Mules	62	4	17	13	3	60	3	17	15	5
Goats	93	3	2	1	1	95	2	1	2	1
Sheep	76	16	3	3	3	81	13	2	3	2
Swine	17	61	9	7	6	15	64	7	6	7
Poultry	7	63	21	2	6	8	67	15	3	7
Other birds	8	72	15	3	2	10	67	7	5	11
Rabbits	10	69	17	2	2	9	64	22	2	2

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

ast, the family farming cattle herd had a particularly sharp drop, falling from 12.2 million heads in 2006 to 10.4 million heads in 2014.

Still considering livestock, with emphasis on milk production, there was a considerable increase in the participation of family farming in the period between the 2006 and 2017 Censuses of Agriculture. In absolute terms, production rose from 11.8 billion liters to 19.3 billion liters, and its relative participation in the total supply of milk rose from 57.6% to 64.2%. Regionally, the South (41%) and Southeast (29%) remained predominant in 2017, while the share of the Northeast region in total family farming was of 19%[12].

The significant drop in crop areas cultivated by family farmers draws attention to the fact that they are agricultural crops of great importance for the food and nutritional security not only of family farmers themselves, but of the entire urban population that needs to purchase these products through the market. In the case of temporary crops, **Table 8** shows that the relative share of family farming in the total area harvested decreased for all the main products in the Brazilian agricultural basket (with the exception of tobacco, which is not a food crop)[13], some of them in a significant way. Only soy and wheat recorded absolute growth in harvested area[14]. In 2017, soybeans became the temporary crop with the largest area harvested by family farmers, reaching 2.8 million hectares. Corn and beans, which were the two main temporary crops used by family farmers in 2006, registered an accumulated loss of more than 6 million hectares.

In regional terms, there are some details to be highlighted. For the family farming from the Northeast region, the harvest area of beans covered 2.9 million hectares in 2006, accounting for 63.3% of the country's total (including both family and non-family farming). For 2017, in turn, this crop had a loss of three quarters in the harvested area, reaching only 761.8 thousand hectares. Therefore, the general drop in beans' harvested area in the Brazilian family farming demonstrated by the Census of Agriculture is explained, to a large extent, by the retraction of the crop in family farming establishments from the Northeast region. The loss of area harvested in family farming establishments from the Northeast region also explains the reduction in the area harvested for rice by family farmers countrywide, which dropped from 621.1 thousand hectares in 2006, when the region accumulated

12 On the other hand, the participation of family farming in egg production decreased from 16% in 2006 to 12% in 2017; the PV remained around 17% for both years (Valadares, 2022).

13 With regard to tobacco, the large predominance of family farming production stands out. Even in the face of the loss of harvested area (from 521,100 hectares in 2006 to 280,000 hectares in 2017) and the restrictions on public financing directed to tobacco, 93% of the crop's harvested area are in family farming establishments (Valadares, 2022).

14 In aggregate, the share of family farming in the total value of temporary crop production fell from 29% to 14%, with a significant reduction in absolute values (Valadares, 2022).

TABLE 8. Harvested area for temporary crops, by typology – Brazil (2006 and 2017)

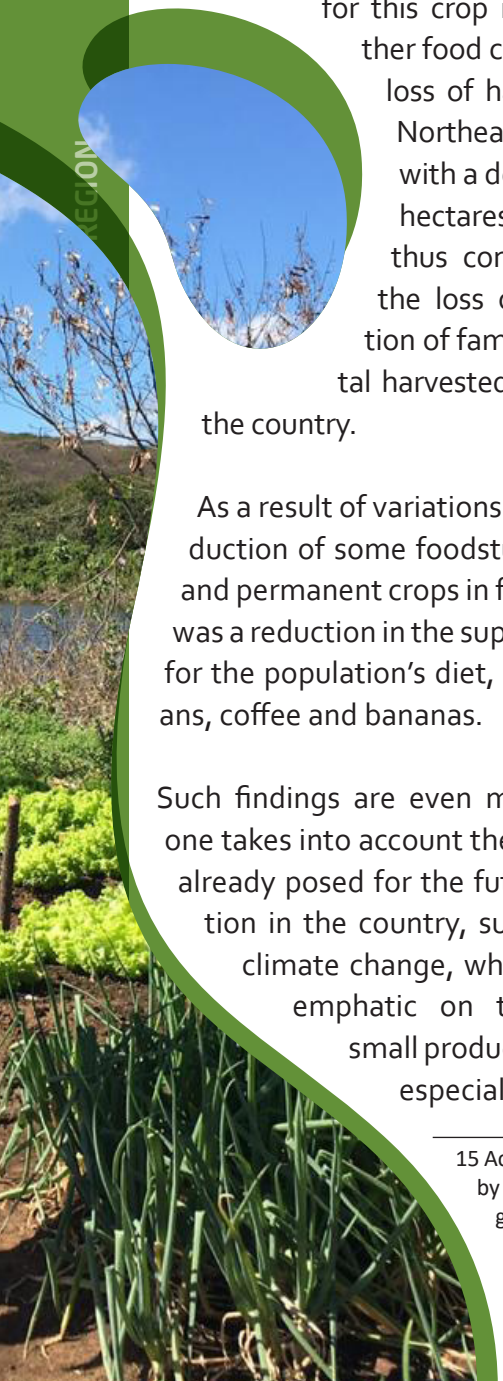
Crops	2006			2017			AF balance (ha)	AF variation (%)
	Total (ha)	AF (ha)	AF/total (%)	Total (ha)	AF (ha)	AF/total (%)		
Corn	11,588,372	6,323,657	55	15,783,895	2,745,039	17	-3,578,618	-57
Beans	4,704,228	3,834,927	82	2,113,124	1,024,806	48	-2,810,121	-73
Soybeans	17,882,805	2,731,537	15	30,722,657	2,846,006	9	114,469	4
Cassava	1,695,644	1,465,012	86	740,611	564,535	76	-900,477	-61
Rice	2,413,150	1,164,867	48	1,716,600	273,250	16	-891,617	-77
Tobacco	567,383	521,079	92	300,546	280,033	93	-241,046	-46
Sugar cane	5,677,391	478,492	8	9,127,645	240,704	3	-237,788	-50
Wheat	1,301,874	323,878	25	1,791,229	359,621	20	35,743	11

Source: Census of Agriculture (IBGE). Available at: https://bit.ly/34BwRqo.

a quarter of all the area harvested for rice in Brazil, to 94.1 thousand hectares in 2017, thus corresponding to a decrease of 84.8%.

Cassava has also lost space in family farming production, despite being a traditional food crop in the Northeast region. Between 2006 and 2017, respectively, the harvested area in northeastern states decreased from 680,000 to 203,700 hectares, corresponding to a 70.1% decrease.

As with beans and rice, the reduction in the area harvested for cassava in family farming establishments from the Northeast, together with the North region - which also recorded a significant drop in the period (-62.7%) -, accounts for the total reduction in the area harvested for this crop in the country. Another food crop with a significant loss of harvested area in the Northeast region was maize, with a decrease of 1.8 million hectares in the same period, thus contributing to explain the loss of relative participation of family farming in the total harvested area of this crop in the country.



As a result of variations observed in the production of some foodstuffs from temporary and permanent crops in family farming, there was a reduction in the supply of basic products for the population's diet, such as cassava, beans, coffee and bananas.

Such findings are even more worrying when one takes into account the challenges that are already posed for the future of food production in the country, such as the effects of climate change, which tend to be more emphatic on the productivity of small producers in some regions, especially the drier ones[15].

From this perspective, according to estimates raised by the GCF (2020), climate change could cause subsistence food crops, such as beans, cassava and corn, to suffer productivity losses of up to 5% by 2030 in the Northeast region, and some scenarios project that cassava production may even disappear from the region[16].

Other products, such as rice and corn, had their national supply increased due to the increase in non-family farming production, which offset the drop in production in family farming establishments[17]. Valadares (2022) highlighted this point as a possible reflection of the commoditization process of these specific products, which are essential items in the Brazilian diet. For the author, this caveat is important because, once the product becomes a commodity, the increase in its national production may be related to the increase in international prices, which makes the option of exporting more attractive than selling to the domestic market[18]. This dynamic characteristic of integrated markets becomes, therefore, an element to be monitored for the purpose of guaranteeing food supply in the domestic market, the counterposition of which would involve strengthening incentives via public policies for family farming, which mainly produces for the domestic market. The next sections dealt precisely with the recent dynamics of these policies in the country, especially in the Northeast region.

15 According to estimates shown by the GCF (2020), the average area lost due to droughts from 1990 to 2016 in the semiarid region of Brazil was of 221,973 hectares per year.

16 Still according to estimates presented by the GCF (2020), there is a significant correlation between rainfall and agricultural production. As a result, from 2017 to 2030, a scenario of 10% reduction in rainfall could cause an average annual loss of R$96.7 million in the value of agricultural production from family farming. If precipitation were reduced by 20%, the annual loss would be R$193.3 million in the value of agricultural production from family farming. For more information, see Alvalá et al. (2017) and Costa, Sant'Anna and Young (2021).

17 Despite the observed losses of temporary crops between the Censuses of Agriculture, family farmers in the country continue to contribute decisively to a large part of the permanent crop products – coffee, fruits in general, with an emphasis on regional products –, as well as to the majority of products linked to extractivism (Valadares, 2022).

18 The high inflation observed in the price of rice in the last year – when production remained at a high level – can be considered an example of this (Ipea, 2021).

4 Public policies for family farming

As previously discussed, family farming comprises a diverse socio-productive segment dispersed throughout Brazil, whose activities assume multidimensional values for a sustainable development strategy. In addition, it is responsible for maintaining a large contingent of job positions in rural areas, as well as the production of food for families' self-consumption and for the supply of weekly street markets and supermarkets, in addition to its important relationship with environmental resources.

In order to strengthen these activities, the Federal Government of Brazil has been developing, for three decades, new public policies aimed at meeting the different demands of this public. The financial resources coming from programs to support production and assistance to these families play a key role in the reproduction of family farming throughout the country. In the particular case of the Northeast region, they contribute to food and nutritional security and to the economy of small and medium-sized municipalities, even more so because it is a geographical space historically marked by poverty and the occurrence of prolonged droughts. Therefore, it is extremely important to maintain, expand and integrate social policies and policies of productive inclusion, aiming to overcome the multiple needs that these farmers face in their daily lives and provide them with means to enhance their participation in the process of sustainable regional development (Aquino, Alves and Vidal, 2020; Silva, 2019).

Given this brief overview, this section deals with the institutional framework and the recent evolution of some of the main public policies to support family farming in Brazil. As already described in the Introduction, it was decided to address three dimensions of government intervention: i) credit and financing policies for fam-

ily farming production – National Program for Strengthening Family Farming (Pronaf); ii) public food procurement policies – Food Acquisition Program (PAA) and National School Feeding Program (PNAE); and iii) agricultural insurance policies adapted to the structural characteristics of family farming establishments – Crop-Guarantee Program (PGS).

In advance, it is worth noting that the programs analyzed make up a dense and complex network of government programs, whose operation encompasses different ministerial structures, bank branches and other government agencies, in addition to the inter-federal relationship that some of these programs require in their implementation. Therefore, it is difficult to obtain updated and integrated data from all the programs, so that, for this section, each one of them will have a different temporal coverage, although relatively recent, but which, in turn, does not compromise the quality of the analyzes undertaken.

4.1 The National Program for Strengthening Family Farming - PRONAF

4.1.1 Institutional and programmatic aspects of Pronaf

Subsidized credit is one of the most adopted state interventions to stimulate agricultural production in most countries (Rocha and Ozaki, 2020). In Brazil, as rural credit has historically become an instrument to favor large farmers in detriment of small and even medium-sized farmers, the development of financing programs that contemplate the multiplicity of players from the Brazilian agriculture has been kept on the agenda of social rural movements, in order to guarantee the maintenance of family farming establishments.

In this sense, with its official establishment in 1996, Pronaf inaugurated a new agenda of government programs aimed at the family farming audience in Brazil, which began to include actions aimed at technical assistance, land acquisition, crop insurance, price support, housing, marketing assistance, among others. Such programs gained greater institutional momentum after the creation of the Ministry of Agrarian Development (MDA), in 1999. Since then, several studies have sought to investigate the impact of these programs on income generation and on the productive capacity of benefiting farmers (Alves et al., 2022a; 2022b; Grisa and Schneider, 2014; Magalhães et al., 2006; Silva, 2012; Valadares, 2021; Valadares et al., 2019).

It emerged as a turning point in the design of the government agenda, by officially standardizing the category of "family farming" (settlers of agrarian reform, artisanal fishers, fish farmers, foresters and traditional communities) as a socio-productive segment whose main characteristics, widely highlighted in the literature, were later incorporated into the Law No. 11.326/2006, also known as the Family Farming Law (Silva, 2015; Valadares, 2022).

Since its establishment, Pronaf has undergone several regulatory changes, in order to adapt it to the diversity that characterizes family farming itself and its multiple interactions in the Brazilian territory (Silva, 2015). In this sense, new lines of financing were created over the years, among which it is worth mentioning Pronaf Agroindustry, Pronaf More Food, Pronaf Women and Pronaf Youth, operationalized both in the modality of investment and farm operating loans[1].

Pronaf's effective interest rate is pre-fixed and varies according to the product to be financed, also depending on the classification of the applicant farmer. For farmers to qualify as poten-

1 The modality of credit for farm operating loans is directed to the improvement of production through the purchase of various inputs (feed, fertilizers, vaccines, among other components) for agricultural production. In turn, the investment credit is intended to expand or modernize the productive infrastructure in the family farming establishment, enabling the purchase of machinery in general, construction of sheds and structures necessary for production.

tial beneficiaries, they must obtain the Declaration of Eligibility for the Pronaf (DAP), which identifies and characterizes the family farming establishment. It should be noted that on-site technical assistance is mandatory and comprises the preparation of a simple plan or technical project, in compliance with official regulations (Alves et al., 2022b).

However, as the agricultural activity is marked by different characteristics and demands in the Brazilian territory – social, economic, structural and environmental –, any model of state intervention needs to adhere to such particularities, with a view to achieving greater operational effectiveness. In this regard, marked regional differences in Pronaf performance indicators have been systematically addressed in the literature. That is, although the Program has a national character, it is marked by different results between the country's territorial divisions, and, in a complementary way, its impacts transcend the universe of agricultural activity, revealing itself in a multisectoral way in the economy (Aquino, Gazolla and Schneider, 2018; Castro, Resende and Pires, 2014; Grisa, Wesz Junior and Buchweitz, 2014; Marioni et al., 2016; Rodrigues, 2019; Silva, 2012; 2014; Silva et al., 2017)[2].

Aquino and Schneider (2011, p. 328) pointed out that Pronaf's own selection criteria contribute to reinforcing the regional asymmetries in its operation, since farmers with lower incomes and lower levels of organization, in the North and Northeast, would have greater difficulty "meeting bank requirements, in contrast to the better economic insertion of family farmers in the South". Therefore, this set of factors aggravates the geographic and economic asymmetries in the distribution of loans in the national territory.

Alves et al. (2022b), in turn, claim that Pronaf maintains an operational ambiguity that causes different tensions, especially with regard to the stimuli it evokes in decisions about agricultural production projects on family farming establishments. The trend towards specialized production of agricultural commodities in these establishments, despite the fact that family farming in Brazil is historically characterized by the productive diversification of both primary and agro-industrial products, has been debated for some time by the literature dedicated to Pronaf and by evaluations institutions about the program (Buainain et al., 2005; Silva, 2015; Bastian et al., 2022; Valadares, 2021).

From this perspective, Pronaf's operational design itself influences the productive diversification potential of Brazilian family farming, insofar as it limits the production decisions of its applicants. This is fundamentally because, although it is a credit program aimed at favoring specific socio-productive training, it is carried out by the banking network, which, even though public, follows the traditional financial logic (Alves et al., 2022b).

Given all this diversity of scope, operational routines and results in terms of the territorial incidence that characterizes Pronaf, in addition to the quantity of public resources mobilized annually in its execution, it becomes necessary to study its impacts from specific coverage clippings, in order to get closer and closer to its execution dynamics and understanding nuances that, many times, can be covered by general averages. Thus, this study aimed to analyze the effect of access to Pronaf loans on the income from the labor of family farmers in states from the Northeast region, considering, for this purpose, the income from the main occupation - arising exclusively from agricultural production - of the head of household.

2 Among the factors recurrently cited as relevant to explain regional asymmetries in the distribution of Pronaf resources are: i) integration of family farmers to markets; ii) local economic dynamics and insertion in agro-industrial chains; iii) regular availability of water and dependence on the acquisition of agricultural inputs to guarantee production; iv) dissemination and operationalization structure set up by official technical assistance in the states; v) pressure from the trade union movement and other social organizations on governments and banks; vi) existence of a banking network better distributed among the municipalities; vii) presence of public technical assistance; and viii) participation of credit cooperatives, among others (Castro, Resende and Pires, 2014; Silva, 2014).

4.1.2 Analysis of Pronaf's implementation trajectory

For the purposes outlined here, this subsection will analyze the recent dynamics in the distribution of Pronaf resources among Brazilian regions, with a special focus on the incidence of the program in the Northeast region. To begin with, **Table 9** brings the aggregated values for the distribution of loan agreements and amounts financed by Pronaf in the last 10 years for which data are available from the Central Bank of Brazil.

First, attention is drawn to the financial magnitude of Pronaf throughout the country during this period. More than 15 million loan agreements were signed and the sum of financed amounts reached R$276.7 billion, with a continuous growth over the years. The average loan size was just over R$18,000. It can also be said that Pronaf is a government action that is well-established throughout the national territory, with annual approvals of loans in virtually all Brazilian municipalities. In addition, the circulation of this money through the consumption of goods and services throughout the year activates the local income multiplier and contributes to boosting the economy of small and medium-sized municipalities far from state capitals (Silva and Ciríaco, 2022).

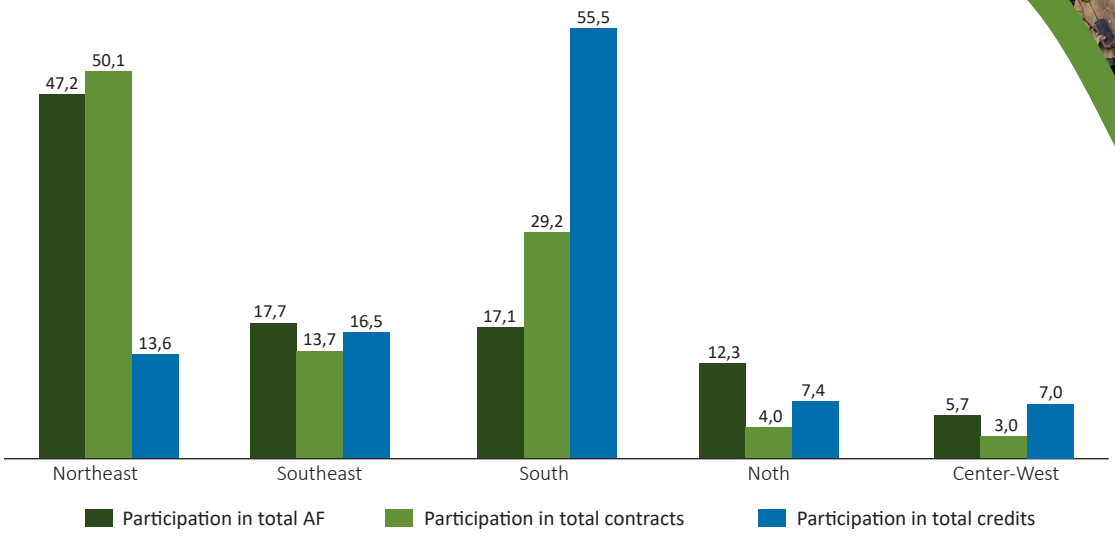
However, these same data indicate a strong regional discrepancy in the distribution of loans. The Northeast region, which is home to the largest number of family farmers in the country, accounted for half of the loan agreements (50.1%) signed during the analyzed period (2013-2022), something close to its share in the country's number of family farmers. It turns out that, when checking the distribution of the financing resources, the region has a much lower percentage, accounting for only 13.6%. That is, the participation of the Northeast in the total financed by Pronaf represents only around ¼ of the sum of the amounts financed for family farmers in the South region, which accounted for 55.5% of the total in the period. This translates into the average value of the contracts: in the Northeast it was of R$ 4,900, just over ¼ of the national average value and by far the lowest mean among all regions. The Center-West region had the highest average value of contracts in this period, R$ 42,400, almost ten times greater than that of the Northeast and greatly influenced by the diffusion of livestock production among family farmers from this region, as observed in the data from the Census of Agriculture. **Graph 8** illustrates these regional inequalities, by allowing a comparison of the participation of each region in the total number of family farming establishments, the total number of loan agreements and total value financed via Pronaf.

By disaggregating these data by year, **Table 10** shows how Pronaf evolved in the Northeast region, both in absolute and relative terms, taking into account its total execution in the country. It is noted that there was a gradual decrease in

TABLE 9. Number of loan agreements and volume of resources financed by Pronaf – Brazil and Macroregions (2013 to 2022)

Region	Total		Average loan size (R$)	Share in total loan agreements (%)	Share in the total amount financed (%)
	Loan agreements	Value (1,000 R$)			
Northeast	7,679,106	37,751,349.5	4,916.11	50.1	13.6
Southeast	2,105,584	45,605,573.2	21,659.35	13.7	16.5
South	4,465,195	153,516,761.5	34,380.75	29.2	55.5
Noth	610,700	20,570,912.1	33,684.15	4.0	7.4
Center-West	454,545	19,288,096.8	42,433.85	3.0	7.0
Brazil	**15,315,130**	**276,732,692.4**	**18,069.24**	**100.0**	**100.0**

Source: Central Bank of Brazil. Available at: https://bit.ly/3Lgb6Mp



GRAPH 8. Relative regional participation in total family farming establishments, the total number of loan agreements and the total value financed via Pronaf: (2013-2022) (%).

Source: Census of Agriculture (IBGE) (Available at: https://bit.ly/34BwRqo); Central Bank of Brazil (Available at: https://bit.ly/3Lgb6Mp).

TABLE 10. Annual evolution of the number of contracts and volume of resources financed by Pronaf – Brazil and Northeast (2013 to 2022)

Year	Brazil		Northeast				
	Total # of contracts	Total value (1,000 R$)	Total # of contracts	Total value (1,000 R$)	Average contract size (R$)	Share in the total # of contracts (%)	Share in the total value (%)
2013	1,988,482	19,947,800.8	923,874	2,957,515.9	3,201	46.5	14.8
2014	1,818,253	24,684,012.0	806,767	3,414,791.3	4,233	44.4	13.8
2015	1,697,655	21,746,638.9	848,776	3,051,223.8	3,595	50.0	14.0
2016	1,113,477	16,621,381.7	520,332	1,823,525.6	3,505	46.7	11.0
2017	1,544,593	22,551,747.0	821,863	3,301,497.2	4,017	53.2	14.6
2018	1,471,626	24,570,482.0	784,523	3,738,745.1	4,766	53.3	15.2
2019	1,356,572	25,937,264.7	719,432	3,781,085.5	5,256	53.0	14.6
2020	1,434,073	31,156,245.2	771,305	4,374,687.2	5,672	53.8	14.0
2021	1,443,330	40,177,705.9	753,144	5,221,025.9	6,932	52.2	13.0
2022	1,447,069	49,339,414.2	729,090	6,087,252.0	8,349	50.4	12.3
Total	**15,315,130**	**276,732,692.4**	**7,679,106**	**37,751,349.5**	**4,916**	**50.1**	**13.6**

Source: Central Bank of Brazil. (Available at: https://bit.ly/3Lgb6Mp).

the number of contracts in the region over the years, going from 923,000 in 2013 to 729,000 in 2022, which was equivalent to a drop of 21.1%. This drop was not specific to Northeastern states, consisting of a national trend. In the country as a whole, the drop in the same period was even greater, 27.2%. However, there was a practically continuous increase in the average value of contracts (with the exception of 2016, when there was a sharp drop in program execution). Such findings are worrying, as they may indicate greater selectivity of farmers on the part of the financial agents that execute Pronaf for the formalization of loan agreements, which, in turn, may imply the exclusion of part of potential beneficiaries. This hypothesis should be better questioned in future studies. Another factor to note is that the participation of the Northeast region has been systematically falling since 2018, both in terms of the total

number of contracts and the total amount financed, a fact that needs to be taken into account by political and social actors in the region for a better understanding of this process, as well as its future reversal.

One of the main reasons for the Northeast to present a low average value per Pronaf contract is related to the fact that the program's main credit line is Pronaf B, also known as Rural Microcredit[3]. This credit line is restricted to the regional portion of the semi-arid region, which extends across almost the entire Northeast region, in addition to the northern portion of the states of Minas Gerais and Espírito Santo. To access it, family farmers need to have a gross annual family income of up to R$23,000, and the maximum financing amounts are also much lower than the other lines of the program: R$6,000 per operation, if the credit project is prepared according to the Agroamigo methodology, and R$3,000 when prepared in a different way[4]. This difference is due to the success obtained by Bank of Northeast, the institution responsible for the Agroamigo methodology, in implementing Pronaf B in the region, a success that has already been widely reported in the academic literature. Just by way of comparison, among the various Pronaf financing lines, the maximum financed limit can reach R$ 400,000 per farmer, thus a much higher amount than the limit allowed for Pronaf B. On the other hand, the interest rate for loans agreed via Pronaf B is the lowest among all financing lines (together with Pronaf A, aimed at agrarian reform settlers): for the 2021/2022 Harvest Plan, the interest rate on Pronaf B was 0.5% per year, while the other lines can reach 5% per year. Another detail worth noting is that, as Pronaf B is basically destined to investment projects and not funding projects, its greater participation in the region means that 78.6% of Pronaf loans in the Northeast in this period are of the investment modality, while in the national average, this modality represented 45.2% of the total financed. In the case of farm operating loans in the region, the crops with the highest volume of financing were corn (grain and forage), beans (black-eyed and green), cassava, cashew (chestnut) and forage palm.

Finally, **Table 11** informs Pronaf aggregate numbers in the 2013-2022 period for each state in the Northeast, which makes it possible to visualize the distribution of the program within the region. It is noted that Bahia, the Brazilian state with the largest number of family farmers,

3 To check the Pronaf groups, including alternative financing lines, credit limits, interest rates, terms and other aspects, see Chapter 10 of the Rural Credit Manual (MCR), available at: <https://bit. ly/36Mwdai>.

4 Agroamigo is a methodology created in 2005 at BNB to offer a differentiated service to Pronaf B customers, aiming at expanding the number of beneficiaries and ensuring quality service, with a reduction in default (Aquino, Alves and Vidal, 2022).

TABLE 11. Number of contracts and volume of resources financed by Pronaf – states from the Northeast region (2013 to 2022)

UF	Total		Average contract size (R$)	Share in the total # of contracts (%)	Share in the total value (%)
	Quantity	Valor (R$ mil)			
Alagoas	412,657	2,379,228.3	5,765.63	5.4	6.3
Bahia	2,115,094	10,235,705.9	4,839.36	27.5	27.1
Maranhão	799,516	5,045,410.7	6,310.58	10.4	13.4
Ceará	1,092,324	4,806,589.9	4,400.33	14.2	12.7
Pernambuco	914,465	4,755,301.4	5,200.09	11.9	12.6
Piauí	955,567	3,749,098.9	3,923.43	12.4	9.9
Paraíba	649,512	2,747,804.0	4,230.57	8.5	7.3
Sergipe	302,672	2,163,192.7	7,146.99	3.9	5.7
R. G. do Norte	437,299	1,869,017.6	4,274.00	5.7	5.0
Total	**7,679,106**	**37,751,349.5**	**4,916.11**	**100.0**	**100.0**

Source: Central Bank of Brazil (https://www.bcb.gov.br/estabilidadefinanceira/reportmicrrural/?path=conteudo%2FMDCR%2FReports%2FqvcRegiaoUF.rdl)

concentrates the largest number of contracts and financed amount in the region, both above 27% in regional participation. In terms of contracts' average value, Sergipe was the one with the highest value, R$7,100, and Piauí showed the lowest average value, with R$3,900.

4.2 Public procurement from family farming

The second line of action addressed in this text concerns the actions developed in different ministries to stimulate food production, especially in the case of family farmers in situations of poverty, with a view to, on the one hand, boosting local economies, and, on the other, making food products cheaper for the population. As a result, by encouraging local food production, whether for sale or for self-consumption, the federal government also starts to work with the principle of food sovereignty, which concerns the capacity and right that communities have to guarantee the production and distribution of basic foodstuffs for their survival, reducing their external dependence. Under this understanding, it is possible to recognize the strategic role to be played by domestic food production.

To support and encourage this process, the State can act through two intervention mechanisms: public procurement and tax exemptions. In the case of public procurement policies, which are the focus of this section, they consist of making institutional channels available to support the sale of products from family farming, either for donations to socio-assistance and teaching entities, with the aim of guaranteeing food assistance to the population in a situation of food and nutritional risk, or for the formation of national regulatory stocks. As a result, the State's purchasing power is now used to encourage local economic dynamics and guarantee the generation of work and income for populations in situations of social vulnerability.

In Brazil, there are two national policies structured around these purposes: the National School Feeding Program (PNAE) and the Food Acquisition Program (PAA). There is already a vast literature showing that factors such as the purchase promise, price support, the destination of products to social assistance entities, the stimulus to the diversification of foodstuffs and the promotion of associativism as a condition of scale for commercialization have contributed so much to guarantee income and food security for families as well as, in a broader sense, the organization of producers and the dynamization of more regionalized food production and consumption circuits (Perin et al., 2021; Silva, 2021; Valadares et al., 2019).

The following subsections will address the general characteristics of these two programs and details about their recent implementation, in order to discuss their potential for the inclusion of Brazilian family farmers in public food procurement markets, with special emphasis on the dynamics of these programs in the Northeast region.

4.2.1 The Food Acquisition Program - PAA

4.2.1.1 Institutional and programmatic aspects of the PAA

The PAA consists of an important action instituted by the Federal Government of Brazil[5], arising from a partnership between different government agencies like the Ministry of Social Development (MDS), the Ministry of Agrarian Development (MDA) and the National Supply Company (Conab). Its main characteristic consists in the public procurement of products from family farmers, considering prices established nationally by Conab in relation to the average prices practiced in regional markets, for donation to social entities, school meals or stock for-

5 The PAA was instituted in July 2003, through the Law No. 10,696, with the purpose of encouraging family farming, comprising actions linked to the distribution of agricultural products to people in a situation of food insecurity and the formation of strategic stocks.

mation, integrating agricultural policy and food security.

The innovative character of PAA resides precisely in an institutional change that was fundamental for its viability, which is the waiver of bidding processes for public procurement, as required by Law No. 8,666/1993, for the acquisition of family farming products, thus reducing bureaucracy in the commercialization process that characterizes the program. This innovation provided a differentiated performance by the Brazilian State to act proactively in the economies of territories with low economic dynamism and a strong presence of family farmers. The acquisition limit is defined via decree, in accordance with each modality of the program, annually establishing a maximum amount per family unit.

Since its inception, Conab has played a key role, mainly by guaranteeing the purchase of agricultural production and the determination of prices, when purchasing food or signaling the reference price. The great advantage for benefiting family farmers is that, when Conab exercises the purchase right, it weakens the role of commercial intermediaries, popularly known as middlemen, in the distribution of production.

In this case, the purchase, distribution and consumption actions are carried out at the same time and within the scope of the municipality itself, favoring the formation of short marketing circuits. In addition, the program facilitated access to diversified foodstuffs by registered social institutions (schools, kindergartens, hospitals, etc.), through agreements signed between the MDS and the states and municipal governments (D'Ávila e Silva, 2011).

Therefore, given the two main purposes for which the PAA was structured – encouraging family farming and promoting access to adequate food for people in vulnerable situations – there are two types of beneficiaries: i) suppliers, represented by family farmers who are beneficiaries of the Law No. 11.326/2006; and ii) consumers, who are people vulnerable to food insecurity that are served by the social assistance network, by food and nutrition equipment linked to the public administration, people assisted by the public education and health network, in addition to people in prisons and units of hospitalization in the socio-educational system (Sambuichi et al., 2022).

To achieve these objectives, the operational design of the PAA took place in a diversified way, either due to its different types of action, its sources of funds, or even the agents that execute it in the different areas of incidence (Silva, 2014a). This complexity has been elaborated over the years in response to a series of demands from the target audience and strategic guidelines related to its institutional management. **Chart 1** shows program's modalities, in line with the 2020-2023 Pluriannual Plan.

Among these modalities, there is the Procurement with Simultaneous Donation (CDS), the main one both in terms of resources executed and in participating family farmers. It has resources from the Ministry of Citizenship and is managed through partnerships between this ministry and Conab, by means of a decentralized execution term (TED), or with state and municipal governments, via the signing of a term of adhesion (Valadares et al., 2019).

The way suppliers access the PAA-CDS differs according to the type of operator, as illustrated in **Figure 4**. In purchases made by Conab, the farmer must be linked to an organization, such as a cooperative or association. The Federal Government, through the responsible agency, transfers the resource to Conab and, if there is financial availability, the disclosure is carried out so that the farmers' organizations make their proposals. When the proposal is selected, farmers can start production and the payment is made to the organizations after proof of delivery of the products to the receiving entities. Proposals are selected according to the program's prioritization criteria, which include the presence of low-income farmers, women,

CHART 1. Current modalities of the PAA

Modality	Description	Operator	Farmer access type	Resource source	Purchase limit (farmer per year) (R$)
Direct purchase	Purchase of specific products with the objective of sustaining prices	Conab	Individual or in group (formal or informal)	Ministry of Citizenship or MAPA	8,000.00
Purchase with Simultaneous Donation (CDS)	Purchase of food for immediate donation to entities	Conab, states, DF and municipalities	Individual or in group (formal or informal)	Ministry of Citizenship	6,500.00[1] or 8,000.00[2]
Milk	Purchase of milk for donation to people in food insecurity; operated in the states of the Northeast and municipalities of the Semi-arid region of Minas Gerais	State governments	Individual or in group (formal or informal)	Ministry of Citizenship	9,500.00
Stock formation	Financial support for the formation of food stocks for subsequent sale and return of resources to the Government	Conab	Cooperative and association of family farmers	MAPA	8,000.00
Institutional purchase	Purchase of family farming products via public call to meet the demands of the purchasing body (consumption of food, seeds and other materials)	Interested entity	Cooperative and association of family farmers	Interested entity	20,000.00
Acquisition of seeds	Acquisition of seeds, seedlings and propagation materials for human or animal consumption; donation to beneficiary consumers or suppliers.	Conab	Cooperative and association	Ministry of Citizenship	16,000.00

Source: Sambuichi et al. (2022).

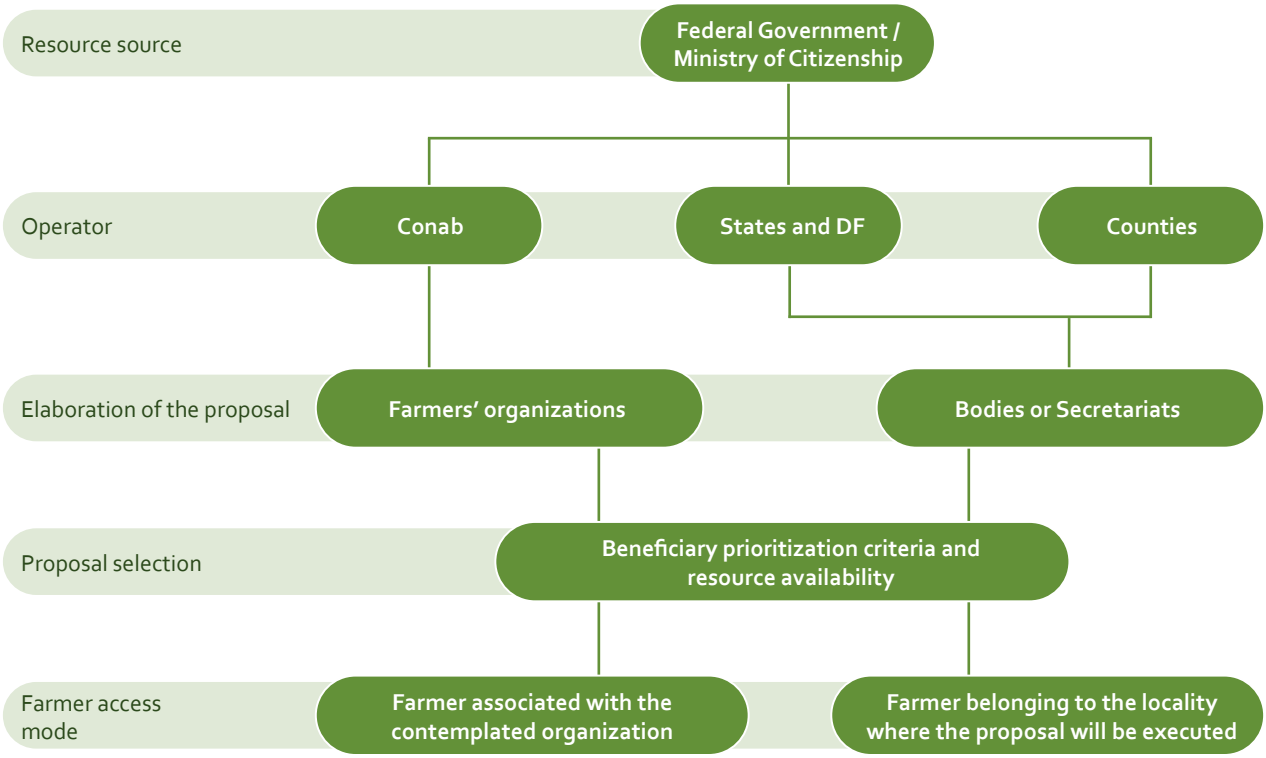


FIGURE 4. Mode of operation and access to the PAA – CDS mode.

Source: Sambuichi et al. (2022).

organic and agroecological producers, traditional peoples and communities, and agrarian reform settlers.

From this perspective, in addition to guaranteeing food security for a large number of people in vulnerability, another expected effect of the program is the generation of an increase in the monetary income of its supplier beneficiaries, mainly the neediest farmers, who constitute one of its main priority audiences. This effect occurs due to the increase in production made possible by the guarantee of future sales and the greater availability of resources for investment in the family farming establishment. This guarantee of product flow also acts as a stimulus for the farmer to diversify his production, introducing new crops in his production unit (Sambuichi et al., 2022).

Therefore, among the main characteristics of the program design that contribute to achieving positive results, as observed by Sambuichi et al. (2022), the following stand out:

i) guaranteed market for food public procurement for family farming: this is the main strategy that characterizes the PAA's intervention model as a program aimed at promoting nutrition and food security, which is based on the assumption that the lack of access to an adequate market is a bottleneck for the development of this type of production;
ii) waiver of bidding processes and simplification of bureaucratic requirements for carrying out food acquisitions: this is an important aspect to explain the results obtained by the program, since, previously, it was very difficult for family farmers to access public procurement programs and policies aimed at the promotion of agricultural activities, such as price guarantee policies, for example;
iii) local procurement and distribution of food: such a strategy allows the program to promote local development and short supply chains, contributing to the promotion of the sustainability of the agri-food system as a whole; and
iv) decentralization in the preparation and execution of proposals: this is a peculiar feature of the PAA that explains its success in encouraging family farming and promoting the diversification of production in the most diverse regions of the country, allowing for arrangements adapted to meet each specific reality.

4.2.1.2 Analysis of the trajectory of execution of the PAA

In its first eight years of operation (2003 to 2010), the PAA assisted more than 700,000 family farming households, with a total investment of more than R$ 2.2 billion, benefiting more than 20 million people with food insecurity. All states in Brazil had already carried out PAA contracts by this period. In 2010, 1,076 municipalities were served, most of them in the Northeast region (Silva, 2014b).

As of 2011, some changes in trajectory of execution can be noted, as shown in **Table 12**. Until 2012, the budgetary expansion observed until then was maintained. In 2013, however, there was a drastic drop in the resources applied and, consequently, in the total number of family farmers included. Over the analyzed period (2011 to 2018), the reduction in terms of resources executed (-76.9%) was also accompanied by a greater dispersion of expenses between municipalities, since the decrease in the number of municipalities benefited (-36.1%) did not occur in the same proportion as the reduction of resources. Thus, municipalities began to receive lower average values, which may have affected the potential of PAA to promote the dynamization of local economies. In turn, the fact that the program continued to operate in a significant number of municipalities demonstrates that it maintained its capillarity, which indicates its strong territorial roots.

There are several factors that can explain the reversal of PAA's trajectory. Here, we will focus on three of them.

A first explanation refers to the fact that a series of internal adjustments took place at Conab, aimed at redefining the institutional design

TABLE 12. Financial amounts, quantities purchased and beneficiaries of PAA (2011-2018)

Year	Executed amount (R$ million)	Quantity od products (1,000 tons)	Benefiting farmers (1,000)	Benefiting municipalities	Benefiting entities (1,000)	Consumers served (million)
2011	1,006.8	465.4	156.6	3,429	25.0	12.7
2012	1,157.1	468.9	175.8	3,630	23.4	12.8
2013	588.6	253.9	93.4	2,635	17.7	8.5
2014	752.6	309.9	112.0	3,065	14.2	9.4
2015	668.6	239.3	96.7	2,665	11.2	11.0
2016	426.6	150.8	77.3	2,428	11.3	10.7
2017	362.6	143.6	68.2	2,456	10.3	9.1
2018	232.7	93.8	53.6	2,192	11.1	6.5
Total	**5,195.6**	**2,125.5**	**454.8**	**4,610**	**65.1**	**80.8**
Variation (%)	**-76.9**	**-79.8**	**-65.8**	**-36.1**	**-55.6**	**-48.8**

Source: Sambuichi et al. (2020).
Notes: Does not include institutional procurement. Values corrected for December 2018 by the INPC.

of the policy implemented by the former MDS (Valadares et al., 2019; Perin et al., 2021). The changes aimed to improve and standardize the program's administrative controls, simultaneously with the construction of a legal and bureaucratic apparatus to support it. The operational structure to monitor and supervise it was set up in response to administrative challenges – given that the program was constantly growing – often posed by the control bodies themselves.

In this sense, the option adopted was to expand partnerships with states and municipalities, in order to speed up the operational processes of PAA and strengthen the federative pact. In this sense, the instrument used to establish the partnership became the term of adhesion, as provided for in Law No. 12,512/2011 and regulated in Decree No. 7,775/2012. Through the term of adhesion, state, district and municipal public administration bodies and entities (or consortia) now have greater ease in executing the program, since there was no longer the need to enter into agreements. Decree No. 7775/2012 also created the Institutional Procurement modality of the PAA, aimed at meeting the demands of government agencies of direct and indirect administration in the states and municipalities, such as university restaurants, prison units and hospitals, opening up the possibility for them to purchase products from family farming with waiver of bidding.

However, the expected resumption of program growth after 2013, as shown by the data, did not occur. The replacement of agreements by adhesion terms, by significantly reducing bureaucratic procedures and the need to control actions carried out by federal entities, resulted in a strategic redirection of Conab's role, weakening its national participation in the execution of PAA. For example, in 2012, the year in which the program achieved its best performance, Conab accounted for 70% of the total funds invested, while in 2018 this share was around just 30%. This reorientation, in practice, significantly altered the way the policy is operationalized, as:

> "In PAA Conab, public procurement is carried out through proposals for the participation of cooperatives and family farming associations, which small producers form to enable their entry into the program, not only with a view to expanding the scale of production, but also with important effects on their self-organization and the productive structuring of farmers. Such proposals for participation are signed between cooperatives and associations and Conab, in line with the decentralized execution terms. In turn, in the state and municipal PAAs, purchases are made through city halls and state governments, from the selection of individual family farmers, who are paid by magnetic card directly by the ministry, in the case

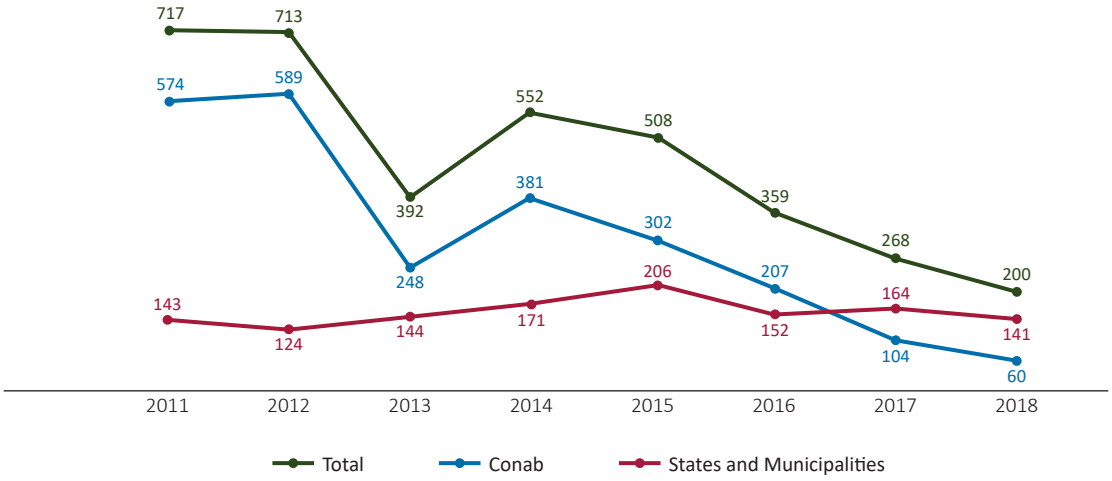
> of operations through the terms of adherence (Valadares et al., 2019, p. 391).

That is, the new operational design of PAA, by deepening the federative decentralization process, transferred to the subnational executing units not only the responsibility for its execution, but also the responsibility for planning, administrating and inspecting. In turn, acquisitions in the PAA Institutional Procurement modality carried out by states and municipalities were far below the drop that occurred in the other modalities carried out by Conab, as shown in **Graph 9**. As a result, the organizations representing family farmers lost protagonism in the decision-making process, while the municipal and state secretariats involved played a central role, even with the power to curb the progress of the program in their respective jurisdictions.

At the same time, the Federal Police of Brazil launched, in 2013, the Operation Agrofantasma, in the state of Paraná. It aimed to investigate alleged crimes of embezzlement of public funds and simulation of food production and delivery committed by public agents assigned to Conab and benefiting farmers (and benefiting organizations). The police operation, despite having taken place in specific locations, caused damage to the image of those involved and of the PAA itself at the national level, with the dismantling of organizations of supplier beneficiaries and the shortage of several entities in the social assistance network that received food. It is worth mentioning that, at the end of the operation, it was proven that the agents involved did not act in bad faith and it was identified that the suspected irregularities were, in fact, lawful organizational strategies for the fulfillment of contracts (Triches and Grisa, 2015).

Another relevant factor, despite the relative reduction of bureaucracy in the sphere of public management, refers to the tightening of sanitary standards for the sale of processed products, which resulted in more difficulties for farmers to access the program. This was due to changes observed in the criteria for purchasing food, according to which processed products should present sanitary and quality control records issued by the responsible bodies, which highlights the challenge of decentralizing sanitary inspection in Brazil (Perin et al., 2021).

As a consequence of this set of factors, the abrupt drop in the execution of the program in 2013 compromised the achievements PAA had until then, such as the promotion of formal organizations of family farmers (cooperatives and associations), the incentive to structure supply



GRAPH 9. Amounts of resources invested by the federal government in PAA purchases in the CDS modality, in total and operated by Conab: states and municipalities (2011-2018) – (R$ million).

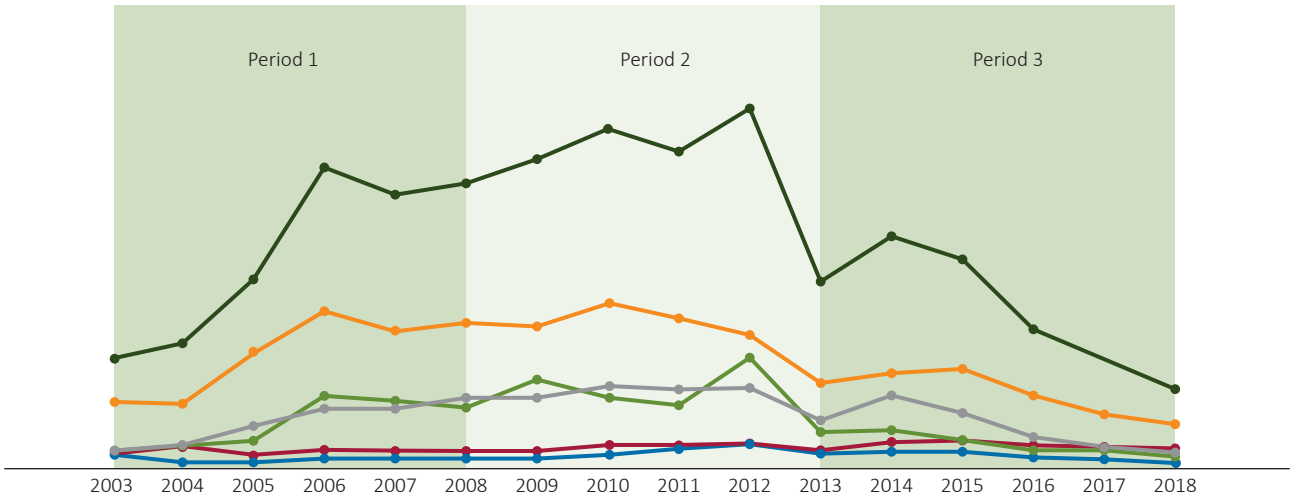
Source: Perin et al. (2021).

chains, the increase in production, diversification, as well as the formation of networks at the local level between farmers, entities and public authorities (Valadares e Souza, 2015)[6]. The PAA no longer reached previous levels, although it registered some recovery in 2014. The situation worsened with the economic and political crisis observed in Brazil from 2015 onwards, especially in the context of the change of the public policies agenda in the country after 2016, under a political strategy of fiscal austerity that reflected in the weakening of several federal government actions.

To summarize this discussion, **Graph 10** allows you to visualize the paths of evolution of the PAA budget resources at national level and by region. It shows three distinct periods of program execution, according to Perin et al. (2021): i) sharp increase from its origin in 2003 to 2008; ii) more gradual growth between 2008 and 2010, with a slight reduction in 2011 and a new increase in 2012; and iii) the significant drop that occurred in 2013, with a reaction in 2014, but a new downward trend in the following years. As previously shown, the evolution of the number of benefiting suppliers and purchased food showed a trend similar to that observed for the amounts of resources invested in the program: a sharp reduction in 2013, a slight recovery in 2014 and a downward trend in the following years.

As for the regional variation, it can be noted that the Northeast region was the one that received the highest volume of resources in all years, which is in line with the objectives of strengthening family farmers in a more vulnerable situation and with more difficulty in accessing traditional markets for agricultural products. Therefore, the weakening of PAA on the federal agenda represented a severe blow to Northeastern family farmers, even more so considering the context of the extreme drought

6 For more details on the regulatory changes in the PAA during this period, see Perin et al. (2021).



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
North	30,62	65,18	30,08	48,57	41,33	40,10	40,69	65,99	65,45	69,36	49,59	79,46	82,10	60,55	64,18	49,21
Northeast	15,71	05,50	381,44	16,91	51,62	77,47	65,19	46,34	491,67	37,24	71,26	02,22	20,63	232,99	164,34	137,90
Southeast	38,04	61,14	30,00	88,56	181,61	25,13	20,58	60,42	251,45	61,57	144,00	232,20	66,97	89,63	49,66	34,37
South	45,16	68,00	80,80	31,00	217,67	87,33	286,06	25,87	94,41	365,21	07,60	16,33	80,69	44,79	45,95	22,24
Center-West	30,64	7,62	4,37	19,71	20,81	25,82	24,01	38,28	52,57	70,14	37,37	46,43	45,13	23,89	13,98	9,50
Total	360,17	07,44	26,68	1.004,75	913,04	955,85	1.036,55	1.136,89	1.055,55	1.203,51	09,82	776,64	95,51	451,85	338,13	253,22

GRAPH 10. Resources invested by the federal government in PAA purchases, in all modalities: Brazil and macroregions – (R$ million).

Source: Perin et al. (2021).

that devastated much of the region precisely in that period (2012 to 2017). It should be noted, at this point, the significant reductions that also occurred in relation to the PAA Milk modality, both in terms of resources applied (-65% in the period) and in the number of suppliers (reached 28.3 thousand in 2012, falling to just over 10,000 in 2018, down around 60% in the period). As the program exclusively served family farmers in the semi-arid region, its reduction also strongly affected family farmers in the Northeast.

Therefore, the discussion undertaken in this section allows us to draw at least two robust conclusions about the recent path of execution of the PAA. First, it became evident that the program lost space on the government agenda, due to a series of factors observed from 2013 onwards and "ratified" from 2016 onwards. This drop was significantly more perverse for family farmers in the states of the Northeast region, relatively the most benefited since its creation, with the aggravating factor that this reversal occurred concomitantly to a drought that seriously affected the activity of these farmers.

Secondly, the operational retraction of Conab and, in particular, of the Procurement for Simultaneous Donation modality, implied a significant change in the direction of the program. This modality served less structured farmers (especially in the Northeast region, as already highlighted), for whom the guarantee of public procurement of production works as an inducer of organization of productive activity. In turn, the Institutional Procurement modality – municipal and state PAA – involves different participation rules that, if they become predominant, alter the program's systematics. This is because, in the model implemented by municipalities and states, farmers can participate individually, delivering their production to a local distribution center and receiving direct payment by bank card. Although this measure may have some positive effect in allowing the reach of "isolated" family farmers, that is, those not organized into cooperatives, especially in small municipalities and far from the capitals, it entails the loss of protagonism of collective and representative organizations of family farmers in the decision-making process, in the execution and in the control of its stages.

4.2.2 The National School Feeding Program - PNAE

4.2.2.1 Institutional and programmatic aspects of PNAE

School meals have been a government issue on the federal agenda since the 1950s, whose milestone was the Decree No. 37,106/1955, when the president at the time, Café Filho, instituted the National School Lunch Campaign (CNME). Since then, there have been a series of institutional changes, until reaching PNAE's current model, which is governed by Law No. 11,947/2009 (Silva, 2019). Its main objective is to contribute to the psychosocial development of school learning and the formation of healthy eating habits in the public basic education network (public schools, philanthropic or community entities), through food education actions and the provision of meals that meet the nutritional needs of students during the school term.

Currently, the PNAE is considered one of the largest nutritional programs in the world, serving, on average, more than 40 million meals per day during school periods throughout the Brazilian public basic education network.

PNAE's current regulatory content provides for decentralized execution among the national federative entities, to serve all students in the public basic education network. It also seeks to increase the number of suppliers of food products, especially at the local level, prioritizing family farming. This model is the result of a broad debate around school feeding and its relationship with the principles of nutrition and food security, carried out, among other actors and instances, by the National Food Security Council (Consea)[7].

7 One of the results of this debate are the guidelines established

In its operational design, the PNAE is nationally coordinated by the National Fund for Educational Development (FNDE), a federal autarchy, linked to the Ministry of Education (MEC), responsible for the financial transfer to the Executing Entities (EEx), which correspond to the state and municipal secretariats of education. The amount transferred to each EEx is calculated based on the number of enrolled students, informed through the Brazilian School Census, which is carried out annually. Reference values vary according to the category of beneficiaries, the stages and modalities of basic education[8].

Among the recent innovations in PNAE's legal framework, one of the main ones refers to the spending rule of at least 30% of the financial resources transferred to the EEx for the acquisition of food from family farming. In order to make it possible to comply with this rule, the EEx can launch public calls – a facilitated public procurement instrument that replaces the traditional bidding process – exclusively for the acquisition of these foodstuffs for schools, facilitating their entry into the program, given the difficulties in meeting the requirements from a traditional bidding process. Family farmers can present their proposals in three ways: individually, upon presentation of the DAP; in informal groups of farmers with DAP; and in formal groups (cooperatives and associations), through productive organizations holding DAP-PJ.

Public calls must comply with two prioritization criteria. The first is territorial, through which proposals from local farmers are prioritized, with DAP linked to the municipality, and then those from the immediately higher territorial level (from the micro-region, the meso-region, the state and the country, in that order). The second criterion occurs at each territorial level, prioritizing, in this order: land reform settlers and traditional indigenous and quilombola communities; organic or agroecological food suppliers; formal groups preferred over informal ones, these preferred over individual suppliers and these preferred over cooperative centrals. The maximum amount that each farmer can trade has changed over the years, currently being equivalent to R$40,000 per year, with no rule, in turn, for minimum delivery.

The PNAE is slightly different to other programs that use public procurement of family farming products, especially the PAA, with regard to greater predictability and regularity in the demand for foodstuffs. It needs to continually attend to the educational cycle throughout the country, which enhances its ability to generate income for family farmers selected via public calls, by representing a safe marketing channel and reducing the risk of investments made in the rural establishments. Furthermore, as it is regulated in the form of a conditional transfer from the Federal Government, with fixed rules for calculating the value of transfers, it is not subject to budget cuts and contingencies, as occurred with the PAA after 2012.

There is also the favoring of local development (positive spillovers), as it generates a new money injection in the economic dynamics through the farmers served, as reported in the international literature on public food procurement (Drake and Woolnough., 2016; Sumberg and Sabates -Wheeler, 2011; Valencia, Wittman and Blesh., 2019).

However, as Silva (2022) pointed out, the inclusion of family farmers in this market has not been a trivial task, either due to the regulatory

in article 2 of the law, which consist of: i) the use of adequate and healthy food, linked to the consumption of varied and safe foods, respecting cultures and healthy eating habits; ii) adoption of food and nutrition education in the learning process; iii) universal service to public school students; iv) social control exercised by the community; v) sustainable development through the acquisition of local food, produced by family farming; and iv) right to school meals respecting equity criteria among beneficiaries.

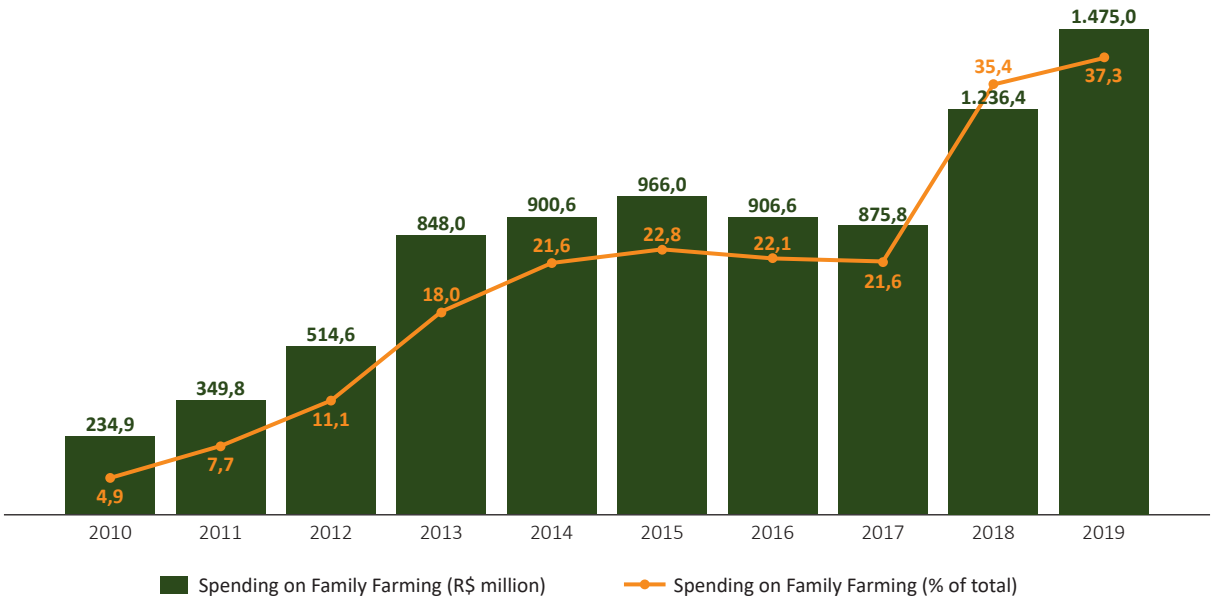
8 Financial transfers are made in ten monthly installments, starting in February, to cover 200 school days per year. The amount of resources allocated to each EEx will be the result of the sum of the values to be transferred to each student served, whose reference values per teaching modality, as last updated until the elaboration of this study, are: Day care: R$1.07; Preschool: R$0.53; Indigenous and quilombola schools: R$0.64; Primary and secondary education: R$0.36; Youth and adult education: R$0.32; Full-time education: R$1.07; Full-Time High School Support Program: R$2.00; Students who attend Specialized Educational Assistance after school hours: R$0.53 (FNDE, 2018).

density that characterizes it, so that the introduction of a rule makes its operational routine even more complex, or because of the number of interests at stake, especially when taking into account the considerable volume of annual budgetary resources passed on to federal entities (around R$4 billion per year). Even so, data show evolution in the degree of participation of family farming in PNAE purchases, as shown in **Graph 11**. The percentage of purchases of products in this segment increased from 4.9% in 2010, the first year the rule was in force, to 37.3% in 2019, surpassing, in aggregate terms, the minimum quota established by the Law No. 11,947/2009. As there is a limit on the amounts traded per family farming establishment, increasing this share in the PNAE's total budget implies an increase in the number of benefiting farmers.

The evolution in the level of purchase, in turn, has not occurred uniformly among EExs. Some states and municipalities have encountered challenges in increasing the share of purchases from family farming. According to the literature, these challenges are associated both on the supply side (difficulties of farmers in the regular supply and adequacy of products) and on the demand side (lack of preparation and lack of knowledge on the part of managers of their role in the process, lack of commitment of city halls in the preparation and dissemination of public calls) (Alves et al., 2021).

4.2.2.2 Analysis of the trajectory of implementation of the PNAE

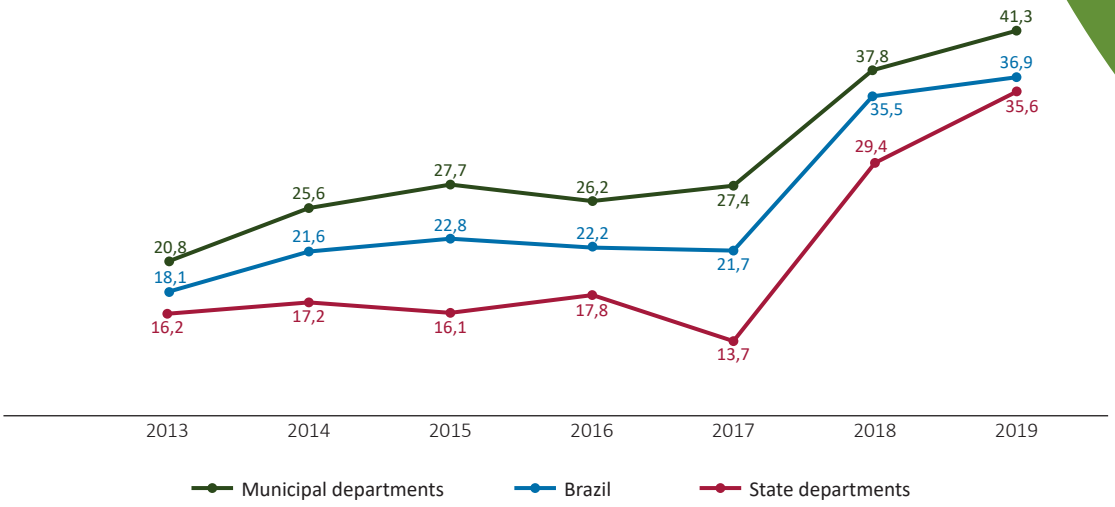
On average, compliance with the new PNAE purchase rule was gradual over the years. That is, as Silva (2022) stated, the rule worked, in practice, much more as an arrival point than as a starting point. It can be seen from **Graph 12** that the national average showed an upward trend until it finally surpassed the minimum level of 30% for the first time in 2018. Among the subnational levels, the municipal average remained above of the state one throughout the period. Another relevant factor is that, of the total financial transfers for the execution of the PNAE, municipal secretariats receive around 70%, and the rest went to the state secretariats.



GRAPH 11. Values traded by the PNAE directly with family farmers and the share of the total budget in each year (2010-2019 - current values).

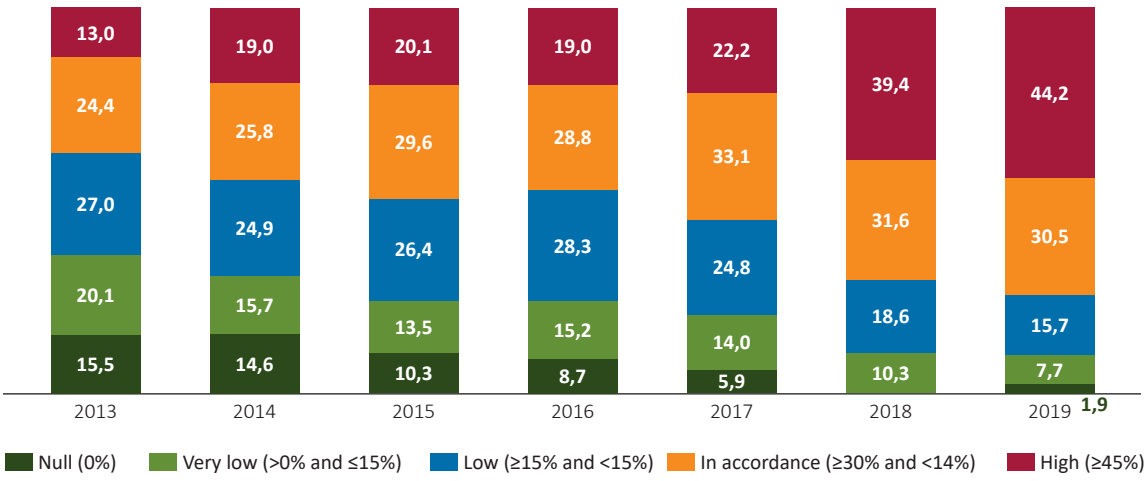
Source: FNDE – Open data (http://www.fnde.gov.br/dadosabertos/dataset?q=pnae).

Elaborated by the authors.



GRAPH 12. Level of purchase of family farming products with financial transfers from the PNAE: Brazil, State Secretariats and Municipal Secretariats (2013-2019) (%).

Source: FNDE – Open data (http://www.fnde.gov.br/dadosabertos/dataset?q=pnae).



GRAPH 13. Annual average performance of municipalities by level of purchase of family farming products with PNAE financial transfers: Brazil (2013-2019) (%).

Source: FNDE – Open data (http://www.fnde.gov.br/dadosabertos/dataset?q=pnae).

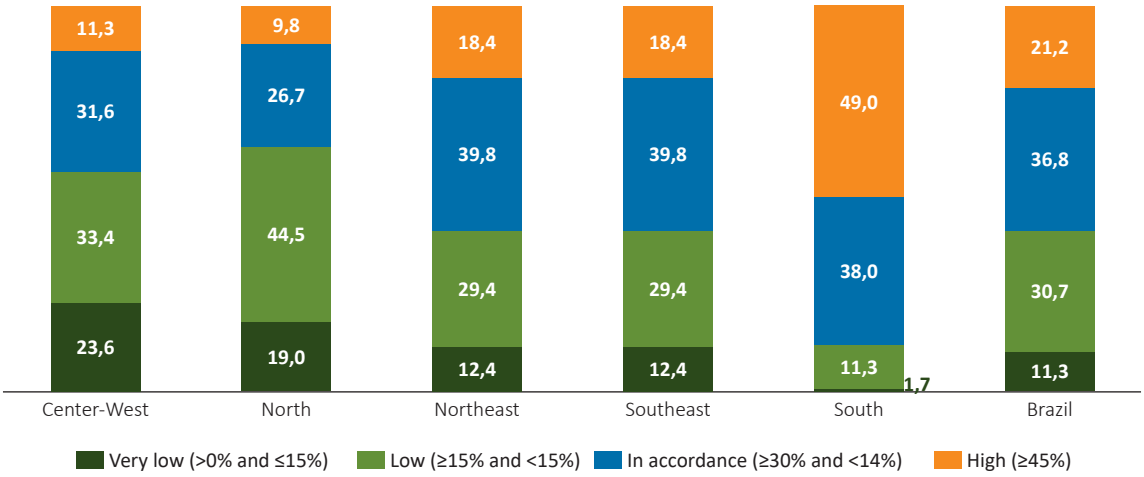
In addition to the variation over the years, there is great heterogeneity in the performance of the federative units within each level. In the case of municipalities, Graph 13 helps to understand this diversity a little. They were classified each year according to the percentage of purchases from family farming achieved, ranging from those with no purchases (0%) to

high performance (above 45%). It is possible to notice that the portion of municipalities that surpassed the minimum of 30% (compliant and high) increased in the series, reaching 74.7% of the total in 2019, while those that did not make purchases decreased until there were practically no more records.

In sequence, **Graph 14** shows the division of the average of municipalities by region and for the country as a whole, based on the sum of transfers and amounts spent on family farming in the entire series analyzed (2013 to 2019). It is noted that the South region had a more outstanding performance: 87% of the municipalities exceeded the minimum required by law, while this total corresponded to 59% in national terms. In turn, the Center-West (42.9%) and North (36.5%) regions were those with the lowest percentages of municipalities that complied with this legal requirement in the period from 2013 to 2019. The Northeast region, on the other hand, presented proportions very similar to the national performance, with 58.2% of municipalities that exceeded, on average, the minimum required. Therefore, it is possible to see that there is still a lot of room for growth in the municipalities of the region for the market of public procurement from family farming, which can be mobilized as a structuring element of production and dynamization of local economies.

Complementing the information previously presented, **Table 13** shows the annual evolution of the percentage of agricultural purchases in the total spent by the PNAE in Brazil and by macroregion. In the specific case of the Northeast, there is a very close follow-up to national annual averages, with a notable evolution from 15.5% in 2013 to 35.5% in 2019, closing the series aggregate at 24.4%. **Table 14**, in turn, breaks down the execution averages between the state and municipal secretariats, which are responsible for the PNAE in their respective jurisdictions, for Brazil as a whole and for the Northeast. It is observed that, like at the national level, in the Northeast region the state secretariats present a trend in the percentage of purchase of family farming products lower than the average of the municipal secretariats.

Considering the information for the Northeast region, **Graph 15** illustrates the percentage performance with the averages of each state and of the group of their respective municipalities, allowing the comparison of the performance between them. The only state that closed the time series reaching the minimum required was



GRAPH 14. Total average performance of municipalities by level of purchase of family farming products with PNAE financial transfers: macroregions and Brazil (2013-2019) (%).

Source: FNDE – Open data (http://www.fnde.gov.br/dadosabertos/dataset?q=pnae).

TABLE 13. Average annual performance by level of purchase of family farming products with financial transfers from the PNAE: Brazil and Macroregions (2013-2019) (%)

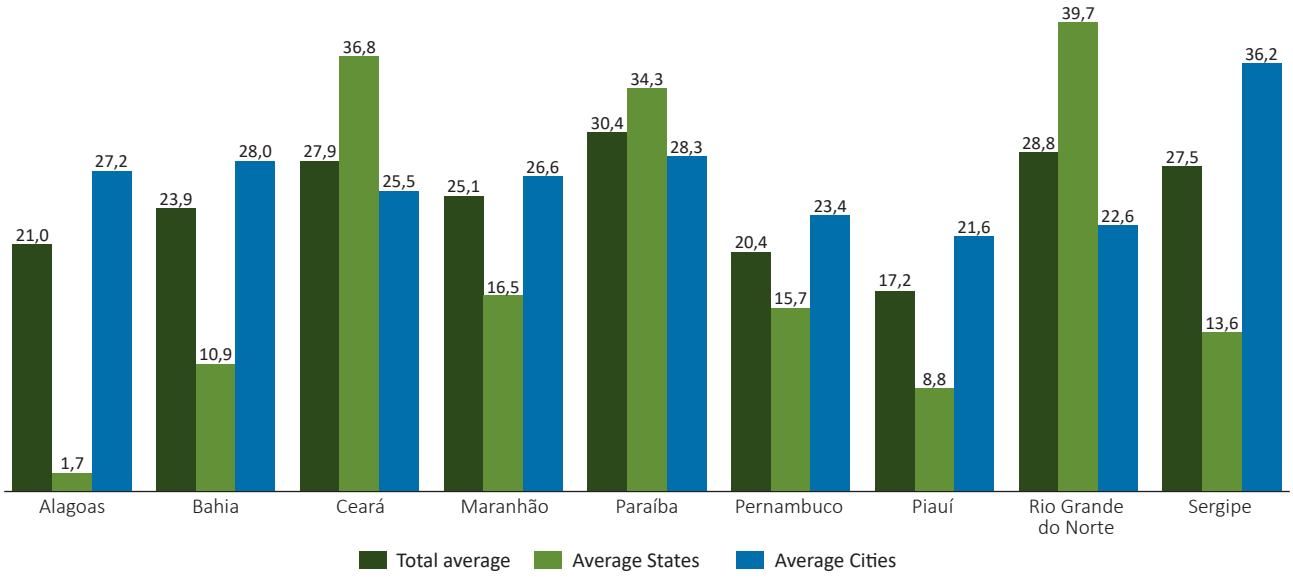
	2013	2014	2015	2016	2017	2018	2019	Average
Northeast	15.5	18.2	19.8	22.1	21.6	33.8	35.5	24.4
Southeast	24.0	36.7	36.7	29.8	34.7	43.4	41.2	34.4
South	31.1	37.1	32.4	29.0	28.2	39.2	36.4	33.1
North	20.4	23.9	22.0	25.9	29.4	35.8	49.3	30.3
Center-West	31.2	20.0	19.3	20.8	23.0	31.4	30.4	25.1
Brazil	**18.0**	**21.6**	**22.8**	**22.1**	**21.6**	**35.4**	**37.3**	**26.1**

Source: FNDE – Open data (http://www.fnde.gov.br/dadosabertos/dataset?q=pnae).

TABLE 14. Average total performance by level of purchase of family farming products with financial transfers from the PNAE: Brazil and Northeast (2013-2019) (%)

		2013	2014	2015	2016	2017	2018	2019	Average
Brazil	**Municipalities**	18.9	23.5	25.7	23.8	25.1	37.7	38	27.6
	States	16.2	17.2	16.1	17.8	13.7	29.4	35.6	22.5
Northeast	**Municipalities**	17.3	20.5	22.1	23.4	23.7	36.5	38.3	26.2
	States	11.1	11.1	13.1	16.9	15.2	25.4	31.1	19.5

Fonte: FNDE – Dados abertos (http://www.fnde.gov.br/dadosabertos/dataset?q=pnae).



GRAPH 15. Average performance of states and municipalities by level of purchase of family farming products with PNAE financial transfers: Northeast (2013-2019) (%).

Source: FNDE – Open data (http://www.fnde.gov.br/dadosabertos/dataset?q=pnae).

Paraíba, with 30.4%. Paraíba also obtained the highest average in the aggregate of municipalities (28.3%), while Rio Grande do Norte held the state secretariat with the highest percentage of purchases (39.6%). The negative highlights were the state of Alagoas (only 1.7% in the aggregate for the period) and the set of municipalities in Piauí (21.6%).

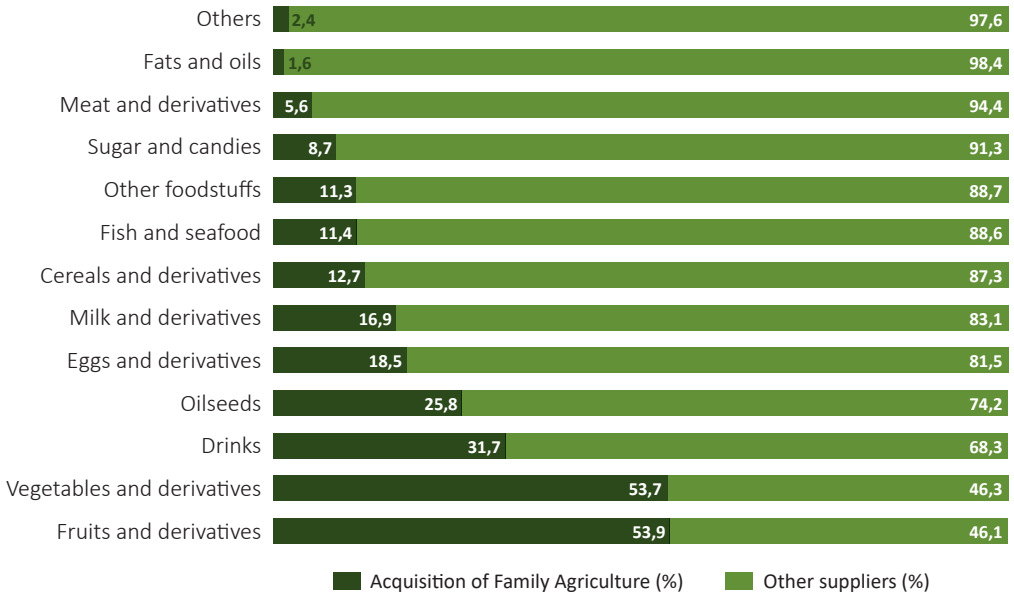
Finally, **Graph 16** shows the relative participation of family farming by group of food purchased by the PNAE at the national level, for 2017. As can be seen, there is greater participation in the food groups of fruits and vegetables, precisely those recommended by the FNDE to be offered in at least three weekly portions. In the case of groups that require a greater degree of processing and industrialization, and consequently have greater added value, the participation of family farming is lower, especially in food of animal origin, given the health requirements for the regularization of agroindustries. Therefore, these data help not only the supply chains in which there may be progress in the participation of family farmers, but also direct possible actions to support the economic organizations of these farmers and the need to adapt public calls to the conditions of local producers.

Therefore, from the general tabulations presented here, it can be considered that, regarding the minimum percentage of purchases from family farming expressed by article 14 of Law No. 11,947/2009, there has been a positive evolution of the indicators since the beginning of its effectiveness, the which denotes the efforts of local managers to adapt. The amounts allocated to the acquisition of these products grew year after year, offsetting the drop observed in the execution of the PAA. However, these indicators still show great variability among the federative units, as they respond differently to factors of the most diverse natures (institutional, socioeconomic, demographic, spatial, etc.), which requires the formation of institutional arrangements specific to the execution contexts to enhance these results.

4.3 Agricultural insurance for family farms: the Harvest Guarantee Program – PGS

4.3.1 Institutional and programmatic aspects of the PGS

The PGS, instituted by the Federal Government in 2002 through the Law No. 10,420, came to fill



GRAPH 16. Participation of suppliers in the spending of different food groups: Brazil (2017) (%).
Source: Special microdata tabulation made available by FNDE.

a gap that existed in rural credit policies in the country regarding the provision of a rural insurance system accessible to poorer family farmers, especially those systematically subject to risks of crop loss due to weather problems, such as prolonged droughts typical of the northeastern region.

In its origin, the fund and the Harvest Insurance benefit was created, aimed at family farmers in the Northeast region, in the semi-arid region of Minas Gerais (Vale do Mucuri and Vale do Jequitinhonha mesoregions in northern Minas Gerais) and in the northern mesoregion of the state of Espírito Santo. Initially, it would serve farmers from municipalities that had declared a state of calamity or an emergency situation, as a result of the occurrence of droughts, in an act recognized by the Federal Government. The insurance was intended to guarantee a minimum subsistence income that would mitigate the effects of the loss of agricultural production due to the adverse climatic phenomenon. Law No. 10,700/2003 named the fund Harvest Guarantee to the fund and the benefit of the program, in addition to deepening the regulation of its functioning. Since then, a series of other regulations have followed, aimed at improving its protection potential and social coverage (Valadares, Alves e Silva, 2022).

The program's audience corresponds precisely to the most impoverished segment of family farming, the one responsible for smallholdings (up to 10 hectares of land) and with low-income (up to 1.5 minimum wage of monthly family income), comparable to the group B of Pronaf. They also cannot use irrigation and they must adhere to the PGS before starting planting, informing the area to be planted with the crops covered by the program.

Family farmers join the PGS by registering in the program and paying a contribution, which will make up the Harvest Guarantee Fund. In addition to the individual contribution of farmers, the Fund's composition includes annual contributions from member states and municipalities, supplemented with resources from the Federal Government and the result of the financial application of its resources. Therefore, the operationalization mechanism of PGS occurs for each agricultural year, through the adhesion of states, municipalities and farmers (Alves, 2009).

Its implementation takes place in the second half of the agricultural year: The Federal Government, through the Ministry of Agriculture, Livestock and Food Supply (Mapa), invites the states to adhere to it. Then, the program's Management Committee establishes, according to the budget of the Harvest Guarantee Fund, the number of quotas for family farmers in each state, distributing them according to the size of the public receiving the benefit, whose parameter is the number of adhesions in the previous years. In the subsequent step, the states repeat the process with their municipalities, in order to prioritize those with a history of recurrent droughts. At the end of the phase of municipal quota distribution, the adhesion of farmers in each municipality begins, even before the planting period. The number of quotas is previously defined based on the Federal Government's budget foreseen for the PGS[9].

Selected family farmers are invited to join the program by paying a contribution[10]. This payment generates the right to compensation for crop failure and allows the calculation of contributions from other federal entities, starting from the municipality, whose contribution is estimated "according to the number of farmers adhered to the program in their jurisdiction" (Alves, 2009, p. 287).

9 If, by way of hypothesis, the budget is R$100 million, the number of shares to be offered results from dividing this amount by the amount that the Federal Government is responsible for contributing to the program: as, under the current rule, the Federal Government must respond for up to 40% of the value of the benefit defined by the PGS management committee, which is R$850.00, so the total quotas to be distributed will be 294,117, i.e., the result of dividing R$100 million by R$340.00 (40% of R$850.00).

10 On the criteria for defining and selecting PGS beneficiaries, consult at: https://www.gov.br/pt-br/servicos/acessar-o-beneficio-garantia-safra

Since it operates under the logic of insurance, the PGS established a parameter for the occurrence of the covered risk – drought – based on the history of drought incidences in the Northeast. As the years of drought occurrence in the region correspond to 30% of the years of the last three centuries, the risk of crop losses due to this climatic phenomenon was established, for the purposes of the program, at 30%, and this parameter started to determine the value of the premium to be paid for joining the insurance. Financial contributions to the Harvest Guarantee Fund, for each participant, were revised and scaled by the Law 12,766/2012, and currently have the following criteria:

1) **Farmer:** 2% of estimated annual benefits;
2) **Municipality:** 6% of estimated annual benefits for the Municipality, as agreed between the State and the Municipality;
3) **State:** added to the contributions of the farmer and the Municipality, it must be in an amount sufficient to complement the contribution of 20% of the estimated value of annual benefits, for the State;
4) **Federal Government:** resources equivalent to at least 40% of estimated annual benefits.

The last phase of the implementation of the PGS concerns the payment of the benefit. This stage involves verifying the occurrence of drought or excessive rainfall and, then, the size of the crop loss caused by these adverse phenomena. To this end, municipalities collect planting and harvesting information from a local sample of farmers participating in the program and, comparing production expectations to harvest outcomes, estimate whether the crop loss – in the municipality as a whole, and not individually – exceeded 50%. If so, participant farmers in the municipality will be able to receive the benefit.

Therefore, the PGS operates according to a vertical solidarity logic – which covers the three spheres of government – and a horizontal one, which takes place between states, between municipalities and between farmers. As the contributions will be part of the Fund, the resources will be able to finance indemnities in any municipality where the loss occurred. This means that, by making their contributions, states, municipalities and farmers who have not suffered a crop failure contribute to indemnify farmers in municipalities and states whose production was impaired by climatic factors. However, as the participation of beneficiaries is small in the financing of benefits, this logic makes the PGS an atypical program, insofar as it is configured as an income insurance linked to agricultural production, whose premium is highly subsidized by the public sector (Alves, 2009). That is, in practice, the PGS works as a solidary policy to protect agricultural production in favor of impoverished family farmers who would not be able to obtain, through the market, protection against the risks to which their activities are exposed.

4.3.2 Analysis of the trajectory of execution of the PGS

In order for farmers to receive the benefit, it is necessary for the municipality to request the program's management body to inspect the crops of participant farmers[11]. The current value of the benefit is R$850 per insured establishment, paid in 5 monthly installments of R$170. However, this value has been frozen since the 2013/2014 Harvest Plan, i.e., 42% lower, in real terms, than the value practiced in the 2002-2003 harvest[12]. As of January 2021, to mitigate the damage caused by the pandemic, the MAPA authorized the payment of a single benefit quota, in the full amount of R$850. **Table 15** provides information on how the composition of the Harvest Guarantee Fund and the value of benefits have changed over the years.

11 The verification of losses follows four analysis procedures: i) information from the sample reports obtained from on-site visits; ii) water penalty with edaphoclimatic information calculated by the National Institute of Meteorology (INMET); iii) calculation of the Water Supply Index for Plant Growth of the National Center for Monitoring and Natural Disaster Alerts (ISACV/CEMADEN); and iv) survey of the Systematic Survey of Agricultural Production by the Brazilian Institute of Geography and Statistics (LSPA/IBGE). The "claim" is confirmed when at least one of the four procedures indicates a loss equal to or greater than 50% and when more than one of them, at least, indicates a loss above 40%.

12 Updated by the Extended National Consumer Price Index (IPCA), the initial value of the benefit would generate a benefit equivalent to R$1,460.23 at the end of 2022.

The entire budget is used to finance benefit payments, in the amount defined by the program's management committee. In the event of a drastic event, an additional amount may be added by the Federal Government via budget supplementation. The Federal Government's budget allocation for the financial contribution to the Harvest Guarantee Fund is what references the decision on the value of the benefit and the number of membership quotas to be offered to the states.

Table 16 shows the "authorized" budget values for the budget action "Contribution of the Federal Government to the Harvest Guarantee Fund", from 2011 to 2021, alongside the amounts "paid" and "remainders to be paid paid". As can be seen, in real values, the Federal Government's budget allocation (authorized amount) had its highest levels in the initial years of the drought (2012-2014), with a reduction in 2015, followed by a partial recovery in 2016. the value decreased year by year until reaching, in 2021 (R$ 245.73 million), a level close to that of 2011. The data also indicate that the level of execution (the ratio between the amounts paid and authorized) was high between 2011 and 2017 – an average of 82% – and that, in almost all of these years (with the exception of 2014), the "remainders to be paid processed" for the following year made up the difference between the "authorized" and "paid" amounts.

TABLE 15. History of the percentage and value of contributions by farmers, municipalities and the Federal Government to the Harvest Guarantee Fund

Harvest	Amoun of benefit (R$)	Farmer contribution (%)	Municipal contribution (%)	State contribution (%)	Federal contribution (%)	Total (%)
2002-2003	475	1	3	6	20	30
2003-2004 to 2008-2009	550	1	3	6	20	30
2009-2010	600	1	3	6	20	30
2010-2011	640	1	3	6	20	30
2011-2012	680	1	3	6	20	30
2012-2013	760	1.25	3.75	12.5	25	43
2013-2014	850	1.5	4.5	15	30	51
2014-2015	850	1.75	5.25	17.5	35	60
2015-2016 to 2019-2020	850	2	6	20	40	68

Fonte: Valadares, Alves e Silva (2022).

TABLE 16. Federal budget for the Harvest Guarantee Fund (2011-2021) - (In 1,000,000 R$)[1]

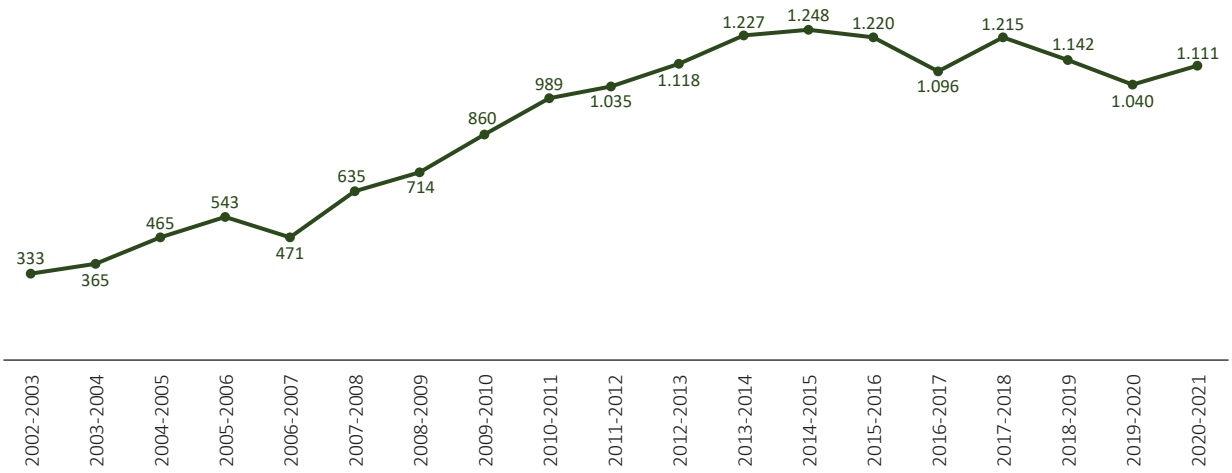
Year	Authorized	Paid	Remainders to de paid paid
2011	228.11	191.52	17.65
2012	1,044.03	685.55	34.71
2013	2,226.39	1,536.68	337.53
2014	1,350.77	1,266.35	0.00
2015	603.41	514.62	77.43
2016	930.74	885.98	81.66
2017	562.60	440.90	43.27
2018	542.71	137.30	117.39
2019	523.18	523.18	390.82
2020	506.90	506.90	0.00
2021	245.73	245.73	0.00

Source: Siga Brasil. Available at: <https://bit.ly/3p2MkHo>.
Note: [1] Values deflated by the IPCA to average values for 2021.

According to Valadares, Alves and Silva (2022), the reduction in the level of values from 2016 onwards may be associated with the end of the budgetary effort that accompanied the most severe years of the drought that affected the region between 2012 and 2017, or even a decrease of the Government's estimated expenditure on the program concomitant with the increase in its percentage contribution to the Harvest Guarantee Fund. Strictly speaking, the Federal Government's budget allocation does not decrease per se. The reduction in the amount "paid" is due to the number of adhesions firmed in the municipalities. The Federal Government only contributes to the Fund after obtaining information on how many farmers joined in the municipalities. In other words, the execution of the federal budget depends on accessions.

In any case, it is from the federal budget that the program's Management Committee must decide between increasing the individual value of the benefit or expanding its coverage. Considering the evolution of the program since its inception, it can be said that the gradual increase in the number of national quotas, as a result of the increase in the budget allocation, allowed for a considerable expansion in the number of adhered municipalities: in the first crop year (2002/2003), there were 333 municipalities; this number rose year by year until reaching 1,035 municipalities, in the 2011/2012 harvest, and reaching its record (1,248 municipalities) in the 2014/2015 harvest. Since then, the number of municipal adhesions has been fluctuating, although it remains above one thousand municipalities. In 2020/2021, a total of 1,111 municipalities adhered, of which 1,011 are in the Northeast, which corresponds to 56% of the 1,793 municipalities in the region and 88% of the 1,262 municipalities in the semi-arid. **Graph 17** consolidates this information.

Comparing, year by year, the municipal adhesions vis-a-vis the federal budget allocation data for the Harvest Guarantee Fund, it is noticed that, until the 2013/2014 crop year, the number of participants had been increasing, until reaching the figure of 1.17 million adhesions. But, especially from 2015/2016 onwards, the number of adhesions starts to fall. For a better understanding of what happened, **Table 17** shows that, in 2013/2014, when 1.2 million quotas were offered nationally, the number of participating farmers was 1.16 million, a reflection of the number of vacancies offered by municipalities – which, that year, was 5% higher than the national quota. In the 2019/2020 crop year, however, the total number of vacancies made available by the municipalities was reduced to 682,400, corresponding to roughly half of the national quota (1.35 million vacancies). As a



GRAPH 17. Municipal adhesions to the PGS.
Source: Valadares, Alves e Silva (2022).

TABLE 17. Total number of federal, municipal and farmer quotas adhered to the PGS (2011-2021)

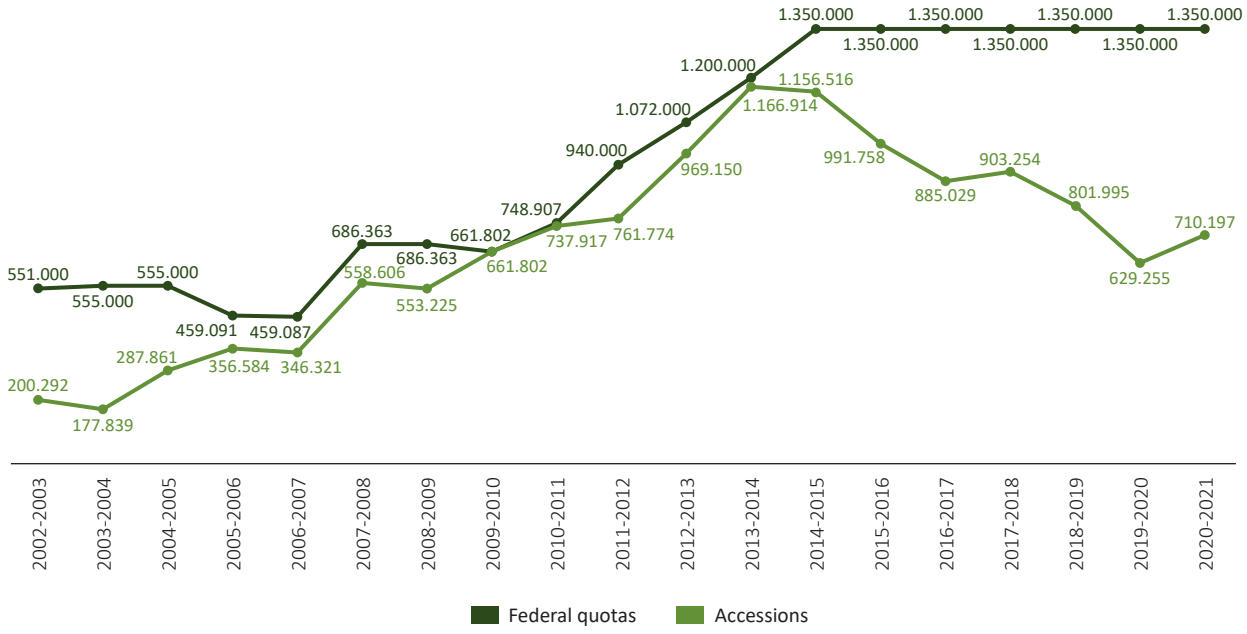
Crop year	Federal quotas	Municipal quotas	Participating farmers
2011/2012	940,000	821,440	761,774
2012/2013	1,072,000	1,053,929	969,150
2013/2014	1,200,000	1,257,717	1,166,914
2014/2015	1,350,000	1,322,324	1,156,516
2015/2016	1,350,000	1,116,123	991,758
2016/2017	1,350,000	984,962	885,029
2017/2018	1,350,000	1,012,844	903,254
2018/2019	1,350,000	870,998	801,995
2019/2020	1,350,000	682,414	629,255
2020/2021	1,350,000	806,525	710,197

Source: Quantitative implementation report. Available at: <https://bit.ly/3Cqv4T6>.

consequence, the number of farmers joining the program was also low in relation to this total (629,200). Since the set of participating municipalities changed little in these two moments, it can be said that the decisive element for this reduction in the offer of vacancies by the municipal administrations was the change in the way in which they started to participate in the financing of the program and the decision, by most of them, not to increase their endowment to compensate for the increase in their per capita contribution to the Fund.

Thus, the percentage of contributions to the Harvest Guarantee Fund, by states and municipalities, gradually increased from the 2012/2013 crop year onwards. The municipal budget allocation, for example, which was 3% for each registered farmer, reached 6% in 2015/2016. Thus, with the regular value of the benefit fixed at R$850, the municipality's contribution per farmer, before R$25.50, increased to R$51. To maintain the level of participating farmers, municipalities would need to carry out a budget increase, but results indicate that this measure did not occur. Therefore, with the increase in the contribution percentage and the maintenance of the budget allocation, there would be no other option but to reduce the number of participating farmers. Data show that this reduction was gradual, as was the application of the new contribution percentages by states and municipalities to the Fund. Nonetheless, although there is a significant recovery in the total number of participants in 2020/2021, reaching 710,2 family farmers, the stagnation of the number of federal quotas and the regular value of the benefit from the 2014/2015 harvest suggest that the Fund's new financing design froze the expansion of the PGS. With an expanded historical series, **Graph 18** complements the previous explanation by showing how this discrepancy between national quotas and the number of adhesions of family farmers to the program is a relatively recent effect in the trajectory of the PGS.

The data referring to the release of benefits from the PGS show, in turn, its importance for family farming in the semiarid region. Despite the downward trend, the crop years showing the greatest number of benefits generated are those that registered the most severe period of the recent drought, from 2011/2012 to 2016/2017, when the average number of municipalities with crop losses reached 940 per year, almost triple the annual average verified until then (324). Indeed, in this period, the number of families accessing the benefit varied from 769,000 to in 2014/2015, the highest number of benefits generated in the history of the program. In the last three crop years, the amount of benefits generated has been significantly reduced, due not only to the decrease in the coverage of farmers, but also to the improvement in climatic conditions. This is evidenced by the comparison between the percentages of mu-

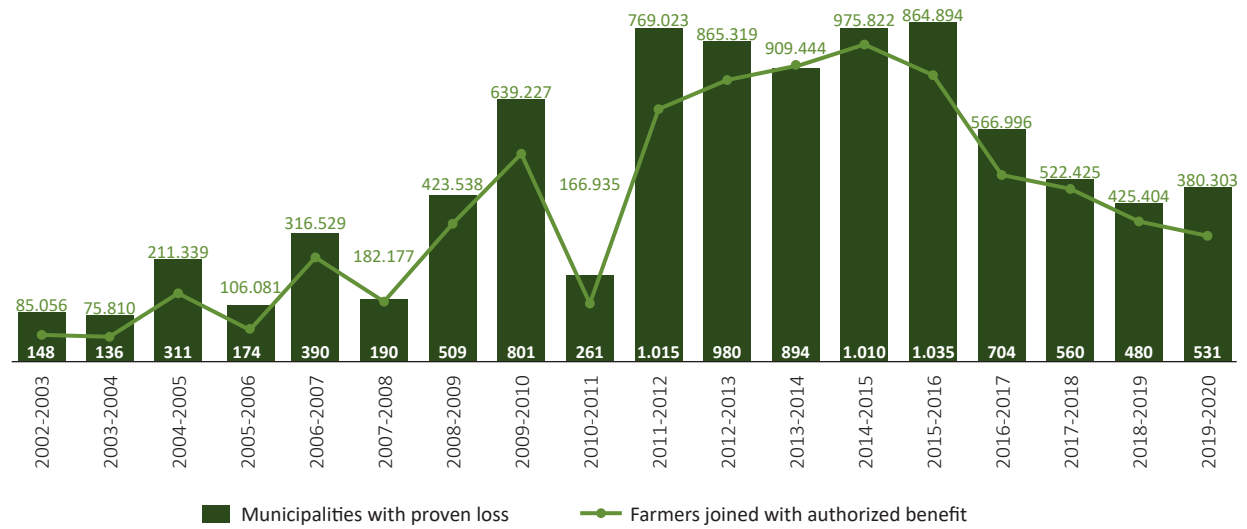


GRAPH 18. Total number of national quotas and adhesions to the PGS (2002/2021).

Sources: For the crop years from 2002/2003 to 2012/2013 and from 2014/2015 to 2018/2019 and 2020/2021, MAPA. Available at: <https://bit.ly/3uFYurm>. Accessed: November 25, 2021; and, for the crop years from 2013/2014 to 2019/2020, MAPA. Available at: <https://bit.ly/3tXweRU>.

nicipalities with verified crop failure: 81%, on average, in the period of the great drought; and 46%, on average, in the last years of the historical series. **Graph 19** illustrates this trajectory.

Therefore, in its two decades of existence, the PGS was consolidated as one of the main initiatives aimed at family farmers in the semiarid region of Brazil. The guidelines drawn up since its implementation made it possible to expand its protective coverage in favor of the most impoverished rural segment and, combined with other policies, made it possible to face a long and painful period of drought without the occurrence of the serious social disorders historically observed in the region in prolonged drought episodes. However, as previously highlighted, the increase in the percentage of state and municipal contributions to the Harvest Guarantee Fund seems to be causing a worrying reduction in its social coverage, in addition to the real loss of the benefit value.



GRAPH 19. Total number of municipalities with crop losses and farmers with paid benefits.

Source: Brazil (2019).

5 Final remarks

This study made it possible to deepen the discussion on the social reality of family farming in Brazil as a whole and in the Northeast region in particular in the face of a series of recent conjuncture factors. Throughout the text, it was initially possible to connect different relevant concepts in studies of this nature, such as territory, multifunctionality, sustainability and public goods, both directly connected with the dynamics of the social reproduction of family farming, even with all the diversity that this socio-productive segment presents.

Then, using information from the last two IBGE's Censuses of Agriculture, an updated situational map of family farming in Brazil was drawn, placing the particularities of the Northeast region alongside the other Brazilian regions. Data reveal that family farming, especially in the Northeastern states, is still inserted in a significant structural and social precarious condition. The historical and perverse land inequalities in the country not only remain but have been reinforced in several aspects, relegating family establishments to portions of land of lower agronomic quality and with less area availability. Such facts compromise these families' own food security, especially in scenarios of rising agricultural production costs, which more strongly affect small farmers.

In addition, the 2017 Census of Agriculture showed a drop in the absolute number of family farming establishments in all regions, totaling approximately 500,000 establishments less between Censuses. As for the occupied area, data indicate that, at the national level, there was stability in the amount, but important differences were observed between the regions. The Northeast and the South (where the measure of the fiscal module is smaller), regions with a historically greater tradition of family agricultural production, experienced a considerable retraction (around 10% each), while the North and the Center-West increased their relative participation. As a result, there was an increase in the

average size of family farming establishments, which, in turn, conditioned (or was conditioned) by significant changes in the production profiles in these establishments.

This new average productive profile that has been consolidating in family farming is characterized by the substantial growth of pasture areas in these establishments and the reduction of crop areas, either permanent and temporary. Such transformations raise an alert about the country's potential to maintain a productive structure of basic foodstuffs in quantity, quality and diversity necessary to supply urban centers and networks of small Brazilian municipalities. With regard to the Northeast region, one cannot lose sight of the fact that these changes occurred in a very adverse context, as the information was collected precisely in the year in which a cycle of severe drought in the region ended (2012-2017), which profoundly shook the productive capacity of local farmers.

However, even with all the adversities, there is no denying that family farming remains resilient, with the maintenance of a considerable volume of people employed throughout the national territory. From this perspective, the Census of Agriculture also expresses relevant potential to be reinforced in these family establishments, both in terms of production and in terms of conservation of the national socio-biodiversity.

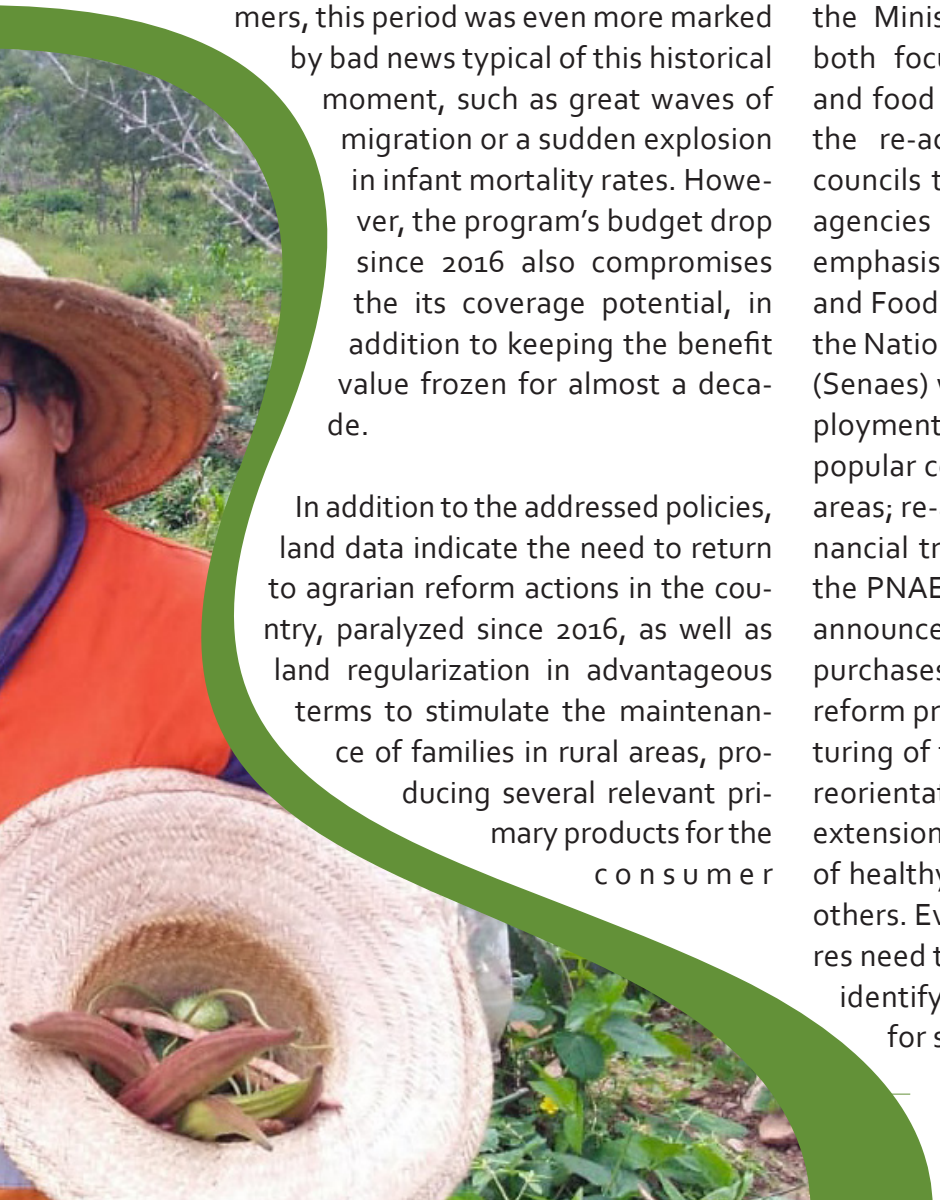
To this end, it is essential to maintain the network of public policies developed since the 1990s to support the activity of family farming in Brazil. It turns out that, as seen for the three dimensions of government intervention, these policies are subject to a series of conjunctural and operational factors that do not always meet the interests of their own beneficiary public. What was observed is that the trend towards "elite" family farming indicated by Census data is even more evident in the recent evolution of Pronaf, where the drop in contracts even in a scenario of continuous growth in the amount financed year after year is worrying. The Northeast continues to have a very low share of total financed resources, despite having the highest proportion of contracts, due to the low average value of these financing agreements.

As for marketing policies, the PAA, which emerged as a major innovation in 2003 and played a key role in the productive organization of family farmers across the country, has been suffering successive declines since 2013, becoming practically residual at the national level. Changes in the program's execution pattern, as identified throughout the text, made its expansion depend on the protagonism and political will of subnational managers, since Conab lost the strategic relevance it had as the main operational agent of the PAA in the early years of implementation. This retraction of the PAA was more harmful for farmers in the Northeast, as the region had, since the beginning of the program, the greatest participation in contracts and in the values passed on for purchases of food products.

The introduction of the mandatory purchase rule for products from family farming in the PNAE, in turn, has proven to be a valuable achievement in opening up new markets for family farmers. Since the Law No. 11,947/2009 came into effect, the PNAE has established an interesting counterpoint to the budgetary drop in other support policies for the sector, including the PAA itself. Data show that the participation of family farming in this public procurement market for school meals has been growing in all regions. It is no

different in the Northeast, as the percentage of purchases grew both for purchases by state and municipal departments, with the region maintaining an aggregate average close to the national level. Even so, there is still room to grow in this market, including greater participation in food chains with higher added value, with some agro-industrial processing, which has proved to be a major bottleneck for family farmers in general, not just in the Northeast.

Finally, another relevant dimension of government intervention for family farming analyzed in this text refers to the PGS, which ensures a monetary benefit to (participating) families from the semiarid region with crop losses due to droughts or other adverse weather conditions. It was verified that the PGS played an important role in social protection, especially in the years of severe drought episodes in the region, contributing to the fact that, together with other public and collective actions by farmers, this period was even more marked by bad news typical of this historical moment, such as great waves of migration or a sudden explosion in infant mortality rates. However, the program's budget drop since 2016 also compromises the its coverage potential, in addition to keeping the benefit value frozen for almost a decade.



In addition to the addressed policies, land data indicate the need to return to agrarian reform actions in the country, paralyzed since 2016, as well as land regularization in advantageous terms to stimulate the maintenance of families in rural areas, producing several relevant primary products for the consumer basket of Brazilians. Such actions appear, therefore, as urgent options to be considered to combat this scenario of inequalities in the Brazilian rural environment.

With this, it is expected that this set of analytical information can serve both to open new research channels, in the sense of deepening points addressed in a more aggregated way, and also to guide decision makers on the future developments of public policies to support family farming in Brazil as a whole and the Northeastern states in particular.

Finally, it is also worth remembering that the new federal administration, sworn in in January 2023, already points to a new institutional and programmatic scenario that tends to be more favorable for family farming throughout Brazil. Among the announced measures, some can be highlighted here: the re-creation of the Ministry of Agrarian Development (MDA) and the Ministry of Social Development (MDS), both focused on sovereignty and nutrition and food security of the Brazilian population; the re-activation of national management councils that allow interaction between state agencies and civil society organizations, with emphasis on the National Council for Nutrition and Food Security (Consea); the re-creation of the National Secretariat of Solidarity Economy (Senaes) within the Ministry of Labor and Employment, whose actions aim to strengthen popular cooperativism in both urban and rural areas; re-adjustment of reference values for financial transfers for the purchase of food for the PNAE, after six years of price freezes; the announcement of the resumption of public purchases related to the PAA and of new land reform projects, paralyzed since 2016; restructuring of the Harvest Guarantee Program; the reorientation of technical assistance and rural extension programs towards the production of healthy and agroecological foods; between others. Evidently, these programs and structures need to be constantly evaluated in order to identify factors that increase their potential for success.

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