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RURAL SOCIOLOGY

Living in the city and producing in the countryside: the growth of a new type of farmer and agriculture in Brazil

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ABSTRACT: Living in rural neighborhoods has always been a characteristic of small and medium-sized Brazilian farmers. However, when observing the agricultural censuses of 2006 and 2017, carried out in Brazil, there is a tendency to separate the place of work and residence of farmers. This articleanalyzed the double residence and the phenomenon of pendular displacement of farmers in the municipalities of Zona da Mata Mineira (ZMM), an important coffee region in Minas in Brazil, and to discuss its possible causes and impacts in the region. The research used data from the 2006 and 2017 Agricultural Censuses of the Brazilian Institute of Geography and Statistics. The data were analyzed using descriptive statistics and multivariate linear regression models in order to better understand the factors that correlate with the percentage of owners living in cities in the municipalities of region. The results showed that, in the case of the ZMM, the growth of urban residence of farmers more expressive than the other regions of the country is mainly due to the predominance of small coffee producers. Furthermore, living in the city does not mean abandoning agricultural establishments, since living in the city does not prevent daily work in the countryside. It was concluded that the urban residence of the farmers constituted a reproductive strategy that made it possible for them to carry out other activities as well as the receipt of retirement and pensions that complement the agricultural income and, consequently, the maintenance of the agricultural establishment.
Key words: pendular displacement of farmers, administrative strategies, countryside-city dynamics.

Viver na cidade e produzir no campo: o crescimento de um novo tipo de agricultor e de agricultura no Brasil

RESUMO: Morar em bairros rurais sempre foi uma característica dos pequenos e médios agricultores brasileiros. No entanto, ao se observar os censos agrícolas de 2006 e 2017, realizados no Brasil, nota-se uma tendência de separar o local de trabalho e residência dos agricultores. O objetivo deste artigo é analisar a dupla residência e o fenômeno do deslocamento pendular de agricultores nos municípios da Zona da Mata Mineira (ZMM), importante região cafeeira de Minas no Brasil, e discutir suas possíveis causas e impactos na região. A pesquisa utilizou dados dos Censos Agropecuários de 2006 e 2017 do Instituto Brasileiro de Geografia e Estatística. Os dados foram analisados por meio de estatísticas descritivas e modelos de regressão linear multivariada a fim de compreender melhor os fatores que se correlacionam com o percentual de proprietários residentes em cidades dos municípios da região. Os resultados mostraram que, no caso da ZMM, o crescimento da residência urbana dos agricultores mais expressivo do que as demais regiões do país deve-se, principalmente, ao predomínio de pequenos produtores de café. Além disso, morar na cidade não significa abandonar os estabelecimentos agrícolas uma vez que a moradia na cidade não impede o trabalho diário no campo. Concluiu-se que a residência urbana dos agricultores constituiu uma estratégia reprodutiva que possibilitou que estes realizassem outras atividades (principalmente não-agrícola) assim como o recebimento de aposentadorias e pensões que complementam a renda agrícola e, consequentemente, a manutenção do estabelecimento agrícola.
Palavras-chave: deslocamento pendular de agricultores, estratégias administrativas, dinâmicas campo-cidade.

INTRODUCTION

The separation between the place of work and the place of residence of rural producers has been a revealing fact of the new dynamics emerging in Brazilian agriculture. According to HOFFMANN & JESUS (2020), 49% of the total employed population in Brazil lives in rural areas, but does not engage in agricultural work, while one-third of those engaged in agricultural activities live in urban areas. That is, commuting between the countryside and the city is a phenomenon of great relevance in Brazil. In states like São Paulo, the most developed in Brazil, 65% of the population residing in rural areas does not work in agriculture and 58% of the "occupied population" in agriculture reside in urban areas.

The phenomenon of farmers with two homes, one in the countryside and another in the city, or even the option of living in the city and commuting routinely to the rural environment, may

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be related to different factors. Environmental and climate issues can affect the production and social reproduction potential of farmers, forcing them to seek income alternatives in the city, as demonstrated by SHARMA & CHANDRASEKHAR (2014) in their study conducted in India, and by COMERCI & MOSTACERO (2021) in their study conducted in Argentina. Similarly, advances in the technological development of agriculture and agribusiness can widen social inequalities in the countryside, concentrating production in the most technologically advanced properties and expelling those who become less competitive (GASQUES et al., 2020). The urban housing of farmers may also be related to factors such as the expansion of urbanization in small municipalities with an agricultural economy, expanding services and employment options for rural families (FIÚZA et al., 2020). This alignment and inclusion of rural people in the city can also occur through access to public policies, such as the rural social security fund (*Previdência Social Rural*), as demonstrated by (REIS et al., 2013).

The sociodemographic changes that affect rural societies show the straightening of the rural flows and relationships with the city, either through housing or in relation to the commuting patterns between the countryside and the city. It is important to investigate these phenomena because many developments and consequences can arise from them. Changes in rural property management strategies and in the choice of the productive activities to be developed in the rural property can occur as a function of the family no longer living in the property, but instead choosing to commute routinely. Changes may even occur in the patterns of family succession itself, since the definition of the successor no longer has to be made based on the child who remained in the rural property with his parents, usually the youngest. Studying the urban housing of farmers and the routine displacements performed by farmers and rural workers between the countryside and the city, therefore, is a way to keep an eye on the new facets of rurality in the contemporary world.

The conclusion of BELL & OSTI (2010), through the analysis of several studies carried out on the occasion of the 2007 meetings of the European Society for Rural Sociology on the theme of 'Mobilities, Vulnerabilities and Sustainabilities: New Questions and Challenges for Rural Europe'. According to the authors, rural mobility and transformations have always existed. However, for something to change, for there to be displacement, there must also be permanence as a way of maintaining the necessary references for those undergoing the change and for the changes to become routine and be absorbed.

The research carried out by COMERCI & MOSTACERO (2021) in the western Argentine pampas, showed that the dual residency of the peasants was affected by changes in the course of the rivers of the region, caused by the construction of dams, which reduced the access to water and deeply affected the way of life of the peasants, compromising their social reproduction conditions in the rural environment. Thus, they had to look for income alternatives in the urban environment. Also in Argentina, in the Santiago del Estero region, NEIMAN & BLANCO (2021) reported that the expansion of soybean monoculture and the advancement of the technological standard of production in agriculture made the reproduction conditions of the peasants unfeasible, leading them to seek to supplement their income outside their place of residence, without necessarily abandoning it.

Studies conducted in Brazil showed difficulties of less technologically advanced farmers to remain competitive in the market, leading them to abandon agricultural activity while maintaining their rural residence. But the opposite has also been observed, namely a significant number of people employed in agriculture residing in the city. According to ALVES et al. (2020), we are heading towards an agriculture in which few establishments are generating most of the production, with the consequence that the residence is losing its link with the rural environment. The percentage of pluriactive families, whose members carry out both agricultural and non-agricultural activities, is growing. This would be the reason for the growth in urban housing for the owners of these establishments.

This article analyzed the double residence and the phenomenon of pendular displacement of farmers in the municipalities of Zona da Mata Mineira (ZMM), an important coffee region in Minas in Brazil, and discussed its possible causes and impacts in the region. . This helped us to better understand their impacts on agriculture and farmers and how to deal with them.

MATERIALS AND METHODS

Data from the 2006 and 2017 Agricultural Census and information on the housing location of the farmers were used in order to describe the characteristics of farmers living in the cities, associated with the economic activities and administrative strategies developed by them in their establishments. The purpose of the Agricultural Census is to portray

the reality of "Rural Brazil" and it is the main and most complete statistical investigation on the rural structure and production of the country. The census is a database that covers the universal collection of information on the establishments and farming activities developed in them, covering characteristics of the farmer and the establishment, the economy and employment in areas with rural, livestock, farming and agribusiness activities. The analyses unit concerns all establishment production that are dedicated, totally or partially, to agricultural, forestry or aquaculture activities, subject to a single administration (farmer or administrator), regardless of its size, legal nature or location, with the objective of production for subsistence or for sale.

At first, the following sociodemographic variables were considered to understand the profile of the managers living in this situation and to compare this profile with those living in the establishment itself: gender, educational level, participation in an association or class entity, and access to technical information. Regarding the comparison of the characteristics of the rural establishments, the variables were: legal status of the farmer in relation to the land, type of management of the establishment, size of the property, type of activity, existence and type of organic activity, existence and type of vehicle, existence and type of funding, whether family farming or not, destination of the production, average number of personnel and importance of the agricultural income for total income. The analyses sought to reveal the profiles of the managers and their establishments for Brazil, Minas Gerais, and the Zona da Mata.

In a second step, multivariate linear regression models were estimated in the SPSS Software in order to better understand the factors that correlate with the percentage of owners living in cities. When working with regression analysis, an analysis of variance should be performed in order to compare the models and evaluate the significance of the regression. Considering the multiple linear regression model, the ANOVA table (analysis of variance table, corrected the by mean) can be constructed. The coefficient of determination and the adjusted coefficient of determination can also be calculated, which will reveal how much the variables inserted in the model explain the variation in the dependent variable, in this case the percentage of farmers residing in the cities.

Finally, it is also recommended to analyze the residues in order to verify the fit of the model (MONTGOMERY et al., 2006). The dependent variable; therefore, was the percentage of managers of agricultural establishments living in the city by municipality (variable y) and the following explanatory variables were tested, which were extracted from both the IBGE's 2017 Agricultural Census and the Fundação João Pinheiro. Namely:

Characteristics of the municipalities:

1) Population size; 2) Urbanization rate; 3) Demographic density; 4) GDP per capita; 5) GDP related to agriculture; 6) Municipal spending on agriculture; 7) Municipal Human Development Index (mHDI); 8) Percentage of employed people aged 18 or over in the agricultural sector; 9) Number of agricultural establishments; and 10) Social Responsibility Index of the state of Minas Gerais. The index, created by Fundação João Pinheiro, measures the implementation by the public administration of policies, plans, programs, projects and actions that ensure the access of the population to: Healthcare, Education, Public Safety, Sanitation and the Environment, Culture and Sports. The index varies between 0 and 1, and the closer to 1 the better the conditions of the municipality.

Characteristics of agricultural establishments in the municipality:

1) Average size of the agricultural properties; 2) Percentage of agricultural establishments in family farming; 3) Percentage of establishments with PRONAMP funding (National Support Program for Medium-sized Farmers); 4) Percentage of pluriactive agricultural properties; 5) Percentage of establishments producing temporary crops; 6) Percentage of establishments with permanent crops; 7) Percentage of establishment raising cattle; 8) Percentage of establishments with other types of animal husbandry, and other types of production; 9) Percentage of establishments with income from retirement and pensions; 10) Percentage of establishments in which other sources of income (from outside the establishment) were more important than the income from the establishment's production; 11) Number of establishments with 50 or more coffee plants; and 12) Income or rent received by agricultural properties.

The hierarchical method was used to define the variables and their order of entry in the model. That is, the literature was used to choose the variables that would be the most relevant for the urban housing of farmers, especially those indicated in the study of FIÚZA et al. (2020), which made several univariate linear regression analyses testing many of the variables used in this study. The major difference in the current study is the estimation of a multivariate model, which allowed us to go beyond the indications of the

previous study, revealing the joint action of the variables in determining the percentage of urban farmers.

The variables related to the "agricultural establishment" that contributed to the model were: 1) "Percentage of pluriactive agricultural properties", 2) "Percentage of establishments producing temporary crops"; 3) "Percentage of establishments raising cattle"; 4) "Percentage of establishments with other types of production"; 5) "Percentage of establishments in which the family's income came from other sources than the agricultural establishment, with these sources of income being more important than the income from the establishment's agricultural production"; 6) "Percentage of establishments with PRONAMP funding (National Support Program for Medium-sized Farmers)"; 7) Percentage of establishments with owners with an educational level of high school or more".

The variables "value of income" or "income obtained by the agricultural establishments", "percentage of agricultural establishments in family farming" and "percentage of establishments producing temporary crops" were not statistically significant, but due to their importance for the topic, they were kept in the model.

RESULTS AND DISCUSSION

The dual residency of farmers: the context of the Zona da Mata Mineira, in the State of Minas Gerais, Brazil.

The Zona da Mata Mineira (ZMM) mesoregion, the location of these studies, is one of the 12 mesoregions of the state of Minas Gerais, which has the largest number of municipalities in Brazil, 853, representing 15% of the municipalities in the country. According to the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*, IBGE), the Zona da Mata Mineira (ZMM) had a population of approximately 2.321.594 people in 2020, representing 11% of the population of the state of Minas Gerais, distributed over its 142 municipalities. Table 1 below shows the distribution of the 142 municipalities of the Zona da Mata Mineira in four strata: 1) up to 5 thousand inhabitants; 2) between 5 and 10 thousand inhabitants; 3) between 10 and 20 thousand inhabitants, and 4) more than 20 thousand inhabitants. Municipalities with up to 10 thousand inhabitants predominate, representing 66.2% of the total. On average, the 94 municipalities of the ZMM with less than 10 thousand inhabitants lost 22.9% of their rural population. However, in terms of the total population, the 142 municipalities of the ZMM practically did not lose population between 2010 and 2020. Although, the rural area of the Zona da Mata Mineira (ZMM) is emptying, the population of ZMM's municipalities showed a growing trend over the last decade: 2.3% on average. As can be seen, the population has left the countryside for the city, but it has remained in the municipalities of the region. The data in table 1 show that while the rural population of the 142 municipalities of the ZMM decreased by 21.3%, on average, the percentage of rural establishments decreased by approximately only 2.8%, or 8 times less. That is, the rural population leaves the countryside for the city, but the rural establishments remain in existence.

The data show; therefore, that there was population growth in the municipalities of the Zona da Mata Mineira (ZMM) between the decade of 2010 and 2020, although, on average, this growth was modest, around 2%. Even among municipalities with less than five thousand inhabitants, the population loss was close to zero. Knowing the economic characteristics of this region can therefore help us understand how the rural population that leaves the countryside has managed to stay in the municipalities of the Zona da Mata Mineira.

The economy of these small municipalities of the ZMM, as highlighted by REIS et al. (2013), depends substantially on government transfers, such as the Municipal Participation Fund (*Fundo de Participação Municipal*, FPM). The capacity of these small municipalities to generate their own revenue from the local economy is small. What's more important; however, is that these transfers from the federal government linked to the FPM have been having an impact as social security on the economy of these small municipalities. Most of its inhabitants are over 60 years old and receive Social Security. According to REIS et al. (2013), social security transfers not only move the local economy of these municipalities, but since 1992, when this social benefit was extended to men and women, farmers and rural workers, they also enabled this older population to live relatively better than the younger generations.

With the receipt of rural retirement payments, the elderly were able to consume private goods, substitutes for public services. Many of these rural retirees became maintainers of the household income, caring for grandchildren and adult children. Could retirement; therefore, be influencing the choice of those farmers who choose to live in the city? Data from the Agricultural Census revealed that 44% of rural establishments in the Zona da Mata received income from pensions and retirements, with this percentage reaching more than 70% in some municipalities. This represents about 20% of the total income of agricultural establishments in the region,

Table 1 - Distribution of ZMM municipalities by population size, rural population distribution and number of rural establishments, 2000-2020.

Population in 2020	Number of municipalities	%	Average change in relation to the population in 2010	Rural population in 2010	%	Average change in relation to the rural population in 2000	Number of rural establishments in 2017	%	Average change in relation to 2006 establishments
up to 5 thousand inhab.	54	38.0	-0.2%	68287	16.4	-27.1%	15328	16.9	-3.1%
from 5 to 10 thousand inhab.	40	28.2	2.1%	111275	26.7	-18.7%	25234	27.8	-0.9%
from 10 to 20 thousand inhab.	32	22.5	4.3%	143543	34.4	-18.3%	31833	35.0	-7.5%
more than 20 thousand inhab.	16	11.3	6.5%	94063	22.5	-15.2%	18441	20.3	2.9%
Total	142	100	2.3%	417168	100	-21.3%	90836	100	-2.8%

reaching more than 50% of the total income of rural establishments in some municipalities.

In order to get an idea of the growth of the urban housing phenomenon of farmers at the levels Brazil, the state of Minas Gerais and the Mesoregion of the Zona da Mata Mineira, a comparison between the data of the Agricultural Census of 2006 and 2017 is presented in figure 1. This comparison shows the growth of urban housing of farmers in the last decade, which went from 23% to 27% in Brazil, from 24% to 33% in Minas Gerais, and from 26% to 40% in the Mesoregion of the (ZMM). In other words, there are indications that there may be peculiar characteristics in the (ZMM) related to the accentuation of this phenomenon in a context marked by the coffee economy. Specifically in this context, the study by FIUZA et al. (2020) showed that there was a 76% increase in farmers living in urban areas of the municipalities of the Zona da Mata Mineira between 2006 and 2017. In other words, there are indications that there may be peculiar characteristics in the Zona da Mata Mineira (ZMM) related to the accentuation of this phenomenon in a context marked by the coffee economy. The study by FIUZA et al. (2020) showed that several of these municipalities in the ZMM mesoregion had more than 60% of their managers living in urban homes: Pequeri inserted in the micro-region of Juiz de Fora with 77% and Volta Grande belonging to the micro-region of Cataguases with 70%. The authors concluded that this new housing modality was quite frequent even in small municipalities, such as those of the ZMM, with less than 20 thousand inhabitants.

In order to better understand the aspects that may be related to the increase in urban housing of these farmers, looks into the socioeconomic profile of farmers with urban housing, as well as the productive characteristics of their establishments, focusing on the 142 municipalities distributed over the seven microregions of the Zona da Mata Mineira (ZMM) in the state of Minas Gerais (MG).

Results of the multiple linear regression model to explain the percentage of farmers living in the city in the 142 municipalities of the Zona da Mata

In general, almost all variables were significant at the confidence level of 10%. However, even those that were not significant were included in the model when cited in the literature and considered relevant to explain the urban housing of farmers, as in the cases of: the Human Development Index of the municipality (HDI); family farming establishments and establishments with the production of permanent crops (REIS et al., 2013; SAKAMOTO et al., 2016; GASQUES et al., 2020).

Small confidence intervals were observed, indicating that the B values in this sample were close to the true B value in the population. The collinearity analysis measures proved to be a good fit since the tolerance was less than 0.2 for only two variables. For almost all the others the VIF was close to 1. Regarding the variables related to the characteristics of the municipality, it was found

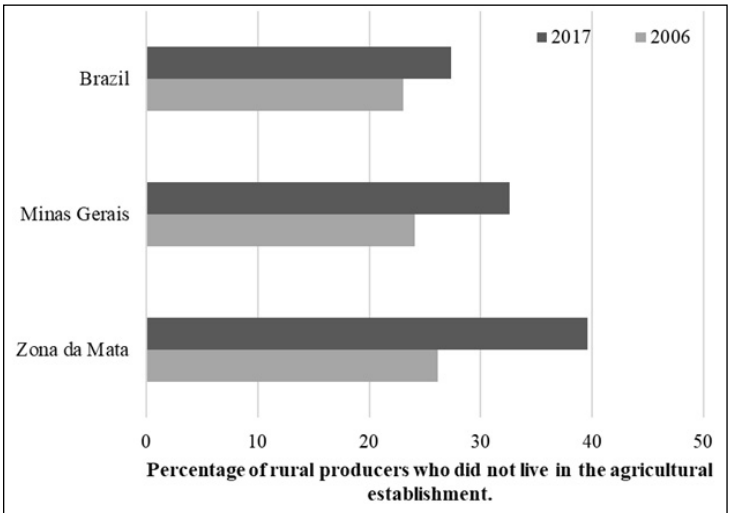

Figure 1 - Percentage of rural producers who did not live in the agricultural establishment. Brazil, Minas Gerais, Zona da Mata and Microregions, 2006-2017.

Source: IBGE - 2006 and 2017 Agricultural Censu.

that the "urbanization rate" was quite important to explain the percentage of farmers living in the city, as, also, found the study of SHARMA & CHANDRASEKHAR (2014). The model showed that an increase of one unit in the "urbanization rate", which is related to the percentage of the population living in the city, increased the percentage of farmers living in the city by 0.38.

Conversely it was found that the higher the "demographic density" of the municipality, the lower were the percentages of "owners residing in cities". That is, the urban housing of farmers was not strong in more densely populated municipalities, being more frequent in municipalities with lower density. It is curious to note that the Human Development Index (HDI), composed of variables related to education, income and longevity, was not significant to explain the urban housing of farmers. The non-influence of factors related to the development index on the assessment of the subjective well-being of farmers contradicts the results of the research by REQUENA (2016), carried out in "developed countries" and "developing countries". The author reported in his study that in "developing" countries, urban quality of life was more attractive to rural people than in developed countries. In these, the quality of life found in rural areas was already at the levels of city life, thus the quality of urban life was no longer an attractive factor, as it was already found in villages and in the countryside. Perhaps this lack of significance, found in this research, can be explained by the fact that the HDI variation between the municipalities was small.

Among the other variables tested in the model, the percentage of "establishments with income from retirement and/or pensions" was not relevant to explain the urban housing of farmers, despite being high in the municipalities under study. Perhaps because all farmers who have the prerequisites for receiving retirement and/or pensions receive it, regardless of their place of residence, whether in the countryside or in the city. However, the study by REIS et al. (2013) pointed to the relevance of social security for the socioeconomic development of small municipalities in the State of Minas Gerais.

Conversely, the variables related to the establishment itself and the owner's profile, on the other hand, were more significant to explain the urban housing of farmers. One of the variables with the greatest explanatory force was the "type of productive activity existing in the establishment", as demonstrated in the study by HOFFMANN & JESUS (2020). Rural establishments with crops, especially with temporary crops, were associated with a 0.37 decrease in the percentage of farmers living in the city. On the other hand, the percentage of cattle-raising, as well as those with other types of production, such as horticulture, floriculture, seeds, forest production, fishing and aquaculture, was positively related to the percentage of farmers living in the city. In this way, it is clear that it is not the fact that the agricultural activity

requires daily work that influences the fact that the house is rural or urban. The data showed that horticulture and animal care did not prevent farmers from living in the city, as also found by MARTINS et al. (2014), when studying the agro-industrial milk chain in Minas Gerais.

The presence of "pluriactive establishments", which had non-agricultural income, was positively related to the urban housing of farmers. The increase in one unit in this type of establishment increased the percentage of urban housing by 0.55. An increase in the percentage of establishments in which the "income from other activities" was higher than the income from the production of the rural establishment contributed to the increase in the percentage of farmers residing in the city.

The present study, on the urban housing of rural producers, although it touches on the theme of pluriactivity of farming families, does not constitute a study of this phenomenon. The classic definition of pluriactivity adopted, for example, by SCHNEIDER (2003), considers residence in rural areas fundamental for characterising this phenomenon. Thus; although, the phenomenon of the growth of urban housing for rural producers is entirely related to the combination of agricultural and non-agricultural activities by members of rural producers' families, urban housing constitutes a distinctive element.

This phenomenon seems to point to a broader change process in the countryside, linked to the experience by agricultural families with a new division of labor, where some of its members dedicate less working time to the agricultural activity as they begin to combine agricultural production with other external activities, as shown in (CAMPANHOLA & SILVA, 2004). The percentage of establishments classified as family farming, was not significant in explaining the urban housing of farmers. Finally, the higher the average value of the income of the establishments, the lower the percentage of urban farmers, indicating that the low income of the establishments may create the need for the change of residence (Table 2).

In strong alignment with the data of the descriptive analysis, the multivariate analysis showed that the variable referring to the percentage of "establishments with an owner with a high school or college education" was positively related to the phenomenon of urban housing of the farmer. An increase of 1 unit of this type of establishment increased the percentage of farmers residing in the city by 0.30. According to SAKAMOTO et al. (2016), the higher the schooling level of the family members, the greater their chances of diversifying their sources of work and income, and of their insertion in the non-agricultural labor market. These results refer to discussions that can also be found in SCHNEIDER et al. (2013) and SILVA et al. (2019), who reported a greater schooling level among the managers of pluriactive establishments. The data suggested that it was more probable that agricultural establishments with higher schooling levels among their members had some of their members seeking occupations outside of the establishment, which may become even more likely when the farmer and his family reside in the municipality.

CONCLUSION

Phenomena such as the increase in urban housing of farmers and the daily commuting between the city and the countryside, which were previously observed only in large urban centers, show that the life of farmers and their families is changing, not only in Latin American countries, such as Brazil and Argentina, and in countries with large rural populations, such as India and China, but also in the developed countries of Europe and North America. However;although, the changes in agriculture and among farmers and their families are quite widespread, their characteristics, specificity and motivations cannot be disregarded.

This study highlighted the specificitys of these transformations by analyzing the increase in urban housing among farmers in the region of the Zona da Mata Mineira in Brazil. When this reality was analyzed considering its projections in terms of country (Brazil) and state (Minas Gerais), different trends were observed in terms of the 142 municipalities of this region, which are home to more than two million inhabitants. In other words, understanding manifestations that can trend in the opposite direction of most cases can still be significant for thousands of people.

The present study showed that the urban residence of rural producers, especially those poorly technical, constituted a reproductive strategy. Non-agricultural activities, as well as the receipt of retirements and pensions complement agricultural income and; consequently, the possibility of maintaining the agricultural establishment. However, the separation between the workplace and the place of residence of these rural producers in the Zona da Mata Mineira (ZMM); although, it reinforces a trend observed in Brazilian agriculture, it also points to slower process of productive exclusion of low-tech farmers.

At the level of Brazil, it is observed that; although, almost half of the employed population lives in the rural area, it does not carry out agricultural work and that, one third of those engaged in agricultural activity live in the urban area. This phenomenon, at the

Table 2 - Description of Multiple Linear Model.

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
(Constant)	19.845	10.231		1.940	.055	-.395	40.084					
Municipality urbanization rate	.318	.061	.366	5.253	.000	.198	.438	.624	.417	.245	.450	2.224
Population size	2.828E-05	.000	.095	1.100	.274	.000	.000	.019	.096	.051	.290	3.446
Mineiro Social Responsibility Index	-.074	.029	-.244	-2.537	.012	-.131	-.016	-.045	-.216	-.118	.236	4.246
Percentage of temporary crop establishments	-.454	.080	-.361	-5.708	.000	-.611	-.297	-.308	-.446	-.266	.543	1.840
Percentage of Livestock establishments and breeding of other animals	.101	.040	.202	2.534	.012	.022	.179	.629	.216	.118	.342	2.920
Percentage of establishments with other types of production	.481	.098	.249	4.912	.000	.287	.674	.234	.394	.229	.845	1.184
Percentage of Pluriactive establishments	.134	.052	.203	2.577	.011	.031	.236	.362	.220	.120	.351	2.848
Percentage of family farming establishments	-.157	.063	-.140	-2.488	.014	-.282	-.032	-.479	-.212	-.116	.687	1.456
Value of income or income obtained by agricultural establishments	-3.940E-05	.000	-.095	-1.633	.105	.000	.000	-.335	-.141	-.076	.649	1.540

Source: IBGE - 2017 Agricultural Census.

level of Brazil, is more intensified in more developed regions, such as São Paulo, for example. However, what seems to be happening in a region such as the Zona da Mata Mineira (ZMM), which is not industrialized, with an average Human Development Index and marked, predominantly, by the presence of low-tech coffee and milk producers, it seems to follow a different rhythm. It was observed in the ZMM that the agricultural establishments of these rural producers did not decrease significantly, even with its going to the urban headquarters of the municipalities of the region. These producers have used non-agricultural activities, as well as retirements, pensions and agricultural activities to remain in the municipality and region.

In the case of the ZMM, it is not the environmental and climatic issues that have forced rural producers to seek income alternatives in the city, as is the case of India and Argentina, for example. However, advances in the technological development of agriculture, whether in coffee or dairy activity, may, yes, be acting as a determinate factor for the exclusion of these little-technical farmers from their activities, not from their agricultural establishments. In this way, non-agricultural income and the receipt of retirements and pensions may be acting as an important buffer in the passage of an agricultural economy that is not technical for technical and increasingly concentrated. The less technical producers have been able to stay in the municipality and in the region using reproductive strategies that combine agricultural incomes, as well as retirements and pensions. In this way, the current agricultural establishments of the ZMM, marked by the production of milk and coffee, seem to tend to dualization: on the one hand, technical rural producers will be left and, on the other, agricultural establishments marked by a subsistence economy and aiming family leisure. The urbanization through which the small municipalities of the ZMM pass seems to be able to absorb these families framed in a peripheral agricultural economy.

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DECLARATION OF CONFLICT OF INTEREST

We have no conflict of interest to declare.

AUTHORS' CONTRIBUTIONS

All authors contributed equally for the conception and writing of the manuscript. All authors critically revised the manuscript and approved of the final version.

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