

Endogenous knowledge, culture, and nature in the approach to sustainable local development in a rural community in Northeastern Brazil

Conhecimento endógeno, cultura e natureza na abordagem do desenvolvimento local sustentável em uma comunidade rural no Nordeste brasileiro

Conocimiento, cultura y naturaleza endógenos para abordar el desarrollo local sostenible en una comunidad rural en el Noreste de Brasil

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Abstract

The knowledge that is inherent to a certain type of society and/or place, the sociocultural exchange between generations, and the possibilities that the ecosystems offer are preponderant factors for the diffusion of sustainable local development in rural communities. The objective of this study was to raise, using conceptual and empirical material, the endogenous knowledge, nature, and culture in the approach to sustainable local development in the rural community of José Gomes, Cabeceiras do Piauí, Northeast Brazil. This is a qualitative, descriptive/exploratory research under an ethnographic approach. Before data survey, Rapport was applied. The sample universe corresponded to 82 community members. Two members of each household, when possible, were interviewed. Standardized semi-structured forms and the direct observation and field journal techniques were applied. The life history method and photographic records, additionally to socioeconomic variables, were adopted in order to collect reports from community members. The collected data were tabulated in spreadsheets using the Excel 2016 software and the results led to the conclusion that endogenous knowledge combined with historical aspects based on nature and culture make it possible to achieve sustainable local development in the researched rural community.

Keywords: Ethnobotany; Traditional knowledge; Ecosystem; Development; Entrepreneurship.

Resumo

O conhecimento que é inerente a um determinado tipo de sociedade e/ou lugar, o intercâmbio sociocultural entre as gerações e as possibilidades que os ecossistemas oferecem são fatores preponderantes para difusão do desenvolvimento local sustentável em comunidades rurais. Ao fazer uso de material conceitual e empírico, objetivou-se levantar o conhecimento endógeno, a natureza e a cultura na abordagem do desenvolvimento local sustentável na comunidade rural de José Gomes, Cabeceiras do Piauí, Nordeste do Brasil. Esta pesquisa qualitativa é classificada como descritiva/exploratória, sob abordagem etnográfica. Antes de realizar o levantamento dos dados, foi aplicado o *Rapport*. O universo amostral correspondeu a 82 comunitários, dentre os quais foram entrevistados dois membros de cada residência, quando possível. Foram aplicados formulários padronizados semiestruturados, bem como o uso das técnicas da observação direta e do diário de campo. O método história de vida foi adotado no intuito de coletar relatos dos comunitários, além de registros fotográficos, agregando às variáveis econômicas e sociais. Os dados coletados foram tabulados em planilhas utilizando o Software Excel 2016, cujos resultados levaram a conclusão o conhecimento endógeno, combinado aos aspectos históricos, baseados na natureza e na cultura, que possibilitam o alcance do desenvolvimento local sustentável na comunidade rural pesquisada.

Palavras-chave: Etnobotânica; Conhecimento tradicional; Ecossistema; Desenvolvimento; Empreendedorismo.

Resumen

El conocimiento inherente a un determinado tipo de sociedad y / o lugar, el intercambio sociocultural entre generaciones y las posibilidades que ofrece el ecosistema son factores preponderante para la difusión del desarrollo local sostenible en las comunidades rurales. En fMediante el uso de material conceptual y empírico, el objetivo fue elevar el conocimiento, la naturaleza y la cultura endógenos en el enfoque del desarrollo local sostenible en la comunidad rural de José Gomes, Cabeceiras do Piauí, Nordeste de Brasil. Esta investigación cualitativa se clasifica como descriptiva / exploratoria, bajo un enfoque etnográfico. Antes de realizar la encuesta de datos, se aplicó O Compenetración. El universo muestral correspondió a 82 comuneros, entre los cuales se entrevistaron dos miembros de cada residencia, cuando fue posible. Se aplicaron formas semiestructuradas estandarizadas, así como el uso de técnicas de observación directa y diario de campo. Se adoptó el método de historia de vida para recopilar informes de los miembros de la comunidad, además de registros fotográficos, sumando a las variables económicas y sociales. Los datos recolectados fueron tabulados en hojas de cálculo utilizando el Software Excel 2016, cuyos resultados llevaron a la conclusión de conocimientos endógenos, combinados con aspectos históricos, basados en la naturaleza y la cultura, que posibilitan el logro del desarrollo local sostenible en la comunidad rural investigada.

Palabras clave: Etnobotánica; Conocimiento tradicional; Ecosistema; Desarrollo; Emprendimiento.

1. Introduction

The knowledge that is inherent to a certain type of society and/or place and the sociocultural exchange between generations about the diversity and the possibilities that ecosystems offer are preponderant factors for the diffusion of Sustainable Local Development (SLD) in a given community. Ploeg and Long (1994) clarify that since the end of the 1990s, this type of knowledge as well as endogenous rural development are themes that have become part of the debates on sustainability. Corroborating them, Rist et al. (2011) emphasize that endogenous knowledge has become an important component of bottom-up approaches to strengthen SLD processes.

Beck (1999) considers four basic levels to analyze endogenous or traditional ecological knowledge. The first is the local and empirical knowledge of the environment – the “documented knowledge”. The second concerns the zeal of the practice of knowledge, adding the principles of management of resources, instruments, and techniques. The third, often strongly intertwined with the previous level, focuses on institutions, norms, and the social organization of the community and the fourth is the worldview that gives shape to environmental perception and meaning to the observation of space, connecting it to the social and spiritual world.

Ploeg and Long (1994) and Gerritsen (2012) claim that endogenous knowledge is deeply related to agricultural practices, being the cause and effect of specific strategies of the farmer based on the co-evolution (or co-production) of nature and society. It therefore consists of a potential contributor to strengthen sustainable development processes (Ploeg & Long, 1994), with repercussions on the use and conservation of natural resources (Ellen & Harris, 1999).

It is also important to emphasize that the social capital present in rural communities and intergenerational knowledge are capable of connecting individuals, their beliefs, virtues, and customs, strengthening or reaffirming tradition as an attribute of rurality (Silva et al., 2020) whose principles or ethos of community life are materialized, for example, in production and harvesting practices as well as in the ways of using nature/plants.

Likewise, cultural heritage is a prominent element in the symbolic and economic support of rural societies (Mello, 2015), assuming that they have autonomy over the natural resources present in their territories and the direction of development they wish to follow.

Based on this assumption, Silva (2016) clarifies that traditionality is legitimized as a singularity that is not exhausted in the face of space/time contradictions. In this line, it is observed that cultural values in rural communities have resisted the changes brought about by globalization, insofar as traditional practices have coexisted with modern living and consumption patterns, including with processes of socio-cultural hybridization.

Based on the abovementioned reflections, the guiding question of this study was whether endogenous knowledge, nature, and culture are factors that can favor SLD in rural communities. It is believed that local traditional knowledge about

nature and cultural heritage is a major factor in the empowerment of rural communities. Thus, the objective was to analyze endogenous knowledge, nature, and culture as driving elements of SLD, taking the rural community José Gomes, in the state of Piauí, Northeastern Brazil, as an axiomatic example.

It is understood that the knowledge acquired over time, especially on nature and cultural resources, is an essential resource to foster SLD. In this sense, it is argued in this research that the historical and cultural aspects, the relationship between worldviews, and the endogenous knowledge of the nature and culture of rural populations can embody elements that mobilize the generation of work and income as means to implement SLD.

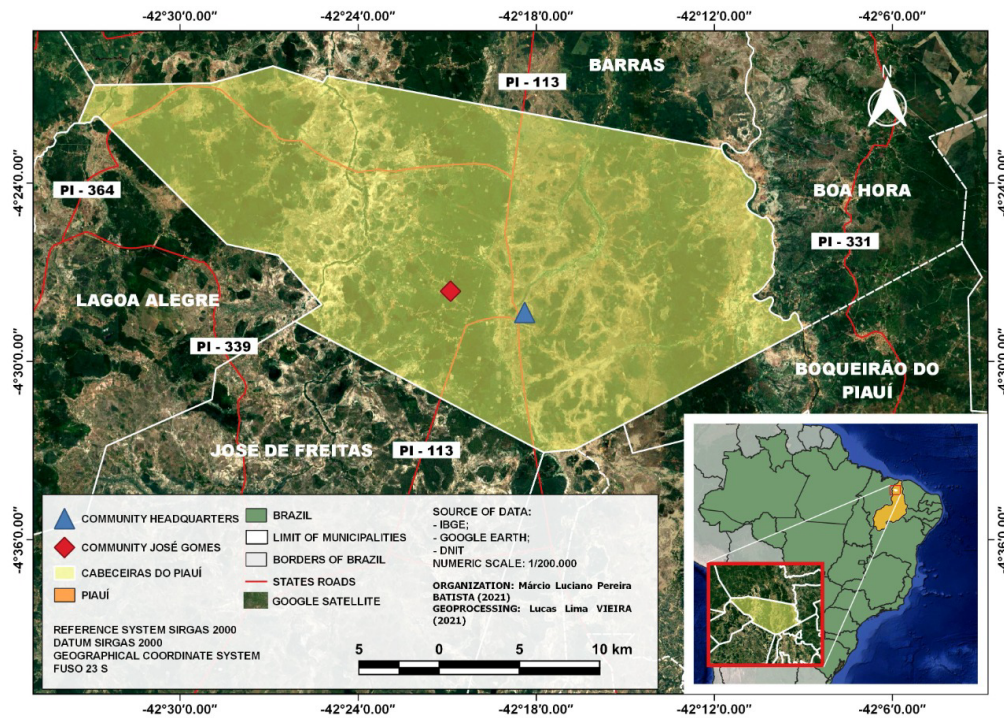
2. Methodology

The rural community José Gomes (Figure 1) is located at the geographical coordinates 4°27'34.7" S and 42°20'58" W, 6 km from the seat of the municipality of Cabeceiras do Piauí and 96 km from the capital Teresina. Cabeceiras do Piauí has a territorial area of 608,525 km², an estimated population of 10,586 inhabitants, and a demographic density of 16.31 inhabitants/km² (IBGE, 2019).

This rural space was inhabited around 1945 by the family of José Valério de Sousa, known as Alenquer (the reason for this name is so far unknown), when there were no residents there. These first residents wanted to change the name of the place. It was known that an old man named José Gomes had lived for a long time in the surroundings, and for this reason they decided to call the town by this name. The family grew and the children got married, causing the community to become populous (which is the reason why practically everyone has kinship ties within the community).

The community is located in an area with a relief structure on the Sedimentary Basin of Maranhão-Piauí (Aguar 2004; CPRM, 2010). The soils are plinthosols, yellow latosols, and rocky outcrops (EMBRAPA, 2014). The average annual rainfall is 1,535 mm distributed from January to April, with minimum and maximum annual thermal averages of 22 °C and 35 °C, respectively, insolation above 2,000 h/year concentrated in the first four months of the year, and a dry season lasting six to seven months (Ferreira & Mello, 2005). According to Castro (2007), the municipality is included in the transition or ecological tension zones that are represented by cerrado, babaçu palm forests, and various other vegetation types.

Figure 1 - Geographic location of the José Gomes community, Cabeceiras do Piauí/PI.



Source: IBGE (2020), adapted by Vieira (2021).

As this is a study that involves direct contact with human beings, the project was approved and consolidated in the Research Ethics Committee (REC) of the Federal University of Piauí (UFPI) under Opinion nº 2,708,249 and registered in the National System of Genetic Heritage Management and Associated Traditional Knowledge (SIGGEN) under process AD8160E. Interviews, records, and the use of images were allowed by signature of the Informed Consent Form (ICF).

The study is classified as descriptive and exploratory with qualitative approach, which provides the interpretation of the researcher through opinions about the phenomenon studied (Pereira et al., 2018). The ethnographic approach was also adopted, allowing a holistic view of people's ways of life. Ethnography focuses on obtaining a consistent description about what a particular group of people does and the meaning of the immediate perspectives they have, as well as bringing important contributions to the field of qualitative research (Mattos, 2011), enabling direct exchanges between researchers and informants. Oliveira (1988), Geertz (1999), and Laplantine (2000) explain that Ethnography has proved to be a method of interactions between the different subjects of the investigation whose analysis of ways of life does not exclude the understanding of behaviors nor the positions and/or worldview of those who place themselves as observers of the process. In view of this, there is a close link between the first author of this investigation and the José Gomes community, due to childhood ties and stories in the community as well as frequent participation in events, meetings and conversations became more intense from the moment this research was carried out, characterizing Rapport (Bernard, 1988), essential in ethnobiological studies.

To obtain the data, a bibliographic search was carried out on the theme and interviews were conducted using standardized semi-structured forms (Bernard, 1988) as well as the techniques of direct observation with record in a field journaling (Silva, 2000). Surveys of the life history and behaviors of the community members were portrayed through both reports and photographs (Malinowski, 1922; Spindola & Santos, 2003; Flick, 2009).

The sample universe of this research corresponded to 42 families, totaling 82 community members. Two members of each household were interviewed, when possible, and the interviews sought to identify and deepen the analysis of the variables

necessary for the investigation, particularly the ways of life, structural living and working conditions, environmental and cultural aspects, and social organization.

In order to reach the proposed objective, the data were analyzed from a systemic view so as to allow the grasping of the specificities of the reality of the community, since the endogenous knowledge, nature, culture, economic and social factors cannot be understood when considered isolated from each other. The collected information was tabulated in spreadsheets using the Excel 2016 Software.

3. Results and Discussion

The José Gomes community is marked by rich memories and traditions from its past. The testimonies of the oldest people confirm the strong feelings that connect them to nature, to neighborly relations, to the culture in the preparation of the land, in planting, harvesting, processing, creating, and living together in society.

The history of the José Gomes community is marked by a past in which the farm personified a way of life and work, being one of the few alternatives for family reproduction, as revealed below by the resident, whose narrative memory rescues different periods of 'abundance' and 'crisis of continuity' of family work.

We lived on the farm only, there was no other way of living, the crop and the production was large, and everyone in the family was working together mainly planting rice, beans, corn, cassava, and sugar cane. But now everything is different; lack of interest from family members, they don't want to go to the fields anymore, and now there is less land to plant (O.V.S 88 years)

The relationship between farmers of the community and nature is indisputable. The existing affinity is intricate because they need it for their survival and for the continuity of the family group, in what has to do with the use of the soil for planting vegetables, even not favoring the environment in some situations such as when they cut down vegetation and burn it, causing degradation processes. This allows us to paraphrase Cândido (1964) in that societies are characterized by the resources they have to satisfy them. Social balance depends on the relationship, need, and satisfaction of the society, with a permanent change between man and the environment present in this interaction.

The data confirm what has been reported here, because with regard to the profile of local farmers, 68.30% participate in family production and are between 25 and 59 years old; 29.27% fit in the age from 60 years and over; only 2.43% are part of the age group between 18 and 24 years; and the other 31.70% dedicate their time to other types of activities. This situation is in harmony with the analyses of IBGE (2010), Silva et al. (2014), and Batista et al. (2020) in the sense that the age group of residents of a given community impacts on agricultural production, affecting local development. After all, rural activities are directly linked to age and the availability of workforce. In the case of the community studied, it is also observed that the majority of the farmers were in adulthood and developing productive activities.

During the collection of empirical data, it was noticed that in past times residents of the community moved around basically on foot, using animals or, less frequently, using bicycle (until present day), through poorly structured local roads. Over the years, the means of transportation have diversified and expanded; there are more bicycles, motorcycles and cars were acquired, and road traffic conditions were improved by the government, especially when the seat of the municipality was created, making the displacement of these rural people to neighboring localities and to the urban area possible. The improvements also favored significant changes in the social (social cohesion, health, education), economic (income, employment), and cultural (exchange of experiences, mental health) conditions of the residents.

The above situation reflects the analysis of Coutinho and Fiúza (2019) who say that the displacements of rural people are not limited to demands focused on economic aspects only, but they are also related to cultural factors that guide their

choices, including of young people who long for flows to other municipalities. The author also observes that, especially in the post-Henry Ford period, after the 1980s, human displacements tended to emphasize new trajectories and characteristics. If the movement between countryside and city was inconstant in a past time, now it gains new directions, with a differentiation between gender and age groups.

With regard to electricity, the only energy source in the community was candles made of beeswax and gas lamp. The empirical survey showed that the community has had electricity supplied by the distributor Equatorial/PI since 2003, which is today present in 97.50% of households. According to Buainain and Garcia (2013), access to electricity is essential; it not only provides access to consumer goods, but it is also an element that can increase agricultural productivity through the possibility of use of relatively simple equipment, in addition to contributing to the access to other services. In line with this, Fonseca and Santos (2009) clarify that modernity has established urban trends in rural areas such as electricity and satellite connections and has also brought culture, music, fashion, cuisine, and various customs to the city. This inhibited isolated definitions, because urban and rural areas share the same space.

The first residents of the José Gomes community consumed water from an artesian well without any type of treatment. Nowadays, the community has three fountains (Figure 2), but only two are functioning and maintained by the City Hall (payment of energy bills); there are also some “cacimbões” (shallow wells) and cisterns (mainly used to wash clothes and bathing); 95% of households have running water. The later data have already been reported by Batista et al. (2020) and contradict the studies by Galvão Junior, Custódio and Duarte (2018) who found that 5.29 million households (approximately 17.45 million inhabitants) in the North and Northeast regions of Brazil do not have access to piped water, which corresponds to 53.9% of the total households in the country that use other forms of water supply. According to data from IBGE (2015), the conditions of water supply in rural areas are unfavorable and deep inequalities in access to quality water supply services still prevail.

Figure 2 - Water supply sources in the José Gomes community, Cabeceiras do Piauí/PI, with untreated water: A = fountain; B, C and D = “cacimbões” (shallow wells).



Source: Data from the authors (2020).

Basic sanitation did not meet the needs of all residents and precarious conditions prevailed, just like when the community was started. Part of the population still use open spaces to meet physiological needs, and the garbage is burned or discarded in the soil. In this regard, Galvão Junior, Custódio and Duarte (2018) emphasize that the absent or insufficient adequate forms of sanitary sewage collection and treatment in the Northeast are factors that have an explicit impact on public health.

As for health services in the studied area, there is no health center. A Community Health Agent comes once a month to visit the homes, to assist the residents. However, many residents practice self-medication using medicinal plants mostly to combat simple diseases such as flu, diarrhea, vomiting, and worms. In case of the most serious diseases, they go to the municipal seat, where there is a Basic Health Unit, and depending on the severity of the disease, they seek the regional hospital that serves the municipality.

Education services in the study area are deficient, and although the community has a school, there are no classes, and students move to the nearest localities or even to the urban area. This scenario is analogous to that of several other traditional rural communities in Brazil, as demonstrated in the studies by Aguiar and Barros (2012); Freitas et al. (2012); Terceiro et al., (2013); Alves et al. (2015); BNDES (2018); and Soares et al. (2020).

According to Batista (2020), 71.96% of the residents of José Gomes had incomplete elementary school; 9.76% had no schooling; 6.1% had completed university education; 4.88% had completed high school; 4.88% had incomplete high school; 1.21% had completed elementary school; and 1.21% had incomplete university education. These data agrees with the dialogue with a resident who highlighted that “*at that time, school was for few; for the poor, school was not a way to improve livelihood*” (O.V.S, 88 years old).

It is important to emphasize that deficiencies in the level of education affected mostly adult and elderly individuals, reflecting on low purchasing power of farmers. In agreement, Ximenes et al. (2019) emphasized that poverty has an effect on limitations and living conditions, and that educational inequalities are closely related to social and cultural inequalities. Castañeda et al. (2018) clarify that adults living in extreme poverty in the world tend to have low education: about 40% of extremely poor adults did not attend school (while only 9% of those who are not poor did not attend school), affecting their productivity.

Still based on the empirical data, in the beginning of the creation of the community, communication between residents was characterized by flows of information that were considered 'late', 'slow' or 'delayed', and occurred through people who passed on the news in mouth-to-mouth conversations. Over the years and with the improvement of information and communication technologies (ICTs), the first radios emerged and greatly facilitated the process. The field research showed that, in the present, 48.20% of the families have radios, satellite television service, and cell phones that work through antennas installed by private companies that charge around R\$ 100.00 per router installed and/or per outdoor signal coverage when users move to other areas.

It was understood that these communication tools provided the community with a greater interaction between rural and urban areas, minimizing the distance and becoming a driving force for local development. Mota and Santos (2011) point out that with technological maximization and, above all, installation of electricity, telecommunication - notably television and radio services - has become accessible to the vast majority of rural farmers. With the arrival of television in the homes of the peasants, the globalized thinking, which until then was inaccessible to countryside people, became part of their new cognitive baggage and part of their daily lives.

As for the diversity of vegetation that existed in past times, according to one of the farmers, “*it is very different from today, as other were put in the place, that were not there at that time, such as those that are used to eat, and today they are the the most abundant in the community*” (A.M.C. 86 years old). In view of this colloquium, it is beneficial to point out that the

insertion of food species in gardens and backyards was important for the community. It contributed to local livelihood, to better meet the nutritional needs, and favored an extra source of income for farmers.

It is noted that, since the foundation of the community, farmers have maintained a strong bond with nature, either as a means of survival through the use of land and vegetables, reproducing rural activities (subsistence agriculture and/or animal farming), or making use of traditional techniques such as planting with green manure, mulching, composting, no-tillage, alternating cropping, non-use of chemical herbicides or fertilizers, employing instruments such as hoes, sickles, axes as working tools and plowing the earth with a tractor (rented by the farmers), in addition to the artisanal harvest that involved the family group. Giraldo (2015) calls this affinity of farmers with the land as the *logic of living with care*, emphasizing that man uses his knowledge developed for many decades and transmits it to the following generations through pragmatic use¹, so as to communicate with the land.

This man - nature relationship is also consistent with Castells' (2008) conceptions insofar as the work and production methods passed from generation to generation are linked to the construction of the identities of family farmers, which is influenced by productive and reproductive institutions, by collective memory, by the apparatuses of power, and revelations of a religious nature.

The residents also had retirement, formal and informal jobs, and government social programs as source of income. Many of them, especially young people, opt for rural exodus in search of better living conditions for themselves and their families. These data are confirmed by the studies conducted by Brasil (2011), Baptista and Campos (2013), Superti and Silva (2015), Batista et al. (2016), and Medeiros et al. (2020).

In one of his studies, Silva (2011) found that the number of rural families is decreasing and, therefore, cannot survive only from agriculture production, that is, they are becoming more and more non-agricultural families. According to this author, "the land and, above all, the parents' house (...) becomes a kind of territorial base, an increasingly important refuge in crises, especially unemployment crises, besides remaining as alternative to return to old age" (Silva, 2001, p.43). Life instability leads farmers to voluntarily subject themselves to employment bonds (Alves, 2016).

In this perspective, it is emphasized that sustainable entrepreneurship arises as a driving force for changing the situation presented in the José Gomes community, taking advantage of the potential and possibilities that nature can provide, generating autonomy and empowerment to farmers for the promotion of 'sustainable businesses', as for example, the exploration of medicinal and food plants, the idealization of fairs with organic products generated by the community, among others.

Not by coincidence, Apostolopoulos et al. (2018) point out that a factor that has contributed a great deal to the quality of socially and environmentally sustainable development policies is entrepreneurship. It has positively impacted on the aspects of financial inclusion, women's empowerment, sustainable agriculture, integration of minorities, among others. For Rashid (2019), this type of business has positive impacts specifically for reduction of poverty, advocating one of the sustainable development goals established by the United Nations.

In line with the above, the Inter-American Development Bank (IADB, 2014) emphasizes that the poor in Latin America spend between 50% and 80% of their income on food, and almost 2/3 of the total rural population still live in poverty.

Family groups had an average of two hectares of land for planting traditional crops such as rice (*Oryza sativa* L.), corn (*Zea mays* L.), beans (*Vigna unguiculata* [L.] Walp.), and cassava (*Manihot esculenta* Crantz) (Figure 3), producing approximately an annual average of 3, 4, 0.8, and 1.5 tons, respectively. The seeds (in the case of spermatophytes) for planting

¹ "A whole body of knowledge developed over many decades and exposed to each generation through pragmatic use". (GIRALDO, 2015, p. 645).

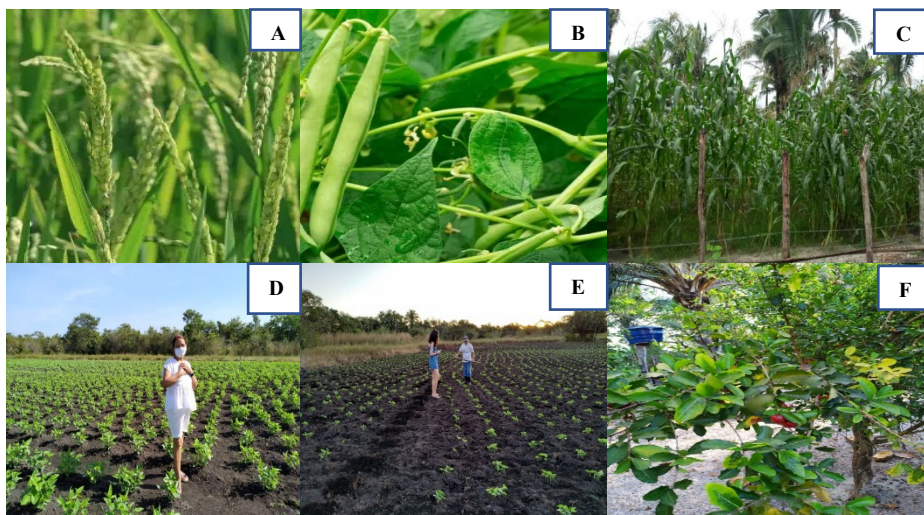
are kept by farmers from one year to the next, who observe superstitions, meteorological relations, and moon phases. This is in harmony with the concept of Palhares and Costa (2018) that traditional family farmers rely on observation to know the time of the waters and the influence of the moon on the production cycle of each species. In other words, family farmers have a particular way of seeing, feeling, and interacting with the world; this condition embodies a striking logic in peasant society and the relationship with the land as a living and working space.

The payment system used by farmers in the provision of services in the community was structured by reciprocity relationships, seen as a different principle of exchange (Sabourin, 2011), as well as by exchange relationships. In this sense, socio-productive practices were distributed under a system of social integration marked by the prevalence of kinship groups and friendship relationships under the gift of reciprocity, even if minimal, since the work practiced by family and/or 'friends' considered the 'exchange of favors/labor force' as payment of wages. Part of the surplus in the harvest was destined to 'helpers' - a cultural practice passed on from parents to children - involving three to four people from the family group, including those responsible for all stages of the production process, since preparation of the land until the harvest. Further, when a farmer did not have a certain knowledge, skill or practice about the production, a certain amount of money was paid to third parties who did not belong to the community.

It was noticed, therefore, that these reciprocal relationships persist in José Gomes due to friendship bonds and/or cultural values, values of maintenance of a moral ethos of the family farmer passed on from parents to children, because as revealed by a farmer, "*although there are some fights, after a while everybody is fine talking to each other, because they consider themselves united, because this is what they learned from their parents and grandparents, that there was only one family there, in addition to other teachings*", adding that "*they are happy, despite the difficult access to education, health, transportation, and other means of good things for us, but even so it is better than in past times*" (A.M.C., 88 years old). It is clear, then, that the construction of the identity of these farmers is linked to the preservation of their socio-cultural heritage, that is, there exists knowledge acquired through intergenerational interactions.

Ratifying the above, Lagares and Almeida (2009) emphasize that this situation is frequent in small properties, since the work is guided by family relationships, godparenting ("compadrio") ties, the neighborhood, the very way of acting in the belonging group, and finally, the economic fragility of these small farmers.

Figure 3 - Species grown in the farms of the José Gomes community, Cabeceiras do Piauí/PI. A = rice (*Oryza sativa* L.); B = beans (*Vigna unguiculata* [L.] Walp); C = corn (*Zea mays* L.); D and E = cassava (*Manihot esculenta* Crantz.); F = acerola (*Malpighia glabra* L.).



Source: Data from the authors (2020).

Besides plantations, there are animals such as cattle (*Bos taurus* Linnaeus, 1758), pigs (*Sus scrofa* Linnaeus, 1758), sheep (*Ovis aries* Linnæus, 1758), goats (*Capra hircusaegagrus* Erxleben, 1777), and chickens (*Gallus gallus* (Linnæus, 1758), raised confined to backyards or free within the perimeter of the community. Hunting of wild animals is also a sporadic cultural and subsistence practice carried out by the local actors of José Gomes.

There is also the production of cakes, sweets, “cajuína” (typical beverage made of cashew [*Anacardium occidentale* L.]), flour, and the use of food and medicinal plants such as cashew (*A. occidentale*) and cashew nuts, lemon (*Citrus limonum* Risso), orange (*Citrus aurantium* L.), mango (*Mangifera indica* L.), cassava (*M. esculenta*), mint (*Mentha x villosa* Huds.), Pequi (*Caryocar coriaceum* Wittm.), pepper mint (*Plectranthus amboinicus* [Lour.] Spreng.), and other productive dynamics observed in the community aimed at consumption and as a means of increasing the family income (Figure 4). The home remedies produced in the community such as bottles, lickers, syrups, and baths, are used to cure diseases such as fever, cough, itch, and worms. These remedies were not intended for sale, as they were produced on a small scale.

It is pertinent to state that this entire production process is related to the knowledge, use, implementation, and appreciation of local food and medicinal plants, favored by the endogenous science of these farmers and by the innovative practices internalized in the community derived from the immersion of the communication networks of the globalized world., There is therefore a relationship of socio-cultural hybridization in the community that calls for a deeper analysis, due to the complexity of the phenomenon, suggesting the need for future studies.

Furthermore, in accordance with Schumpeter (1982), innovations can be perceived in a maximized way, in numerous ways, with emphasis on the development of new products, new production techniques, creation of new markets, or new forms of organization. According to Castells (1999), this new system of universal digital communication is promoting the global integration of the production and distribution of words, sounds, and images of culture as well as personalizing them to the taste of the identities of the individuals. It is pertinent to add that although the market acts to promote new consumption patterns and ways of life, it does not disregard local identities and cultures. For example, family farmers in the José Gomes community reproduce consumption habits of the urbanities to enjoy and insert themselves in modernity. Therefore, the market should not be understood apart from culture and identities.

Figure 4 - Productive dynamics present in the José Gomes community, Cabeceiras do Piauí/PI: A and B = manufacture of cassava flour; C, D, E, F, G, H, I = manufacture of cashew sweet and ‘cajuína’; J, L = sale and purchase of cashew nuts; M = production of beans.



Source: Data from the authors (2020).

On the other hand, according to Silva et al. (2014) and Paula Filho et al. (2016), based on the challenges faced by family farmers regarding the effectiveness of public policies aimed at rural development and especially at the improvement of community infrastructures, it is necessary to understand local specificities more accurately, considering the socioeconomic dynamics and physical and productive factors.

In this perspective, it should be noted that José Gomes' cultural relations were characterized by religious celebrations and pilgrimages to other places, mainly to the municipal seat, where the patron saint São José was celebrated, when they thanked the annual harvest and requested a blessing for the new crop. The religious cultural movements existing in the community were the celebrations of São Raimundo Nonato (Figure 5) and the Santa Luzia's Triduum, which took place in the months of August and December, respectively, stirring the community. Ninety-four per cent of the community members belonged to the Catholic religion, while 4.80% were evangelicals, and 1.20% had no religion. It is pertinent to highlight this high percentage of Catholics because festivities linked to the agricultural calendar are still a common practice in rural Piauí, representing a regional traditionality. Canclini (1983), Pimentel (1997), Chianca (1999), Cavnac (1999), and Lopes Júnior (2001) discuss the cohesion between rural popular festivals and the agricultural production and work calendar of rural communities.

Figure 5 - Religious festivities and their locations in the José Gomes community, Cabeceiras do Piauí/PI: A - A, B = São Raimundo Nonato church; C, D = celebrations for the patron saint; E, F = auction using products produced in the community.



Source: Data from the authors (2020).

These movements are preponderant for the community to publicize its productions, as there is the moment of “auctions” in which “jewels” are presented, namely, the cakes, sweets, lickers, syrups, flour, fruits, and vegetables locally produced. They are auctioned, generating income and likely promoting SLD. Lagares and Almeida (2009) reinforce that “popular rural festivals seem to be programmed according to the agricultural calendar. Most of them are concentrated after the harvests when these faithful participants can already ask for the next harvest and thank them for the antecedent one”.

4. Conclusion

It was found that endogenous knowledge, nature, and culture of community members favor SLD. Knowledge and use of different types of vegetables and subsistence agriculture have been primarily responsible for providing food and income to the populations living in the study area, strengthened by the intrinsic attachment to nature displayed by the residents. It is also clarified that the reports of the farmers were essential to understand the dynamics presented by the community.

It was also noticed that tradition is an inherent characteristic of José Gomes’ farmers, where cultural and identity ties are essential values for the maintenance of natural and family heritage, with the land being the object of social reproduction, reciprocity, sociability, and rural ways of life.

As the inhabitants of the community have access to technical assistance networks and programs to support the strengthening of family farming through, for example, lectures, training, counseling, and improvement of production techniques that add technology to science and mainly to endogenous knowledge, SLD will be further fostered.

Finally, based on the issues raised in this research, longitudinal studies are recommended to deepen the analysis of the influence of endogenous knowledge, culture (which includes the processes of socio-cultural hybridism between traditional family farming and scientific agronomy), and nature on the promotion of SLD, especially the knowledge and use of Non-Conventional Food Plants (NCFPs).

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