



# Development pathways for family farmers: Lessons from Brazil on the need for targeted structural reforms as a means to address regional heterogeneity

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## ABSTRACT

Identifying development pathways for family farmers is one of the main on-going global efforts toward rural development. Promising development pathways are assessed for Brazil as a case study based on official data from the national agricultural census. The results revealed that modernization is the most consolidated development approach, which promotes farmers' integration into global agribusiness value chains and gave rise to the first generation of agricultural policies based on subsidized credit. Census data show that the modernization approach directly supports around 10% of Brazilian family farmers, particularly in the South of the country. More recently, efforts have been made to promote a new rural development paradigm through short food supply chains, which gave rise to another generation of agricultural policies based on governmental procurements. It is estimated that this approach may provide a development alternative for about 10% of the Brazilian family farmers who are closer to consumer markets. As a result, around 80% of family farmers in the country remain unreached by the current development approaches. These are farmers facing structural constraints such as insufficient land to produce (mainly in the Northeast region) or lack of land tenure rights (mainly in the North region). There is an urgent need for land reform as well as a new generation of agricultural policies targeting local potentials as a way of addressing regional heterogeneity in Brazil and elsewhere.

## 1. Introduction

In recent decades, there have been advances in recognizing the importance of family farming worldwide (Lowder et al., 2016). Once seen as part of the poverty problem, family farmers are increasingly seen as key actors in campaigns to improve food and nutritional security (Cao et al., 2016). Some countries have intensified their support to family farmers, either by responding to farmers' demands or by including rural development in their strategic agendas (FAO, 2019).

Globally, family farmers constitute over 98% of all farms and work on 53% of agricultural land (Graeb et al., 2016). Nevertheless, besides an increased recognition of the large number of family farmers and of their potential for generating societal benefits, there is still limited knowledge about effective development pathways for this highly diverse segment, whose definition is not even commonly agreed (Lowder et al., 2016).

Most investments to support family farming focus on the promotion

of competitive business models seeking integration into global markets and based on the agricultural modernization paradigm of the Green Revolution (Dethier and Effenberger, 2012). As the incorporation of smallholder farmers into global agribusiness value chains resulted in mixed empirical results in previous experiences (Spoor, 2015), more recently, there have been initiatives following new rural development paradigms based on short supply chains (van der Ploeg et al., 2000).

However, the lack of robust consideration of the specific contexts in which family farmers live may lead to generic policy approaches that insufficiently consider local contexts and dynamics (Lowder et al., 2016). An existing challenge is to identify development pathways suitable for the large diversity of conditions faced by family farmers (Guanziroli and Di Sabbato, 2014). It includes new agricultural policies for promoting different farming systems and the removal of barriers faced by farmers as a means of providing them with the freedom to agency (Sen, 1999).

To address this issue, Brazil represents an insightful case study since

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it has a clear legal definition of family farming<sup>1</sup>, relatively long-term governmental efforts for promoting this sector, comprehensive agricultural census, and dense academic debate on the topic. According to the 2017 Brazilian Agricultural Census, family farmers comprise 3,897,408 rural households, accounting for 76.82% of the total rural households in the country (Brazilian Institute of Geography and Statistics [IBGE], 2019).

Agricultural policies first began to provide support for family farmers in Brazil in the 1990s (Grisa and Schneider, 2015). These policies are largely the result of farmers' demands advocated through representative organizations such as farmers' unions and social movements (Fernandes, 2014). In this sense, Brazil has pioneered contemporary support programs for family farmers (Graeub et al., 2016). Despite growing investments, existing development pathways for family farmers are still under scrutiny.

Following the international trend, the initial focus in Brazil was on the modernization of family farmers through the adoption of new technologies, market integration into agricultural commodities supply chains and professionalization of farmers' management practices (Abramovay, 2012). The main agricultural policy to foster family farming modernization is the subsidized rural credit Pronaf,<sup>2</sup> which was created in 1996 and currently represents the main agricultural policy targeting this group. Over the last decade only 452,750 wealthy family farms have managed to increase participation in total production (Guanzirolí and Di Sabbato, 2014). Based on this, scholars agree that only a limited proportion of family farmers would be able to become competitive food producers (Buainain and Garcia, 2013), fitting into the modernization pathway.

Brazil has also recently started promoting an alternative development pathway based on a new rural development paradigm, which promotes short food supply chains as an alternative for market integration (Hinrichs, 2000; Schneider, 2013). The food procurement program (*Programa de Aquisição de Alimentos* - PAA, created in 2003) and the school feeding program (*Programa Nacional de Alimentação Escolar* - PNAE, modified in 2009) feature as the new generation of agricultural policies aimed at creating direct agricultural markets for family farmers (Grisa and Schneider, 2015).

Besides these agricultural policies responding to alternative development paradigms, simultaneously, Brazil has also made efforts to promote structural agrarian reforms. The most relevant to this study is the land reform program aiming to address the demands of landless farmers and small farmers for access to farming land. Despite its contested outcomes, around 10% of the country has been the object of rural settlements and almost one in every five farmers in Brazil is a settled farmer (Medina et al., 2015).

After more than two decades of investments in family farming development based on different approaches, it is now possible to assess the progress made and the remaining challenges. This study sought to learn from the contributions of each existing development pathways in order to build a comprehensive view of the possibilities for family farming development in Brazil with potential lessons for other countries. Specifically, it aimed to:

- (1) Summarize the state of the art of existing knowledge on development pathways for family farming;

- (2) Explore the need for structural reforms and for a new generation of agricultural policies as a means for addressing regional heterogeneity.

## 2. Theoretical framework - Pathways for family farming development and the Brazilian context

There is a consensus in the world economic literature that development is related to overcoming barriers that restrict individuals' freedom to agency (Sen, 1999). Therefore, promoting development implies the need to identify and address the main barriers in a pragmatic manner in order to stimulate local potentials (Banerjee and Duflo, 2011). Targeted actions aimed at overcoming these barriers are seen as the most appropriate path to development.

The main challenge in overcoming barriers is that it often implies the need for structural reforms. Political willingness for reforms depends on support from the population and on efforts to overcome actors opposed to these reforms, which may lead to conflicts. Many structural reforms are not carried out due to the lack of a favorable political environment, and policies end up being directed to more superficial actions, but with less opposition.

Pathways for family farming development have been explored by researchers from different international organizations such as the Food and Agriculture Organization (FAO) of the United Nations. Progress has been made in the identification of actions to be promoted and in the summarization of ongoing initiatives in several countries. A key barrier to be addressed is the need for land reform in order to provide family farmers with the land they need to produce (FAO, 2012). Related to this is the need for land tenure rights that favor investments overtime (Sharma and Jha, 2018).

Land tenure issues include three large groups of family farmers: a) rural smallholdings (*minifúndios*) needing additional land to become financially viable<sup>3</sup>; b) farmers without land title whose land tenure uncertainty hinders long-term investment; c) landless rural workers with no access to land as a means of production. Land reform is the solution proposed by farmers' organizations such as Via Campesina, an issue that faces strong opposition from large farmers and governments around the world (Karriem, 2009).

In being one of the most unequal countries in the world, Brazil represents well the importance of addressing land reform (United Nations Development Programme [UNDP], 2016). The country has a highly concentrated land structure, which is the outcome of a historical process of occupation by large plantation farms promoted by the *Sesmarias* land tenure regimen during the colonialism. It was followed by the exclusion of the less affluent from the possibility of owning land by the Land Law of 1850. More recently, conservative agriculture modernization policies promoted since the Statute of Land (*Estatuto da Terra*) of 1964 favored large-scale commodity-producing farmers (Leite et al., 2018).

The expansion of commodity-exporting agribusiness based on large-scale farms has direct implications for the increase in land consolidation that can be easily observed in agricultural frontiers such as Mato Grosso and Matopiba<sup>4</sup>. The growing political power of large-scale farmers among congressmen increasingly limits the possibility of structural reforms in favor of family farmers and alternative paradigms for rural development (Leite et al., 2018).

As a consequence of concentrated land structure, the segment of family farmers in Brazil has an origin characterized by social marginalization in relation to large farmers, poverty, isolation, informal land

<sup>1</sup> The 2006 National Policy on Family Farming (Law number 11.326) defines family farmers according to the following four criteria: (1) they own no more than four fiscal modules, whose area varies according to the municipality and is defined by Law 6746/1979; (2) their workforce consists mainly of family members; (3) their income derives predominantly from the farm and (4) the farm is managed by the family.

<sup>2</sup> Pronaf is the Portuguese Acronym for the National Program for Strengthening Family Farming (*Programa Nacional de Fortalecimento da Agricultura Familiar*).

<sup>3</sup> In Brazil, one fiscal module is deemed the minimum size of land for a farmer having a financially viable business. The size of the fiscal modules is defined at the municipal level.

<sup>4</sup> Portuguese acronym for a new agricultural frontier between the Brazilian states of Maranhão, Tocantins, Piauí, and Bahia.

tenure, and high spatial mobility in search of opportunities (Wanderley, 1999). Organized farmers struggling for land reform first appeared in the 1950s through the Peasant Leagues, but they were suppressed by the 1964 military coup. Only with the end of the military dictatorship in 1985 new rural social movements such as the Landless Rural Workers Movement (MST) emerged, fighting for land reform (Karriem, 2009).

As a response to demands for land reform throughout the country, the national government was forced to create rural settlements in the 1980s. Thus, from the mid-1980s onward, rural settlements were created in all states of the federation at a slow and irregular pace (Bergamasco, 1997). In the 1990s, Pronaf was launched as the first policy targeting family farmers and in the 2000s, for the first time, the government had a legal definition of family farming. At the same time, a greater effort was started to settle landless farmers in rural settlements (DelGrossi and Marques, 2015).

In the Fernando Cardoso government (1995–2002), 540 thousand families were settled or had their informal land tenures regularized<sup>5</sup> on 21.1 million hectares. In the Lula government (2003–2010), there were 614 thousand more families settled or regularized on 48.3 million hectares and in the Dilma government (2011–2016), another 133 thousand families were settled or regularized on 3.2 million hectares (INCRA, 2020). The whole country currently has more than 9,400 settlement areas, covering almost 88 million hectares, where 973,000 settled families<sup>6</sup> live and work (INCRA, 2020).

Despite the great effort for land reform by the Federal Government in partnership with many State Governments, the outcomes were strongly criticized (Girardi and Fernandes, 2008). Experts claim that instead of an actual land reform policy, Brazil has promoted a policy of creating settlements to appease conflicts in the countryside, which did not reduce land concentration (Binkowski, 2018; Heredia et al., 2013).

The Gini index for land inequality in Brazil has remained stable since 1975, at around 0.86. The fraction of land held by the 5% largest establishments rose from 69% in 1995/1996 to 71% in 2017 (Hoffmann, 2020). Furthermore, the 1% landowners with the largest land hold 45% of the entire rural area, while small landowners, with less than 10 ha, have less than 2.3% of the total land area in the country (OXFAM, 2016). These data reveal that although important, the government's effort in the settlement of family farmers did not reduce inequality in access to land. In this sense, land concentration is deemed to be the fundamental basis of the problems of the Brazilian agrarian issue and, therefore, the source of conflicts over land.

Some of the agricultural policies in support of family farming were dismantled with the closure of the Ministry of Agrarian Development in 2016 (Leite et al., 2018). Currently, it can be said that there is little support in Brazil for land reform and for establishing effective pathways for the development of family farming (Marchetti et al., 2020). Governments have advanced in the past 25 years but with clear limitations on structural reforms (Vergara-Camus and Kay, 2017). The concentration of land remains a challenge to development pathways that are suitable for the diversity of family farmers in the country.

### 3. Methods

Available statistical information from the Brazilian Agricultural Census was used as indicators for key factors determining development pathways for family farms. The outcomes of the new 2017 Census were compared with the last one of 2006. Both were conducted by the Brazilian Institute of Geography and Statistics (IBGE) and were made

<sup>5</sup> The National Institute for Colonization and Land Reform (INCRA) provides support for family farmers in rural settlements, in areas of colonization as well as in conservation units by creating rural settlements and by regularizing informal land tenures.

<sup>6</sup> This figure includes families settled in both colonization projects and rural settlement projects.

available at its website (IBGE, 2019). This Census was based on interviews carried out virtually in the totality of rural households in Brazil and coherently considered family farms in accordance with the national law definition (Law no 11.326). In 2017 the Decree 9,064 slightly altered the definition of family farming and consequently removed 61 thousand households from this category (DelGrossi et al., 2019). However, this amount represent less than 2% of the total number of family farmers in Brazil, and this small difference did not influence the comparisons made in this study since it is focused on general trends in broad categories of indicators.

From the parameters made available by the IBGE, those that best express the studied development pathways were selected (Table 1), encompassing a set of six indicators (Table 2). Based on literature review on development pathways we searched the IBGE database for the most suitable indicators for each development approach. For the modernization pathway focusing on integration into commodities supply chains, the most suitable parameters available were market integration and access to credit (Pronaf). For the new development pathway focusing on short supply chains and alternative markets, the most suitable parameters were farmers' membership in cooperatives and organic production. Finally, for assessing structural challenges, selected parameters refer to land tenure (owner-occupier with land title) and land size (farm larger than one fiscal module).

For the general description, we present the national and regional averages for each indicator, considering the five officially delimited Brazilian regions (North, North East, Center-West, South East, and South)<sup>7</sup> (Fig. 1). The key indicators for each development approach were correlated with farm performance defined as income per household. This study has only used indicators with significant correlation with income. The intentionality of this analysis was to focus on parameters with clear relation to income as the best available proxy for development. It is worth noting that due to methodological changes made in the Brazilian Census, not all variables used in 2006 were available in 2017; therefore, some indicators are not completely comparable over time.

In addition, maps with the greatest potential for explaining the studied dynamics were prepared for the spatial visualization of the key variables covering the whole country. The maps were made at the municipality level for all of Brazil. The proportion of the holdings with a positive outcome for each of those factors in relation to the total number of holdings was calculated for every municipality. The municipalities received a score from 1 to 5 according to their correspondent quintile. Different scales of colors were used in the figures to represent this score ranging from dark scale (best performance) to light scale (worst performance).

An important clarification is that the Agricultural Census in Brazil is conducted at the household level (*estabelecimento agropecuário*) defined as "any production area which is dedicated, entirely or partially, for agricultural, forestry or aquaculture exploration, regardless of its size" (IBGE, 2019). By collecting data at the household level, IBGE does not restrict the Census to landowners but also include those who have temporary or precarious access to land as tenants, partners, or occupants of public lands.

### 4. Results

#### 4.1. Modernization pathway

##### 4.1.1. Existing knowledge

The modernization approach focuses on enabling family farmers to engage with agribusiness supply chains. Studies show the relevance of staple markets to most farmers in developing countries, particularly in

<sup>7</sup> According to the IBGE, the regional division of Brazil consists of States and Municipalities grouped into regions aimed at adding a perspective to the understanding of national territory organization.

**Table 1**  
Conceptual pathways for family farming development.

| Pathways              | Approaches                                 | Agricultural policies                       | Academic field                               | Assessed parameters   | Reach (% of farmers)                  | Challenge                  |
|-----------------------|--|---|--|---|---------------------------------------|----------------------------|
| Modernization         | Integration into commodities supply chains | Subsidized credit                           | Microeconomics, Accounting, Rural management | Market integration and access to credit (Pronaf)                      | 10%, mainly in the South              | To increase coverage       |
| Rural Development     | Short supply chains in alternative markets | Governmental procurement                    | Rural sociology                              | Member of cooperative and organic production                          | Potentially 10%, closer to markets    | To measure actual coverage |
| Structural challenges | Removing barriers to farmers' agency       | Land reform, targeted agricultural policies | Geography, Anthropology                      | Owner-occupier with land title and farm larger than one fiscal module | 80%, particularly Northeast and North | Political willingness      |

**Table 2**  
Evolution of the development pathways coverage according to indicators available for the 2006 and 2017 Agricultural Census on family farmers.

| Pathway               | Indicator                          | Correlation with income | 2006 Census (number and % of households) | 2017 Census (number and % of households) | Regional breakdown (2017)                                   |
|-----------------------|------------------------------------|-------------------------|--|--|---|
| Modernization         | Market integration*                | 0.797**                 | 2,586,859 (55.74%)                       | 2,255,201 (57.86%)                       | N: 69.97<br>NE: 37.79<br>SE: 76.22<br>S: 80.69<br>CW: 72.46 |
|                       | Access to credit (Pronaf)          | 0.569**                 | 557,470 (12.77%)                         | 270,187 (6.93%)                          | N: 2.63<br>NE: 3.83<br>SE: 7.74<br>S: 18.25<br>CW: 5.52     |
| New development       | Member of cooperative              | 0.712**                 | 237,836 (5.45%)                          | 412,305 (10.58%)                         | N: 3.23<br>NE: 1.32<br>SE: 14.53<br>S: 37.26<br>CW: 10.92   |
|                       | Organic production                 | 0.274**                 | 74,805 (1.71%)                           | 49,330 (1.27%)                           | N: 1.38<br>NE: 0.73<br>SE: 2.06<br>S: 1.54<br>CW: 2.20      |
| Structural challenges | Owner-occupier with land title     | 0.550**                 | 3,399,350 (77.86%)                       | 3,156,701 (80.99%)                       | N: 83.86<br>NE: 77.77<br>SE: 82.90<br>S: 86.66<br>CW: 78.61 |
|                       | Farm larger than one fiscal module | 0.244**                 | 777,252 (16.93%)                         | 926,468 (23.77%)                         | N: 26.18<br>NE: 11.05<br>SE: 31.19<br>S: 43.79<br>CW: 40.82 |

*Note 1:* As the number of family farmers has dropped between 2006 and 2017, the data are presented first as the absolute number, then in proportional terms, as a means to avoid misinterpretations of the averages.

*Note 2:* In the regional breakdown, we used N for North, NE for Northeast, SE for Southeast, S for South, and CW for Center-West.

\* For the 2006 Census, the indicator used was integrated and highly integrated to markets. For 2017, the closest indicator available was "marketing of agricultural production."

\*\* Significant correlation with income.

areas where families tend to have few alternatives to agriculture (Diao et al., 2010). Modernization is a dominant view in sectors with great political influence such as the Ministry of Agriculture (MAPA) and large farmers' unions such as the National Confederation for Agriculture (CNA, 2018). Family farms are seen as small rural companies that must be professionally managed (Table 1). According to this approach, there is no difference between large and small farmers other than land size and, therefore, no distinction of treatment should be made.

Examples of family farming modernization through integration into agribusiness supply chains include contract chicken growers, contract pig farming, dairy contract farming, and farmers growing commodities such as soybean through contracts of barter with multinational traders (Souza and Buainain, 2013). For modernization, family farmers need to move forward in terms of compliance with health standards, adoption of

technology compatible with production protocols, and growing the scale of production as means for competing in markets with small profit margins (Saes and Silveira, 2014).

Governments can play a role in promoting farming modernization (Abramovay, 2012). In Brazil, the first generation of family farming-oriented agricultural policies mainly focus on the modernization paradigm through the promotion of the Pronaf-subsidized rural credit, which plays a role in promoting access to modern technologies, inputs, and equipment (Grisa and Schneider, 2015). Subsidized credit is by far the agricultural policy with the largest budget in the Brazilian agricultural policy, accounting for around US\$ 7,7 billion invested annually (MAPA, 2019).

Modernization is also supported from an academic perspective. Microeconomics provides important guidance for defining the production

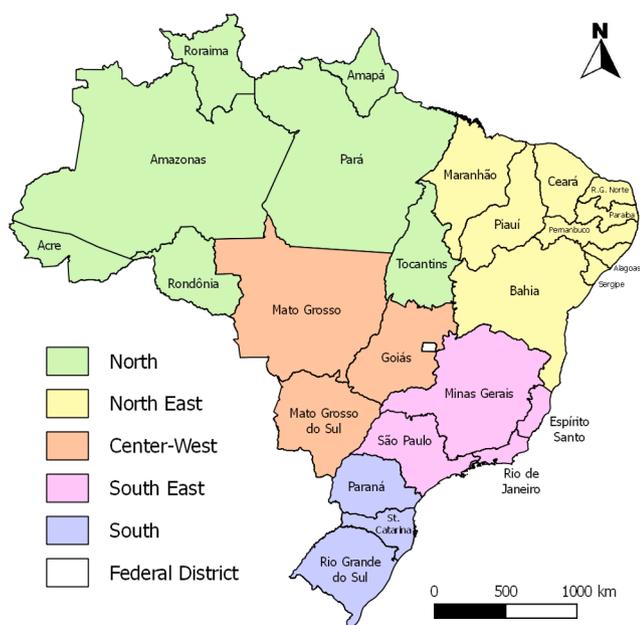


Fig. 1. Brazilian official regions.

levels of rural enterprises based on the efficient allocation of resources. Accounting notions help in assessing business profitability, liquidity, and solvency. Notions of rural management help with investment analysis, which is critical when contracting credit. These studies are greatly influenced by American academia.

#### 4.1.2. Reach

The 2017 Census revealed that 57.86% of family farmers in Brazil are integrated into markets, while 42.14% reported not marketing their agricultural produce (Table 2). The South is the best market-integrated region, with 80.69% of the family farmers reporting to market their agricultural production, while the Northeast and part of the North are the regions with less integration into agricultural markets (Fig. 2a). These data show that almost half of the family farmers in Brazil basically farm for family consumption and are not integrated into agribusiness supply chains.

Family farmers benefiting from the main modernization policy (the Pronaf credit) accounted for 12.77% of the total family farmers in 2006 and 6.93% in 2017 (Table 2). The South is the best performing region, with 18.25% of family farmers having access to government-subsidized credit (Fig. 2b). Studies show an increase in Pronaf's budget over the past years but the number of farmers served has remained relatively stable, indicating that the same farmers are accessing higher amounts each year (Capellesso et al., 2018; Corcioli, 2019).

Limited market integration and restricted access to credit for agricultural production reflect in farmers' income. According to the 2017 Census, only 14.13% of family farmers had gross income above US\$ 12,500 per family per year, while 43.51% had an annual income between US\$ 1,250 and US\$ 12,500, and 42.36% had an income below US\$ 1,250 per year. In the 2017 Census the farm value of production was categorized into the following main classes: above US\$ 12,500 per family per year (equivalent to fifty thousand Brazilian Reals per year), between US\$ 1,250 and US\$ 12,500 (between five thousand and fifty thousand Brazilian Reals) and less than US\$ 1,250 per year (less than five thousand Brazilian Reals). Taking market integration and access to the Pronaf credit as proxies, we estimate that the modernization development pathway covers around 10% of family farmers in Brazil. Once credit, as the main agricultural policy promoting modernization, reached 12.77% of family farmers in 2006 and 6.93% in 2017, the Census official data reveals the limited reach of the modernization

approach in Brazil so far. It is important to mention that while the 2006 Census data has already been released for all types of Pronaf, the 2017 Census data has been released for Pronaf B and Pronaf V but not yet for Pronaf A.<sup>8</sup> Once the data on Pronaf A becomes available, it is expected that the percentage of family farmers with access to credit in 2017 will increase. Other studies corroborate this estimation on relative low access to Pronaf by family farmers as a whole (Capellesso et al., 2018). Additionally studies reveal that only 452,750 family farms (9,35% of total) managed to increase participation in total production recently (Guanziroli and Di Sabbato, 2014).

The main challenges of the modernization approach would be to increase market integration in the Northeast and North regions (Fig. 2a) and to broaden the coverage of Pronaf beyond the Southern region (Fig. 2b). By their turn, family farmers would have to invest efforts for accessing commodity markets, which are increasingly demanding (Wilkinson, 2003). One example is the growing requirements for quality in the milk supply chain imposed by both government and large dairy companies buying fresh milk from independent or cooperative farmers (Lima and Medina, 2018).

There is also the challenge of remaining in the commodity markets over time, given the growing demand for the scale of production and for technical standards to remain competitive. Farmers marketing in agricultural commodity supply chains tend to suffer indefinitely with reduced earning margins caused by stabilizing trading prices and increasing production costs (van der Ploeg et al., 2000). Access to governmental credit is also demanding in terms of criteria for eligibility as well as in terms of the management discipline required to remain compliant.

## 4.2. Rural development pathway

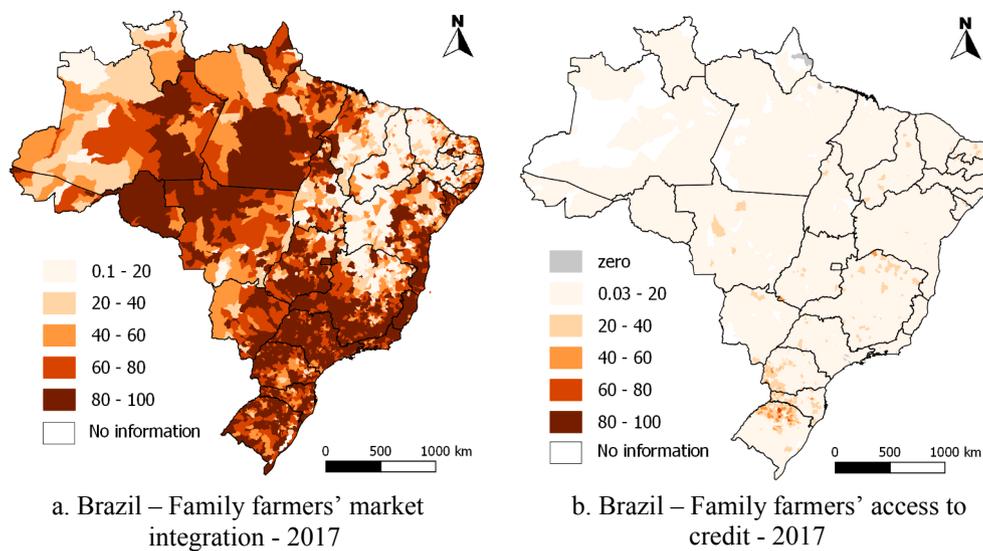
### 4.2.1. Existing knowledge

Once family farmers use mainly family labor, their economic rationality is defined as a trade-off between consumption needs and labor hardness, unlike corporations that use contracted labor targeting profits (Chayanov, 1986). The new rural development pathway explores possibilities for connecting family farmers to alternative marketing channels where farmers sell directly to final consumers (Hinrichs, 2000). Direct markets are seen as a means to avoid competition with corporate farming in conventional agricultural commodities supply chains.

As farmers competing in agricultural commodity supply chains tend to suffer indefinitely from shrinking profit margins, alternatives include strategies for reducing production costs and for increasing income (van der Ploeg et al., 2000). Options to reduce production costs include cooperation to optimize sales and purchases and adoption of agroecological practices based on the use of local inputs. Options to grow income include selling in niche markets such as organic markets, promoting short supply chains such as community-supported agriculture (CSA) (Oliveira et al., 2019), processing food in local agro-industries as a means to add value to products, differentiation of products based on geographical indication and artisanal manufacturing, and search for non-agricultural sources of incomes through pluriactivity (Sakamoto et al., 2016).

To promote direct agricultural markets, the Brazilian government promoted a new generation of agricultural policies creating new markets through government procurement programs (Grisa and Schneider, 2015). This approach gained momentum in 2003 with the creation of

<sup>8</sup> Pronaf A is the initial credit for families settled either in land reform (*reforma agrária*) or in land credit (*crédito fundiário*) settlements. Pronaf B targeted family farmers with an annual family income of up to 20,000 Brazilian Reals by 2017 (currently this limit is 23,000 Brazilian Reals). Pronaf V included all family farmers with an annual family income greater than 20,000 Brazilian Reals up to 360,000 Brazilian Reals by 2017 (currently this maximum limit is 415,000 Brazilian Reals).



**Fig. 2.** Spatial description at the municipal level of family farmers' market integration (2a) and access to credit as the main agricultural policy promoting modernization (2b), according to the 2017 Agricultural Census (IBGE, 2019).

the Food Acquisition Program (PAA) and in 2009 with adjustments made in the National School Feeding Program (PNAE) leading schools across the country to spend at least 30% of their budget for meals with fresh products produced by local family farmers (Oliveira et al., 2018). These programs led to the creation of a huge market for products such as vegetables and fruits, among others (Kleine and Brightwell, 2015).

There is an on-going insightful academic effort for the conceptual definition of this new rural development paradigm. In particular, researchers in the field of rural sociology have made important qualitative contributions characterizing this alternative development pathway and conducting case studies (Schneider and Niederle, 2010). This research approach has great influence from European academia.

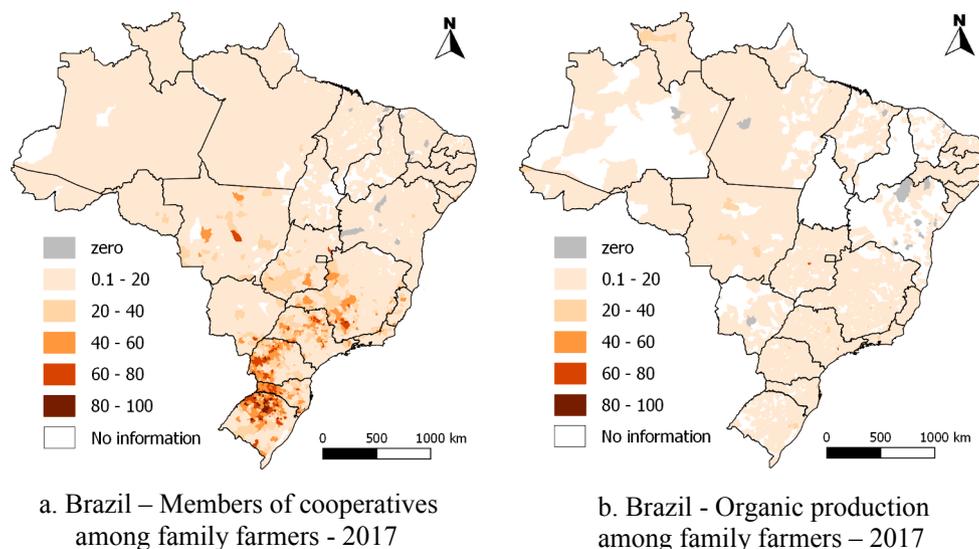
#### 4.2.2. Reach

Despite the great contributions of qualitative and conceptual studies, there are still few quantitative surveys to assess the number of farmers that can benefit from this development pathway. As proxies for estimating the reach of the New Development Paradigm, we selected the following variables from the Agricultural Census: 1. Member of

cooperative since farmers have a greater chance of marketing with governmental procurement programs if they belong to cooperatives and 2. Organic production since organic markets represent one of the main direct markets available for farmers.

The Agricultural Census data show that the proportion of family farmers who are members of a cooperative grew from 5.45% in 2006 to 10.58% in 2017 (Table 2). The South was the best-performing region, with 37.26% of family farmers belonging to cooperatives, while Northeast and North had very low levels of family farmers associated with cooperatives (Fig. 3a).

On the other hand, only 1.26% of Brazilian family farmers take part in organic markets and this number has dropped since the last 2006 Census (Table 2). The Southeast was the best performing region, with 2.06% of family farmers producing and marketing organics, while in Northeast, this figure was 0.73% (Fig. 3b). As there was a change in variables for assessing organic farming in Brazil between the last two agricultural censuses, it is not possible to establish a reliable assessment of the evolution of this indicator. However, the most important aspect for this study is that regardless the methodological approach, the



**Fig. 3.** Spatial description at the municipal level of family farmers' participation in cooperatives (3a) and organic production (3b), according to the 2017 Agricultural Census (IBGE, 2019).

number of organic family farmers in Brazil remains relatively low. Recent studies revealed that only 17 thousand farmers (including family farmers and large farmers) were registered as organic producers by the Brazilian Ministry of Agriculture by 2018 (Lima et al., 2020).

These indicators allow an initial estimation that potentially around 10% of family farmers can access direct markets and benefit from the New Development Pathway. These tend to be the better-organized farmers based in regions where consumers have higher purchasing power. Farmers benefiting from these markets tend to be the ones with capital for investing to meet consumer expectations for quality, access, and frequency of product delivery.

This estimation is corroborated by other studies exploring indicators such as the availability of local markets and pluriactivity. It was estimated that 10.17% of the farmers' markets in the Brazilian state of Goiás favor family farmers and local products, working as an alternative to commodity markets (Verano and Medina, 2019). In Brazil, the number of pluriactive farmers in 2013 accounted for 18.3% of the rural households (Sakamoto et al., 2016). As in the case of short-food supply chains, pluriactivity is deemed to contribute to rural development by offering alternative sources of income for farmers. However, access to sources of income additional to farming depends largely on the proximity of the household to urban areas (Sakamoto et al., 2016).

### 4.3. Structural challenges pathway

#### 4.3.1. Existing knowledge

The need to address structural challenges hindering family farmers' development has been neglected in Brazilian politics and also by a part of the scientific community (Lerrer and Forigo, 2006). As a result, about 80% of family farmers in the country remain unreached by the current development approaches targeting this segment. These farmers endure structural constraints to their development such as lack of access to land for agricultural production and lack of land tenure rights. Family farmers need support to overcome these structural barriers hindering their development as well as access to targeted agricultural policies that meet the idiosyncrasies of their production system.

Marginal farmers in marginal areas would greatly benefit from alternative development pathways that take into consideration the diversity of farming systems and build on their main assets (Souza et al., 2019). Government has to evolve from the current one-size-fits-all approach, which is mainly focused on subsidized credits for cattle, to encourage diverse local potentials. The literature on peasantry, although largely neglected in recent debates, has been particularly insightful by revealing the characteristics and potentials of the different rural segments that can be supported. These segments include indigenous groups (Posey, 1985), traditional communities established along river banks and *quilombola* communities formed by descendants of former escaped slaves brought from Africa (up to the 19th century) to work on sugarcane plantations (Marin and Castro, 1998). They also include the *assentados* settlers that received small pieces of land from the National Institute for Colonization and Land Reform (INCRA) as a result of struggle for land reform, *colonos* migrating from other Brazilian regions to agricultural frontiers in the search of better living conditions, and *posseiros* which are informal land occupiers that are commonly found in agricultural frontiers as well (Medina and Barbosa, 2015).

There is, therefore, urgent demand in the country for a new generation of government-led structural reforms that provide family farmers with the necessary conditions to realize their productive potential (Medina and dos Santos, 2017). It is critical to promote better access to land as a means for meeting demands of landless families across the country, for increasing the agricultural areas of smallholdings in the Northeast, and for land titling in the North (Monteiro et al., 2019). Lack of schools in the countryside as well as poor access water in specific regions such as in the Brazilian North East are also issues that needs to be addressed. Only policies that ease the constraints that family farmers endure and take into account their specific assets, capabilities, and

interests can boost family farmers' potential.

Academically, there are important contributions on this subject in disciplines such as agrarian geography (pointing out the challenges) and anthropology (revealing the characteristics of local lifestyles and production systems to be promoted). The main academic contribution of these studies is to uncover the local specificities that need to be addressed by a mosaic of specific solutions for the different Brazilian regions.

Although often neglected, there is great potential for South-South academic cooperation as structural challenges for rural development (such as land tenure issues, need for rural schooling programs, and demands for infrastructure) are shared by countries such as Brazil, India, Mozambique and many others. Scientists from the global south have made important contributions by identifying freedom to agency as fundamental to development (Sen, 1999), by advocating autonomy in the use of agricultural inputs as a foundation for food sovereignty (Shiva, 2016), by promoting social business through small loans for poor households (Yunus, 2010), and by providing basic guarantees as a means to overcome rural poverty (Graziano da Silva, 2019).

#### 4.3.2. Reach

According to the 2017 Agricultural Census, around 80% of the family farmers have land title, but 20% either do not own the land they farm on or remain under informal land tenure regimes, which hinders long-term investments in their farms (Table 2). Under precarious land tenure regimes, among family farmers, the 2017 Census identified 219,478 (5.63% of the total) operator farmers (*concessionários*); 183,533 (4.70% of the total) lending contracted farmers (*comandatários*); 111,226 (2.85% of the total) tenant farmers (*arrendatários*); 88,643 (2.27% of the total) partner farmers (*parceiros*); 83,433 (2.14% of the total) squatter farmers mainly living in public lands (*Ocupante*); and 54,394 (1.39% of the total) landless farmers (*produtor sem área*). Family farmers without land title are found across the whole country (Fig. 4a).

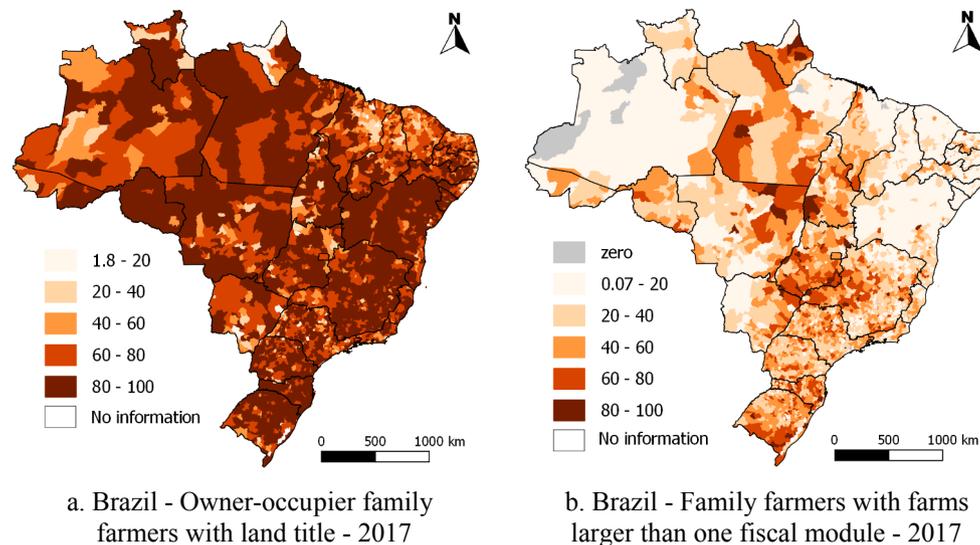
In 2017, only 23.77% of family farmers had more than one fiscal module, while 76.23% had up to one fiscal module, which is the minimum size of land a farmer is supposed to have in order to have a financially viable business. The larger proportion of smallholdings with less than one fiscal module (*minifúndios*) is in the Northeast region, where almost 90% of the family farms are too small to be viable (Fig. 4b). This figure is particularly relevant as almost half (47.18%) of the Brazilian family farmers live in the Northeast region.

These data reveal the importance of land reform in providing more land for smallholding farmers, recognizing (with land title) farmers under informal land tenure regimes, and giving landless farmers access to agricultural land. In addition to the challenge of land reform, the 2017 Census also revealed the need for rural education reforms. In 2017, in 17.94% of Brazilian rural family households, there were still adults who had never attended school, with a negative highlight for the Northeast where this number was higher than 26%.

Taking land tenure and size of the land as proxies, we estimate that around 80% of Brazilian family farmers face structural challenges for their development and are unreached by the current development pathways. Among the biggest challenges are land regularization, mainly in the North (Fig. 4a), and land reform to provide small farmers with access to land, mainly in Northeast (Fig. 4b). The 2017 Census official data revealed that land reform would directly benefit 2,970,994 family farmers living under one fiscal module (73.23% of the total family farmers in Brazil), 83,433 family farmers living in public lands under informal land tenure regime (2.14% of the total) and 54,394 landless farmers (1.39% of the total).

## 5. Conclusion

Acknowledging the importance of family farming has been an important achievement globally, leading to contemporaneous efforts to identify promising rural development pathways. In Brazil, the 1990s



**Fig. 4.** Spatial description at the municipal level of family farmers' land tenure situation (4a) and size of the farms (4b), according to the 2017 Agricultural Census (IBGE, 2019).

were marked by the pursuit of the modernization paradigm promoted through agricultural policies such as subsidized credit. The 2000s were prodigious in devising an alternative rural development pathway based on short food supply chains. After more than 20 years since the beginning of the government's efforts to support family farming, it is now possible to measure some achievements but also the limitations of these approaches. Based on official figures from the Agricultural Census, it is estimated that the modernization pathway reaches about 10% of Brazilian family farmers and the new rural development pathway can potentially benefit another 10%.

The remaining 80% of Brazilian family farmers stay relatively marginal to the benefits of the main development approaches promoted by the Brazilian government. The two main challenges remaining to be addressed are: 1. Overcoming structural constraints faced by farmers, such as access to productive land, which requires radical land reforms, and 2. Promoting dedicated agricultural policies that address the idiosyncrasies of farmers' diverse production systems. There will be little progress in the Brazilian Northeast region until land reform takes place and the Amazon sustainable development will not be reached without support to local traditional production systems (Medina and Barbosa, 2015; Pacheco, 2012).

The intricacy that characterizes family farming worldwide demands an interdisciplinary approach. There is no doubt that modern agricultural and management practices need to be promoted at all times and can contribute to all farmers, just as establishing new local markets is a crucial alternative for farmers' commercial integration. However, it is also critical to address the structural challenges faced by family farmers and to build on existing local production systems.

While Brazil has pioneered contemporary support programs for family farmers, the amount of support provided to them is still insufficient. This article seeks to contribute to existing knowledge on potential development pathways for family farmers by pointing out three distinct complementary approaches to be fostered by different policies. Development pathways for family farmers include efforts for promoting modernization and short food supply chains, but it will not be an omnibus approach until structural barriers hindering farmers' agency are overcome.

It is not enough to address only one structural limitation such as access to land. Although land reform is fundamental, issues such as water availability, quality of the soil and access to markets also have to be taken into consideration. In other words, it is essential to move forward with integrated actions that combine structural reforms such as

efficient land reform with agricultural policies. For future studies, we recommend expanding analysis with other variables, especially access to water, which is an important limitation in the semi-arid region of Brazil. It would also be important to explore differences within the family farming category mainly considering ranges in agricultural production and income.

#### CRediT authorship contribution statement

**Gabriel Medina:** Conceptualization, Data curation, Formal analysis, Methodology, Writing - original draft, Writing - review & editing. **Marcelo Gosch:** Data curation, Formal analysis, Software, Writing - original draft, Writing - review & editing. **Mauro DelGrossi:** Conceptualization, Writing - original draft, Writing - review & editing.

#### Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.geoforum.2020.11.008>.

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