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Distribution of Income and Poverty in the Chico Mendes Extrative Reserve (Resex)

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Abstract

Conservation units, such as Extractive Reserves (RESEX), appear as alternatives for sustainable development in the region. The aims of this study is to evaluate the evolution of income distribution and poverty levels in the Chico Mendes RESEX in the last 20 years. We work with the methodology of the ASPF project, developed at the Federal University of Acre (UFAC), based on indicators of economic results, Gini Index and poverty line. The results indicate the maintenance of income inequality among families, with a slight reduction in the first decade, in addition to the increase of the poor and extremaly poor in the recent period.

Keywords: poverty, distribution of income, RESEX Chico Mendes, Amazon Region

1. Introduction

Since the 1970s, through development policies implemented by the Military Government, Brazil undergoes profound social and economic transformations, including in the rural areas, through the process of conservative modernization. The process of modernizing agriculture was based on the introduction of capital in the form of heavy machinery, which left workers in the countryside without an occupation, resulting in immense changes in the rural environment, initially by subordination of agricultural activities to the dominant sectors of industry and financial capital and by the agricultural occupation by large companies from

government intervention (GRAZIANO NETO, 1982; MACIEL, 2003; WANDERLEY, 2014).

Modernization took place partially, primarily reaching the large landowners and in specific regions. It was necessary to expand the requirements for new techniques and machinery, since the agricultural activity would only promote an adequate economic return from production based on the scale model. Thus, small producers were marginalized and excluded from this policy, since they did not have a productive and economic structure to meet the demands (SILVA, 1999; DELGADO & BERGAMASCO, 2017).

In the process of conservative modernization the Amazon was also included from the development policies, which culminated in the expropriation of a considerable part of the traditional population, generating enormous social, economic and environmental impacts, since the process disrupted the extractive activity, but it was the economic base of the region, replacing by the practices considered "modern" of extensive cattle-raising of cut and logging (COSTA, 2000; MACIEL, 2007; SOUZA, 2008).

Faced with socio-economic and environmental problems, such as the expropriation of the traditional population and the deep deforestation in the region, which were triggered by the modernization process, the result was the great social and environmental movements that demanded, above all, an effective reform policy based on the precepts of sustainable development. Thus, in the 1970s, the first agrarian reform policies were promoted by the State in an attempt to mitigate the social and environmental damages caused by development policies (GUANZIROLI *et al* 2001; MACIEL, 2007).

Within this context, the Conservation Units (UC) emerge as a new model of environmental and land policy, so that the implementation took place based on strategic islands of conservation of indirect use and also with the objective of promoting the social and economic inclusion of traditional population that depend on forestry activities to guarantee their social maintenance (ALLEGRETTI, 1989, HALL, 1991).

To do so, in 1990, the first Extractive Reserves were created, consisting of a new modality of CUs, whose characteristics are areas used by traditional populations, with activities based on extractivism, subsistence agriculture and the rearing of small animals, aiming at the defense of livelihoods and the culture of these populations in a way that assures the sustainable use of the unit's natural resources (BRASIL, 2006).

In this sense, the research problem of the present work is: does only the implementation of RESEX Chico Mendes suffice for the economic viability and effective distribution of income among settled families?

We work with the hypothesis that the creation of RESEX Chico Mendes is fundamental for the maintenance of families in the region, but it is necessary, in addition to strengthening traditional activities, the development of sustainable productive alternatives for income generation and adequate occupation.

The objective of this study is to evaluate the relationship between income distribution and poverty of the families at the Chico Mendes RESEX in the last 20 years. Specifically, it seeks to identify which are the main products that generate income among the producers and to verify the evolution within a period of almost two decades, besides evaluating through the stratification of classes what the levels of poverty between the producers.

The importance of the present work is precisely to help both the community involved and the public managers to search for and implement policies that encourage adequate productive

alternatives for the generation of jobs and income among forest dwellers, with a view to eradicating poverty rural.

1.1 Developmental Units and Conservation Units in the Amazon

From the 1960s, Brazil underwent intense transformations resulting from the so-called process of conservative modernization. This process led to profound changes in the Brazilian rural environment, in view of two central dimensions: first, the subordination of agricultural activities to the dominant sectors of industry and financial capital; and the occupation of agricultural frontiers by large firms from government incentives (WANDERLEY, 2014).

According to Silva (1999), the modernization took place partially, affecting some products and in some specific regions, benefiting some producers and only some phases of the production cycle.

Thus, the demand for new techniques and machinery was increased, since agriculture would only provide an economic return to Brazil if its production happened in a scale regime, thereby marginalizing the so-called "small producers" or peasants (DELGADO & BERGAMASCO, 2017).

Moreover, "undermined by the lack of legal title to their possessions, peasants suffer the consequences of land concentration, which is the most apparent aspect of capital imposed by large agricultural enterprises" (ESTERCI, 1987 apud WANDERLEY, 2014, p. 5).

In this context, the recent transformations in the Brazilian Amazon can be classified, since, on the one hand, the traditional extractivism of the rubber entered again in decline, with the abandonment of the old rubber plantations and, on the other, with the process of development of the military government, looking for to leverage the economy of the region from large enterprises and the implantation of the "modern" agriculture (MACIEL, 2007).

This process has led to serious social and environmental problems, such as the disappearance of traditional populations and huge deforestation in the region, with effective environmental degradation, culminating in the emergence of various social and environmental movements. Thus, the struggle for land tenure and sustainable development is highlighted in the various forums on the theme (MACIEL, 2007).

With more attention being given to the Brazilian rural situation, the responsible agencies were concerned with the attempt to solve the land situation, especially in the Amazon. Conflicts over land have highlighted the hitherto unknown small producers:

> The milestones of these struggles in these periods are the Land Statute (Law no. 4.504, dated November 30, 1964) - promulgated during the first military government - and later the First National Plan for Agrarian Reform, which was launched in 1985. Progressively, the number of rural settlements has multiplied. The greatest number was implemented during the Fernando Henrique Cardoso government in the 1990s under the pressure of the struggle for land (WANDERLEY, 2014, p.29).

There is a need to rename and detail the profile of those hitherto marginalized by history, since "peasants" or "subsistence farmers" can embody a vision of economic and social backwardness. As a result, the nomenclature "family farming" emerged, characterized by being more neutral, since it is presented in a less depreciative way (WANDERLEY, 2014).

In the 1960s, with the realization of agrarian reform, family farmers were able to defend themselves against social disaster and had the opportunity to finally be able to compete in the market (GUANZIROLI *et al* 2001).

On the other hand, Conservation Units (CUs) were created from environmental policies, a result of a process contrary to the form of economic occupation of the Amazon through the developmentalism of the 1960s. Initially the implementation of the CUs was based on strategic islands of conservation of the biodiversity of indirect use. The Conservation Units were created together with the empirical awareness of rubber tappers and all those who rely on forest activities to survive in the Amazon (ALLEGRETTI, 1989; HALL, 1991).

Protected areas are essential for conservation. However, in addition to the management problems that the units face, there are struggles against the pressure on natural resources, since it is necessary to produce and conserve these localities (RYLANDS & BRANDON, 2005).

These areas present structured economic objectives in their creation. Some initiatives are shown how one can increase work and income fronts with the creation of new areas of environmental protection, which should be managed, having as principles the orderly use and respect to the support capacity of the environments (BRASIL, 2014).

The institutions responsible for public policy development have the challenge of overcoming the fundamental contradiction between the static nature of property rights and the economic dynamics of competition in markets, where RESEX intends to operate (GOESCHL & IGLORI, 2006).

In this sense, it is worth noting that some policies implemented by the Brazilian State aimed at the Amazon for the integration of this region into the country, resulted in great environmental degradation and low level of technological adoption. The expansion of livestock and soybean production in the Amazon culminated in the increase in deforestation rates, mainly due to the expansion of road networks. Therefore, Brazilian institutions still have enormous weaknesses in the elaboration and conduction of environmental policy strategies, especially in relation to extractive reserves (DIAS-FILHO & ANDRADE, 2006; SOARES-FILHO *et al*., 2006; FANTINI & CRISÓSTOMO, 2009; FREITAS *et al* 2017).

In essence, the insufficiency of policies compromises the development purposes of the RESEX areas. The families that live in the reserves are politically isolated, with little capacity to influence the planning of these areas, and are still disadvantaged in their subsistence income (SANTOS & BRANNSTROM, 2015).

The Extractive Reserves emerged as a new model of Conservation Unit, seeking to solve the land problems of the region and having as background the tripod of sustainable development - ecological prudence, social justice and economic viability (MACIEL, 2007; MACIEL *et al* 2014).

The Extractive Reserve was defined and characterized in Art. 18 of Law 9,985 of July 18, 2000, as:

> (...) an area used by traditional extractive populations, whose subsistence is based on extractivism and, in addition, on subsistence farming and small animal husbandry, and has as basic objectives to protect the livelihoods and culture of these populations, and to ensure the sustainable use of the unit's natural resources (BRASIL, 2006, p.8).

The exploration of RESEX resources follows protocols for better production conditions. Conservation Units should not refrain from making a clearer commitment to overcoming social deprivation or from actively participating in social policies undertaken at other institutional levels (LIMA, 2016).

Nevertheless, some authors do not agree with the creation of conservation units for direct use, such as RESEX, since, besides privileging a select group of producers, they do not necessarily coincide with the protection of biodiversity (BROWDER, 1992). Moreover, Homma (1993) states that there is no point in the creation of RESEX, because extractivism is doomed to failure, and is inherently technologically backward.

On the other hand, Maciel (2003) agrees that the traditional extractivism in the Amazon practically did not evolve technologically over time, but the technical delay is not inherent in the productive system extractivist.

RESEX Chico Mendes is part of a broad environmental policy for the Amazon, being at the same time an important land policy for the region, which is fundamental for forwarding the discussions around the struggle for land tenure. Thus, it is an institutionalized command and control policy to strengthen social justice among forest dwellers as well as to combat environmental degradation (MACIEL, 2003).

1.2 Income Inequality and Rural Poverty in the Amazon

Several studies related to the evolution of the income distribution and the labor market in Brazil show that economic growth occurred in any period was not accompanied by a significant improvement in income distribution (MATOS, 2005).

In the last decades, the data of income concentration in Brazil confirm that there is a strong trend of income inequality and high levels of poverty, showing an unequal country that inherited this historical condition of social injustice, which significantly excluded its population from access minimum conditions of dignity and citizenship (BARROS *et al* 2001).

According to Soares (2010), in the 2000s, Brazil surprised to experience significant reductions in the Gini index. The reason for this result is still much debated and, for this reason, several factors have been pointed out that conditioned this reduction, such as: Federal income transfer programs; changes in the educational profile of the employed population; the relevance of relative prices; changes in the demographic structure and in the labor market.

The distribution of income in Brazil showed a significant improvement in recent years, however, it is still considered very high when compared with developed countries (HOFFMANN, 2009).

According to Silva (2010), Brazilian society is extremely exclusionary from the economic and social point of view, constituting masses of self-employed or wage-earning workers with incomes much lower than those that condition them to a precarious life without social guarantee.

For Sen (2000), poverty should be seen as an element of deprivation of the basic capacities of the individual and directly affects the living conditions of the people, leaving them at levels locally defined as unwanted.

According to Soares (2009), poverty is characterized as one-dimensional or multidimensional. One-dimensional poverty is related to the deprivation of basic needs due to the low level of income. Thus, two parameters are considered: the indigence line and the poverty line. The first is tied to the minimum monetary value for the purchase of food that has the basic energy quantity or recommended for the survival of the individual. On the other hand, the second category includes food, clothing, education, housing, transportation and health, as well as access to the fundamental issues of society regarding the rights and obligations in the exercise of citizenship through analysis of cultural variables, social and political.

Multidimensional poverty presents three distinct aspects: intensity / severity, which refers to the measurement of poverty levels; time / duration, taking into account the temporal issue of poverty, especially its permanence; and dimensions / extensions, focusing their study on the various forms of deprivation in the life of an individual (OLIVEIRA, 2010).

Income concentration and social inequalities, problems directly linked to poverty, are also responsible for most economic, social and environmental problems in Brazil. In addition to the problems related to poverty, rural communities in the Amazon, the distance and difficulty of access, low participation or lack of access to basic social services make rural communities more vulnerable (SOUZA, 2008; COSTA, 2000).

In this context, Angelsen *et al*. (2014) found that environmental income is fundamental for low-income families, although in recent years this type of income is decreasing with respect to the composition of household incomes. In addition, poor families in rural areas depend heavily on subsistence products, basically those related to extractivism and also from agricultural sources.

Concerning the role of these transfers to small production, Homma *et al*. (2014) argues that these have been used as a survival strategy, exerting a significant participation in the financial stability of small producers. However, he warns that these resources do not stimulate the creation of productive opportunities.

Poverty and loss of biodiversity are two of the world's major challenges. The claims of the conservation contribution to poverty alleviation, however, remain controversial. The overall potential for biodiversity conservation to support poor communities is high: the top 25% of priority conservation areas can provide 56% to 57% of benefits, such as payments for environmental services. Aggregate benefits are valued at three times the estimated opportunity costs and exceed $ 1 per person per day for 331 million of the world's poorest people (TURNER *et al* 2012).

In order to do so, the Brazilian North region, which is covered mostly by the Amazon, is an economy characterized by many fragilities, among them, the low level of industrialization and technological innovation, deficit infrastructure and great difficulties to raise investments (NOGUEIRA & SILVA, 2015).

In addition, Costa (2000) states that income concentration and social inequalities are also responsible for a large part of Brazil's economic, social and environmental problems. Rural communities in the Amazon region, due to their distance and access difficulties, have low participation and / or lack of access to basic social services, making rural communities more vulnerable (SOUZA, 2008).

Thus, in the last years, the North and Northeast regions of Brazil became focus of the Federal Government's income transfer policies and presented significant results in the income distribution indices. However, in the Amazon it is fundamental to think of income distribution policies that will effectively generate regional development from the production, commercialization and consumption of regional products.

In the 1990s, the "family agriculture" category was adopted by the Federal Government in formulating the National Program for Strengthening Family Agriculture (Pronaf), whose activity was organized by and for the family. Pronaf would have been responsible for providing investment and costing loans to family farmers, and could thus empower and encourage this large part of the rural population (ABRAMOVAY, 1998; ABRAMOVAY & VEIGA, 1999; MATTEI, 2005).

Thus, as the poverty condition is not limited to the reduced availability of monetary income, expressed in the dollar or real per day, the overcoming of poverty is not exhausted in the simple distribution of credit to the poorest. Access to credit should be embedded in a broader and more comprehensive policy that considers the individual or family receiving it not only as poor but as a farmer who, if properly supported, has the potential to ensure, in a better survival of their family and participate in the production of the wealth of their local community. The support in question concerns access to all productive resources and the goods and services necessary not only for the reproduction of a quality of life considered socially satisfactory, for the construction of the "patrimony of the poor" (HELFAND PEREIRA, 2012).

It should be remembered that the Chico Mendes Reserve, despite having its limitations, can count on policies to strengthen extractive production, plus the mapping of land squatters, which may provide some land decentralization, followed by a better distribution of income, when compared to years as well as the periods of "rubber outbreaks" (MACIEL *et al.*, 2014).

2. Methodology

2.1 Characterization of the Object of Study

The present study was carried out in the Chico Mendes Extractivist Reserve, located in the southeastern region of the State of Acre, created on March 12, 1990, by Decree No. 99,114, the region has about 970,570 ha (hectares), covering the municipalities of Rio Branco, Xapuri, Epitaciol ândia, Brasil éa, Assis Brasil, Sena Madureira and Capixaba. By land, access can be made by highway BR 317, which contours RESEX on its east-south side and has traffic throughout the year. And by river, through the Xapuri River and its tributaries, or by the Rio Iaco and Rio Macau ã in the municipality of Sena Madureira - except in periods of drought due to the low water level (BRASIL, 2006). Currently, about 2,000 families live within RESEX.

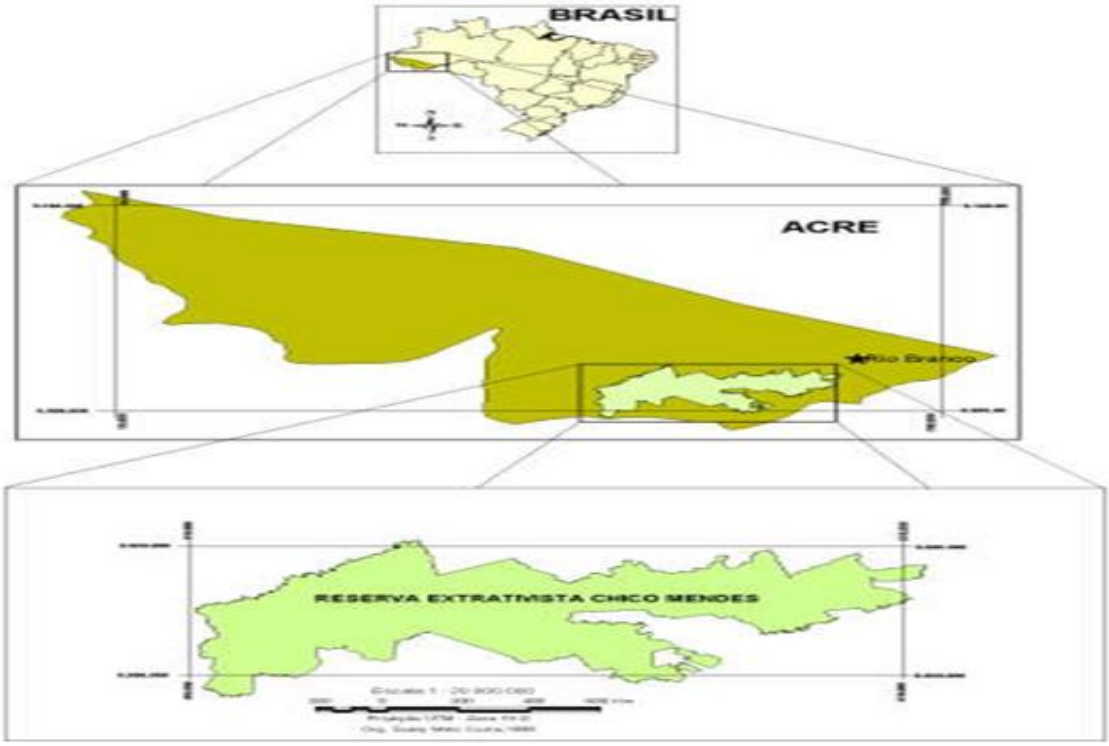

Figure 1. Positioning of the Chico Mendes RESEX in Brazil and Acre

Source: Laboratory of Environmental Analysis and Planning apud Costa (2008: 26).

2.2 Material and Methods

The surveys are carried out by sampling. The sample was defined from three stages:

- Stratification of the area according to level of development (high, medium or low), with reference to criteria related to production volumes, ease and quality of access, availability of infrastructure and technical assistance, and the degree of community organization;
- Draw of half of the conglomerates in the study areas - the rubber plantations, in view of the representativeness within each defined stratum;
- Finally, within each conglomerate, a simple random sampling was carried out, with 10% of the production units being the object of this study, and 69 extractivist sites were surveyed.

This work has information on the results obtained from field research in the 1996/1997, 2006/2007 and 2014/2015 periods at the Chico Mendes RESEX for the research project "Socioeconomic Analysis of Rural Family Production Systems in the State of Acre" (ASPF[1]), which has been developed for more than 20 years, currently headed by the Center for Juridical and Applied Social Sciences (CCJSA), Federal University of Acre (UFAC).

In the ASPF project, several indicators were constructed for the economic evaluation of rural family production in Acre, ranging from traditional to indicators that only apply to rural family production. The main economic indicators used in the current research are briefly described below:

a) Self-consumption (AC)

$$AC = \sum Qbcpi * Pini = 1$$

Being:

AC = self consumption

Qbcp = quantity of self-produced good produced

pi = unit price of the self-produced good

i = items of self-produced goods produced (v = 1, 2, ..., n)

b) Gross Profit (RB)

The gross result is basically the value of the production destined to the market, obtained by the following formula:

$$RBQv.pp$$

Being:

RB Gross Income (%)

$Q_m = q_v . q_s$

Q_m = quantity of the product intended for the market.

1 The ASPF project develops socioeconomic research in the area of rural family production in the Acre region since 1996, resulting in several publications on the subject. For more information see: http://aspf.wordpress.com/

q_v = quantity of product sold

q_e = quantity of the product of the exercise in stock

P_p = unit price to producer

c) Total Gross Income (RBT)

Sum of gross income (RB) of production with income derived from income transfers (school scholarship, family etc.) and of the salary outside the Family Productive Unit (UPF). The RBT is calculated for the UPF and the family members.

$$RBT = RB + RT + RA \quad (2)$$

Being:

RB = gross income

RT = income from monetary transfers (municipal, state and federal)

RA = wage income outside UPF

d) Gross Family Margin (MBF)

Gross family allowance (MBF) is the specific net income to indicate the monetary value available for the subsistence of the family, including a possible increase in the standard of living, if the amount is sufficient.

$$MBFRB - (CV - Cftf)$$

Being:

RB = Gross Income;

CV = variable costs

$Cftf$ = actual cost of the family workforce

The value of the $MBF/Q_h\ /d$ to compare with the opportunity cost, which in this work is the value of a daily wage paid in the region.

$MBF/Q_h\ /d$ = index of remuneration of family labor;

d = number of working days.

e) Level of Life (NV)

The Standard of Living (NV) is the total of the value appropriated by the family producer, including imputed amounts, less the financial obligations with loans. The standard of living is calculated by:

$$NV(MBFACCjicc)AA$$

Being:

AC Personal consumption.

C_{jicc} = interest charged to working capital.

AA = annual repayments of loans

f) Value of Consumer Goods Purchased in the Market (VBCC)

The Value of Consumer Goods Purchased in the Market (VBCC) is an indicator that measures the quantity in amounts in Reais bought by the farmer family, the formula is given by:

$$V_{bcc} = \sum_{u=1}^{n} (Q_{bcc})u.p_u$$

Being:

V_{bcc} = value of purchased consumer goods and services

Q_{bcc} = quantity of consumer goods and services purchased or

p_u = unit price of a good and / or purchased consumer service

u = items of consumer goods and services (u = 1, 2,..., n).

g) Economic Efficiency Index (IEE)

It is the indicator of benefit / cost. It is defined by the following formula:

$$IEE = RB/CT$$

Being:

RB = Gross Income;

CT = Total Costs.

- IEE> 1, the situation is for profit.
- IEE <1, the situation is loss.
- IEE = 1, the situation is equilibrium.

h) Gini Index

The Gini Index is a measure of concentration or inequality used in the analysis of income distribution and can be used to measure the degree of concentration of any statistical distribution. Thus, this methodology will analyze these issues in the present work. This index works as follows: how much equal to 0 corresponds to absolute equality and when equal to 1 corresponds to absolute inequality, so the closer the index gets to 1 the worse the income distribution will be.

i) Reason 10% + / 50% - or Reason for Kuznets

Created by Simon Kuznets (1955), it expresses the geometric form of the relationship between growth and inequality. In short, it is a way of measuring the inequality that exists in the distribution of income of the richest individuals with the income of the poorest individuals. It compares the income of 10% of the richest individuals relative to the income of 50% of the poorest individuals. It should be noted that the greater the ratio, the greater the distance between incomes between the richest and the poorest.

j) Poverty Line

Most studies on the problem of indigence and / or poverty define the monetary value of ½ minimum wage and calculate the number of households whose income is less than this line. The indigence line refers to the minimum income required to purchase a food basket with minimum or recommended energy amounts. The poverty line is above the indigence line, as

they include, in addition to the value of the food basket, all other non-food expenses, such as clothing, housing, transportation, etc. (CAMPOS & CAMPOS, 2008).

Among the methods that define the line of indigence or poverty defined by income, those that use the proportion of the minimum wage stand out. This method is widely used, because in theory, the minimum wage should meet the basic needs, not only of food, but also of housing, clothing, etc. The values commonly used as poverty line are ½ minimum wage and ¼ for poverty line.

According to data collected by the ASPF project carried out between 1996/1997, 2005/2006 and 2014/2015, the income of the producers of RESF Chico Mendes UPF was divided into five social classes according to the minimum wage class A of two to four minimum wages, class C of ½ to two minimum wages, class D who earn up to ½ minimum wage and put class E, families with incomes less than ¼ of minimum wage.

Table 1. Classification of the income range, values according to the minimum wage.

Class	Income Streams (SM)
A	NV> 4 MW / month;
B	2 SM / month <NV <4 SM / month;
C	1/2 SM / month <NV <2 SM / month;
D - Poverty	1/4 SM / month <NV <1/2 SM / month;
E - Extreme Poverty	NV <1/4 SM / month;

Source: ASPF (2018).

k) Restatement

In order to carry out the price update, the National Consumer Price Index (INPC), prepared by the Brazilian Institute of Geography and Statistics (IBGE), was used. Thus, the current values (in Reais) were collected in the periods 1996/1997, 2005/2006 and 2014/2015, with the values updated for July 2018.

2.3 The Distribution of Income and Poverty in RESEX Chico Mendes: Considerations over Two Decades

The research developed over the last two decades by the ASPF Project allows us to identify the economic, social and environmental changes that occurred within the Acre region, in particular in the Chico Mendes RESEX. From the economic point of view, according to Table 2, in the periods studied, there was a reversal in the generation of gross income, between 1996/1997 and 2005/2006, according to the productive activities performed by RESEX Chico Mendes families, since agricultural activities and animal husbandry, which had the greatest participation in the composition of the gross income of the families, at the beginning of the studies, presented a greater reduction, with the resumption of the protagonism of extractivist activities, notably rubber and chestnut, in the recent period.

Table 2. Evolution of income generation among Chico Mendes RESEX family production units - Acre - 1996/1997, 2005/2006 and 2014/2015

Exploration Line	Gross Income (%)			Evolution A – B	Evolution A – C	Evolution B – C
	1996/1997 – A	2005/2006 – B	2014/2015 – C			
Agriculture	***34.07%***	***24.71%***	***29.95%***	***-27.47%***	***-12.07%***	***21.23%***
Manioc	10.31%	10.56%	12.69%	2.43%	23.09%	20.17%
Rice	7.35%	7.32%	4.09%	-0.41%	-44.36%	-44.13%
Beans	6.76%	1.78%	4.70%	-73.74%	-30.55%	164.42%
Coffee	0.02%	0.78%	2.14%	4,313.15%	12,033.40%	174.94%
Watermelon	6.56%	0.96%	2.02%	-85.36%	-69.26%	110.00%
Corn	1.86%	1.03%	1.27%	-44.96%	-31.96%	23.62%
Banana	0.12%	1.13%	2.32%	805.67%	1761.56%	105.54%
Others	1.09%	1.16%	0.74%	7.22%	-32.18%	-36.75%
Livestock	***37.31%***	***30.17%***	***29.04%***	***-19.15%***	***-22.17%***	***-3.74%***
Ox breeding	11.12%	17.47%	15.85%	57.10%	42.58%	-9.24%
Bird breeding	11.96%	5.20%	6.18%	-56.53%	-48.33%	18.86%
Pig breeding	11.02%	6.03%	4.73%	-45.29%	-57.12%	-21.62%
Sheep breeding	1.83%	0.81%	1.68%	-55.81%	-8.11%	107.96%
Others	1.38%	0.66%	0.49%	-52.02%	-64.54%	-26.10%
Extractivism	***28.62%***	***45.12%***	***41.01%***	***57.65%***	***43.27%***	***-9,12%***
Cashew Nuts	15.22%	27.12%	27.47%	78.22%	80.51%	1.29%
Rubber	13.40%	9.51%	12.14%	-29.07%	-9.41%	27.72%
Certified Cashew Nuts	0.00%	4.32%	1.18%	0.00%	0.00%	-72.65%
Wood	0.00%	4.17%	0.11%	0.00%	0.00%	-97.48%
Others	0.00%	0.00%	0.11%	0.00%	5,852.94%	0.00%

Source: ASPF (2018).

Regarding agricultural activities, there was a reduction in the share of gross income in the first decade studied, due to the structural and productive difficulties encountered by the families at that time, such as the increase in production costs, the low level of technology employed and lack of infrastructures of branches for the flow of production. In the last decade, there is a considerable increase in the participation of this activity in the generation of gross income, leveraged mainly by the macaxeira, coffee and banana.

Still in Table 2, there is a reduction in the share of total gross income generation, specifically of creations of lower commercial value, such as poultry, sheep and pigs, basically used as a complement to income and self-consumption of families. Cattle breeding in the first decade showed a strong advance in the composition of gross income, which was worrying, considering that it is an activity totally incompatible with the guiding precepts of Extractive Reserves. However, when evaluating the evolution in the recent period, it is perceived that income generation from this activity has reached the limit, since the restrictions imposed by the management of RESEX prevent the progress of deforestation and the opening of new pasture areas.

As far as extractive production is concerned, it can be seen that this type of activity has been maintained as a protagonist of the income generation in the Chico Mendes RESEX, following the idealized model of the use of natural resources in a sustainable way, mainly the extraction of Brazil nuts -Brazil and rubber. However, they are activities that can not advance in the generation of income. Thus, diversification of production is essential for rural family production and acts as a precautionary mechanism, especially when "flagship" products are undervalued.

In the last decade, it is noticed that the rubber and mainly the chestnut reached the limit of production, needing innovations. For the extraction of latex, for example, there were several public policies implemented with the objective of making their production viable, such as the subsidy through the Chico Mendes Law[2], as well as the installation of a male condoms factory with public resources. However, the project has several political, institutional and economic problems that directly affect the viability of the extraction and sale of latex in the region.

Brazil nuts, for their part, face enormous difficulties in rationalizing production. The price of this product has been showing high appreciation, given the insufficient increase in supply. The main innovation adopted in this type of production comes from good production practices and processing. However, innovations previously implemented, such as certification, have been abandoned, expressing the sharp decline in the last decade, but an important path to be taken to generate sustainable income (Table 2). The organization of the production chain and the regulation of the market becomes fundamental for the strengthening of this sector in the region, in particular the valorization of Brazil nuts in the recent period.

The evolution of economic performance within productive households of the Chico Mendes RESEX reflects the productive and income generation difficulties in the last two decades, according to Table 3. It is observed that the median gross income earned by families was lower than the current minimum wage (R $ 954.00) in all periods studied, in addition to the 14% reduction in this indicator in the last decade. This means that families are likely to resort

2 State Law no. 1,277 / 99, which provides for the transfer of a state subsidy for each kg of rubber marketed in the State of Acre, remunerating the environmental services rendered by the extractive community.

to other types of income outside the productive units, such as salaried and government transfers, mainly pensions and family grants, for their maintenance.

In terms of economic efficiency, it can be clearly seen the loss of the productive activity, in average terms, per unit of production over the two decades analyzed, according to the Economic Efficiency Index (Table 3). Combined with the production and marketing difficulties of production, this means that revenues are not accompanied by rising production costs, nor on an adequate scale.

Table 3. Evolution of the economic performance of the productive units of the Chico Mendes RESEX - Acre - 1996/1997, 2005/2006 and 2014/2015

Economic Indicators	Unit	1996/1997 (A)	2005/2006 (B)	2014/2015 (C)	Evolution A – B	Evolution A – C	Evolution B – C
RB	R$/month	460,11	661,41	568,95	44%	24%	-14%
GFM	R$/month	412,52	600,95	468,61	46%	14%	-22%
VBCC	R$/month	211,21	713,62	732,73	238%	247%	3%
LDM	R$/month	417,33	1418,35	1601,77	240%	284%	13%
AC	R$/month	1307,18	672,78	436,51	-49%	-67%	-35%
NV	R$/month	1699,26	1394,95	733,75	-18%	-57%	-47%
IEE	un.	1,37	0,74	0,67	-46%	-51%	-10%
TI	un.	0,39	0,63	0,95	62%	143%	50%

Note: Median results by Family Production Unit (UPF). Monetary adjustment up to July 2018. GI - Gross Income; GFM - Gross Family Margin; MDL - Market Dependency Line; SC - Self-consumption; SL - Standard of Living; EEI - Economic Efficiency Index

Source: ASPF (2018).

Moreover, Table 3 shows that a worrying situation identified among households was the worrying rise in the market dependency, increasing by almost 250% in the first decade and consolidating in the recent period. This expense in the market represents more than three times the monetary value pocketed by the extractivists, represented by gross family income, which results in possible external indebtedness. In addition, low incomes combined with increased market dependence directly affect one of the strengths and characteristics of rural family production, which is production for self-consumption, with a significant reduction of 67% in 20 years.

Self-consumption directly affects households' living standards in monetary terms, since this indicator accounts for non-monetary values, such as self-consumption, to determine the reality of the living standards of rural households. It can also be seen in Table 3 that, with self-consumption strengthened, as observed in the first period, the standard of living of families came to represent almost two monthly minimum wages. On the other hand, the reduction of the self-consumption reflects in the reduction of the standard of living, which showed a high weakening in the last two decades, reducing to 57%.

Regarding the distribution of income, Table 4 presents some key indicators to know how this process is occurring in the last 20 years. From the Gini index, there is a superficial reduction in the level of income inequality among RESEX Chico Mendes families. In the first decade, there was a small reduction of 8%, mainly due to the strengthening of extractive activities that were encouraged through the implementation of some public policies. However, in the recent period, it was observed that the level of inequality practically returned to the initial levels of the first survey, indicating a Gini of 0.48, probably due to the limitation of the production of the main extractive products that urgently need technological innovations for the promotion of sustainable productive alternatives.

Figure 2 shows the great inequality of appropriate gross income (MBF) by families in the study region. It is worth noting the exorbitant difference between producers who earn income from R $ 28.15 to R $ 8,923.19 per month, the median gross family margin around R $ 567.47 / month. This means that half of the families have incomes below this value, which corresponds to only 59% of the minimum wage in force in 2018.

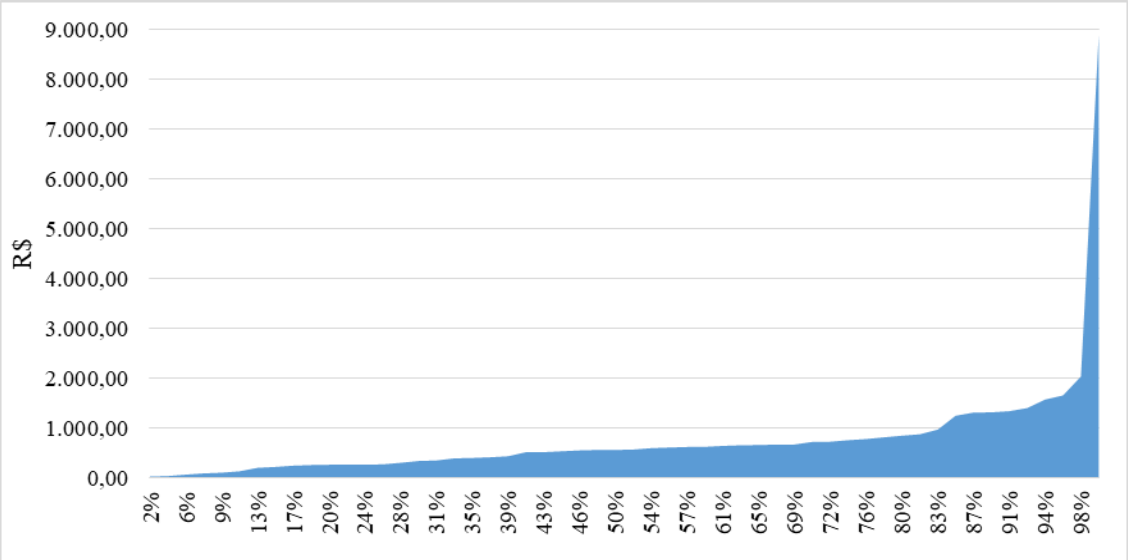

Figure 2. Income distribution among RESF Chico Mendes UPFs - 2014/2015

Source: ASPF (2018).

According to Table 4, the percentile of the 10% richest producers points to a reduction of around 85% in the last 20 years, seeming even contradictory with the Gini index, which deserves more detailed studies. However, the reduction of the poorest 50% percentile may also indicate concentration / readjustment in other income strata / percentiles, as well as the spread of lower incomes and, therefore, more poverty and misery among the families studied, which can be glimpsed by the stratification of families.

Table 4. Indicators of income inequality - Chico Mendes RESEX - Acre - 1996/1997, 2005/2006 and 2014/2015

Indicators	1996/1997 (A)	2005/2006 (B)	2014/2015 (C)	Variation A - B	Variation A - C
Gini	0,49	0,45	0,48	-8%	-1.42%
% income 10% +	25%	16%	4%	-36%	-85.70%
% income 50% -	25%	31%	22%	24%	-13.66%
Ratio between 10%+ / 50% -	1	0,51	0,17	-49%	-83.44%

Source: ASPF (2018).

Figure 3 shows the distribution of income among RESEX Chico Mendes families, based on the poverty level (D) and extreme poverty (E) terms. It should be noted that in the first decade, the survey conducted in the two periods did not identify the presence of families in the extreme poverty range in the study region. However, the third period survey (2014/2015) found that 9% of families are in extreme poverty. On the other hand, in the other extreme stratum, class A, there was an evolution of 35% in the last two decades, corroborating the results of the return of the Gini index to the levels of 1996/1997.

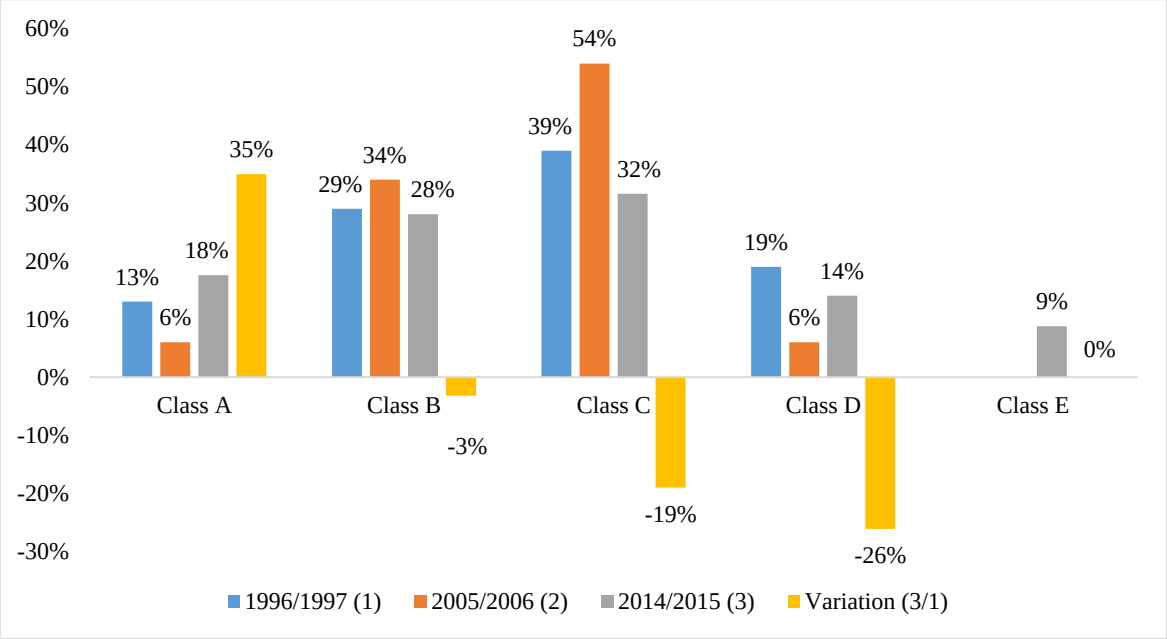

Figure 3. Stratification of RESEX Chico Mendes families by income (Living Standard), according to the poverty line, 1996/1997, 2005/2006 and 2013/2014

Source: ASPF (2018).

The results identified for the Gini index found that, between the periods 1996/1997 and 2005/2006, considerable progress was made in the conduct of public policies for the distribution of income, as well as in the process of alleviating poverty within the Chico Mendes RESEX. However, in the third period studied (2014/2015), it can be seen that the public policies implemented to improve income distribution and poverty eradication have

reached the limit and probably there have been no significant changes and adjustments to ensure effectiveness once that it was observed that the level of concentration of income presented a level similar to the first survey, besides significant changes in the intermediate classes and the appearance of miserable ones.

Thus, it is essential to advance studies on the generation and distribution of income and poverty among forest communities, so that they seek to assist in the conduct and implementation of appropriate policies to encourage sustainable productive alternatives that are in line with with the precepts of sustainable development and proposals for the implementation of Extractive Reserves.

3. Conclusion

The surveys carried out by the ASPF Project within the Chico Mendes Extractive Reserve allowed us to identify the main features and economic changes that occurred in an interval of approximately two decades, mainly regarding aspects of production, income distribution and poverty.

The present study aimed to identify the form of income distribution and poverty in the Chico Mendes RESEX, considering the periods 1996/1997, 2005/2006 and 2014/2015, as well as to evaluate the economic performance of the settled families and the main productive changes occurred in the period.

A first evaluation regarding the generation of gross income has identified a specialization in some extractive products, especially due to policies to encourage production, such as rubber, with the subsidy of the Chico Mendes Law and the establishment of a factory of male condoms in the municipality of Xapuri-AC, which uses as the main raw material the latex extracted in the region. However, it was observed that extractive products probably reached their limit on income generation, especially due to the difficulties of implementing technological innovations, notably for rubber and Brazil nuts, in particular related to productive rationalization and organization and regulation of markets.

The productive, technological and even institutional difficulties showed that they directly affect the economic performance of families. There was a marked reduction in the gross income earned by the population, even lower than the current minimum wage (R$ 954.00). Allied to this process, there was a strong reduction of self-consumption, which is one of the essential characteristics and strengths of rural family production, directly affecting the living standards of families and worrying greater dependence on the acquisition of consumer goods in the market.

The results showed that there was an increase in Gross Income (24%) and Gross Margin (14%), which, however, represented just over half of the current monthly minimum wage. They also reveal that, more and more, the income of the families of the Chico Mendes Extractive Reserve is being used to purchase goods in the market, given that there was a 247% increase in the VBCC, accompanied by a decrease in percentage terms, of self-consumption (-67%) and a reduction of 57% in the standard of living of households.

Regarding the distribution of income and poverty, the Gini index pointed out that there was a limitation in the policies implemented, since twenty years after the first survey the index returned to the initial levels. In addition, the stratification of income groups clearly showed the need for public policies that are decisive for the eradication of poverty, since in the first two periods there was no evidence of the presence of families living in extreme poverty, which was observed in the recent period.

Specifically at poverty levels, it was identified that there was a reduction of the families that are in classes B, C and D. The families are still mostly belonging to classes C and B, respectively. Although there has been a significant increase of 35% in families belonging to class A, the emergence of families of class E, that is, families that are in extreme poverty.

Still, according to the results, it can be seen that more than half of the families living in RESEX Chico Mendes live below the minimum wage and, even more worrisome, about 15% of these families are below the poverty line.

Therefore, the scenario found within the Chico Mendes Extractive Reserve promotes the formulation of specific public policies focused on the incentive and strengthening of rural production and income, through access to technologies and the sustainable exploitation of natural resources, so that guarantee the social reproduction of families in the forest.

References

Abramovay, R. (1998). Bases para formulação da política brasileira de desenvolvimento rural: agricultura familiar e desenvolvimento territorial. Brasília-DF, IPEA, Relatório final.

Abramovay, R., & Veiga, J. E. da. N. (1999). Instituições para o desenvolvimento rural: o caso do Programa Nacional de Fortalecimento da Agricultura Familiar (PRONAF). Brasília, IPEA,. 41 p. (Texto para Discussão, 641).

Allegretti, M. (1989). Reservas Extrativistas: uma proposta de desenvolvimento para a floresta Amazônica. Fundação SEADE, *São Paulo, 3*(4), 23-29.

Angelsen, A., Angelsen, A., Jagger, P., Babigumira, R., Belcher, B., Hogarth, N. J., & Wunder, S. (2014). Environmental Income and Rural Livelihoods: A Global-Comparative Analysis. *World Development, 64*, 12-28. https://doi.org/10.1016/j.worlddev.2014.03.006

ASPF - Análise Socioeconômica de Sistemas Básicos de Produção Familiar Rural no Estado Acre. 2018. Disponível em: <http://aspf.wordpress.com>. (Projeto de Pesquisa do Centro de Ciências Jurídicas e Sociais Aplicadas da UFAC).

Barros, R. P., Henriques, R., & Mendonça, R. (2001). A estabilidade inaceitável: desigualdade e pobreza no Brasil. Rio de Janeiro: IPEA.

BRASIL. (2006). Ministério do Meio Ambiente. Plano de Manejo Reserva Extrativista Chico Mendes. Xapuri-AC, 91. Disponível em: http://www.icmbio.gov.br/portal/images/stories/imgs-unidades-coservacao/resex_chico_mendes.pdf

BRASIL. (2014). Guia alimentar para a população brasileira. Ministério da Saúde, Secretaria de Atenção à Saúde, Departamento de Atenção Básica. – 2. ed. – Brasília: Ministério da Saúde, 156 p.

Browder, J. O. (1992). The limits of extractivism: Tropical forest strategies beyond extractive reserves. *BioScience, 42*(3), 174-182. https://doi.org/10.2307/1311822

Campos, R. T., & Campos, K. C. (2008). Análise das medidas de renda, distribuição e pobreza dos Municípios da área de influência da Barragem Castanhão Ceará. Rio Branco: 46º Congresso da Sociedade Brasileira de Economia, Administração e Sociologia Rural (SOBER) Julho 20-23.

Costa, J. A. da. (2008). Pagamento pelos serviços ambientais na Reserva Extrativista Chico Mendes. Monografia para obtenção do título bacharel em Economia, Universidade Federal do Acre, UFAC, 55p.

Costa, S. S. M. (2000). Caracterização Ambiental da Reserva Extrativista Chico Mendes (Acre-Brasil): Subsídios ao Plano de Manejo. Florianópolis: UFSC,. Tese (Doutorado em Ciências).

Delgado, G. C. (1985). Capital financeiro e agricultura no Brasil: 19651985. São Paulo, Ícone,. (América Latina)

Delgado, G. C., & Bergamasco, S. M. P. P. (orgs.) (2017). Agricultura familiar brasileira: desafios e perspectivas de futuro. Brasília: Ministério do Desenvolvimento Agrário.

Dias-Filho, M., & Andrade, C. (2006). Pastagens no Trópico Úmido. Belém: Embrapa Amazônia Oriental, 255 p.

Esterci, N. (1987). Conflito no Araguaia: peões e posseiros contra a grande empresa. Petrópolis: Vozes, p.5, costa.

Fantini, C. A., & Crisóstomo, C. F. (2009). Conflitos de interesses em torno da exploração madeireira na Reserva Extrativista Chico Mendes, Acre, Brasil. *Boletim do Museu Paraense Emílio Goeldi, Belém, 4*(2), 1-17. https://doi.org/10.1590/S1981-81222009000200002

Freitas, J. S., Mathis, A., Farias filho, M. C., Homma, A. K. O., & Silva, D. C. C. (2017). Reservas extrativistas na Amazônia: modelo de conservação ambiental e desenvolvimento social? *Revista GEOgraphia, Niterói, 19*(40), 150-160. https://doi.org/10.22409/geographia.v19i40.1020

Goeschl, T., & Igliori, D. C. (2006). Property Rights for Biodiversity Conservation and Development: extractive reserves in the Brazilian Amazon. *Development and Change, Malden, 37*(2), 427-451. https://doi.org/10.1111/j.0012-155X.2006.00484.x

Graziano, N. F. (1982). Questão Agrária e Ecologia: Crítica da moderna agricultura. Rio de Janeiro: Brasiliense.

Guanziroli, C. E. et al. (2001). Agricultura Familiar e Reforma Agrária no Século XXI. Rio de Janeiro: Garamond.

Hall, A. (1991). Amazônia: desenvolvimento para quem? Desmatamento e Conflito Social no Programa Grande Carajás (PGC). Rio de Janeiro: Zahar. 300 p.

Hassler, M. L. (2005). A importância das unidades de conservação no Brasil. *Revista Sociedade & natureza, Uberlândia, 17*(33), 79-89.

Helfand, S., & Pereira, V. (2012). Determinantes da Pobreza Rural e Implicações para as Políticas Públicas no Brasil. pp.121-159. In: BUAINAIN, A. M. et.al. A nova cara da pobreza rural: desafios para as políticas públicas. Brasília: *IICA,. (Série desenvolvimento rural sustentável, 16*, 540.

Hoffmann, R. (2009). Desigualdade da distribuição da renda no Brasil: a contribuição de aposentadorias e pensões e de outras parcelas do rendimento domiciliar per capita. *Revista Economia e Sociedade, Campinas, 18*(1), 213-231. https://doi.org/10.1590/S0104-06182009000100007

Homma, A. K. O. (1993). Extrativismo vegetal na Amazônia: Limites e oportunidades. Brasília: EMBRAPA-SPI, 202 p.

Homma, A. K. O., Menezes, A. J. E. A. D., & Moraes, A. J. G. de. (2014). Dinâmica econômica, tecnologia e pequena produção: o caso da Amazônia. In: BUAINAIN, A. M.; ALVES, E.; SILVEIRA, J. M.; NAVARRO, Z. (editores técnicos). O mundo rural no Brasil

do século 21: a formação de um novo padrão agrário e agrícola – Brasília, DF: Embrapa, 979-1010.

Lima, D. M., & Peralta, N. (2016). Programas de transferência de renda em duas Unidades de Conservação na Amazônia brasileira e Sustentabilidade. *Novos Cadernos NAEA, 19*(2), 43-67. https://doi.org/10.5801/ncn.v19i2.2379

Maciel, R. C. G. (2003). Ilhas de alta produtividade: inovação essencial para a manutenção dos seringueiros nas reservas extrativistas. Campinas, Instituto de Economia/UNICAMP, 98 p. (Dissertação de Mestrado).

Maciel, R. C. G. (2007). Certificação ambiental: uma estratégia para conservação da floresta amazônica. Campinas, Instituto de Economia/UNICAMP, 195. (Tese de Doutorado).

Maciel, R. C. G., Cavalcante, F. P. G., & Souza, E. F. (2014). Distribuição de Renda e Pobreza na Floresta Amazônica: Um Estudo a partir da Reserva Extrativista (RESEX) Chico Mendes. *Revista de Estudos Sociais, Cuiabá, 32*(16), 136-153. https://doi.org/10.19093/res.v16i32.1946

Matos, J. D. (2005). Distribuição de renda: fatores condicionantes e comparação entre as regiões metropolitanas pesquisadas pela PED. Porto Alegre: FEE, 57p. (Documentos FEE; n. 62)

Mattei, L. (2005). Impactos do PRONAF: análise de indicadores. Brasília, NEAD/MDA. (Estudos NEAD, 11).

Nogueira, H. A. S., & Silva, R. G. (2015.). Análise espacial da desigualdade econômica na Região Norte do Brasil: um estudo das microrregiões. *Revista de Estudos Sociais, Mato Grasso, 33*(17), 28. https://doi.org/10.19093/res.v17i33.2234

Oliveira, Leonardo Santos de. (2010). Três Ensaios sobre Pobreza Multidimensional. Rio de Janeiro, 2010. 123 p. Tese (Doutorado em Economia) – Programa de Doutorado em Economia, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

Rylands, A. B., & Brandon, K. (2005). Brazilian Protected Areas. *Conservation Biology, Washington, 19*(3), 612-618. https://doi.org/10.1111/j.1523-1739.2005.00711.x

Santos, N. A., & Brannstrom, C. (2015). Livelihood Strategies in a Marine Extractive Reserve: implications for conservation interventions. *Marine Policy, Cardiff, 59*, 45-52. https://doi.org/10.1016/j.marpol.2015.05.004

Sen, A. (2000). Desenvolvimento como Liberdade. São Paulo: Companhia das Letras.

Silva, J. G. (1999). Tecnologia e agricultura familiar. Porto Alegre: UFRGS,. 239 p.

Silva, M. O. S. (2010). Pobreza, desigualdade e políticas públicas: caracterizando e problematizando a realidade brasileira. Revista Katálysis, *Florianópolis, Ensaio, 13*(2), 155-163. https://doi.org/10.1590/S1414-49802010000200002

Soares, S. S. D. (2009). Metodologias para estabelecer a linha de pobreza: objetivas, subjetivas, relativas, multidimensionais. Rio de Janeiro, 50 p.

Soares, S. S. D. (2010). O ritmo na queda da desigualdade no Brasil é aceitável? Revista de Economia Política, *São Paulo, 30*(3), 364-380. Julho Setembro/. https://doi.org/10.1590/S0101-31572010000300001

Soares-Filho, B. S., Nepstad, D. C., Curran, L. M., Cerqueira, G. C., Garcia, R. A., Ramos, C. A., ... Schlesinger, P. (2006). Modelling Conservation in the Amazon Basin. *Nature, London, 440*(23), 520-523. https://doi.org/10.1038/nature04389

Souza, E. F. de. Os Polos (2008). Agroflorestais como Pol ítica de Desenvolvimento Rural Sustent ável em Rio Branco no Acre: da proposi ção à realidade. Vi çosa: DED/UFV, 2008. 180p. Disserta ção (Mestrado em Economia Dom éstica) – Universidade Federal de Vi çosa.

Turner, Will R., Brandon, K., Brooks, T. M., Gascon, C., Gibbs, H. K., Lawrence, K. S., … Selig, E. R. (2012). Global Biodiversity Conservation and the Alleviation of Poverty, *BioScience*, *62*(1), 85-92. https://doi.org/10.1525/bio.2012.62.1.13

Wanderley, M. N. B. (2014). O Campesinato Brasileiro: uma hist ória de resist ência. *Revista de Economia e Sociologia Rural, Piracicaba –SP*, *52*(1), 25-44. https://doi.org/10.1590/S0103-20032014000600002