

Book Chapter

Socioeconomic Analysis of Rural Credit and Technical Assistance for Family Farmers in the Transamazonian Territory, in the Brazilian Amazon

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Published **May 20, 2020**

This Book Chapter is a republication of an article published by Galdino Xavier de Paula Filho, et al. at Journal of Agricultural Science in September 2016. (Galdino Xavier de Paula Filho, Miquéias Freitas Calvi, Roberta Rowsy Amorim de Castro. Socioeconomic Analysis of Rural Credit and Technical Assistance for Family Farmers in the Transamazonian Territory, in the Brazilian Amazon. Journal of Agricultural Science; Vol. 8, No. 10; 2016. DOI: 10.5539/jas.v8n10p177)

How to cite this book chapter: Galdino Xavier de Paula Filho, Miquéias Freitas Calvi, Roberta Rowsy Amorim de Castro. Socioeconomic Analysis of Rural Credit and Technical Assistance for Family Farmers in the Transamazonian Territory, in the Brazilian Amazon. In: João Silva Dias, editor. Prime Archives in Agricultural Research. Hyderabad, India: Vide Leaf. 2020.

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Abstract

In Brazil, Rural Credit and Technical Assistance policies for family farming were formulated with the goal of promoting rural development in a sustainable and integrated manner. This study is the result of the *Monitoring and assessment of public policies for territory management in the Pará Amazon* project, undertaken by the Federal University of Pará (UFPA), aimed to evaluate the main socioeconomic impacts and limitations for the execution of these policies in the Transamazonian Territory. It is characterized as qualitative and exploratory, developed from bibliographic research and field research, based on data obtained through interviews conducted with 22 families of farmers who are beneficiaries of Rural Credit, the B modality of the National Programme for Strengthening Family Agriculture (PRONAF) and of the Technical Assistance Policy, whose sample corresponds to 10% of total contracts made effective within that Territory, between the years of 2013 and 2014. In addition to these farmers, for the analysis of the Technical Assistance service, interviews were conducted with extension workers from eight organizations, one of which is a state public company and seven of which are outsourced companies hired by the Federal Government to provide this service. The descriptive analysis shows that PRONAF B focuses on areas that produce short cycle food crops and on fishing activities. The technical assistance service provided by the public company is carried out in all the cities within the Territory, but only meets 10% of the demand; the service provided by the outsourced companies also occurs in all cities and its greatest setback is the delay in the release of funds by the Federal Government, which generates delays in the agricultural calendar and discontinuity in the productive activities, due to the end of the term of the companies' contracts.

Keywords

Brazilian Amazon; Family Farming; Rural Credit; Technical Assistance

Introduction

Although the importance of family farming in food production is unquestionable, in many countries this category is still developing mainly with its own resources, with a low level of access to rural credit and technical assistance policies to foment these production systems [1,2]. Worldwide, there are approximately 2.5 to 3 billion people living in rural areas that are directly and indirectly involved with food productions, for subsistence and/or for supplying urban centers [3]. One may observe that regions with developed agriculture contribute towards local development and the development of society as a whole. For this reason, this theme is a recurring topic in several countries. In the Brazilian Amazon, family farming exhibits reduced productivity due to low soil fertility in most of the territory, lack of technical orientation and precarious infrastructure in the rural zone [4]. Many establishments reach productive exhaustion due to the practice of shifting cultivation, which degrades the soil and the forest, making the continuity of many production systems impossible [5].

Among the rural development policies, one may observe that in the last years, rural credit and technical assistance for family farming have been contemplated in many governmental actions. However, these services are still insufficient to meet the actual demand of the farmers, especially in developing countries, as the state or private institutions consider credits for farmers to be a risky, difficult and expensive business, and therefore offer different interest rates with respect to large-scale agriculture [6]. Technical assistance contributes towards a greater efficiency of production systems and towards the integration of several agricultural functions in different levels of development, resulting in the accumulation and validation of technical knowledge among farmers [7]. All of these services are essential

to potentiate economic growth and to improve the quality of life within the rural zone [8].

Kumar et al. [9] point out that credit is one of the essential inputs for agricultural development, because it capitalizes and guides farmers towards proceeding with new investments and/or adopting new technologies. In relation to technical assistance, one notes that, due to environmental imperatives faced by many countries, this service has been guided, in the last years, by agricultural production programs and actions with environmental conservation, such as the *Conservation Technical Assistance Program* in the United States [10] and the National Technical Assistance and Rural Extension Policy (PNATER) in Brazil.

However, the conclusion that emerges is that there is a positive correlation between rural credit and technical assistance [11,12]. In a study on technical efficiency and potential for productivity of cocoa culture (*Theobroma cacao* L.) among farmers in countries in Central Africa, Binam et al. [13] observed that access to credit had a significant impact on the technical efficiency of producers, especially in Cameroon, Nigeria, Ivory Coast and Ghana. These authors reveal that the role of credit, accompanied by technical assistance, cannot be underestimated, as when farmers have access to these services, they display greater efficiency from a productive point of view. Access to rural credit and technical assistance can enhance the ability of poor households to acquire agricultural raw materials, and as such, the development of rural credit institutions is a necessary condition for increasing work and soil productivity, and is a crucial factor for encouraging the development of low income farmers [13].

In Brazil, especially in the Brazilian Amazon, rural credit and technical assistance policies are widely discussed in a way that is integrated into strategies to improve the productivity of family farmers, as restrictions in the use of new areas for agriculture became a great concern in the last decade due to governmental strategies aimed at the reduction of deforestation [14,15]. These policies, along with the diffusion of technology, use of agricultural inputs and fertilizers, mechanization, supply of

information to farmers and social infrastructure investments in the rural areas are extremely important for the development of the agriculture [16]. There are cases in which, even though application of these policies takes place, there are no results which involve structural changes in the production system of the farmers, so as to indicate that many of them need improvement [17]. According to the last Agricultural Census carried out in Brazil [18], in the Brazilian states that correspond to the Amazon Region, there are 413,101 family agricultural establishments (9.4% of family agricultural establishments in Brazil), in an area of 16,647,328 hectares (20.7% of the area of family agricultural establishments in Brazil). However, there is a vast literature regarding the absence or inadequacy of public policies for this category, especially those related to rural credit and technical assistance [15,19-21].

The PRONAF B benefits farmers linked to social organizations (cooperative organizations, associations, fisherman colonies etc.) with annual income until R\$ 20,000.00 and possess the PRONAF Declaration of Aptitude. The farmers benefited by the outsourced technical assistance are exclusively residents of the areas of the new modalities of land reform, such as the Settlement Project (PA); the State Extractivist Settlement Project (PEAEX); the Sustainable Development Project (PDS); and the Extractivist Reserve (RESEX); it is also necessary for them to be in the list of beneficiaries of the land reform carried out by the National Institute of Colonization and Land Reform (INCRA) and that they are considered family farmers, according to Law nº 11326/2006 [22].

Considering this situation, this study has objective to evaluate the rural credit policies, the B modality of PRONAF and the public technical assistance executed in the Transamazonian Territory, in the Southwest Region of the State of Pará, within the Brazilian Amazon. The main impacts of these policies on socioeconomic and productive aspects were analyzed, as well as in the local and regional dimensions, in addition to the main limitations for the full effectuation and execution these policies.

One must note that outsourced technical assistance, although a service provided by private companies, is a public service in nature in this case, as the outsourced companies are hired by the Federal Government. However, for the purpose of this study, this modality of service will be named outsourced technical assistance. Additionally, the technical assistance studied in this work relates to the *Technical Assistance and Rural Extension*, which results from PNATER, directed towards the family farming segment in Brazil.

The conception of this work is contemplated in the actions of the *Monitoring and Assessment of Public Policies for Territory Management in the Pará Amazon Project*, executed by way of a partnership between the Ministry of Agrarian Development (MDA) and the National Council of Scientific and Technological Development (CNPq) with the Federal University of Pará (UFPA).

Methodology

Characteristics of the Study Area

The integration of the Territory is the Transamazonian Highway (BR 230) and the Xingu River. It is formed by 10 cities: Altamira, Anapu, Brasil Novo, Medicilândia, Pacajá, Placas, Porto de Moz, Senador José Porfírio, Uruará and Vitória do Xingu (Figure 1). The Territory possesses a total area of 250,973 km² and an approximate population of 331,770 inhabitants, with a population density of 2.62 inhabitants/km² [23].

In this region reside family farmers, settlers from land reform programs, fishermen, riverside communities, indigenous peoples and *quilombolas*. The most notable rural activities within the Territory are cattle raising, practiced extensively, cocoa production and the cultivation of food crops which are consumed by these family groups, who then commercialize the surplus [24,25].

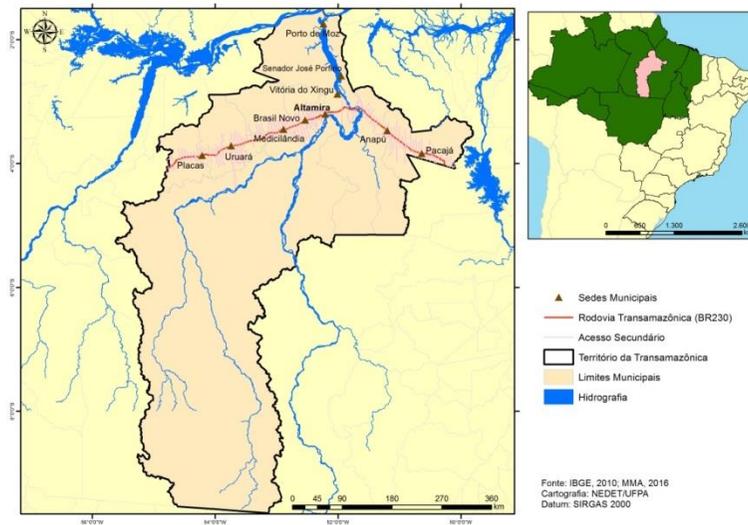


Figure 1: Transamazonian Territory, state of Pará, Brazil.

The Transamazonian Territory is located in the Central Region of the Brazilian Amazon; its economic is characterized by vegetable extractives, and which have been transformed into agricultural frontiers for the production and expansion of the *commodity* market, a process which intensified by way of public funding towards the implantation of agropecuary projects, increasing the levels of deforestation, as stated in a vast literature available on this theme [26-31].

Currently, the Territory is entering a new cycle of natural resource exploitation, aimed at making use of the hydroelectric power of the Xingu River, in the Altamira Region, where recently the Belo Monte Hydroelectric Dam, the third largest in the planet, was constructed. This enterprise is one of the main works of the Growth Acceleration Program carried out by the Federal Government, which justifies it as being strategic for the resumption of economic growth in the country [32], based on the national security discourse. This fact has significantly altered the agricultural and agrarian conformation and reality within the Territory, culminating in new challenges and opportunities in sight for family farms, which demand new studies, searches for

market strategies and supply of information to farmers and technicians inserted in this space [33].

Data Collection

This study was conducted in 2013 and 2014. The target demographic was composed of family farmers who lived in the Transamazonian Territory and were beneficiaries of rural credit in the PRONAF B modality, as well as of the public technical assistance actions. The study utilized primary data collected from the farmers by way of structured questionnaires, and secondary data from academic literature and official documents.

The sampling technique was utilized and interviews were conducted with 22 farmers who are beneficiaries of rural credit (PRONAF B) and of technical assistance in seven cities of the Territory (Altamira, Brasil Novo, Medicilândia, Placas, Senador José Porfírio, Vitória do Xingu and Porto de Moz), which is equivalent to 10% of total contracts existent during that period (Table 1). Interviews were also conducted with employees of the Pará State Technical Assistance Company (EMATER), which acts in all the cities within the Territory, as well as with employees or directors of seven outsourced companies hired by the Brazilian government to provide services in three cities (Anapu, Pacajá and Porto de Moz).

Data Analysis

One encourages an analysis of the Transamazonian Territory that particularizes the cities, especially regarding their physical and productive characteristics, as the cities that are located along the Xingu River (Porto de Moz, Senador José Porfírio, Vitória do Xingu and part of Altamira), have an economy based on artisanal fishing, chestnut collection and annual crop cultivation. The cities located along the Transamazonian Highway (Placas, Uruará, Medicilândia, Brasil Novo, Anapu, Pacajá and the other part of Altamira) the system of production is based on cocoa production and extensive cattle raising, as analyzed by Bratman [34], Godar et al. [35] and Hetrick et al. [36].

Analytical Procedures

The analysis of performance to the public policies for family farming was carried out in a particularized and individual form between the farmers of the cities that compose the Territory, verifying the performance level of a city in relation to another by way of descriptive and inferential statistics. In this sense, a hypothesis was elaborated in which cities with a higher degree of access to information, local development or schooling of its farmers may be more susceptible to the execution of these policies. At the same time, the social environment and the socioeconomic dynamic associated with the production possibilities of the cities are factors that may contribute towards greater access to the policies.

Results and Discussions

Characteristics and Performance of PRONAF B among Beneficiary Farmers

There are only seven cities (out of ten) within the Transamazonian Territory in which there are farmers who are benefited by PRONAF B. By analyzing Table 1, one may observe that this credit modality was applied predominantly in fishing activities (58%), food culture production (37%) and small animal raising (5%). In other words, PRONAF B was applied mainly in fishing activities of residents of the Xingu River margins and in small subsistence food culture systems (horticulture, tubers and grains), located in cities along the Transamazonian Highway. It is worth noting that the city of Altamira presents both characteristics (Table 1).

The study revealed that PRONAF B faces several hindrances to its execution in the Transamazonian Territory. Although fishing is one of the most funded activities, EMATER, the public institution that guides the beneficiaries, has no professionals in this area to carry out the technical assistance on this raising system. Another difficulty is the absence of banking agencies in some cities, which forces the beneficiaries to dislocate themselves to other cities in order to receive the financial

resources of their funding. This dislocation elevates costs and diminishes the buying power of the received credit.

Table 1: Activities funded by rural credit (PRONAF B) in the Transamazonian Territory.

Municipality	Interviewed farmers	Funded activity	Percent age of the sample	Percentage by funded activity	Region of the beneficiaries
Medicilândia	01	Small animals	5%	Small animals: 5%	Highway: 42% of the funded activity
Brasil Novo	03	Food crops	16%	Food crops: 37%	
Placas	03	Food crops	16%		
Altamira (highway)	01	Food crops	5%		
Altamira (river)	02	Fishing	11%	Fishing: 58%	River: 58% of the funded activity
Vitória do Xingu	03	Fishing	11%		
Senador José Porfírio	03	Fishing	5%		
Porto de Moz	06	Fishing	31%		
Transamazonian Territory	22	-	100%	100%	100%

Literature shows that rural credit for small farmers has been essential in structuring their production systems, as observed by Reardon et al. [1] in a revision work regarding this policy in countries of Latin America; and in a work conducted with asymmetric information developed by Boucher et al. [37] in Peru, Nicaragua and Honduras, whose results are similar to those found in this study, in which it was found that the main benefit and positive aspect of access to credit was the organization of the families' productive systems. In this study, the received credit was invested in the acquisition of equipment and construction of service structures, which contributed directly to the productive sovereignty of the families and to the food security strategies, seeing as the activities performed by these farmers, in addition to being aimed at commercialization, also had food self-sufficiency as a goal.

Technical Assistance in the Vision of the Farmers and the Policy's Executors

The technical assistance executed in the Transamazonian Territory is stratified in two forms:

i) Technical assistance executed by a public agency (EMATER). Although the national directive recommended by PNATER is to universalize this service for farmers, the company prioritizes service mainly to the beneficiaries of PRONAF. EMATER acts in all the cities within the Territory, but admits that the service provided falls short of the demand, serving only 10% of the farmers who need these services. For years, the company has been demanding from the State of Pará Government the hiring of more professionals in order to meet the demand for this service.

ii) Technical assistance executed by outsourced companies hired by INCRA. This action is articulated within the scope of the *Plano Brasil Sem Miséria* (Brazil Without Misery Plan), a Federal Government Program, by way of public tenders for specific areas that are the new land reform modalities, such as in the example of settlement projects in the cities of Anapu and Pacajá, and in the *Verde Para Sempre* (Forever Green) RESEX, in the city of Porto de Moz.

The beneficiaries of the Brazil Without Misery Plan are families who find themselves in a low income situation. The selection is carried out by the outsourced company's technicians, together with the Social Assistance Municipal Offices. All cities within the Territory were contemplated by this policy, but it was mostly applied in the cities with a smaller Human Development Index (HDI), as there is a strong correlation between the socioeconomic situation of the families and the level of development of the cities where they reside (Table 2).

This study identified 1,300 families being benefited by the technical assistance provided by the outsourced companies in the Anapu and Pacajá settlement projects and 1,849 families in the *Verde Para Sempre* RESEX, in the city of Porto de Moz (Table 2). One may note that the fact that the city of Pacajá holds the

largest number of families benefited by the technical assistance policies may be justified by it being the city with the highest number of settlement projects and of families settled in land reform areas among the cities within the Territory.

Among the main difficulties encountered for the consolidation of the technical assistance policy, one may highlight those related to the logistics of access to the farmers' properties, especially those located in the settlement projects and in the RESEX, which require hours of travel to reach, as observed previously in works conducted by Ludewigs et al. [39], and Pereira and Sauer [40]. However, the greatest difficulty, which persists over the years, has been the lack of effectuation of the public policies and actions by INCRA toward the consolidation of the land reform areas, especially the settlement projects, such as the actions of road construction and maintenance of roads throughout the year (especially in the rainy period); the issuance of property titles of rural lots; and, especially, the release of funds for technical assistance within an adequate timeframe. The delay in the release of financial resources by INCRA for the providers of these services is a recurring problem that affects the agricultural calendar, generating a series of problems that become irreversible. This situation, regrettably, takes place throughout the entire Amazon, as may be observed in works carried out by Pacheco [41], Tourneau and Bursztyn [19], and Silveira and Wiggers [21].

The present study found that there is a deficit in the provision of technical assistance services, both by the public company and by the outsourced companies. In addition to this deficit, in the settlement projects there is the further problem of discontinuity of the actions, especially due to the fact that the outsourced companies operate by public calls, with a specified deadline for the execution of the activities, and after the end of the contract, they leave the settlement, leaving the farmers to wait for the next contract, which is not always executed by the same company or initiated in sequence. This public policy model has generated interruption, discontinuity and repetition of stages that have already been carried out due to lack of communication, increasing public spending and producing few effective results.

Table 2: Data from the technical assistance provided to the farming families in the Territory (2014).

Municipality	Nº of families served by PBSM ¹	Nº of families served in the land reform areas ²	Nº of families served by EMATER ³	HDI of the cities ⁴
Altamira	225	0	230	0.665 (medium)
Anapu	325	1,979	172	0.548 (low)
Brasil Novo	75	0	204	0.613 (medium)
Medicilândia	150	0	313	0.582 (low)
Pacajá	375	1,300	382	0.515 (low)
Placas	75	0	135	0.552 (low)
Porto de Moz	75	1,849	201	0.503 (low)
Senador José Porfírio	150	0	91	0.514 (low)
Uruará	225	0	269	0.589 (low)
Vitória do Xingu	150	0	87	0.597 (low)
Transamazonian Territory	1,825	5,128	2,084	0.567 (low)

Note. ¹ Plano Brasil Sem Miséria; ² According with the Agricultural Census [18]; ³ Estimated value based on EMATER's 10% service capacity. The demand takes into consideration the current number of agropecuary establishments in the cities, based on the Brazilian Institute of Geography and Statistics' Agricultural Census [18]; ⁴ Based on data from the United Nations Development Program [38].

The privatization of technical assistance has not been positively evaluated by national and international experts. Diesel et al. [42] argue that the initial justification for the privatization of services was that agriculture had achieved a satisfactory level of production, requiring advanced technology. However, this is not the case of the region being studied, where the production systems of family farmers still have a number of limitations, especially those related to the absence of the many structural public policies, such as lack of electrification in a large part of rural homes, lack of recovery of local roads, among others, as observed by Hostiou et al. [43] and Brondizio and Moran [44] in works conducted with family farmers in the Transamazonian Territory. It is possible that this scenario may change over the next few years, as there are other land reform areas in these cities that may be contemplated by the public calls for technical assistance.

Performance of the Cities upon Accessing the Rural Credit and Technical Assistance Policies

Considering the public policies are aimed at family farming, it is assumed that the cities with the best performance in access and operationalization of the policies are the ones with the highest number of agricultural establishments. However, the higher number of family farmers is not enough to ensure the execution of these policies, as it is necessary that the family farmers are duly apt to access them. Relating the information of Tables 1 and 3, one finds that the cities with the largest amount of agropecuary establishments were not necessarily those that most accessed the credit and technical assistance policies conceded to family farming in the Transamazonian Territory.

Pacheco [41], Leite et al. [45], and Castro and Singer [46] consider the condition that the farmers find themselves in to be fundamental in determining access to these policies; they analyze that, although, in the last years, many settlements for family farming have been created in the Brazilian Amazon, many of these are not duly consolidated with structural policies, such as roads and rural electrification. Ludewigs et al. [39], Pers et al.

[47], and Bratman [34] point out that this situation hinders the execution of the other public policies for settlements, which may lead to the abandonment of these areas by the families who were settled there.

Table 3: Distribution of agropecuary establishments in the Transamazonian Territory (2014).

Municipality	N° of Agropecuary Establishments	% of Agropecuary Establishments
Altamira	2,305	11
Anapu	1,729	8
Brasil Novo	2,044	10
Medicilândia	3,139	15
Pacajá	3,825	18
Placas	1,351	7
Porto de Moz	2,012	10
Senador José Porfírio	911	5
Uruará	2,693	12
Vitória do Xingu	874	4
Transamazonian Territory	20,883	9.3*
Brazil	5,219,504	

Note. * Percentage in relation to the number of establishments in the State of Pará. Source: Adapted of IBGE [18].

Regarding PRONAF B, one notes a predominance of small farmers and fishermen in Porto de Moz, Altamira and Brasil Novo, the cities that have the highest number of agropecuary establishments in the entire Transamazonian Territory (Table 3). This analysis refers only to rural credit in the B modality of PRONAF, although there are at least ten other credit modalities. However, due to the heterogeneity exhibited by these segments, as well as the local opportunities that present themselves (public policies, market, productive structure), which in turn are related to physical and socioeconomic characteristics of the cities, it is possible that in analyses of other modalities, access is concentrated in other groups of cities.

The public technical assistance, conducted by EMATER, which follows (or should follow) PNATER's directives, is lacking, as the company cannot meet its demand, due to a reduced technical

staff. The last hiring of extension workers took place in the year of 2006. This deficit, regrettably, is a reality across Brazil, as previously observed in works conducted by Diesel et al. [42], and Taveira and Oliveira [11]. In a study conducted on the performance of family farming in Brazil between the years of 1996 and 2006, Guanziroli et al. [48] highlighted that this segment is diversified and requires specific policies, and that the absence or inadequacy of policies for family farming contributes towards the existence of negative indicators and little increase in agricultural production.

As for the technical assistance executed by the outsourced companies, directed towards the new modalities of land reform, the cities with the highest number of families settled in these areas are likely to have a higher number of beneficiaries, a fact which may justify the city of Pacajá being the one with the highest number of beneficiaries (Table 2), since it is the city with the highest number of settlement projects and settled families, as observed in Table 4.

Outsourced technical assistance services in Extractive Reserves in the Amazon are recent, and scientific literature does not yet contain works with results that show the efficiency of these services, which makes a deeper discussion regarding this theme and the establishment of comparative parameters for the results impossible. The experience encountered in the city of Porto de Moz is one of the pioneers within the Amazon. This study revealed that the main difficulties encountered by the technical assistance services in this conservation unit are the delay in the transfer of funds for the companies that provide the services (which was also observed in settlement projects), and the logistics surrounding the provision of services to the families, due to the geographical dimensions and the difficulty of access to the various communities of the RESEX. Although there are 2002 families in this unit, the company's hiring tender foresaw service to 1849 families, or 92% of the demand. According to the company that provided this service in the RESEX, the financial and technical limitations made service to all families impossible.

Table 4: Modalities of land reform and number of families settled in the Transamazonian Territory (2014).

Municipality	Modalities of land reform	Nº of settled families	Families settled by city
Altamira	05 PA	1,718	4,367
	05 PDS	2,516	
	03 RESEX	133	
Anapu	01 PA	1,658	2,107
	03 PDS	449	
Brasil Novo	04 PA	773	773
Medicilândia	02 PA	1,705	2,876
	01 PDS	1,171	
Pacajá	24 PA	6,591	7,519
	01 PDS	928	
Placas	06 PA	1,381	2,002
	04 PDS	621	
Porto de Moz	01 PA	90	2,202
	01 PDS	46	
	01 RESEX	2,002	
	01 PEAEX	64	
Senador José Porfírio	06 PA	2,083	2,149
	01 PDS	66	
Uruará	09 PA	2,146	2,819
	03 PDS	673	
Transamazonian Territory		26,814	
Brazil		969,296	

Note. PA: Settlement Project; PDS: Sustainable Development Project; PEAEX: State Agroextractive Settlement Project; RESEX: Extractive Reserve.

Source: INCRA, [49].

Conclusions

The PRONAF B rural credit was concentrated in areas whose production is based on short cycle food cultures and on fishing activities, playing an important contribution to the sovereignty and food security of the benefited families, as they invest the funds in the acquisition and/or improvement of the productive infrastructure. However, the absence of banking agents in some cities and of skilled professionals to carry out the technical orientation on the funded activities hinder the effectiveness of this policy.

Public technical assistance is carried out by EMATER in all the cities, but this institution can only meet 10% of the existing demand. The main limitation encountered is the reduced number

of technicians, as professionals have not been hired for at least ten years.

Outsourced technical assistance takes place in all cities by way of actions articulated within the scope of the Federal Government's Brazil Without Misery Plan, aimed at farmers who find themselves in a low income situation; at family farmers and extractives situated in a RESEX; and two settlement projects. The greatest difficulty for the implementation of these actions is the delay in the release of funds to the providers of services by INCRA, resulting in the delay in technical assistance activities related to the agricultural calendar, as well as in the interruption of the activities, due to the end of the contracts with the companies that operate this policy.

In a general way, it is observed that these public policies for family farming are poorly accessed among farmers in the study region, the Transamazonian Territory, however, this work does not exhaust the debate regarding the assessment of productive inclusion programs for family farming. It may contribute in the evaluation of access to these programs, from the specificities of each city, considering physical and productive factors and, mainly, the socioeconomic and political dynamic of these cities.

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