

Identity and Sustainability Profile of the Manoel Ciriáco dos Santos Quilombola Remnant Community, Guaira/PR

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Abstract

The remaining quilombola communities, often neglected in terms of their legal and social recognition, constitute spaces of resistance, in which ancestral knowledge, practices and traditions remain preserved, especially with regard to the relationship of respect for land and culture. In this context, this study aimed to outline the identity and sustainability profile of the Manoel Ciriáco dos Santos Quilombola Remnant Community, Guaira, Paraná state, Brazil, considering aspects of the three pillars of sustainability. The research adopted as methodological instruments discussion groups and semi-structured interviews with community representatives. The content analysis technique was used to analyze the data, organized based on the categories: social, economic and environmental aspects. The results demonstrate that the community faces significant challenges, especially related to the process of territorial demarcation, which directly impact the level of education and the preservation of local cultural manifestations. It was also observed that community members recognize their daily practices as sustainable, since they are based on respect and conservation of the environment. Therefore, the Manoel Ciriáco dos Santos community represents an important resistance movement in the face of territorial and social conflicts, remaining firm in the affirmation of its ethnic and cultural identity. Their way of life rescues and preserves traditional values and knowledge, with agriculture as their main source of income, characterized by practices with low environmental impact, especially when compared to the activities carried out on neighboring rural properties.

Keywords: social, economic, and environmental aspects, resistance movement, family farming

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Introduction

Boff (2014) relates sustainability to the growing need to meet human demands amid population growth, increasing food production, and rising social inequality, which keep many in vulnerability and extreme poverty. Techniques to boost production have often degraded natural resources, contaminated soil and water, and reduced biodiversity. Sustainability, therefore, entails the conscious use of resources so that present needs are met without harming future generations (Muniz et al., 2023), integrating economic, social, and environmental dimensions (Boff, 2014; Muniz et al., 2023).

This approach enables sustainable development or “ecodevelopment”, which unites economic and environmental aspects with social and cultural innovations (Sachs, 2008; Veiga, 2010). In Brazil, understanding these concepts requires considering the country’s ethnic and cultural diversity, where historically marginalized groups—such as quilombola communities—express resistance by preserving political, cultural, and social structures in defense of freedom, dignity, and rights (Fiabani, 2005).

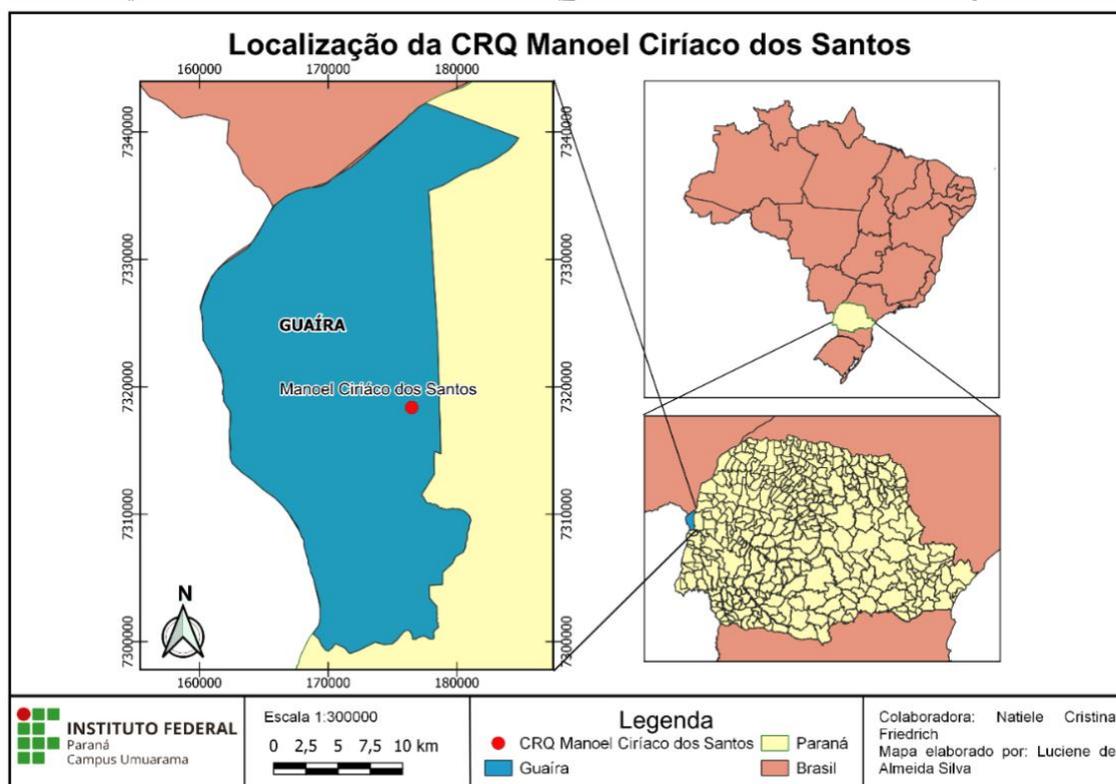
Typically located in rural areas, quilombola communities rely on family farming for subsistence and income (Fidelis, 2011). Formed through diverse processes involving enslaved Africans, freed persons, Indigenous peoples, and others, quilombos historically resisted the slave system through land occupation in various forms (Fiabani, 2005). However, they still face socio-environmental, economic, cultural, racial, and political conflicts that hinder access to basic rights and sustainable development (CONAQ, 2018). Land holds ancestral, cultural, historical, and spiritual value, yet inequalities rooted in the colonial period persist, particularly in rural areas (Dimenstein et al., 2020; Fidelis, 2011).

Examples in Paraná include the João Surá Community, practicing agroecology as both an income source and a social practice based on cooperation and solidarity, and the Vila Baeté Community, where installing photovoltaic energy in the local school reduced costs and promoted sustainability, aligning with SDG 7 of the UN 2030 Agenda (Oliveira, 2001; ONU, 2015).

The focus of this study, the Manoel Ciriáco dos Santos Community, integrates ecological, political, economic, social, and spiritual dimensions, representing resistance to structural racism and an alternative development model known as “ethnodevelopment”, which rejects extractivism and promotes sustainable, culturally rooted territorial practices (Santos & Nyamien, 2022). The research aimed to outline the community’s identity and sustainability profile, considering the three pillars of sustainability.

Materials and Methods

The study was carried out in the Manoel Ciriáco dos Santos Quilombola Community, located in the rural area of Guaíra, western Paraná, in the Maracaju dos Gaúchos region, predominantly inhabited by descendants of Italians and Germans. The quilombola territory is concentrated in Gleba 04, Colônia C, Rural Lots N° 186, covering approximately 24.7 hectares (Hoffmann, 2012).

Figure 1*Location of the Manoel Ciriaco dos Santos Quilombola Remnant Community*

Source: Prepared by Luciene de Almeida Silva and Natiele Cristina Friedrich, for this study (2022)

A preliminary bibliographic review on sustainability and family farming was conducted to correlate theoretical concepts with practices observed in the community. The research adopted a descriptive approach, aiming to characterize and analyze sustainable aspects present in the locality.

Data were collected through discussion circles and semi-structured interviews with community representatives, in moments of shared lived experiences. These encounters sought to understand organizational dynamics and residents' perceptions of environmental, social, and economic issues. The study was approved by the Research Ethics Committee (CAAE No. 53182421.2.0000.8156/2021).

Interview and discussion circle data were analyzed using Bardin's (2011) content analysis, structured into three predefined categories: environmental, social, and economic aspects. Categorization followed the principles of exhaustiveness, homogeneity, and grouping of convergences and divergences. Results were discussed in light of the literature and participants' perspectives.

In the environmental dimension, interviews addressed four guiding questions: the existence of ecological measures in the community; understanding of the concept of sustainability; sustainable practices in place; and use of ecological technologies. Responses were organized into two analytical axes: ecological practices adopted and conceptual understanding of sustainability.

For the social dimension, sociodemographic data were collected, including age, education, marital status, and number of children. For the economic dimension, the analysis considered family income composition, housing conditions, access to healthcare, transportation, electricity, and means of communication.

This systematization enabled an integrated analysis of the three dimensions - environmental, social, and economic - providing a comprehensive understanding of the community's reality and its alignment with the principles of sustainability and ethnodevelopment.

Concepts of Sustainability and Family Farming

Rocha (2023) traces the etymology of “sustainability” to the Latin *sustentabile*, meaning to sustain or maintain, defining it as the balance between resource exploitation and preservation to meet present needs without compromising future ones (Sachs, 2008). Boff (2014) describes sustainability as based on three pillars—economy, society, and nature—whose interaction enables economic development alongside social rights and environmental protection. Elkington’s “Triple Bottom Line” model reinforces that sustainability requires being economically viable, socially just, and environmentally responsible (2W Energia, 2022; Boff, 2014).

Historically linked to economic growth, development has been redefined to include social, cultural, and environmental dimensions, giving rise to “sustainable development” (Sachs, 2008). Global awareness was influenced by *The Limits to Growth* report (Club of Rome, 1972), which warned against unlimited growth and resource overuse, predicting collapse without changes in production and consumption (Herrington, 2020; Oliveira & Claro, 2024). Current data confirms these risks, highlighting the need for equitable wealth distribution and environmental preservation (Cappellin & Giuliani, 2006).

Boff (2014) critiques the capitalist, anthropocentric model for depleting resources, concentrating wealth, and fostering inequality, pushing social and ecological systems toward collapse. Sustainability thus entails ensuring livelihoods, preserving ecosystems, and promoting social justice (Dinnebier & Morato Leite, 2017). Persistent crises exacerbate poverty and marginalization, demanding actions to reduce inequality, eradicate poverty, expand access to clean energy, and foster inclusive, sustainable economic growth (Oliveira & Claro, 2024).

The environmental dimension emphasizes the rational use of resources, adopting renewable sources, reducing waste, and enforcing regulations. In Brazil, Clean Development Mechanism (CDM) projects have shown positive environmental, social, and economic impacts, proving sustainability involves social inclusion and innovation (Godóy et al., 2024).

Social sustainability focuses on human well-being, quality of life, and equity (Stoffel & Colognese, 2000). Sachs (1986) links it to social justice, requiring reduced inequalities and improved living conditions, especially for marginalized groups. Sen (2000) broadens poverty to include deprivation of freedoms, impacting education, health, housing, leisure, and civic participation. Solidarity, according to Boff (2014), is key to counteracting exclusion and inequality.

The UN 2030 Agenda, with 17 SDGs and 169 targets, seeks integrated solutions for environmental preservation, local economies, and social inclusion (Barbado & Leal, 2021;

Oliveira, 2001; ONU, 2015). Basso (2003) notes that sustainable rural policies, valuing territorial and cultural specificities, place family farming at the center, boosting economic viability and rural living conditions.

In Brazil, the concept of family farming gained traction in the 1990s through agrarian reform movements, becoming institutionalized via PRONAF (Brasil, 1996). Abramovay (1998) emphasizes that it is defined less by property size than by family-managed production, valuing labor, diversity, food sovereignty, and sociocultural continuity. Family farming combines ownership, management, and labor within kinship structures (Wanderley, 2009).

Despite challenges from agribusiness expansion, family farming remains relevant, shifting from subsistence to a driver of sustainable rural development (Meneghatti et al., n.d.). PRONAF has strengthened this role, with record funding in 2023/2024 (R\$ 71.6 billion), fostering sustainable practices and social inclusion (Gambetta & Pereira, 2023).

In quilombola communities, family farming is central to livelihoods and cultural reproduction (Fidelis, 2011). Their agriculture blends traditional knowledge with sustainable resource use (Bráz, 2022), aligning with SDGs by ensuring food security, income, and cultural resistance (Santos & Nyamien, 2022).

Sustainability vs. Quilombola Communities: The Case of the Manoel Ciriáco dos Santos Community

In the context of family farming associated with the principles of sustainability, it is essential to consider economic, social, and environmental aspects in an integrated manner. According to Abramovay (1998), rural establishments based on family farming should adopt productive practices that ensure ecological balance, thereby fostering sustainable development in rural territories.

In this regard, quilombola communities, as traditional groups historically excluded from formal development processes, continuously seek social inclusion and the improvement of their living conditions. From this perspective, studying the sustainable practices adopted by these populations has proven to be fundamental to understanding both the challenges and the potential of sustainable development applied to quilombola family farming.

In the specific case of the Manoel Ciriáco dos Santos Quilombola Remnant Community, which is the subject of this research, the analysis of the three pillars of sustainability (environmental, social, and economic) revealed the need for methodological approaches that are sensitive and adapted to local socio-cultural dynamics. During the interviews, it was observed that participants sometimes showed resistance or difficulty in maintaining a linear and continuous discourse, which at times compromised the flow of dialogue. This scenario required the adoption of complementary methodological strategies, particularly mediation through culturally appropriate perception and communication tools, such as community dialogue circles.

All the visits to the community were essential to building a broader and deeper understanding of the local reality, allowing access to information that would not have been fully captured through formal interviews alone. Particularly noteworthy was the role of meetings held in the community hall – a space traditionally dedicated to cultural activities, gatherings, and moments of socialization – as favorable environments for the development of more

spontaneous, open conversations rich in information. During these occasions, narratives emerged that contributed significantly to understanding the processes of social organization, productive practices, and the perceptions of the quilombola people regarding the environmental, social, and economic issues that shape their reality.

Perception of Environmental Aspects of the Manoel Ciriáco dos Santos Quilombola Remnant Community

In the environmental category, members of the Manoel Ciriáco dos Santos Quilombola Remnant Community identified as sustainable practices: vegetable cultivation, fish farming, photovoltaic solar energy, and pesticide-free agriculture.

Residents reported that, at the time of the community's formation, much of Guáira's territory was forested, later deforested for soy, corn, and pasture. They perceive neighboring properties' agriculture as distinct from family farming due to monoculture, mechanization, and chemical input use. Legally, however, Federal Law No. 11.326/2006 defines family farming by management, family labor, and income from rural activity, not by the absence of such practices (Brasil, 2006).

For the community, the communal vegetable garden exemplifies sustainable agriculture, aligning family farming with the appreciation of sociocultural diversity as a strategy for rural identity building and solidarity (Meneghatti et al., n.d.). Pesticide-free farming is viewed as environmental preservation, reflecting awareness of the negative impacts of fertilizers and pesticides, which - despite boosting productivity - cause environmental degradation, resource pollution, and serious health risks to workers and consumers (IBGE, 2015). Since 2008, Brazil has been the world's largest pesticide consumer, with Paraná ranking third nationally (UFPR, 2022).

Linked to the dominant agricultural model, pesticide expansion has become a public health issue, with impacts such as respiratory diseases, cancer, endocrine disorders, genetic damage, and biodiversity loss (Carneiro et al., 2015). Although the community equates pesticide-free practices with organic production, official recognition requires certification, absent in this case.

When asked about sustainability, some residents associated it with environmental preservation and considered the community sustainable, though most lacked a clear definition. This gap reflects the absence of structured Environmental Education (EE), crucial for building critical, collective awareness and driving practices aligned with socio-environmental challenges (Rodrigues & Costa, 2004). EE fosters citizenship and social transformation by enabling the identification of structural causes of environmental problems and developing collaborative solutions (Sorrentino et al., 2005). For Jacobi (2003), sustainability is transdisciplinary and cross-sectoral, depending on integrating diverse knowledge systems, especially in education, so that society incorporates them into daily actions.

Perception of Social Aspects of the Manoel Ciriáco dos Santos Quilombola Remnant Community

Formal education emerges as a key driver of personal, social, and economic transformation, as well as a tool for promoting social justice by fostering critical citizens engaged in social, economic, and political processes (IBGE, 2015).

The interview data (Table 1) show that all respondents wished to have continued their studies but pointed to early entry into the labor market, racial prejudice, and, in some cases, health issues as causes for dropout.

Table 1

Profile of the Interviewees, Residents of the Manoel Ciriáco dos Santos Quilombola Remnant Community

Interviewee	Education Level	Age	Marital Status	Number of children
1	Complete secondary education	21 to 30 years old	Single	0
2	Incomplete primary education	51 to 60 years old	Married	2
3	Incomplete secondary education	21 to 30 years old	Common-law marriage	1
4	Complete secondary education	18 to 20 years old	Common-law marriage	1
5	Incomplete primary education	61 to 70 years old	Widow	3
6	Complete secondary education	31 to 40 years old	Single	1
7	Incomplete primary education	31 to 40 years old	Common-law marriage	2
8	Complete primary education	61 to 70 years old	Married	2
9	Complete secondary education	41 to 50 years old	Married	6
10	Complete secondary education	51 to 60 years old	Married	3

Source: Author's own work (2022)

Similar findings appear in Rocha and Silva (2016), who highlight structural barriers such as the lack of nearby schools and racial discrimination, which hinder permanence and success.

In this regard, the account of Interviewee 9 illustrates, in a compelling manner, how structural and institutional racism was present in the school trajectory of community members, even before the official recognition of the community as quilombola:

Interviewer: Before the conflicts caused by the recognition as a quilombo and the demarcation of lands, how was coexistence with the society of Guaira? Did you always identify prejudiced attitudes? **Interviewee 9:** I'll tell you the truth. Around here, there was always a lot of prejudice, because we've been saying since school days; we were still children, and we suffered inside the schools — the teacher didn't teach us properly, they taught the white people; they didn't teach Black people, there

weren't many of us and conditions were poor, there were no resources, so we were humiliated, mainly for being Black. We didn't even learn our own history in the classroom, I never heard about the Quilombo, about the community, our culture — we never learned that in school; we learned it from our grandparents, father, mother, and among ourselves. (Interviewee 9, 2022)

The narrative reflects how invisibilization of Black history, along with exclusionary teaching, reinforced marginalization from childhood. The absence of content on quilombola identity and Afro-Brazilian history deepened the denial of belonging.

Land demarcation intensified discrimination, with reports of segregation in schools and on buses. This reveals the persistence of structural racism, expressed in rights denial, unequal education, and difficulty in institutional recognition. Anti-racist education, valuing diversity and strengthening ethno-racial identity, is essential for overcoming these inequalities.

Almeida (2019) defines this as “institutional racism”, whereby normalized practices in power structures perpetuate marginalization. The recognition process was led by the Clóvis Moura Working Group (GTCM), whose visits strengthened identity reconstruction and led to certification by the Palmares Cultural Foundation (Ribeiro, 2018).

Quilombola education extends beyond schools, encompassing traditional knowledge and practices passed through generations. All interviewees cited participation in handicraft and culinary courses, and storytelling as key to transmitting values and collective memory—an example of UNESCO's (2006) intangible cultural heritage. Family and community ties shape education alongside formal schooling.

José Maria, son of Manoel Ciriáco, was remembered as a spiritual leader and cultural reference. His death weakened cultural transmission, especially among youth. Capoeira, once active with berimbau and atabaque (Figure 2), has declined and is no longer practiced (2022), indicating a break in intergenerational transmission.

Figure 2

“Capoeira” Circles in the Manoel Ciriáco dos Santos Quilombola Remnant Community



Source: Archive of the Manoel Ciriáco dos Santos Quilombola Community (2022)

Regarding the community's religious practices, interviewees highlighted the worship of Umbanda and Candomblé, African-based religions traditional among quilombola remnants. However, over the years, in search of greater acceptance and social integration in Guaíra's society, there was a gradual shift toward Catholicism. Subsequently, some community members also began affiliating with Evangelical churches, evidencing transformations in the local religious landscape.

The Manoel Ciriáco dos Santos Quilombola Remnant Community stands out for its solidarity and cultural preservation, in stark contrast to the historical marginalization it has faced. Among the cultural expressions present in the community, "capoeira" and African-based religions – manifested through dance, song, play, games, and rituals – play a central role. These practices preserve the history of enslaved Africans and constitute cultural elements embedded in Brazil since the colonial period, representing fundamental symbols of Afro-Brazilian resistance and identity (Franco, 2021; Silva, 2019).

It was found that these cultural elements are a fundamental part of the identity of the Manoel Ciriáco dos Santos Quilombola Remnant Community. However, over its history, such expressions have faced adverse reactions, intensified by land conflicts arising from demarcations, during which the community faced numerous threats. Notably, in the account of Interviewee 9, the influence of the external environment on the transformation of the local cultural pattern is evident:

Interviewer: Regarding the community's culture, do you believe there have been losses due to external influence? **Interviewee 9:** We lost a lot; I remember from when I was a child and compared to today, due to the lack of cultural support, being a Traditional Quilombola community with its customs, we lost much of that. Today, we are working on rescuing all of it, but it is still slow. And to say as well, the municipality, in terms of Culture, is very weak or pretends not to see. We knocked on the municipality's door regarding culture here in Guaíra, and you can see it; ours is the only one near the municipality of Guaíra. (Interviewee 9, 2022)

Additionally, community members reported incidents involving the use of religious elements of Afro-Brazilian culture against them. Several "spiritual works" were found on quilombola lands, provoking resentment and fear among residents, who felt violated by the appropriation and negative manipulation of their culture. These actions, seemingly premeditated to destabilize the quilombola movement, culminated in unfounded accusations that the quilombolas themselves were carrying out such spiritual works to attract attention, further intensifying mistrust and internal conflict.

In this context, Ribeiro (2018) reports an incident of a "spiritual work" directed at community leaders, in which a coffin containing a dead black chicken, "pinga" (sugarcane liquor), candles, sand, and a cross was found at the back of quilombola property, along with an inscription bearing the name of the quilombola leader and the predicted date of his death. The author highlights the intentional use of Umbanda elements as a form of intimidation and threat against the community. During conversations, quilombolas mentioned having found various objects buried or hidden on their lands and frequently observed traces of burnt colored candles near their homes.

In the interviews, when asked about experiences of racism, seven interviewees confirmed having faced discriminatory situations, describing episodes of segregation, inequality, and

explicit manifestations of racial prejudice. Informal conversations provided a deeper understanding of the racism faced by the community, evidencing the persistence of this problem in their daily lives.

According to Campos and Lima (2024), racism transcends individual attitudes, constituting a collective, social, and institutional manifestation that maintains privileges for those positioned at the top of the racial hierarchy. This form of discrimination has a material basis linked to the economy, power, and unequal distribution of resources, functioning as a mechanism that perpetuates inequalities and ensures benefits for dominant groups.

In addition to the direct attacks suffered by the quilombolas of the Manoel Ciriáco dos Santos community, racism also disrupted internal relations within the community itself. The fear and insecurity arising from the threats led some members to leave the territory. Consequently, internal debates emerged regarding the recognition as a quilombo and the land demarcation process, revealing divergences over these matters. Social injustices also have subjective repercussions on individuals, as the fear of racism affects personal identity recognition, potentially causing mental confusion, distress, anxiety, and depression (Almeida, 2019; Dimenstein et al., 2020).

In this sense, the recognition of quilombola identity was questioned by many members of the Manoel Ciriáco dos Santos community, who expressed concern about the potential escalation of tensions with neighbors. As for overcoming racism, there was an almost complete absence of hope, as expressed by Interviewee 2:

Interviewer: Can the community bring knowledge about Black history? **Interviewee 2:** Yes. There are many stories about what we've been through in our lives. **Interviewer:** What does this contribute to society? **Interviewee 2:** It teaches the teacher, right, taking it outside. But racism... only God can end it, because it won't end. **Interviewer:** For you, can knowledge combat racism? **Interviewee 2:** It can reduce it, but end it completely? I don't think so. Only God Himself can intervene so it ends. Prejudice, my dear, is too much. (Interviewee 2, 2022)

It is worth noting that the Manoel Ciriáco dos Santos Quilombola Remnant Community regularly receives visits from educational institutions at different levels. During these visits, quilombolas conduct presentations and dialogue circles in which they share the community's historical trajectory (Figure 3). Throughout these interactions, they recount the conflicts faced by the community to convey knowledge to the visiting students, strengthen intercultural dialogue, and contribute to the appreciation and preservation of quilombola identity.

Figure 3*School Visit to the Manoel Ciriáco dos Santos Quilombola Remnant Community*

Source: Archive of the Manoel Ciriáco dos Santos Quilombola Community (2022)

During the interviews, participants unanimously perceived that knowledge of Black history plays a fundamental role in the fight against racism. Although they expressed skepticism about the possibility of completely eradicating racism, all agreed that expanding historical knowledge can contribute significantly to its reduction.

The Perception of the Economic Aspects of the Manoel Ciriáco dos Santos Quilombola Remnant Community

Regarding the economic aspects of the Manoel Ciriáco dos Santos Quilombola Remnant Community, several elements were identified, as organized in Table 2.

Table 2

Economic Profile of the Interviewees, Residents of the Manoel Ciriáco dos Santos Quilombola Remnant Community

Interviewee	Vehicle	House building material	Access to electrical energy	Access to health	Access to internet
1	Car	Masonry	Yes	SUS*	Yes
2	Car	Masonry	Yes	SUS*	Yes
3	Motorcycle	Wood	Yes	SUS*	Yes
4	Motorcycle	Wood	Yes	SUS*	Yes
5	Car	Wood	Yes	SUS*	Yes
6	Motorcycle	Wood	Yes	SUS*	Yes
7	Car	Masonry	Yes	SUS*	Yes
8	Car	Masonry	Yes	SUS*	Yes
9	Car	Masonry	Yes	SUS*	Yes
10	Car	Masonry	Yes	SUS*	Yes

SUS* - Sistema Único de Saúde¹

Source: Author's own work (2022)

In the accounts of quilombola community members, the relevance of public incentive policies promoted by the federal government was highlighted, especially housing programs. Initially, the houses were built with wooden structures and thatched or grass roofs, later evolving to asbestos coverings. From 2003 onwards, with the implementation of federal housing programs, some residents were benefited, enabling them to build masonry houses, which is a significant achievement and the fulfillment of a long-cherished dream for the community.

Regarding economic activities, the cultivation of small family gardens was identified, with agricultural production sold through contracts established under the Food Acquisition Program (Programa de Aquisição de Alimentos – PAA), linked to the public administration of the Municipality of Guaira. The dynamics of this practice were detailed by Interviewee 2:

Interviewer: So you've lived in the community all your life. What are the community's sources of income? **Interviewee 2:** I used to work first, hoeing for others, day labor, picking cotton, planting with a small machine, planting rice, soybeans, hoeing everything for others. **Interviewer:** Do you currently work? **Interviewee 2:** I work here in the community, but now I stay at home more, do some things, but really working a lot I can't anymore. **Interviewer:** How is the work and the earnings from it divided? **Interviewee 2:** Everyone has their own projects, right? Vegetable garden projects, each one in their own name, and when it's time to plant vegetables to deliver to the village, one helps the other to take them to the Indigenous

¹The Sistema Único de Saúde (SUS) is Brazil's public health system that provides universal, free, and comprehensive healthcare services to all residents, guided by principles of equity and social participation.

people. **Interviewer:** And do you deliver vegetables only to the Indigenous people?

Interviewee 2: To the Indigenous, to schools, to the soup kitchen, and when there's surplus after the accounting is done, what's left they sell to the market, in town and donate to others.

Interviewer: How does payment work? Does everyone get paid for the work? **Interviewee 2:** Yes, everyone; this year I don't know, but last year it was 4 thousand.

Interviewer: Per month? **Interviewee 2:** Not per month, per year.

Interviewer: 4 thousand per year? **Interviewee 2:** Per year. (Interviewee 2, 2022)

From the above, it is evident that the main source of income for the Manoel Ciriáco dos Santos quilombola remnant community comes from the cultivation and commercialization of family gardens. Additionally, income is supplemented through social security benefits, such as retirement and sickness aid, as well as the Bolsa Família Program, and, in some cases, work outside the community.

This socioeconomic scenario is similar to that found in other Brazilian quilombola communities. For example, Pedrosa Junior et al. (2008), when investigating quilombola remnant communities in the Vale do Ribeira region (São Paulo), identified that the main source of household income was government benefits, such as pensions (40.5%) and Bolsa Família or Bolsa Escola (33%), followed by the sale of agricultural products (34.2%). Furthermore, the commercialization of forest-extracted products (23.1%) and income from occasional work on third-party farms (25.4%) also significantly contributed to the livelihood of about a quarter of the families analyzed (Pedrosa Junior et al., 2008).

An important aspect to highlight is the negative impact of the COVID-19 pandemic on the economic structure of the Manoel Ciriáco dos Santos quilombola remnant community, particularly regarding contracts under the Food Acquisition Program (Programa de Aquisição de Alimentos – PAA), which were severely affected. The community's family units were unable to renew or establish new contracts for 2022, compromising their main source of local income. This situation reflects a broader scenario of worsening socioeconomic indicators in the country, which had already been in decline since the beginning of the government administration in 2019, as pointed out by Ribeiro-Silva et al. (2020).

In addition, even before the pandemic, the community faced difficulties paying electricity bills, especially those related to the water pump used for irrigating the gardens. Due to accumulated arrears, the utility company cut off electricity to this connection, directly affecting irrigation. Faced with the urgent need to maintain the gardens, the quilombolas broke the seal that prevented access to electricity and resumed using the service.

This problem was later resolved with the implementation of a solar photovoltaic energy generation system in the community (Figure 4), representing a significant step toward energy autonomy and the sustainability of agricultural activities carried out by residents.

Figure 4*Solar Photovoltaic Energy System Installed in the Manoel Ciriáco dos Santos Quilombola Community*

Source: Author's archive (2022)

The photovoltaic system installed in the community is composed of 16 modules of 330 Wp, model CS6U-330P from the Canadian brand, and a 5 kW inverter from the Sofar brand, model 5KTLM-G2, integrated into the electrical connection responsible for irrigating the garden. The implementation of the distributed microgeneration system was completed in November 2020, with an expected monthly generation of approximately 590 kWh. This initiative brought significant benefits to the community, both in reducing costs associated with electricity consumption and in adopting a clean and renewable energy source. As shown in the consumption history (Figure 5), the system can almost entirely offset the electricity bill, leaving only the minimum fee and any excess charges when consumption exceeds the system's generation capacity.

Figure 5
Electricity Bill for the Irrigation System of the Manoel Ciriáco dos Santos Quilombola Community, August 2022



Source: COPEL (2022)

Solar photovoltaic energy is widely recognized as a clean and renewable source that uses solar radiation, which is an inexhaustible resource, to generate electricity, promoting not only cost reduction but also strengthening environmental sustainability. Hasegawa et al. (2020) demonstrate that photovoltaic systems significantly reduce energy expenses while preserving natural resources, reducing dependence on fossil fuels, and cutting pollutant emissions. Furthermore, adopting solar photovoltaic energy contributes to mitigating climate change by reducing greenhouse gas emissions and decreasing reliance on fossil fuels as energy sources (IBGE, 2015).

In this regard, energy efficiency, when associated with changes in consumption habits, aligns with the principle of conservation of energy, according to which “energy can be transformed or transferred, but never created or destroyed” (Feynman et al., 2008, p. 43), a concept that also has socioeconomic dimensions (Santos et al., 2006). Therefore, it is emphasized that sustainable development is intrinsically linked to improving the energy efficiency of systems, as such progress promotes economic, social, and environmental gains, constituting an essential path for fostering sustainability in traditional communities (Santos et al., 2025).

Thus, it can be stated that the implementation of the solar photovoltaic energy system in the Manoel Ciriáco dos Santos Quilombola Remnant Community not only reduced energy costs but also represented a significant step toward environmental sustainability and community autonomy, serving as an effective strategy for strengthening the socioeconomic structure while preserving natural resources.

Conclusion

The Manoel Ciriáco dos Santos Quilombola Remnant Community represents a movement of territorial and social resistance, affirming and preserving its ethnic and cultural identity through the recovery and maintenance of traditional knowledge, values, and practices.

Agriculture, the community's main source of income, is carried out using low environmental impact practices, causing less damage compared to neighboring properties and contributing to local sustainability.

Looking toward the future, the environmental dimension highlights the importance of the continuous implementation of Environmental Education projects, the promotion of the sustainable use of natural resources, and the creation of community spaces for ecological practices such as gardens, composting, and reforestation. Socially, it is essential to recover and strengthen cultural manifestations, value ethnic and cultural identity among young people, and promote events that revitalize collective memory and the sense of belonging.

From an economic perspective, it is necessary to expand public policies aimed at generating income and productive autonomy, encouraging the creation of cooperatives or solidarity economy networks within the community. The promotion of ethno-development emerges as a sustainable alternative to the traditional economic model, fostering development aligned with quilombola cultural and environmental specificities.

Finally, it is recommended to carry out new interdisciplinary studies to deepen knowledge about the community, strengthen dialogue between public authorities, academic institutions, and the community itself, as well as ensure continuous monitoring of actions, guaranteeing the active participation of quilombola members in decision-making processes. These measures are essential to ensure that the development of the Manoel Ciriáco dos Santos Community is sustainable, inclusive, and respectful of its history and identity.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The author declares that Grammarly, an AI-assisted writing software, was used in proofreading and refining the language used in the manuscript. The usage was limited to correcting grammatical and spelling errors and rephrasing statements for accuracy and clarity. The author further declares that, apart from Grammarly, no other AI or AI-assisted technologies have been used to generate content in writing the manuscript. The ideas, design, procedures, findings, analyses, and discussion are originally written and derived from careful and systematic conduct of the research.

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