

Impact of Food Acquisition Program in the Sertão-Apodi and Açu-Mossoró Territory from Brazil¹

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Abstract

The objective of this paper is to analyze the importance of the Food Acquisition Program (FAP) on the dynamics of rural development of the Territory Citizenship Serto of Apodi, from Rio Grande do Norte state, trying to understand the relationship between the economic structure and family farming organization and diversification of the agriculture family, with access to the state market from Brazil in the period 2003 to 2011. As the study methodology included municipal secondary data through desk research and used a qualitative approach, in addition to quantitative data obtained through reports Brazilian Supply Agency (CONAB), which have operations with FAP since 2004. Furthermore, we employ the LLM, Probit and Logit Models with the objective of to verify is the institution like cooperative and associations impacts the amount of investment in the FAP. It was possible to see the relation-

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ship between the economic structure and organization of family farmers (especially cooperatives and associations) and the diversification of family farming operations with the FAP. However, there is a perceived weakness in the legalization of organizations, such as the absence of the Municipal Inspection Service (SIM), State (SIE), and Federal (SIF), especially for processed products like honey, fruit pulp and milk, as well as certification for organic products. Also we found that the number of cooperative and associations impacts the amount of investment in FAP, given that a association more increase in 58% the probability of investment in FAP be greater the R\$500.000,00.

JEL Classification: R11; R58; Q18

Keywords: Territory; FAP; agricultural trading; collective organization

1 Introduction

Nowadays there are a discussion in the literature about the effect of public policies. In this context, more specifically, a sector as agriculture is fundamental to the economic development. The agriculture is the base for the another sectors of economy. However, arise questions as what agricultural model to use in the process of economic development. Exist the option of employ the agro-export model and the family farm model. In the agro-export model predominates the big enterprise that use strongly the technological innovation. In the family farm, mainly in the study object of this paper, exists a production labor intensive.

Therewith, from 2006 in the Lula's government arises public policies in Brazil directed to Northeast region that aims rise the demand for the foods produced through family farming model in the region. This program was called Program Acquisiton Food(FAP) Then, arise a question, the quality or number of institutions in this region can to impact the amount of resources received for this region? More specifically, taking into account a territory, there are differences between institutions of these territories that can affect the FAP investment?

In this context, the research aims to verify whether the institutions affect the quantity of resources invested by Federal Government of Brazil in the Sertão-Apodi and Açu-Mossoró territories through the studies of agricultural institutions of each municipality that compose the territory. We'll estimate the LLM, Logit and Probit models to check if the rise in the number of associations and cooperatives rises the likelihood of a town to receive FAP investments of federal government.

Beyond this introduction and conclusions, the research have more four sections. The first presents the literature review , discussing about the new institutional economic. The second shows the data used by research. The third stems the Econometric Model and the fourth discuss the results.

2 Literature Review

2.1 Local and Global Food and the institutions

The issue of institutions with local and global food arise of new institutional economy, where several authors has been studying the importance of institutions in the economic development. The theoretical framework here interprets the Institutional Capamunicipality Indicators (ICI) of the territory here is based on an approach of actors Norman Long and Jan Douwe van der Ploeg, and analysis of the New Institutional Economics, the latter represented by exponents like Ronald Coase, Oliver Williamson, Douglass North and Vitto Saccomandi. These two approaches propose to interpret and explain the collective capamunicipality of actors at the micro / local constitute institutional arrangements, and the power of choice here based on the economic analysis of Coase (1980) and Saccomandi (1998), with a view to conducting actions with the range of situations considered desirable. Thus, the ability of organization and the power of choice of actors would be interwoven and connected to the necessity of building structures to provide adequate economic improvement of living conditions in rural areas. The actor oriented perspective, or the perspective of the actor, launched in the second half of the twentieth century, is one of the most appropriate approaches to interpret and explain the interfaces and the actions of the actors in the development process. It is a result of re-

search work carried out many years by Professor Norman Long of Wageningen University, Wageningen in the Netherlands, with the collaboration of with the collaboration of teachers also Wageningen University Jan Douwe van der Ploeg and Alberto Arce.

Among the different strategies developed when it aims to boost economic potential from the territory, has seen an effort in directing public policy in deploying those related to economic, social and environmental. However, it is observed that the implementation of some public policies designed to boost territorial development tends to focus on economic factors and often do not express the importance of significant factors related to the environmental, cultural and institutional. Institutions in its various versions are placed as fundamental to the construction of a new legal framework for operating and governance structures are, in essence, incentives and restrictions on individual behavior, created by individuals for better interaction between organizations and actors, and between state and market. The most promising theoretical and empirical advances in the study of this subject have been made ??in recent years by the New Institutional Economics (NIE). Your domain and its economic version, which are highlighted in this paper, is reference exponents as Coase (1937), Williamson (2000) and North (1990).

Note that most of the studies on these institutions seeks to differentiate the notion of organization. According to North (1990), organizations are more defined in terms of structures of recognized and accepted roles, while institutions are beliefs, norms, behaviors and rules that allow development organizations. According to Eaton and Meijerink (2007), as well as institutions, organizations also provide a framework for human interaction, and conceptually rules (which are institutions) should be differentiated from players (which are organizations). On the one hand, according to Eaton and Meijerink (2007), the rules define the way the game should be played, and on the other hand, the goal of the players within that set of rules is to win the game by choosing the best combination of skills , strategies, and coordination. A useful distinction between different institutional levels was also drafted by Williamsom (2000), when he sought to distinguish institutional environment of institutional arrangements. For this author, institutional arrangement refers to a set of constraints, both formal (laws, contracts, etc..) And informal (norms of social behavior, etc..), Which interact with the institutional environment and

conditions the economic interaction. In designing Williansom (2000), the institutional environment has its most appropriate application to the macro level of country or region. The institutional arrangement also regarded organizations, refers more to the micro level and governance structures are formed by groups led by a common goal. According to Eaton and Meijerink (2007) are examples of common arrangements or governance structures, businesses, farmers and cooperatives (such as economic organization), as well as schools, universities, churches, trade unions, etc.. (such as social and political organization).

According to this authors, a development economic of country is directly related with the institutions of the same. Whether the country have good institutions and respect the property rights and the contracts, there are more probability of this country be developed. Moreover, the social organizations like associations and cooperatives of a region, can impact in the amount of resources that come from federal government.

Schutter (2009) stated that since the global food crisis put hunger at the top of the political agenda, important efforts were made, at both international and national levels, into increasing the supply of food. Still according to Schutter (2009) even if the worlds attention has shifted to the economic crisis, the food crisis is not over. It continues to have devastating consequences, and is further aggravated by the financial, economic, and ecological crises we have been witnessing lately. In the face of growing uncertainty about future prices on the markets of agricultural commodities, we should have worked to increase the resilience of food systems. Instead, it is the crisis that has proven resilient.

According to Schutter (2009) At the national level, the implementation of the right to food first requires targeting the most vulnerable, identified through systems mapping food vulnerability and insecurity. A number of countries have regular mapping systems in place or have launched specific mapping exercises during the crisis period. As pointed by Schutter, a of countries that mapped the vulnerable zones regardings food insecutity was the Brazil. This mapping was a of motivations to creation of FAP.

2.2 Diversity of Family Agriculture and Rural Development

The affirmation of family farming as a major segment of the economy for the

rural development process in Brazil is a recent phenomenon and incontestable. For Schneider (2008), its projection over time represents the expression of the collective capamunicipality of mobilization and organization of family farmers, which has been reflected in the recognition of public policies on rural development and its transformation into a theme of academic interest for analyzes and studies by researchers and scientists. From the standpoint of analytical and theoretical study of family farming requires, according to Ploeg et al. (2000), a multidimensional analysis of its diversity, especially of their organizational forms of economic production and work and their relationship with nature and with notions of sustainability.

It is a complex and dynamic nature of rural development, and the increasing possibility of changes in the light of the achievements in this field over the last decades, makes wherewith Ploeg et al. (2000) suggest including the need for the construction of a new paradigm. According to Ploeg et. al (2000) rural development is seen as a multilevel process, multi-actor and multi-faceted. In all these levels, according Ploeg et al. (2000), appears a series of responses, or strategies, that are related to the previous paradigm of the green revolution. It is noteworthy that in recent decades the theories and studies of agricultural economy, not only in Brazil, prioritized broadly the process of agricultural modernization, trying to explain how it offered shelter to understand the changes and their implications in relation to local and regional economies. In general, the analyzes favored the dominant technological change on agriculture and the effects of the Green Revolution on production processes where these changes occurred in Brazil especially in the period 1965-1985.

From the second half of the 1980s, the debate starts a change of direction, which is intensified from the 1990s. This discussion is directed at the international level on issues related to regional diversity, endogenous development, choices and strategies of actors, and the diversification of agriculture, which have always been ignored by the dominant discussions, treated as residual and destined to extinction or inadequate as analytical unit. Thus, discussions about the diversity of family forms of production, which came to inspire Brazilian authors in the 1990s, have gained a considerable international dimension. This began to reveal more and more that the stiffness of the debates around the exogenous models of the green revolution was not adequate to explain what was happening inside the rural areas. In the construction of this new debate,

contributions and analysis of rural development and its complexity have been increasingly used, mainly from the 1990s when discussions take shape that seek to overcome the Manichaeism that the tone of the debate on the process of agricultural modernization and rural areas.

Analytically, we start from the premise that the modernization of the technical base of agriculture is an important but not the only expression of the process of agricultural modernization and rural changes, allowing us to advance the debate on agricultural diversification in environments modernization. Taking modernization as a starting point, it is possible to find shelter for interpreting empirical and theoretical-methodological form that achieves successful family farming as their breeding environments modernization, but the intensities and shapes expressed in that Ploeg (1994) classifies as different farming styles⁴.

According to Nunes et al. (2012), the diversification of family farming is the result of the different farming styles, which are constructed by the action of free farmers at the local level, through combinations within its properties in a relatively autonomous relationship between technology and market. And the economic and social activities are operated by institutional arrangements that constitute the diversity of family farming, from which emerge the regional dynamics of rural development which are subject to action and influence public policy in an institutional setting. A useful distinction between different institutional levels was also drafted by Williansom (2000), when he sought to distinguish institutional environment of institutional arrangements. For this author, institutional arrangement refers to a set of constraints, both formal (laws, contracts, etc..) And informal (norms of social behavior, etc..), Which interact with the institutional environment and conditions the economic interaction. In designing Williansom (2000), the institutional environment has its most appropriate application to the level of country or region. The institutional arrangement also regarded organizations, refers to governance structures and comprises groups led by a common goal.

⁴For this author, the style of agriculture (styles of farming) is actually a complex, ie, an integrated set of concepts, norms, knowledge, experiences, etc., Seized by a group of farmers in a particular region, and describes the way in which the practice of agriculture is carried forward. These result in several types of familial forms of farming operationalized based on variables which express situations of greater or lesser diversification, in this case agricultural practices and strategies.

In the general, family farming develops through dynamic regional of rural development, these engendered from complex production systems, where diversity and diversification are the result of different farming styles. In the Northeast the main dynamics were stimulated by the end of the 1980 policy that insisted on integrating the region into the economic dynamics of the center-south of the country, aiming to reproduce the income of agricultural modernization in specialized models of innovation exogenous preferentially to foreign market. As the characteristic of diversification of production systems, the segment of family farming always reproduced the recipe to produce both for home consumption and to supply the market with their surplus.

And, unlike the exogenous innovation models of agricultural modernization, the dynamics of rural development based on family farming has always possessed chances for the emergence of what Ploeg et al. (2004) defines as new (novelty), and that there is this possibility in the diversification of family production units. Thus, policies from the 1990s becomes increasingly undeniable recognition of family farming as an important segment for the process of transformation and innovation structures in rural areas where public policy issues are addressed valuing themes related to diversity, endogenous development and diversification before despised and treated as residual and without analytical importance.

2.3 Evolution of public policies directed to the family farm

During the period 1965-1985, peak and decline of the modernization process of Brazilian agriculture, public policy, especially its agricultural policy mechanisms were targeted for large-scale production, monoculture export in large farms and agricultural enterprises and for introducing external technologies. As Nunes (2009), the support provided by the state in order to expand and intensify the mechanisms of agricultural policy to modernize agriculture (credit, research, technical assistance and rural extension, markets, etc..) Was designed mostly from individualized interventions in large units modernized production. These actions did not reach the majority of farmers and, as Sabourin (2009) have become ineffective in both economic and social returns as the change of the technical base of the family farm, which remained predominantly tradi-

tional.

In the Northeast, the mechanisms of agricultural policy were directed to the deployment of large government programs of economic structure, such as the Programme of Land Redistribution and stimulus Agribusiness of Northeast (PROTERRA) 1971 and Programme Development Areas integrated Northeast (POLONORDESTE) 1974. These programs have favored the serving large agricultural producers and exporting companies, despite the initial goal was to stimulate agrarian policy through distribution via purchase small areas of land for irrigation. These programs were intended to overcome the problems of infrastructure and agriculture in the Northeast of the country, which reproduces low levels of productivity and production volume by means of a technical basis delayed operating traditional agricultural systems. These programs influenced more strongly in the 1970s and 1980s, through the dissemination of the belief of the notion of progress and modernization of agriculture.

For family agriculture the public policy structuring economic projects were directed to a minor range, but it introduced an interesting logic of endogenous innovation through diversification of production systems in dynamic regional of rural development. According to Sabourin (2009), after the experience in the context of Northeast Program from 1985 to 1988, the Superintendency for the Development of the Northeast (SUDENE) implemented the Support Project for Small Rural Producers (PAPP), between 1988 and 1992, with the support of World Bank. This program searched to introduce into the environment of family farming important economic and social institutions, such as the cooperatives and associations, through the creation of structures of collective organization, and stimulating the democratic participation. To Sabourin (2009), the last level of PAPP, 1993 to 1997, which became the Program to Combat Rural Poverty (PCPR), was marked by a new direction of public policy, ie, for actions to combat poverty and the fulfillment of specific social groups, always through collective participation and democratic. This model was widespread in countries in Africa and Latin America under the name of Community Driven Development, which had its first experience in Mexico and Brazil in the early 1980s (Sabourin, 2009, p. 145).

Still in the first half of the 1980s, the agricultural policy instruments to modernize agriculture are overwhelmed by the macroeconomic instability that plagued the country, starting the decline of exogenous models and special-

ized agricultural modernization. Unemployment, environmental degradation, increased rural poverty, among others, made? The exogenous modernization were questioned, making the moment for movements of claims, as the demand for credit, land reform, the expansion of actions to combat poverty etc., like the actions supported by the World Bank, to the point of forcing the state to redefine their policies. This environment has become appropriate to affirm the family farm as an important segment of the economy and intensify actions intended concern for farmers, since most of these have not been achieved by the policies for decades.

In the late 1980s, and in a context of globalization, the exogenous models and specialized were gradually discredited, while that started the debate towards more diverse endogenous and diversified models and regional dynamics in rural development. This debate already meant the emergence of a new environment, making the 1990s were the redefinition of the concepts and fundamentals of regional development, and therefore a new concept for public policy. In this context, the demands of movements revindication acted to make public policy signaled to processes of differentiation mechanisms of agricultural policies and agricultural diversification of family farms dedicated to sustainable rural development. And as a result of claims, actions between the 1990s can highlight the intensification of agrarian reform and the creation in 1996 of the National Program of Support for Family Agriculture (PRONAF).

In the Northeast, especially in the 1980s, through the support of public funds to stimulate the organization and build economic structure of family farmers reveals that government programs, such as the PROTERRA and POLONORDESTE, or the Community Driven Development, not reached the expected results. Although programs like these have sought to build economic structure, and in the case of the latter actions have conditioned the release of funds only to collective organizations (associations or cooperatives), these actions have not translated into development. It is suggested, therefore, that the major cause of non-development comes from the collective approach of programs, where the problems have always resided in nature, in the preparation, conduct and content of the proposal of economic structuring. (Sabourin, 2009, p. 145).

Especially for family farmers in the Northeast, the investments were quite adapted to deploy small traditional infrastructure, like flour mills, small earth

dams and warehouses or silos to store grain and fodder. These projects encouraged the emergence of cooperative associations, among which, most of which were created and became inactive, as well as access to credit for economic production have been only symbolic. Especially in the Northeast, the Community Driven Development approach allows us to test two types of participatory mechanisms within the line of the Small Rural Communities (SRC). Were the Credit Projects Community (CPC), to collective facilities and the Municipal Councils of Rural Development (MCRRD) that, according Abramovay (2001), would be taken up later under the sustainable development plans in the Northeast in 1994. (Sabourin, 2009, p. 145-146).

According to Sabourin (2009), there are several public policies for rural development context. They are divided into five groups: i) distributive policies to support production (subsidies and loans from the Ministry of Agriculture, Livestock and Supply, MAP and the Ministry of Agrarian Development, MDA), ii) irrigation policy of the National Water Resources iii) social policies of the Ministry of Social Development, MDS iv) regulatory policies and the management of natural resources of the Ministry of Environment and the management of the markets of the Ministry of Industry and Trade, and the management of health conditions of the MAP and v) taxation policies of the Ministry of Economy and Finance.

The government funding programs of the 1980s accounted for more government action than state policies, which were subject to discontinuities when changing governments or restrictions from international funding organizations. Indeed It represented attempts, most delusive, public interventions that have not led to nothing or very little. Regarding to PRONAF this was considered more as a state policy, was designed in the 1990s as an instrument of agricultural policy to develop the family farm. However, assessments made by Abramovay (2004) note that in the form of individual credit or subsidy for collective equipment, PRONAF benefited over those farmers with more capital, mainly in southern Brazil. This analysis is found when looking at the relationship between the percentage of farmers and the fate of PRONAF by region, 1998 to 2011. Notes a further regional inequality and acute concern when a comparison between regions Aquino & Schneider (2011) show that 50% of farmers in Brazil are located in the Northeast region. However, according to Aquino & Schneider (2011), 47.14% of the financial resources of PRONAF

were in this period destined for the South.

Development policies of the 1990s, PRONAF sets up a powerful strategic tool for regional development promoted by family farms. Obviously, for this, PRONAF should become a priority in the design and integrated both with other agricultural policies to offer, such as the expansion of the land reform process, as with agricultural policies demand the 2000s, such as the Acquisition Food Program(FAP). This program was created in 2003 with the purpose of enabling, via agricultural marketing, the inclusion of family agriculture products in the markets, especially the institutional.

2.4 The FAP like strategy of trading of family farming

The Food Acquisition Program (FAP) was established by Law 10,696 of 2003 as a structuring action of the Fome Zero, and its action consists in the purchase of family farming in order to consign them to the people and social groups in situations social vulnerability to institutional markets (school lunches, prisons, etc.), and / or to form inventory. This program is part of an issue of significant importance, but still little known in the literature of rural studies, and even by policymakers and by the farmers and social movements: the trading mediated by the state.

With public policies presented in the Multiyear Plan (MP) 2004-2007 Federal Government's policies of the 2000s, there are actions that territorial development, as well as PRONAF, are directed to the family farm and its diversity. These actions express what to Veiga (1992) means the affirmation of family farming as a strategic economic sector to stimulate rural development dynamics, as well as for the reduction of regional inequalities. One can say that in the context of agricultural and agrarian policies, PAA is an innovation for joint agricultural production (supply) with food consumption (demand), since it proposes to act in trading. In fact, its greater range and innovative policy, according to Nunes et al. (2012), focuses on three points: 1) enhance and maintain traditional cultures (previously disregarded agricultural policies in exogenous models and specialized green revolution), in addition to enabling the diversification of family farming and the emergence as Ploeg et al. (2004), the new (novelty), 2) creating collective organizations and consolidate the existing (groups, cooperatives, networks, etc..) And enable new and 3) respect

the diversity of family farming and boost the economy of the region by create new local and regional markets and consolidate existing ones.

Considering these three points, the impacts of FAP reveal the specific municipalities and disparities between regions. According to Nunes et al. (2012), the regions most absorbed financial resources were the South and Northeast, followed by the Southeast region. This suggests that institutional arrangements in the South in a more consolidated economic structure (cooperatives, associations, networks, etc..) Has greater capacity to absorb political and expand their markets. However, the Northeast region is in an even laggard, where instruments such as the FAP have served to further create arrangements that give life to an economic structure fragile and vulnerable. In the Northeast, the collective organizations that have emerged since 2003, according to Nunes et al. (2012), much has been made possible with the proceeds of territorial policies, which remain revealing a strong dependence.

Decree No. 4,772, of July 2, 2003, created the Group Manager for the deployment of PAA assigning the National Supply Company (Conab) the responsibility to achieve technical support for its operationalization. PAA is operationalized through the Ministry of Social Development and Fight against Hunger (MDS) and CONAB, in partnership with State and Local Governments, civil society organizations and social movements. A management group coordinated by MDS and with representatives of the Ministry of Finance, Ministry of Agrarian Development (MDA), the Ministry of Agriculture, Livestock and Supply (MAPA), and the Ministry of Planning, Budget and Management (PBM) carry out monitoring of program defining the rules for its implementation and enforcement. The main types of acquisition of agricultural family operationalized by the EAP are: 1) Buy Direct Family Agriculture (BDFA): It is an operation that is always done after harvest, enables the acquisition of food from family farms, the reference prices for producers preferably organized into formal groups (cooperatives and associations) or informal, inserting family farmers market more fairly, via direct purchase of its production in order to meet food shortages and nutritional status of people. It is operated by CONAB with features of MDS and MDA. Value traded per farmer / year is of R \$ 8,000.00; 2) Buying for Simultaneous Donation (Donation CPS) promotes the link between family farming and local demands for food and nutritional supplementation for schools, nurseries, shelters, nursing homes, hospitals and

other public and social programs of the municipalities, resulting in boosting the local economy, the strengthening of family farming and the generation of employment and income in rural areas. This mode is also known as Direct Purchase Local Family Agriculture (CDLAF), when it is operationalized by state and local governments, or by Purchase Family Farming with Simultaneous Donation (Donation CPR), operationalized by Conab resources with MDS. Value traded per farmer / year is of R \$ 4,500.00; 3) Formation of the Family Farming stock (stock FFS): aim to purchase food crop in force, fit for human consumption, coming from family farmers organized into formal groups for stockpiling in their own organizations. It is operated by CONAB with funding from MDA and MDS. Value traded per farmer / year R\$ 8,000.00.

It is noteworthy that the FAP is the set of public policies territorial rural development in the 2000s, these directed to the family farm. Lying on the rise, but still far from policies such as PRONAF, according Grisa et. al (2009), PAA has been claimed as an important policy tool for development and diversification of the family farm, and operates with a view to adding value, providing conditions for endogenous forces and innovation can emerge and develop at the local level and regional level. Are for these reasons that a policy such as the PAA operated along with others, such as the Program, which will be discussed below, has generated great expectations among political operators, farmers and especially the rural scholars and researchers.

The implementation of the FAP signals a new and interesting setting for innovation and stimulate rural development and territorial endogenous, especially with regard to public policies. The highlights of this innovation happen at the time that its operations are conducted in combinations with other programs, focusing on offering such PRONAF through its modalities that require local products. Furthermore, combinations occur through diversification of family farming, respecting regional diversity and knowledge at the local level, and valuing cultures with traditional agroecological practices. And by supporting family farms, the FAP helps in marketing products while maintaining a relationship with nature from the perspective of economic, social and environmental. However, according to Nunes et al. (2012), one difficulty encountered in this process is the absence or deficiency of legalizing collective organizations of family farmers, ie, records necessary for commercialization, such as the Municipal Inspection Services (MIS), State (SIE), and Federal (SIF) processed

products such as honey, fruit pulp and milk, as well as to acquire certification for organic products.

According to Grisa et. al (2009), PAA means new opportunities for access to markets, which has contributed to the increase of the rent increase, new job opportunities and encouraging value addition of agricultural family. The challenge today is to advance in the production chain by the farmers through the implementation of infrastructure for collective processing of products as a means of access to markets with higher value. The PAA and government procurement have encouraged the diversification of production in rural areas in the Rio Grande do Norte, especially in the Territory of Citizenship Hinterland Apodi, contributing to reducing the effects of seasonality.

3 Data

The data used by research was the amount of investment of APF since 2006 until 2013. The number of cooperatives and associations in each municipality of Assu-Mossoró and Sertão-Apodi territory also were surveyed. Table below show the data and descriptive statistics.

Table 1: Data Used

municipality	Territory	Investment R\$	Associations	Cooperatives
Apodi	Sertão-Apodi	7,961,219.15	5	2
Campo Grande	Sertão-Apodi	801,915.85	4	0
Caraúbas	Sertão-Apodi	1,123,613.40	5	2
Felipe Guerra	Sertão-Apodi	464,484.20	5	0
Itaú	Sertão-Apodi	1,293,280.03	3	1
Janduís	Sertão-Apodi	58,500.00	1	0
Messias Targino	Sertão-Apodi	80,928.00	1	0
Patu	Sertão-Apodi	76,487.50	1	0
Rafael Godeiro	Sertão-Apodi	125,934.00	1	0
Rodolfo Fernandes	Sertão-Apodi	339,596.30	1	1
Severiano Melo	Sertão-Apodi	887,445.75	5	1

Triunfo Potiguar	Sertão-Apodi	130,497.00	1	0
Umarizal	Sertão-Apodi	295,253.60	2	0
Upanema	Sertão-Apodi	859,707.50	2	0
Alto do Rodrigues	Açu-Mossoró	337,497.95	2	1
Areia Branca	Açu-Mossoró	379,236.00	1	0
Assu	Açu-Mossoró	1,489,371.30	7	2
Carnaubais	Açu-Mossoró	100,000.00	0	1
Ipanguaçu	Açu-Mossoró	1,524,743.53	0	1
Mossoró	Açu-Mossoró	941,604.50	3	1
Pendências	Açu-Mossoró	437,000.00	1	0
São Rafael	Açu-Mossoró	261,000.00	1	0
Serra do Mel	Açu-Mossoró	1,158,759.85	3	1

*Source:*Authors

Table 2: Descriptive Statistics

Variable	Mean	Min	Max	Std
Investment	R\$ 918,611.97	R\$ 58,500.00	R\$ 7,961,219.15	R\$1,607,418.85
Associations	2.39	0.00	7.00	1.92
Cooperatives	0.70	0.00	4.00	0.97

*Source:*Authors

In the figure below are the localization of territories studied. We note that the most municipalities are below average and also that cities as Apodi had a investment much higher than the mean, unlike of towns as Janduís, which had a investment only of R\$ 58.500,00, whose is the smaller.

4 Econometric Model

We employ in the research the regression model of quality response, which are LLM(Linear Likelihood model), Logit and Probit. The section objective

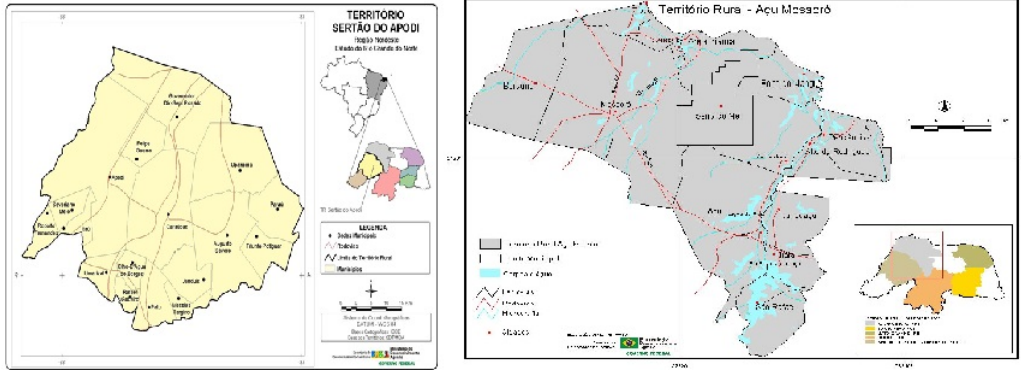


Figure 1: Sertão Apodi and Açú-Mossoró Territories

to present these models. Moreover, we aim to develop the models which will be estimated by research.

4.1 Linear Likelihood Model

This model follow the specification according to Gujarati (2008):

$$Y_i = \beta_1 + \beta_2 X_i + u_i \quad (1)$$

Where $Y_i = 1$ if investment in the Acquisition Program of Food is higher than R\$500.000,00 and 0 otherwise. X_i =number of cooperatives in the town. Taking the conditional expectation in (1), we have the probability:

$$E(Y_i|X_i) = \beta_1 + \beta_2 X_i = P_i \quad (2)$$

4.2 The Logit Model

The model is specified according to Gujarati as:

$$P_i = \beta_1 + \beta_2 X_i \quad (3)$$

Now, consider the following representation to Y_i

$$P_i = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}} \quad (4)$$

We can to write the previous equation as:

$$P_i = \frac{1}{z + e^{-Z_i}} = \frac{e^Z}{1 + e^Z} \quad (5)$$

Where $Z = \beta_1 + \beta_2 X_i$. The equation (3) is the logistic distribution function. As Z_i varies of $-\infty$ to $+\infty$. P_i varies between 0 and 1.

4.3 Probit Model

Define the utility index not observed I_i , whose is determined by one or more explanatory variables as:

$$I_i = \beta_1 + \beta_2 X_i \quad (6)$$

Under normality, the probability of that I_i^* is less or equal to I_i can be calculated through ADF standard normal as:

$$P_i = P(Y = 1|X) = P(I_i^* \leq I_i) = P(Z_i \leq \beta_1 + \beta_2 X_i) = F(\beta_1 + \beta_2 X_i) \quad (7)$$

Where $P(Y = 1|X)$ indicate the probability of a event occur given the value of explanatory variable X.

5 Results

5.1 Influence of Cooperative and Associations in Sertão-Apodi territory

We use the following specification with the objective of to check the whether the number of cooperatives and associations have influence in the probability of APF to be higher R\$ 500.000 in the period researched. If the parameters β_2 and β_3 are positives, a increase the the number of cooperatives and associations rises the probability of investment exceed R\$500.000,00.

$$higher500 = \beta_1 + \beta_2 coop + \beta_3 associations \quad (8)$$

Firstly, we analyze the impacts of the number of cooperatives and associations inf Sertão-Apodi territory according to equation (8). In this territory, we can

detach Apodi municipality, which had the higher investment. Despite this municipality have the greater investment, your association number is equal to Caraúbas, for example, that can indicate higher efficiency of Apodi in relation to another cities.

Table 3: Estimated Parameters Sertão-Apodi

model	β_1	p-value	β_2	p-value	β_3	p-value
llm	-0.06	0.75	0.19	0.29	0.14	0.07
logit	-3.31	0.04	1.83	0.25	0.85	0.10
probit	-1.98	0.03	1.09	0.26	0.51	0.07

Source:Authors

The estimated parameters show that the associations number have more influence in the municipality investment over R\$ 500.000,00, because the parameter β_3 was significant to 10%. Regarding the marginal effects, whether the municipality to increase one cooperative, there is a probability of 45% of the investment to be higher R\$ 500.000,00 according probit model.

Table 4: Marginal Effects Sertão-Apodi

Model	cooperatives	associations
logit	0.45	0.21
probit	0.43	0.20

Source:Authors

5.2 Influence of Cooperative and Associations in Açú-Mossoró territory

Following the previous section, we estimate the influences of cooperatives and associations in the Açú-Mossoró FAP investment. The results are in the table

below.

Table 5: Estimated Parameters Assu-Mossoró

model	β_1	p-value	β_2	p-value	β_3	p-value
llm	0.02	0.93	0.03	0.72	0.44	0.21
logit	-2.68	0.13	0.30	0.64	1.55	0.29
probit	-1.66	0.10	0.18	0.61	0.97	0.25

Source:Authors

The coefficients show that the associations and cooperatives number don't have explanatory power about the FAP investment, because they aren't significant to 5% level. However the marginal effects analysis show that the associations influence more the APF investment than cooperatives for this territory.

Table 6: Marginal Effects Assu-Mossoró

Model	cooperatives	associations
logit	0.07	0.38
probit	0.07	0.37

Source:Authors

There is an explanation because the institutions have influence in the APF investment in the Sertão-Apodi territory unlike Assu-Mossoró territory. While the agricultural model of Sertão-Apodi territory focuses in the family farming model, where the production is geared to the local and regional markets. Already in the Assu-Mossoró territory the predominant agricultural model is based in conception of exogenous technology geared to agro-exportation whose the focus is the production for foreign market. Thus, the associations or cooperatives don't affect the APF investment in the Assu-Mossoró territory.

5.3 Influence of Cooperative and Associations in both territories

The estimated parameter according to equation 8 are in table below:

Table 7: Estimated Parameters

model	β_1	p-value	β_2	p-value	β_3	p-value
llm	0.06	0.07	0.11	0.07	0.14	0.23
logit	-3.34	0.01	0.79	0.05	2.36	0.05
probit	-2.02	0.00	0.48	0.03	1.44	0.04

Source:Authors

The work also calculated the marginal effects of logit and probit model, that are in table below. In the llm model, the own coefficients are the marginal effects.

Table 8: Marginal Effects

Model	cooperatives	associations
logit	0.19	0.58
probit	0.19	0.56

Source:Authors

The marginal effects are important towards the statement of public policy by the state. Whether the state add one cooperative in your municipality, the likelihood of the investment in APF be greater than R\$500.000,00 is of 19%. Likewise, the government add one association in your municipality, the probability of the investment in APF exceed R\$500.000,00 is 58%. This results suggest that the state should to incetive a creation of new associations and cooperatives for, thus, to increase the investments of APF in your municipality. Moreover, there is evidence that regions which have institutional organization higher, are prone to higher rural development like south region of Brazil.

6 Conclusion

We conclude that the institutions have strong impact in the FAP investment in both territories. Adding one cooperative, the probability rises in 20% the FAP investment and one association rises 60% the probability of FAP investment exceed R\$ 500.000,00. However the associations had a greater weight than the cooperatives in both territories. This amount have very significance, because we have talking of municipalities with low GDP share in Brazil. This findings suggests that public managers supports the creation of new associations and cooperatives in your municipality. This findings also efforts the institutions role in economic development defended by Williamson (2000) and North (1990).

Another important result is that in territories whose the predominant model is the exporter agricultural model based in the big enterprises and in exogenous technological vector, there is also a strong presence of small farmers. In the Açu-Mossor'ó territory the associations and cooperatives are in a few number and its influence in the FAP investment is smaller. Unlike Açu-Mossoró territory, the Sertão-Apodi territory have greater number of cooperatives and associations, was more influenced by these institutions, due this agricultural model be more diversified and endogenous based in family farm.

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