

# Agroecology and Empirical Knowledge in Brazilian Quilombol Communities

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**Abstract**—Agroecology has presented itself as an excellent research tool in understanding the countless ways that people relate physically, culturally and spiritually to the environment. However, little attention has been given to ecologically sustainable alternative practices as ways to reduce the impacts generated by traditional production and that cause damage to biodiversity, especially in quilombola (slave-refugee) communities, where the human-plant relationship is very intimate. In this context, the present work aimed to carry out a survey of agroecological practices developed in Brazilian quilombola communities, which are communities where direct descendants of the slaves who were brought to Brazil, at the time of their colonization by the Portuguese, live. The research consists of a literature review with a qualitative approach, in which articles available on the Google Scholar platform were selected. Thus, in light of the studies analyzed, it was possible to describe agroecological practices present in quilombola communities, such as: Management of heirloom seeds; Use of the moon phases for guidance on plantations; Production of native seedlings, and even verifying the efficiency of the application of participatory methodologies such as Agroecological exchanges in backyards to learn about the practices and limitations encountered by residents in food production.

**Keywords**—Agroecological practices; Traditional communities; Traditional knowledge.

## I. INTRODUCTION

Agroecology can be understood as a science that respects ecological and socio-cultural diversity, and that defends the need to generate systemic, holistic knowledge, contextualized from local cultures, as a way of rethinking the way of life, production and consumption of communities. These ecologically sustainable practices inspire countless reflections to get closer to a reframed knowledge of the alliance-relationship between man and nature. According to Cotrim and Dal Soglio (2016), the process of building scientific knowledge must take into account a set of essential elements: a holistic and systemic view of science, immersion of family and community social relations including traditional peoples, social construction of the actors involved in this process, dialogue of empirical knowledge, ecological principles of agriculture, a market embedded in social relations, and the participatory method.

Quilombos, or quilombolas (refugee-slave communities) have been part of the history of Brazil since the 16th century, and were called mocambos. The term 'quilombo' appears in the late 17th century, and in the 18th century both terms were adopted in colonial documents to characterize fugitive communities. In the 19th century, there are records that quilombos were located not only in rural areas, but also in urban areas, in the suburbs of slave cities (Gomes, 2015).

There are more than 2500 quilombola communities throughout the Brazilian territory, of which 500 are distributed in several municipalities in the state of Bahia (Palmares, 2018). Most of these communities preserve the culture and knowledge of their ancestors accumulated over the centuries, bringing valuable information on the use of natural resources, in addition to valuing traditional knowledge (Oliveira 2015).

The social composition of Brazil has a permanent mark from the African matrix, while Afro-descendants still

suffer the terrible legacy of black slavery. The State's recognition of the identity of contemporary quilombolas, after so many centuries, shelters the recovery and appreciation of Afro-descendant cultures in a social system that is still exclusive and discriminatory (Pereira, 2012).

Quilombola populations are culturally differentiated groups that have their own social, cultural and economic conditions, maintaining specific relations with the territory and the environment in which they are inserted. They have knowledge accumulated over centuries and close contact with the environment, which facilitates obtaining information about the use of natural resources. (Pinheiro & Monteles 2007). In addition to this traditional knowledge being the basis of agroecology, it also reaffirms the peasant identity through political organization and articulated actions based on ethnicity, inserting itself in agroecological transition processes coupled with cultural rescue. It is of great relevance that the agroecological knowledge is transmitted to the present generation, seeking its survival under physical, cultural and economic aspects, ensuring the principle of sustainability for the next generations (Brazil, 2014).

These practices that have been used for several generations by quilombolas through empirical knowledge are transmitted through parents and grandparents, such as the use of medicinal plants to prevent and treat common illnesses in their community, since such knowledge is inserted in their culture (Guimarães et al., 2019).

The knowledge about agroecology and traditional knowledge of these communities is configured as a process of coproduction between man and the ecosystem, emphasizing that these groups have knowledge built over time in interaction with the environment, strengthening the construction of agroecology, and have high socioeconomical scientific relevance, and contribute to the conservation and management of vegetation (Toledo 2015), by highlighting the ability to maintain biodiversity in their territories.

This study aimed to conduct a survey of agroecological practices present in Brazilian quilombola communities, examining the future perspectives of man with the territory transformed by modernization in the countryside.

## AGROECOLOGY AND POPULAR KNOWLEDGE

The 19th century was marked by events that directly influenced the agricultural context, among which we highlight the movement called the Green Revolution. This program aimed to achieve an increase in world agricultural

productivity through experiments in the field of plant genetics and the development of agricultural techniques. (Brum, 1988). However, what was verified is that negative externalities originated from this movement, such as, social exclusion, destruction of biodiversity and overvaluation of monoculture to the detriment of the diversification of crops (CAPORAL, 2008).

In light of this scenario of depletion of essential resources for the most varied of human activities, Rodrigues, Neto, Galvão (2019) emphasize the importance of changing the attitude of the human being. Thus, agroecology is highlighted, as it is concerned with the balance of nature and the production of sustainable food. According to Altieri (2004), it is an approach that integrates socioeconomic principles linked to those of agronomy and ecology to understand the effects of technologies on agricultural systems and society in general.

This paradigm is presented with a holistic view considering environmental and human issues (Aquino, Assis, 2005).

Agroecology aims to promote the dialogue between knowledge, providing a relationship between traditional knowledge and scientific knowledge (Altieri, 2012). In this perspective, it encourages researchers to understand techniques used by farmers in agricultural management, such as the development of traditional calendars for programming agricultural activities (Altieri, 2004).

As an integrating science, Agroecology recognizes and feeds on popular knowledge, knowledge and experiences of farmers, indigenous peoples, forest peoples, fishermen, quilombola communities, as well as other social actors involved in rural development processes, incorporating the endogenous potential, that is, present in the "area" (Caporal and Azevedo, 2011).

Agroecology, by incorporating understandings and popular knowledge, goes beyond the simple approximation between agronomy and ecology, which allows a fundamental methodological pluralism for the scientific knowledge offered by different disciplines for the design of more sustainable agro-ecosystems and agriculture, which is what matters from the point of view of planet conservation and species survival. (Feiden, 2005).

Agrobiodiversity, in the agroecological context, is essentially a product of human intervention, based on inventiveness and creativity in the interaction with the natural environment. However, cultural processes, knowledge, practices and agricultural innovations developed and shared by farmers are key components in this process that determines and conditions it (Silva and Junior, 2018).

According to Altieri (2012), it is through ethno-agricultural research that this traditional knowledge is rescued and considered as the primary source for agroecological practices. Popular wisdom in cultivating is inherent to those who practice it, regardless of methods, techniques, technologies or terms applied, after all, when knowledge is passed from generation to generation, one is aware of what is being accomplished (Rosa and Freire, 2010).

Thus, there are agroecological practices that are very present in quilombola communities, according to Pinheiro and Monteles (2007), the remaining quilombola communities (RQC) are culturally differentiated groups that have their own social, cultural and economic conditions, maintaining specific relations with the territory and with the environment, in which they are inserted.

Currently, they live in a permanent context of threats due to the pressure of capitalist exploitation superimposed on their traditional material and immaterial territories (Haesbaert, 2007). Most of the many rural black communities spread across the country, in conflict for the recognition of the traditional possession of collective lands, are mostly identified as “lands of black”, not always associated with the classic historical idea of the quilombo.

The productive and cultural values of quilombolas must be part of the culture of an entire generation and these groups present knowledge, built over time in the interaction with the environment that articulate aspects to be considered and valued in the strengthening and construction of agroecology (Loures, 2011). It is noteworthy that these groups have knowledge built over time in the interaction with the environment. Furthermore, what the quilombolas say is that it is not possible to think about the world without considering that everything on earth has water. It can be said that the world of water condenses the reciprocal relationships of communities with nature (Mirales, 1998).

In the context, RQCs can provide important contributions to the conservation of socio-cultural and biological diversity of species known to traditional populations (Guimarães, 2019). For the process of insertion of a culture to take place, it is necessary to consider the various dimensions of culture, the valuing not only of the individual process, but also of the collective and the dialogue with other cultural perspectives.

The remnants of quilombos, having as their central argument the protection of culture and also of traditional knowledge (Matteo, et al, 2016), the modes of production of traditional peoples and communities used in planting, breeding, hunting, fishing, extractivism and

handicrafts, are associated with kinship and crony relations and are based on relationships of exchange and solidarity between families, local groups and communities.

In this way, the foundation of agroecology is based on the ancestry of these peoples, to strengthen the commitment to society that intends to have a sustainable development, having as reference the principles that guide the collective construction that are founded on knowledge on the basis of agroecology, as stresses Seville Guzmán (2001, p.39), “local eco-evolution has a logic for the functioning of the agro-ecosystem, in those areas where traditional historical management has shown conditions of sustainability”.

Toledo and Barrera-Bassols (2015) point out the importance and value of traditional knowledge, being an essential component used by the farmer for the appropriation of nature, perception and conception of the use of natural resources.

It is known that the act of preserving cultural heritage brings with it the idea that it is necessary to save something that is in danger of disappearing and being forgotten. In this process of understanding the world, it is expected that society as a whole can develop skills in order to effectively interfere in the direction of present and future society, with a broad view of what is happening on the planet; who can know the importance of discovering and developing responsibilities in themselves, so that, as future adults open to relationships and differences, they can contribute to a balanced and specifically processed transformation, in favor of a sustainable future.

This new common cultural movement, which has as its core the awareness of the serious situation in which humanity and the planet are, of the responsibility of all citizens in the face of the problems generated by capitalist society and, particularly by the ruling class; the urgent need to train new generations in a completely opposite perspective, centered on the social reality in which they live, without questions of race, color, social class, etc; the importance of scientific and technological knowledge for the construction of a just, democratic and peaceful society for all human beings, without exclusions or privileges (Morin, 2002). In this context, knowledge about the principles of agroecology in traditional communities, especially in quilombolas, becomes even more relevant to expand and conserve the socio-cultural and biological diversity of species known to traditional populations.

## II. MATERIALS AND METHODS

The research is configured as a literature review, which aims to recognize, select, classify and synthesize the relevant evidence available in research (Cordeiro et al., 2007) being carried out from October to November 2019, and includes published articles in the period from 2010 to 2019, available on the platform <https://scholar.google.com.br>. It was opted for this platform, because the reports of experiences in quilombola communities are published in public congresses, so this information is not presently available in databases. The key words used in the search were: quilombola community, traditional knowledge, agroecology, which after analysis, 7 articles were selected for the study that deal with agroecological practices carried out in Brazilian quilombo communities.

## III. RESULTS AND DISCUSSIONS

After reading the title and abstract, 7 articles were identified that directly addressed the researched theme (Chart 1).

The article “Agroecological practices in peasant and quilombola communities” (Mendonça, 2015), presents agroecological experiences with rescue, production and conservation of heirloom seeds, built by farmers from Peasant and Quilombola Communities in the Citizenship Territories of Chapada dos Veadeiros and Vale do Paranã, Goiás, Brazil, reducing dependence on the multi-seed market. According to Silva and Junior (2018), the valuing of local knowledge and the application of agroecological principles in agriculture are strategies for the conservation, use and improvement of genetic diversity, since ancient forms of management served as the basis for different forms existing agriculture.

The second article, entitled “Quilombola communities in the Velho Chico territory” (Barbosa, Almeida, Santos, 2015), refers to a report, which portrays the experience of students of the Postgraduate course in Social Innovation with Emphasis on Solidary Economy and Agroecology at the Federal Institute of Education, Science and Technology-IF Baiano, in quilombola communities of Lagoa do Peixe, municipality of Bom Jesus da Lapa in the state of Bahia, Brazil.

In this experience, it was found by the authors that these peoples use traditional knowledge in some agricultural practices, such as: Use of specific techniques to combat insects; The orientation of the phases of the moon for conducting plantations. Such empirical

knowledge is passed on from older people in the community and to younger people.

The study by Mota Dias (2012), entitled “Quilombolas and medicinal forest resources in southern Bahia, Brazil” aimed to interpret the traditional knowledge of a quilombola community about the use of plant species for therapeutic purposes. Through interviews and field observations, the researchers identified respondents in the indications for these plants. This knowledge proved to be “an efficient socio-environmental-cultural tool for the practice of handling several species of plants from the most varied botanical families and also included a vast knowledge of sustainable and conservation of forest species for local use” (Mota Dias, 2012, p.158).

The report of experience, presented by Barbieri et al (2018), aimed to describe the experiences of Project Women sowing agroecology, developed by women from Quilombola communities in the Carová region in the state of Pernambuco, Brazil.

The project was led by a young woman who was part of the “Agroecological training program for young farmers in Pernambuco” that began in 2016, in which young people participate in workshops in order to be mobilizers and trainers of other young people of their communities, through the “young to young” methodology focused on the formative process in agroecology.

In the project Women Sowing Agroecology, activities are developed that aim to: strengthen and rescue traditional knowledge; application of new knowledge for agroecological transition in food production; implementation of an agroforestry system in the community and discussion of feminism related to politics, socioeconomic aspects, gender violence, and sexual division of labor.

The experience reported by Trindade, Souza, Barros (2017), entitled “Quiandeu Community - Ipixuna do Pará”, comes from a technical visit, with forest engineering students, from the Federal Rural University of the Amazon campus Paragominas (UFRA-PA) in a quilombola community in the municipality of Ipixuna in the state of Pará, Brazil. During this visit, some agroecological practices were observed in the community, such as: Preservation of the agroecosystem; Shared land use; Agroforestry management.

Chart 1: Identified works that address the studied theme

TITLE / AUTHOR	DESCRIPTION OF ACTIVITIES
AGRICULTURAL PRACTICES IN PEASANT AND QUILOMBOLA COMMUNITIES (Mendonça, 2015)	Heirloom seed management
QUILOMBOLA COMMUNITIES OF THE VELHO CHICO TERRITORY (Barbosa, Almeida, Santos, 2015)	Use of moon phases for guidance on plantations.  Use of specific techniques to combat insects.
QUILOMBOLAS AND MEDICAL FOREST RESOURCES IN SOUTHERN BAHIA, BRAZIL (Mota Dias, 2012)	Cultivating medicinal plants in backyards.
WOMEN SOWING AGROECOLOGY: an experience of living with these semi-arid in quilombola communities in the caroá region – PE (Barbieri et al ,2018)	Strengthening and rescuing traditional knowledge. Application of new knowledge for agroecological transition in food production. Implementation of an agroforestry system. Discussion of feminism related to politics, socioeconomic aspects, gender violence, and sexual division of labor.
QUIANDEUA COMMUNITY - IPIXUNA DO PARÁ: reports on strength, resilience and union of quilombola peoples (Trindade, Souza, Barros, 2017)	Preservation of the agro-ecosystem.  Shared land use.  Agroforestry management.
AGROECOLOGY, UNION AND INNOVATION: the project “fish on table, plant in the forest” (Garcia-Prado, 2015)	Production of native seedlings.  Organic olive oil.
TRANSITION OR RECOGNITION OF AGRICULTURAL PRACTICES IN THE QUILOMBOLA COMMUNITY COLONIA DO PAIOL (Valente et al ,2015)	Reuse of garbage.  Various crops in backyards, without the use of chemical inputs.

In this study, the authors also conclude that this moment provided students and teachers with a broad perception of these practices mentioned above, in which the community members put themselves in the role of transmitting knowledge. According to Feiden (2005), by preserving local knowledge, we seek to preserve the identity, customs and traditions of each people, enabling the conquest of social rights and the improvement of the quality of life of these populations, instead of focusing

only on production by production, forgetting the desires of the men responsible for this.

The experience report entitled “Agroecology, union and innovation” (Garcia Prado, 2015), exposes the experience of an extension project entitled “Fish on Table, Plant in Forest”, developed by the author of the report, who had as one of its objectives to encourage community integration and technical qualification of quilombolas in the Espírito Santo and Rio Preto communities, in the

municipality of São Mateus in the state of Espírito Santo, Brazil.

Initially, meetings were held with rural producers with an agroecological profile belonging to quilombola communities. To facilitate this initial dialogue, participatory methodologies were used, thus identifying the longings and weaknesses of members of these communities. From this initiative, there was an articulation with various sectors of society, such as Universities and the municipal secretary of agriculture, in order to meet the identified demands. Thus, lectures and qualification courses in pisciculture, organic olive oil, production of native seedlings and generation of solar energy took place for all rural producers of the properties of the communities interested in these activities.

The work developed in the quilombola community Colônia do Paiol by the Cooperative Organization of Agroecology (OCA) in partnership with the Center for Agroecology Ewê of the Federal University of Juiz de Fora (UFJF), was reported by Valente et al (2015). OCA is “a cooperativework in agroecology, which, with a multidisciplinary team, seeks to work on values and practices of good living, contributing to the autonomy, sovereignty and economic and socio-cultural empowerment of communities” (Valente, 2015, p. 02). Several visits to the community were made in order to identify the potentialities and the present problems. Project members used participatory methodologies such as Agroecological exchanges in backyards to learn about the practices and limitations encountered by residents in food production. The Tree methodology was also used in order to identify the collective problems of the community (root), dreams (canopy) and discuss proposals to solve problems and make dreams come true (stem).

According to Altieri (2012), the dialog of knowledge is an essential condition for the development of a truly ecological agriculture, in which the people who have the knowledge must be part of the planning process. In this way, local skills can be mobilized through participatory development approaches, combining local popular knowledge with the knowledge and skills of external agents in the design and dissemination of appropriate agricultural techniques.

In view of these applied methodologies, they suggested several reflective questions that addressed several themes, among which the destination of the garbage produced in the community was highlighted, and a workshop was held that addressed the reuse of garbage. Thus, the actions that were carried out in the community, included a holistic approach about the problems, desires,

relationships and processes of knowledge construction in the community. In view of the existing complexity in the various situations encountered, Aquino and Assis (2005) approach agroecology as an emerging paradigm with a holistic approach, which encompasses environmental and human issues.

#### IV. CONCLUSION

From the literature review, which aimed to carry out a survey of agroecological practices developed in quilombola communities in Brazil, scientific articles and reports of experiences that pointed out such practices were identified. These experiences in the communities occurred from educational actions of educational institutions that sought within the experience of quilombola peoples an exchange of knowledge between popular knowledge and academia.

In the agroecological practices observed, activities that involve the handling of heirloom seeds and the cultivation of medicinal plants stand out. In addition, empirical knowledge is evidenced by means of practices, such as: the use of the phases of the moon for orientations in plantations and specific techniques for combating insects; preservation of the agro-ecosystem; shared land use; agroforestry management; reuse of garbage and various crops in backyards, without the use of chemical inputs.

In view of the above, we find that the empirical knowledge of quilombola peoples is present in the most varied activities, and its development is important for strengthening agroecology, since the dialogue between popular knowledge and scientific knowledge is one of the foundations in maintaining this paradigm.

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