

Local Productive Arrangement of Non-Wood Forest Products in Paraná Coast, Brazil, Between Ascension and Decline

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Abstract

The Paraná Coast since the 1970s had a strong relationship with NWFP (non-wood forest products) extraction with commercial purposes, and from this activity survived more than 1,500 families in the region during the period of highest ascension of the activity. From the 90's began the decline of activity and the exodus of families to large urban centers. In this perspective, this study aimed to present a current diagnosis of NWFP extractivism, identifying the main implications of the activity for families that the NWFP is the main income source. Thus, descriptive exploratory research was carried out, and in the total were identified 127 families, and from this total, representatives from 14 families participated in the elaboration of a DRP - Participative Rural Diagnosis between June and November of 2017. The species of greatest commercial value reported by the interviewees were orchids, bromeliads, ferns and several medicinal herbs. The study concluded that from the 127 families identified, 75 dropped out the activity and joined to the rural exodus which reached levels of reduction of 60% of people who lived in the communities in just two decades. The main factors in the external context that contributed to the decline of NWFP APL in Paraná Coast were: lack of legislation on sustainable extractivism (n=20.02%), low government support for cultivation introduction (n=16.73%), lack of credit lines that could be accessed by communities (n=11.44%). The main factors in the internal context that contributed to the productive arrangement decline were: lack of crops legalization (n=30.01%), lack of agronomic knowledge about the species with the greatest productive potential (N=9.01%), strong dependence on few middlemen (n=8.99%). The scenario results in a perverse cycle where the communities, because they are impoverished and have low capacity for organization, were invisible to the public power, and because they were invisible to the public power they were still impoverished. It was concluded that the combination of negative factors simultaneously led to a strong rural exodus, and it is urgent that debates be raised on the possible ways in which impoverished rural communities can organize themselves and collectively strengthen their actions, obtaining greater bargaining power with the several levels of public power in order to promote rural development.

Key words: extractivism, atlantic rainforest, sustainable development, coastal communities, traditional communities

INTRODUCTION

Agriculture in Brazil started to have some importance with the cultivation of sugar cane and the manufacture of sugar cane brandy still in the colonial period, however in the same period several other products with origin in the forest extraction also gained commercial relevance, especially heart of palm for human consumption, caixeta (*tabebuia cassinoides*) for handicraft, orchids for ornamentation and several kind of herbs for medical use (Anacleto et al., 2017) these types of products are called Non-Wood Forest Products - NWFPs (Fao, 1995).

The term NWFP (Non-Wood Forest Products) covers products that come from the forest that were not originates from wood and which may have multiple purposes (Fao, 1995) such as: edible, medicinal, chemical, ornamental, forage, fuel, fiber, biochemical, aromatic, rubber, gums, waxes, tanning, oily products among others. Given the multiple uses and high population demand, the trade of non-wood forest products has become attractive to the market, especially by people who live in communities close to forest areas (Negrelle, 1998; Fiedler, 2010).

Specifically, in relation to the NWFP trade in Paraná Coast, Negrelle and Anacleto (2012) reveal that from 1920s, tourists acquired the habit of collecting plants from Atlantic Rainforest for ornamental and medicinal purposes, over the time, the residents perceived an alternative of income and small commercial establishments appeared on the borders of BR 277 and BR 376 roads, which connect the capital of Paraná State to the coast.

From this period on, the residents in these regions obtained satisfactory income from extractivism and trade of NWFP, and then the first cultivation experiences began, this way it was formed a Local Productive Arrangement - APL with the agglomeration of high number of producers, retailers and wholesalers, as well as other small companies associated to the activities of extractivism, cultivation and commercialization of NWFP (Balzon, 2005; Guerra et al., 2009; Negrelle and Anacleto, 2012; Anacleto and Negrelle, 2013).

The 1980s was the peak of the NWFPs exploitation in the region and according to Anacleto and Negrelle (2013), about 300 families were registered in this period, which depended on the exploitation of NWFPs, and had this activity as the main income generator. However, in spite of its importance as an income generator, since 2000 the production, cultivation and extractivism of several NWFP species declined especially because of the legalization difficulties of this type of trade with protection and environmental defense institutions (Ferreira et al., 2007; Guerra et al., 2009; Negrelle and Anacleto, 2012).

The initial impediments to trade legalization were associated to the lack of management plan and lack of the legal land ownership, which did not allow that trade could be legalized. During this period, illegal trade of NWFPs began, and the inspections were initiated by environmental protection institutions, since a significant portion of the products traded in the APL came from extractivism (Negrelle and Anacleto, 2012). This was the beginning of a period of survival difficulties for many families that lost their main source of income with the prohibition due to Brazilian legislation, and with no alternatives of income, occurred the migration of a large number of families to other agricultural activities or the exodus of these families. The result was a consequent reduction in the number of properties, businesses, wholesalers and retailers that operated in the NWFP APL, situation that remains until nowadays.

According to Fiedler (2010), the NWFP market is still growing in Brazil, due to the great diversity of use of these products found in Brazilian forests, and due to the growth in Brazil of the use of herbal products. Similarly, as reported in Paraná Coast, Fiedler (2010) also observed that NWFP trade in many regions remains with the origin of the raw material traded in extractivism.

Negrelle et al. (2012) complement and emphasize that NWFP extractivism is most often carried out by impoverished communities, and highlight that these communities that are lacking of regional development alternatives have been strongly influenced by rural exodus, according to Estades (2003) this situation is getting worse due to the lack of income generation opportunities.

The NWFPs have relevance both in the ecological and economic aspects in Paraná Coast, and they are inserted in the context of rural pluri-activity, being one of the several forms of family income complement. However, in spite of their relevance, until now few studies have been carried out in order to understand what are the factors that have accentuated the decline of the APL, as well as what factors could reverse this trend of the weakening of the NWFP APL. Thus, in this context, this study aimed to investigate the factors that determined the socioeconomic decline of the Local Productive Arrangement of Non-Wood Forest Products in Paraná Coast, generating a contingent of information that can be used to reverse this situation.

MATERIAL AND METHODS

Data collection was from July 2016 to October 2017, it included visits to communities where there were reports about the cultivation, extractivism and trade of NWFP (Balzon, 2005; Guerra et al., 2009; Negrelle and Anacleto, 2012).

Study Area

Initially a producer was interviewed who had also been an extractor of NWFPs from the Atlantic Rainforest and, according to Emater-Paraná located in Guaratuba, besides she has been lived there for more than 15 years, she was considered a "leader in the community". Anacleto and Negrelle (2013) argue that, as some elements of the study population were identified, they were asked to indicate other families and so on, in a process called self-generated sampling.

A total of 127 families were identified who had already had relation to production, extractivism or trade of NWFP in Paraná, but they had abandoned the activity, then 14 families were predisposed themselves to participate of this research.

In addition, a participatory rural diagnosis (DRP) was organized in order to diagnose the most relevant factors in the socioeconomic decline of the NWFP APL, and the phases of this activity were oriented without the interference of the researchers in the opinion of the people as proposed by Verdejo (2006) and Ferreira et al., (2017).

The DRP occurred in September 2017 with the voluntary participation of 14 families' representatives and the prerequisite for participation was that they had already had an activity with income in the APL, but that they had abandoned the activity.

Impact matrix analysis

The analysis of the factors that led to the decline of the NWFP APL was carried out as proposed by Negrelle and Anacleto (2012), highlighting the threats and weaknesses related to the extractivism, production and trade of NWFPs, grouping the weaknesses in the internal context of the properties, and the threats in the external context the properties.

The opinions expressed by the interviewees were evaluated as to their practiced and suffered influence in comparison with other opinions, and then it was organized a cross impact matrix, which result generated the relevance index obtained by the equation.

The impact matrix according to Negrelle and Anacleto (2012), assigns percentage values from 0 to 100 to each opinion expressed by the interviewees, first individually and later the information was crossed in a collective way, comparing as to the respective influence practiced and suffered, and the higher the index the greater the relevance of the factor that contributed to the decline of the NWFP APL.

The impact matrix generates an index of relevance (importance to the APL) that can be obtained by the equation:

$$IR = \frac{InRn * InPn * 100}{\sum Sisp}$$

IR = Relevance Index of the evaluated situation;

InRn = Index of suffered influence;

Inpn = Index of practiced influence;

Sisp= Summation of the indexes (InRn* InPn) of all the issues analyzed by the participants

After the completion of the primary data collection, according to Vergara (2000), it was carried out the interpretive and descriptive analysis of the contents obtained during the interviews, using the data triangulation technique between the observations of the researchers in the DRP, the documents analyzed and the similar answers obtained from the families interviewed.

The results were evaluated using the program Microsoft Excel.

RESULTS AND DISCUSSION

The average age of the interviewees was 44 years old, and the family composition was on average 5.1 people per family. The families dedicated themselves to the extractivism, production and trade of NWFP during 12.7 years on average and after that time they ended up leaving the activity.

In total, 127 families were enrolled in the activities related to NWFPs along the Paraná Coast. From this total, after only two decades, only 40% still remained in the rural communities, and the rest of them had moved to Curitiba or cities in the metropolitan region seeking for other income alternatives (Figure 1).

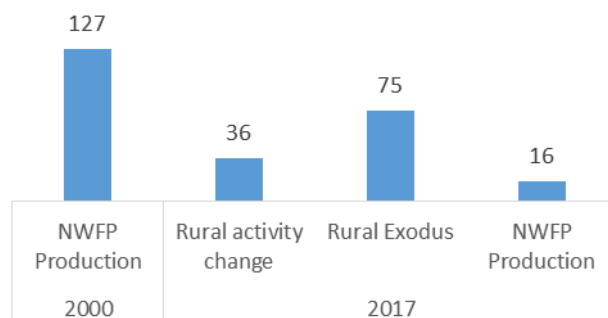


Figure 1. Evolution of the exodus of families involved in the Local Productive Arrangement of Non-Wood Forest Products in Paraná Coast from 2000 to 2017.

Among the many factors that contributed to this scenario of rural exodus, Balzon (2005) emphasizes that the extractivist communities do their work with the use of rudimentary and substantial technology, which are linked to other factors such as limited access to land cultivation due to declivity, and especially when occurs the confrontation with the environmental legislation that results in a scenario of little hope under the solution of these problems.

In Brazil, the history of NWFPs utilization is usually associated to remaining natural ecosystems of the country and they are in territories inhabited by traditional populations (indians, caiçaras, maroon, caboclos and ribeirinhos, faxinais and extractors) as well as peoples and family farmers (small farmers, rural family entrepreneur and fishermen), being common the extraction of these forest products as an alternative of income. The Atlantic Rainforest, in particular, has been identified as one of these areas of strong pressure for extraction of NWFPs. At the same time, this ecosystem is recognized as a hotspot, ie, a top priority for biodiversity conservation as well as social diversity in Brazil as reported by Ferreira *et al.* (2017).

The adversity scenario was aggravated for the local communities as several environmental parks were created in the region, and according to those interviewed people the ecological and preservationist needs were given an indifferent priority to the social economic causes, when it was necessary to think about the set of human needs.

In this context, the study revealed (Table 1) that the lack of legislation on the proper exploitation of NWFPs is still unclear, and indeed it constitutes the first barrier to NWFP use. Similar to that described by Balzon (2005) and Anacleto and Negrelle (2013) when they need to commercialize these NWFPs, they must have a marketing authorization in accordance with the requirements of environmental legislation, both in the case of cultivation and extractivism, such as legislation on the use and trade of NWFPs is not standardized for all species, this factor was also classified by the majority of the respondents (n=78%) as a preponderant decision in order to give up the activity (Table 1).

Table 1. Main factors associated to the decline of Non-Wood Forest Products Local Productive Arrangement in Paraná Coast in the perception of the interviewees.

Threats				Weaknesses			
		IR				IR	
1	Lack of legislation on sustainable extractivism in the Atlantic Rainforest area.	20.02	1	Lack of legislation for cultivation			30.31
2	Low or no government support for the introduction of NWFP crops	16.73	2	Agronomic unawareness of the species with the greatest productive potential			9.01
3	Lack of credit lines that could be accessed by communities	11.44	3	Strong dependence on few middlemen (wholesalers)			8.99
4	Lack of community organization	11.44	4	Difficulty of access to credit lines with solidarity support for adequate production structures			7.90
5	Asymmetry in the distribution of profits between producers and middlemen	7.08	5	Difficulty in accessing the local and regional market			6.09
6	Lack of cooperatives or associations of producers	5.33	6	Little knowledge on sales techniques			5.55
7	Competitors already consolidated in the market	5.33	7	Lack of production standardization			5.55
8	Difficulties in running off the crops	4.75	8	Lack of production sequence			5.55
9	Lack of agronomic crop orientation	4.74	9	Traditional consumer's unknown species			5.03
10	Low market price paid by retailers and wholesalers	4.74	10	High cost of production			4.78
11	Resistance of landscapers in using NWFPs	2.54	11	Rejection of NWFPs by regional retailers			4.12
12	Social concern related to the use of extracted NWFPs	2.04	12	Low market reach and coverage			3.01
13	Few retailers and wholesalers in the region	1.77	13	Commercialization difficulty			3.01
14	Species produced are the same in the most of the properties	1.04	14	Low quality of the product offered to the market			0.55
15	Lack of specific and registered products for NWFP production	1.01	15	Individual trade			0.55

Source: Field research

The diversity of NWFPs that there is in Paraná Coast is capable of providing numerous benefits to impoverished rural communities, as well as being an important income alternative, because in these regions are found medicinal, food and ornamental resources, and although they exist in large quantities, this diversity contrasts with the difficulties reported by the interviewees in accessing these natural stocks, as well as the difficulty of constructing crop structures.

According to Negrelle *et al.* (2012) and Ferreira *et al.* (2007), the use of forestry products in Paraná Coast is not prohibited, but the possibilities of trade are restrictive due to the lack of individualized management plans for most species with commercial interest.

The forms of sustainable use of NWFP according to Ferreira *et al.* (2017) still need understanding and more focused actions to the reality of each rural community and with a management plan that reflects this reality. Additionally, technicians and authorities should be more involved with the local reality, listening, learning and respecting the perspective of the forest population. Therefore, when analyzing the possibilities of working with NWFPs, by rural communities and their stay in the protected areas of sustainable use with quality of life, it is recommended to consider the development of a strategic plan systematized from the vision and participation of those involved in the extraction in line and supported by scientific knowledge (study of socioeconomic and ecological sustainability).

Still, according to Ferreira et al. (2017) from this understanding, it is possible to consider that the result of the synergy between science and community can sustain and bring the rural communities in public policy formulation for these territories. There is need for extensive discussions related to production factors available, focusing mainly on the problems in these communities.

Thus, the pressure of these populations by studies that establish protocols of extractivism and production could result in more significant advances and strengthening of the APL. However, the rural communities along the Paraná Coast have not yet established levels of organization that could enhance bargaining power among the institutions and it could be a viable alternative for solving this impasse, being in the incentive to cultivation or the sustainable extraction of the forest.

In this context, the low organizational capacity of these communities promotes that they could not be heard by the people and institutions that could lead them solutions in order to mitigate the problem and minimize the rural exodus that currently occurs, and because of the exodus, the capacity to strengthen the social situation continues to weaken.

It should be noted that residents in these rural communities have historically always had a relationship with the exploitation of NWFPs, and in the most cases (n=85%), the learning about the use and exploitation of NWFPs was obtained from family members in a cultural heritage, and this movement puts traditional knowledge at risk.

Negrelle et al. (2012), Ferreira et al. (2014) also reveal the invisibility of these communities to the public authorities, and they point out that although some species of NWFPs such as bromeliads, orchids, medicinal herbs among other extractivism products supply a significant part of the formal commerce in Paraná and neighboring states, there are still gaps that prevent families that live in these impoverished communities from the use of these natural resources.

The context of NWFPs such as the bureaucratic process, the lack of public policies for sustainable extractivism, the difficulty of accessing rural credit lines, and even the orientation for the implantation of agronomic crops, mean that people are prevented from accessing sources of income in order to ensure their food security and survival, a situation that amplifies the rural exodus and forces the families to migrate to other regions, and with no professional preparation they ended up living in "favelas" (slum) without dignified conditions of survival.

The issues of greater relevance in the internal context point to three main factors. The first refers to the lack of technical production knowledge and the domestication of species with the possibility of trade.

The majority of the species demanded by the consumers are native species and different from those traditionally found in flower shops, but besides the limits of the technical question is the difficulty in accessing the financing for investment in production structure, due to the lack of income or documentary irregularities of the properties.

The combination of these factors forces that the NWFPs from Paraná Coast continue with their origin in the extraction process, however the plants from this process are not standardized according to the need of the final consumer, there is a lack of deliveries periodicity to the customers. The result is the low quality of the products offered that limits the extractors to make a satisfactory negotiation in face of the weak bargaining power that they have. According to Moreira (1998), production quality is an essential factor in strengthening the APL, independent of market segmentation, in this context it is necessary that the activities are planned for efficiency, which, besides guaranteeing income generation and food security to these families can also meet the demands of regional consumers.

Still, according to Moreira (1998), the producer must have space, physical conditions and especially the skills and knowledge necessary to elaborate the NWFP productive activity. However, these prerequisites were not observed in the case of extractivism. The possible alternatives for changing this framework may arise from the interaction of universities with the development of courses, lectures or extension projects that consider these communities reality, improving production and marketing capacity and satisfying the regional consumer properly.

In this context, it is urgent that alternatives be debated, and that rural communities have a greater organizational capacity since there are no management plans that release the extractivism, it is important to enable alternatives for cultivation in order to generate family income. Thus, taking advantage of the fact that these communities have knowledge about non-wood products, the correct guidance on appropriate species domestication and management practices would bring economic growth and social strengthening for these communities, as also described by Ferreira and Negrelle (2007).

A possible way to reverse this scenario according to Costa (2004) is to provide agronomic knowledge and crop management to the community in relation to the species that already have these protocols. However, Anacleto and Negrelle (2013) describe that it is essential to have the support of public policies that adapt to the extractive communities and their knowledge of local biodiversity, avoiding that their traditional knowledge get lost with the rural exodus.

Anacleto et al. (2017) describe that the main way to mitigate the problems of regional extractivism is the dialogue of knowledge that involves science, public power and communities in the sense of searching for concrete alternatives in order to mitigate the problems observed.

However, it is urgent that the internal processes in the communities be respected, but at the same time it is necessary that happens the strengthening of the rural development based on the strengthening of the social situation and the organization of the communities in an associative way. According to Fernandes (2017), the reorientation of the community must be in itself, involving economics, politics and self-management, it could transform the individualistic reality into a collective reality sustained by collective actions, providing a more comprehensive and knowledgeable view of local needs.

The organization based on the collective, could result in the expansion of the bargaining power of these communities in searching for problems mitigation, namely:

- i) The collective products sale aiming at a better price, reducing the financial power of the middlemen, in a more fair and symmetrical way.
- ii) The organization of collective purchases of inputs for lower prices may constitute another benefit of the collective organization.
- iii) Access to the public agencies in the negotiations related to the improvement of roads for the crops disposal.
- iv) Allocation of public places in the municipalities in the coast to in order to organize producers' fairs.
- v) Collective pressure for the establishment of NWFP management plans.
- vi) Ways to search for the facilitation of access to financing institutions with solidarity guarantee.

CONCLUSION

In total, 127 families were identified, and of this total, 75 experienced a rural exodus that reached levels of reduction of 60% in two decades.

The main factors in the external context that contributed to the decline of the NWFP APL in Paraná Coast were: lack of legislation on sustainable extractivism (n=20.02%), low government support for crops introduction (n=16.73%), lack of credit lines that could be accessed by communities (n=11.44%). The main factors in the internal context that contributed to the decline of the productive arrangement were: lack of crops legalization (n=30.01%), agronomic unawareness on the species with greater productive potential (n=9.01), strong dependence on few middlemen (n= 8.99%).

The scenario results in a perverse cycle where the communities, because they are impoverished and have low organizational capacity, were invisible to the public power, and because they were invisible to the public power they were still impoverished and unable to organize themselves in order to seek for solutions for the problems in relation to the NWFP APL, so the conjunction of negative factors resulted in a strong rural exodus.

There is an urgent need for debates on the possible ways in which these impoverished rural communities can organize themselves and collectively strengthen their actions, in order to obtain greater bargaining power at the several levels of public power.

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