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ABSTRACT

This paper, entitled Productivist agricultural systems to multifunctional agriculture in the cocoa agrarian system, in Bahia, Brazil, aims to understand the processes of knowledge transmission in the history and transformation of the cocoa agrarian system, considering the regional economic crisis that has been maintained since the 1990s, coming from the crisis of monoculture of the agricultural commodity. The transformations in rural areas are due to the expansion of rural settlements and, from a technical point of view, the transition from partially productive agriculture to agroecological and multifunctional agriculture through family agriculture and new agrarian reform settlements. Partially productivist because of the agricultural production systems in the cocoa region of the state of Bahia that has been structured, in the Atlantic Forest biome, of tropical forest, in cabruca production systems, recently recognized, as an Origin Indication (Geographical Indication), by the National Institute of Industrial Property (INPI), including, historically, those patron systems, that preserved the forest, in the secular cabruca system, where the cacao was planted under secondary tropical forest, maintaining the extensive green of the south coast of the state of Bahia.

Keywords: *multifunctional agriculture, cocoa, agrarian system, affectivity and reflexive expectations*

Introduction

This research project, called *Productivist agricultural systems to multifunctional agriculture in the cocoa agrarian system in Bahia, Brazil,* aims to understand the processes of knowledge transmission in the history and transformation of the cocoa agrarian system, considering the regional economic crisis that has been maintained since the 1990s, coming from the crisis of monoculture of the agricultural commodity. The transformations in rural areas are due to the expansion of rural settlements and, from a technical point of view, the transition from partially productive agriculture to agroecological and multifunctional agriculture through family agriculture and new agrarian reform settlements.

Partially productivist because of the agricultural production systems in the cocoa region of the state of Bahia that has been structured, in the Atlantic Forest biome, of tropical forest, in *cabruca* production systems, recently recognized, as an Origin Indication (Geographical Indication), by the National Institute of Industrial Property (INPI), including, historically, those patron systems, that preserved the forest, in the secular *cabruca* system, where the cacao was planted under secondary tropical forest, maintaining the extensive green of the south coast of the state of Bahia.

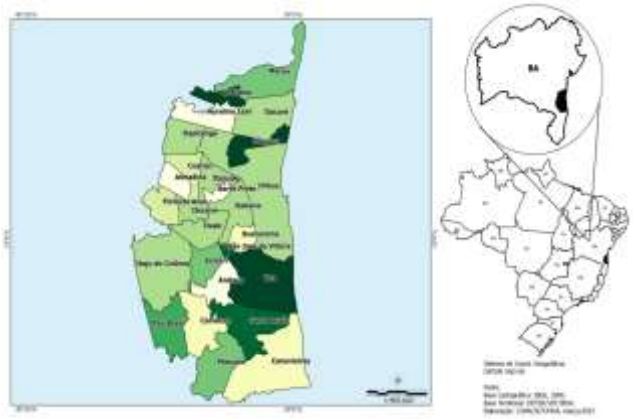
The crises of the cocoa monoculture begin in the 1990s with the growth of regional unemployment, a considerable decrease of the cocoa production in the south of Bahia, becoming Brazil a cocoa importer with the productive disruption of the agricultural systems based on the *cabruca* cocoa plantations, increasing, an intensive way, the deforestation of the Mata Atlântica (tropical forest) and agriculture being replaced by the cattle breeding system.

Figure 1. *South America and Brazil*

Historically, although the existence of the cabruca system, the cocoa production systems was increased with an intensive technological package with chemical intrants, expanded by the Special Commission for the Cocoa Plantation (CEPLAC - *Comissão Especial para a Lavoura Cacaueira*), since

the 1960s, during the Green Revolution, consolidating, through the 1970 decade, Brazil (and the south of Bahia) as the first world cocoa producers.

Figure 2. *Brazil, Bahia and Region Cacaoyère (South Coast)*



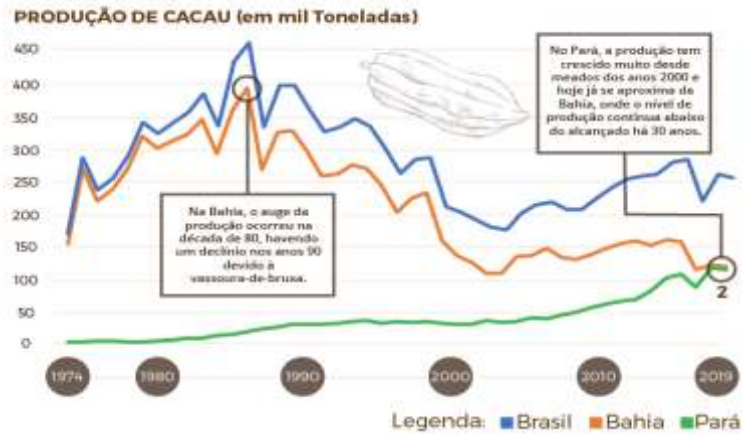
The regional unemployment crises (rural and urban) promotes the organized structuring of the social movements to the agrarian reform, intensified the land occupations and invasions, **coming to consolidate the new settlements of agrarian reform, structuring a family agriculture type**, also dependent on the public policies for the finance with credit and investment based on infra-structure and plantation with temporary cultures for the family security and supply in the first moment.

In the second moment, the family farmers of these agrarian reform settlements relatively structured have begun to obtain the financial resources from the federal government programs, mainly from the National Program for Enforcement the Family Agriculture (PRONAF - *Programa Nacional de Fortalecimento da Agricultura Familiar*), beyond the revenue transfer programs, as family scholarship, micro-credit programs from the North-est Brazil Bank, beyond other institutional markets, as the Food Acquisition Program (PAA - Programa de Aquisição de Alimentos) and the National Program of the Education in the Schools (PNAE - Programa Nacional de Educação nas Escolas), all these programs destined for the family farmers in the region.

A type of family agriculture has begun an agroecological transition process from the productivist cocoa systems with other cultures to agroecological production systems without the agrochemical use.

Although the agricultural practices are fixed on the productivism of the Green Revolution, which was expanded in the second middle of the 20th century with the diffusion technologies, mainly in the employers' agriculture systems with *cabruca*, and the saturation of this model, this technological paradigm consists to a serious and deep economic and technological crises with a slow economic recuperation, demanding productive diversification founded in new paradigms that preserve and conserve the tropical forest (Mata Atlântica), decrease and eliminate the agrochemical using and keep clean the water resources with the productive inclusion, through the employment and occupation generation around the family farm.

Figure 3. *Cocoa Production (Mille Tons)*



Note: In Bahia, the peak of production has happened in th 1980's decade and there was a decline in the 1990's due to the Witch's Broom disease. In Pará, the production has increased since the middle of 2000 years and it is next to Bahia, where the production Level continues below those reached 30 years ago.
Subtitle: Brazil (blue), Bahia (orange), Pará (green).
Source: MAPA 2020.

These paradigms present as tends in the agroecologies in the family farmers and the agrarian reform settlements, as in the indigenous communities, emerging the principles of the double green revolution (agriculture and environment) destined to re-structure the employers' agricultural production systems and the family farms without the pesticides using, which, because of the economic crises, had decreased considerably, keeping in the employers systems that got to be structured with cloning and hybridism on the genetical enhancement process with plants more resistant.

The tendencies of a multifunctional agriculture expansion are based on the cocoa *cabruca* system, introducing the family and employer production systems in the agrarian reform settlements with the public functions from multifunctional agriculture, based on economic, environmental, social, cultural, territorial, and educational in the knowledge transmission. Between generations, the cocoa plantation concerns the *cabruca* systems and the agroecological management, being the affectivity and the reflexive expectancies the spatial and the time connection process in the heritage succession and the collectivity, obtaining the micro-economic results of the incomes in the family and employer agricultural farms.

Methodology

The methodology is based on the theoretical reflections and the case studies, using a convergence of methods. Because of the pandemic situation, this paper does not consider the empirical results coming from the surveys, leaving it to other papers.

a) analyses-diagnostic of the agrarian systems develop into the *Institut des Sciences et Industries du Vivant et de l´Environnement* - AgroParisTech, in France;
b) theoretical and methodological approach around the affections and the reflexive expectancies as connections of the technology and knowledge transmissions;
c) approach on the geographical indication (*appellation d´origine*) of the *cabruca* system;
d) the Thomas Khun's scientific paradigm notion and the technological paradigm between the neo-shcumpeterian and the evolutionist for the approach concerning the productive and multifunctional agricultures;
e) theoretical and methodological approach funded into the Russian agroeconomist Chayanov thought.

The methodology implies researching the statistical data and the empirical data and information together with the family farmers and employers' producers in a productivist, in transition, or multifunctional agricultural situation.

To understand the process of agriculture evolution, it is necessary to know the social structure of the countryside, the agricultural farms' typology. **To Chayanov, the peasant farm is a complex and heterogeneous social phenomenon**. Chayanov presents his essential thesis: for the agriculture enterprises, the most efficient size is not large and small, but the optimal average, where there is an equilibrium between the advantages and disadvantages from the small and the large farm. The optimal production is considered that will have the lower cost. The optimal depends on the geographical conditions, the production specialization, and other objective factors (Carvalho, 2014).

The Analyse-diagnostic Method in the agrarian systems based on the progressive steps, from the general to the particular, from the macro scale (international, national, and regional) to lower production and reproduction size of the rural families (the family unit). It considers the agricultural and non-agricultural activity systems around the increased importance of the phenomenon of the pluriactivity in the occupation and income of the rural families and value the extractivism, the Yard, and housework as essential activities in the family unit reproduction (Dufumier, 2007).

This stratification may be done through agroecological zones, establishing a family and activity systems typology. Furthermore, the formation to implement the methodology comprehends other different phases and participative teaching-learning processes, using direct samples, analyzing the diversity of the most important phenomena. The sample size is determined from the complexity and diversity of the studied reality. Before, although, it is defined by the approach scale: territory, municipality, rural community (family farms, indigenous, descendants of "quilombos", agrarian reform settlement or an urban or peri-urban community where the agriculture and other activities are practiced.

Using this methodology, a regional analysis is done, as landscape reading, collection, and data treatment, historical interviews, and elaboration of the

family and production system typology, following some concepts are presented: activity systems, culture system, cattle breeding system, transformation system, yard system, extractivism system, non-agricultural activity system and housework system.

Theoretical Reflections

According to Kuhn (2011), with the choice of the paradigm term, it is intended to suggest some examples accepted in the real scientific practice that includes, at the same time, law, theory, and application - models are proposed from the coherent and specific scientific research. Men whose research is based on shared paradigms are compromised with the same rules and standards for scientific practices.

Technology has played several times an important function in the origin of the new sciences since crafts are an important source of easily accessible facts that could not be discovered casually.

The schools, typical of the first development stages of a science, create this situation.

Any history can be interpreted in the absence of any implicit body of methodological and theoretical connected beliefs that allow a selection, evaluation, and criticism. Both the facts accumulation and the theory articulation became highly oriented activities.

The new paradigm implies a new and complex definition of the field of study. Those who do not or are not capable of accommodating their work must proceed in isolation or unite to some group. A paradigm is an accepted model or standard. A paradigm may be very limited.

The paradigms acquire their status because they are more successful than their competitors to resolve some problems that the group of scientists recognizes as bass. The paradigm forces the scientists to investigate some nature aspects with a deep and detailed approach.

Kuhn (2011) says a class of facts where the paradigm showed the nature of the things. Using it to resolve some problems, the paradigm needed a necessary determination in a more variety of situations. The second class of current facts is determined; however, it is more restricted and related to those phenomena that can be directly compared with the predictions of the paradigm theory (Kuhn, 2011). The paradigmatic period is regularly marked by frequent and deep discussions on the methods, problems, and standards of legitimate solutions. The substitution of the paradigms by the rule should facilitate the comprehension of the scientific diversity and specialization.

The paradigm governs, first, not only a study object but also a group of science practitioners. Any oriented research study by paradigms or that destroys the paradigm must begin by the localization of the group or responsible groups (Kuhn, 2011). The concept of technological paradigms is consequent of the scientific paradigm (Kuhn, 2011).

Dosi had idealized the technological paradigm concept: a model of solutions of technical problems based in the natural sciences to purchase new knowledge that their owners try to protect against an excessive and fast diffusion between its competitors (Couto Filho, Machado and Gomes, 2007).

The technological paradigms define the opportunities of successive innovations in a certain direction or technological trajectories. When the paradigm is saturated, different technological and scientific trajectories are necessary to develop biotechnological processes.

Freeman and Perez propose to include the economic factors, changes in the associated costs to the production and distribution conditions in the analysis of the innovation. The institutional factors may be determinants in the innovation and modernization processes of the enterprises. The techno-economical paradigm is the result of a selection process of series of viable combinations of institutional, organizational, and technical innovations, implying changes that permeate all the economy with an important influence on own behavior (Couto Filho, Machado and Gomes, 2007).

There is a consensus on the existence of a crisis in the productivist paradigm of the Green revolution with the social and environmental impacts, considering the decrease of the agricultural productivity and changes into the sustainable points of the paradigm. Historically these comprehend different technologies in some Brazilian regions, including the wealth and misery production, with social inequality and unemployment.

Among the economic and environmental impacts, there are the following aspects: the costs increasing of the production; increasing of the reached productivity levels with the current technological standard of the modernization that becomes more difficulty; the cost of the additional doses of fertilizers would be higher than the income that could obtain: impossibility of increase the work scale of the mechanical equipment (to prepare the soil, harvest) with the degradation of the physic structure of the soil, consequence of the poids of the machines and equipment: intensive mechanization and modern using of inputs (fertilizers and agricultural defensives) and environmental degradation; utilization of the modern packages with the increase of the erosion process; and the aggravated process in the country of tropical climate with the preparation without soil protection; soil plow in the tropics with a problem because of the strong rains and the burn of the microlife of the soil by the sun; chemical pollution with the pesticides utilization, water, animal life and men contaminations; agricultural defensives using that eliminate the natural enemy of the pests, breaking the biological balance.

The agro-ecologies appear as a set of principles where its basis is technical use, ensuring environmental preservation and sustainable agriculture, involving different tends, as biological agriculture, bio-dynamic agriculture, organic agriculture, and permaculture, each one with its specificities. Environmental preoccupation is the common aspect.

Figure 4.

Source: Avaible in photos in the cocoa region of Bahia - Google Search. [Accessed: 27 September 2021]

The agroecological thoughts are based on ecological principles as the starting point, the natural systems, as the studies on the indigenous and peasant production systems with the more embracing approach of the agricultural units. Analyzing a point of view of the using and resources enjoyment and considering the changes that transform the communities, the agricultural production unit is a special type of ecosystem, an agro-ecosystem where a series of ecological relations occurs.

The imported techniques from the developed countries had implied aggressions for the environment because they were inappropriate to climate and complexity of tropical ecosystems and the technological packages of the developed countries imply a process of the rural population marginalization of undeveloped countries.

The agro-ecologies appear as an application of principles that rule the natural systems in agriculture, based on agronomic science, together with other sciences, like social sciences, in the accumulated knowledge of the indigenous systems and know-doing of the farmers. The agroecologies consist of a sustainable agriculture model that guarantees the preservation of natural resources and the productive capacity of agricultural systems and the development of rural communities.

Figure 5.

Source: Avaible in after cocoa harvest. Photo in the cocoa region of Bahia - Google Search. [Accessed: 27 September 2021]

The technological innovations tend to be near to the family production, characterizing an artisanal aspect. Family agriculture is near to the agroecological principles because of its productive logic or polyculture tradition. The productive logic is not based on productivity. The direct producer aims to maintain the family patrimony and conserve the tradition in a polyculture that is near to ecological sustainability.

The agroecological productive system tends to be appropriate to the natural conditions and the farmers' resources, considering the complex relations between the elements (subsystems) of a farm around the balanced ecologically development.

The Multifunctionality of the Family Farmer and the Sustainable Development

The multifunctional agriculture appears based on the European ecological movement, distinguishing the French movement, being the current objective of the European Common Agriculture Policy (PAC), aiming the sustainable development. Brazil does not yet have a public policy destined for multifunctional agriculture and sustainable development while not structure the technological basis of its agribusiness, today conducted by the scientific orientation of productivism paradigm. There were some specific programs related to the subject, as the donation of directs payments for family farmers through the green scholarship.

Multifunctionality refers to an economic activity that may have multiple productions and contribute to satisfying many objectives for the society. Multifunctionality is a concept that refers to an activity, considering the specific proprieties of the production process of its multiple products (OCDE, 2001).

The public goods produced by the agricultural multifunctionality are consequent of the action of the implemented policies by the private economic agents. The rural landscape is the result of a private productive structure, but they are public goods. One part of the goods is not tradeable, as the welfare (Galvão and Vareta, 2010).

France was the first country to adopt the multifunctionality concept as concrete public policy to create the establishment territorial contract that consists of a contractual way to compensate the farmers that have lost their gains. This concept proposes a differentiated model of natural resources using of its farms, aiming to the protection of its natural, social and cultural patrimony. The agricultural patrimony of the European Union is destined for a rural development policy, considering a balance between the economic, social, and ecological values, even if the non-agricultural employees are dominant and the farmers being occupied in the partial time (Galvão and Vareta, 2010).

Agricultural production influences the landscape through the decision combinations that concern land utilization, the composition of the basic products, and the establishment practices. The structural changes, as the constructions implantation in the rural establishment, the junction of the land parcels influences the landscape. The intensification of the agricultural production in the last decades has reduced the diversity of the landscape in many regions because of the simplification of the structure of the agricultural lands and way to use the lands,

low density of cultures, the disappearance of trees, lagoons, and other landscape that are obstacles to the mechanization and the agricultural constructions of the industrial kind that transform the landscape.

The technologies and cultural practices are important for the environment. The inappropriate culture and harvest methods based on heavy machines can lead to soil degradation or compaction. The minimum work in the soil and the cultural practices of soil conservation reduces the soil exposition to the air and hydric erosion. The cultures by rotation and the roof cultures can enrich the soil with nutritive elements and organic materials.

The exploration system that respects the environment as biological agriculture is based on production techniques, especially those adapted to biological cycles and risks. A production less intensive can increase the level of some products and environmental services.

The multifunctional approach proposes different complementary functions in the landscape. The economic function crosses the agricultural production that has to secure the income to the houses and. The socio-structural function implies the promotion for the employ, the development of society, the associative activities, and the bonds between the urban and rural populations. The environment function implies the durable gestion of renewable resources: soil, water, biodiversity, or landscape.

Related to the natural environment, the restrictions on the fertilizers and phytosanitary products eliminate the risks of contamination and the pollution of the natural environment, including the soil, groundwater, and biological agriculture proposes the application of the cultural practices that restore and keep the soil fertility. The reconversion of the conventional agricultural establishment to biological agriculture constitutes the regeneration of degraded lands by the productivist agriculture (Papageorgiou, 2002).

The notion of multifunctionality of agriculture is becoming a popular concept that implies an old reality of the rural world because of the different functions exercised. A farmer produces meat or milk and does the gestion of a part of the territory, which contributes to creating a rural landscape, benefiting the touristic industry, contributing to keeping the ecosystem and its natural resources.

Three functions are executed at the same time: the economic function to produce and create employes; the environment function to protect and valorize the ecosystem and the social ou cultural function that consists of creating the landscape with a value, keeping some agricultural traditions, as part of the local culture (Jean, 2007).

The multiple functions (multifunctionality) of rural territories also comprehends the following aspects: production function that provides healthy and quality products for the consumers; products whose origin and production conditions are known; the territorial function to occupy the territories, to generate the space, to preserve the landscape and natural resources and the social function that contributes to employ, to animate the countryside and to produce the collective services (Jean, 2007).

According to the 2017 Agricultural Census, of Instituto Brasileiro de Geografia e Estatística (IBGE - Brazilian Institut of Geography and Statistics, in

the cocoa region (South Coast), of a total of 23,277 farms, 20,283 (**87.13%) farms did not use agrochemicals** and 2,981 (12.87%) used this type of products in their cultures. Of a total of **17,083 family farms**, 15,251 (**89.28%**) **did not use agrochemicals (pesticides)** and 1,821 (10.65%) did. Of a total of **6,194 employer farms**, 5,032 (**81.24%**) **employer farms did not use agrochemicals (pesticides)** and 1,162 (18.76%) employer farms used these products.

The cocoa *cabruca* agrarian system structure in the south of Bahia had happened during the historical processes of the region with the expansion of the agricultural systems from the first to the second half of the XXth century, through the primary land occupation, land grabbing, and acquisitions through the market and transmission of the inter-generation knowledge in the family affection and collective reflexive expectations when the techniques, the management, and technological packages diffuse between the farmers, forming owner agrarian system with the agricultural production systems types and farmers categories.

Figure 6. *Cocoa Cabruca Agroforestry System*

Source: Available in cocoa *cabruca* agroforestry system Google. [Accessed: 27 September 2021]

There are 9,241 farms with 195,381 hectares of natural forests (Mata Atlântica) and 14,142 farms with 2015,109 hectares of agroforestry systems, mostly cocoa with tropical forest (Mata Atântica). It is a very privileged region by virtue of the tropical forest extension. The sum of the areas of natural forests and agroforestry systems are in the total of 410,490 hectares.

Figure 7. *Cocoa Cabruca Agroforestry System*

Source: Available in cocoa *cabruca* agroforestry system Google. [Accessed: 27 September 2021]

The total area of pastures (natural and planted) is 432,972 hectares. We emphasize the quantity of pastures planted. This is the result, in part, of two phenomena: deforestation and the occupation of areas outside cocoa surfaces (areas of less fertile soil for cocoa plantation). In low yielding soils, farmers plant grass for pasture.

Table 1. *Forest and Pastures in the Cocoa Region (South Coast) of Bahia (Brazil)*

Cocoa region (South coast)	Quantity of farms	Area (ha)
Natural forests destined for the permanent preservation or legal réserve	9.241	195.381
Natural forests	1.650	27.416
Agroforests systems	14.142	215.109
Natural pastures	4.160	71.376
Planted pastures in good conditions	6.415	304.957
Planted pastures in bad conditions	2.875	56.639

Source: IBGE (2017). Author's elaboration.

In the cocoa region, according to the IBGE Agricultural Census, in 2017, there are 5,633 farms with 384,974 heads of cattle. The concentration of cattle occurs in the western zone of the South Coast Identity Territory. There is a relation quantity of heads of cattle and area with pastures of 0.89 heads of cattle/hectare.

Affectivity as Structural Sense to Transmit the Knowledge of the *Cabruca* Cocoa System

Affectivity is the main link that consolidates the individual sense of belonging and identity to a community. This sense implies, empirically, the rural youth action to welfare for his family and community where lives. Hence, it needs to be recognized and valued by the State as a development strategy to reach the public policies in the places (Bittencourt Machado, 2018).

The educational function establishes the affection links of the person with his community, the local territory, creating the conditions to enforce the community relations. These relations weaken through the migration movements resultant of the absence of occupation, jobs, and income in the region and when the State does not act through the public policies (Bittencourt Machado, 2018).

Chayanov and the Family

Chaynov thought is based on the economic organization of the agricultural production system, and the relation between the demographic size and the active family works, establishing the production conditions for the auto consumption, the agricultural supply production for the market and the work effort, and the keeping of the agricultural production systems.

The central aspect is the size of the family that depends on the biological cycle from the constitution to the death of the family chief in different periods.

Thus, there are variations in the disponible work strength in each domestic group that will determine the access to land. The family differentiation cycle explains the fact that different peasant groups appear as possessors of different sizes of lands, according to Archetti (2014).

Do the Chaynov analyses have two important empirical consequences under the new technologies approach that could be accepted by the peasant producers? The first hypothesis is that the technology is good to propose a fast increase in work productivity. The peasant will be oriented to two objectives: to obtain more revenue with less work, but only to reach these objectives if there is a work intensity quota, which allows using its work strength resources (Archetti, 2014).

The importance of work product is determined by the family dimension and composition, the number of family people capable of working according to the exploration productivity, and the degree of auto exploration dues to the family workers which provide some work during the year (Chayanov, 2014).

Wanderley (2014) says that Chayanovs' objective is to formulate a theory that explains the operation of the production family units in agriculture and comprehend the peasant in its global context in the modern capitalist society. To Chayanov, that whom works is the farmer and his family, and the family is the owner of the property. In the family unit, the production result consists of an indivisible income that is impossible to separate what was generated by the capital investment or land income (Wanderley, 2014).

The *Cabruca* Cocoa System and the Geographical Indication

After the vassoura-de-bruxa appearance in the region, a disease in the cocoa plantation, caused by the fungus *Crinipellis perniciosa*, that had decreased the local production, were introduced varieties more resistents to the fungus, including Theobahia and the clones CEPEC 2002-2011, that doing part of the culture in many properties. **The cocoa region of Bahia had developed local knowledge and experiences that had founded the unique agriculture model - the cabruca system. The traditional cocoa plantation in the south of Bahia had following the "cabrucada forest" system, characterized by the cocoa plantation under the shadow of the trees of Mata Atlântica and is used in the region for more than 200 years. This practice was used by the first immigrants, who considered the cabruca system a precursor of the current agro-forest systems** (Slow Food Brasil, 2018).

Frequently, cabruca cocoa is associated with organic cocoa. Furthermore, **not all *cabruca* cocoa is organic because the *cabruca* system indicates the cocoa plantation under the native or planted trees, there being the pesticides utilization or other techniques to pests control**. However, with the objectives to produce good, clean, and fair fruits from agroecological basis, most communities and farms in the south of Bahia produce organic *cabruca* cocoa (Slow Food Brasil, 2018).

The most rural properties of eucalyptus, Conilon coffee, and extensive cattle breeding cultures have threatened this patrimony through burning,

deforestation, and, in consequence, replacing cocoa production (Slow Food Brasil, 2018).

In 2018, the cabruca cocoa was recognized as a geographical indication by the National Institute of Industrial Property (INPI - *Instituto Nacional de Propriedade Industrial*). The geographical indication, regulated in the Industrial Property Act, a federal law, is an intellectual property instrument used by many countries, directing to protection and valorization of the traditional products related to their production origin.

The product related to its origin with the legal guarantee and protection, through IG, may be the quality central virtuous link in a territorial system. Its conception and essence have the objective to assure the production and association quality to own geographical origin, aspects that change it into a strategic instrument of agricultural products differentiation.

The benefits of the implementation of IG for small and average producers of traditional products include, in other functions, the stimulus to innovations in the production techniques, territory preservation, and promotion to regional tourism.

The *Indicação de Procedência* (IP - *Indicação de Procedência*) concerns the geographical name of the country, city, region, or local of the territory that became known as extraction, production, and fabrication center of determined product or service. The Origin Denomination (DO - *Denominação de Origem*) is the geographical name of the country, city, region, and local of a territory that designates the product or service whose qualities or characteristics must relate to the geographical environment, including the natural and human factors.

The Associação Cacau Sul da Bahia is an author of Geographical Indication demand to the national institute. This association is formed by 14 associations, cooperatives, and sectorial institutions. The general comprehension is that the geographical indication for the *cabruca* cocoa must enforce the cocoa and chocolate productive chain and many dimensions: economic, social, environmental, and technological diffusion.

The associations are the following, APC (Associação dos Produtores de Cacau), COOPERAPC (Cooperativa Agroindústria do Cacau e Chocolate), COOPAG (Cooperativa Agrícola de Gandú), AGIIR (Associação dos Gestores de Ibirataia, Ipiaú e Região), COOAFBA (Cooperativa da Agricultura Familiar da Bahia), Cooperativa Cabruca, Fazenda Lajedo do Ouro, Mars Cacau e RPPN Mãe da Mata (Reis *et al*, 2018).

The cocoa cabruca of the CABRUCA (Cooperativa dos Produtores Orgânicos do Sul da Bahia) contributes to the biodiversity conservation in the south of Bahia, but with the health and welfare of the consumers. Scientific studies proved that the cabruca systems have the function of a real ecological path for many species that move between the forest of Mata Atlântica in the south of Bahia. Most of the cocoa production is provided by CABRUCA, and it is sold directly for the international and national chocolate industry. The small part is transformed into raw material directed for the cosmetic industry (Cooperativa, 2018).

In its origin, the *cabruca* cocoa system follows the principles that could be, in the XXIth century, the agro-ecologies, since the second half of the XVIIIth century, in the south of Bahia, toward the half of XXth century, with the Green

Revolution. These historical agroecological values are being considered to recognize the geographical indication of the organic *cabruca* cocoa as a trend to multifunctional agriculture, replacing productivist agriculture.

Conclusion

Since the monoculture crises of the cocoa region, in the south of Bahia, during the end of 1980 years, the agrarian system that is, being structured cross by successive transformations with the appearance of the new social, economic and technological events, which had changed, radically, the accumulation standards of the rural and urban economic agents. The expansion of the fungus *Moniliophthora perniciosa*, the origin of the Vassoura-de-bruxa disease, had reduced, considerably, the cocoa production in the region, causing significant loss of the regional income, and unemployment and income decrease and diminution of the profit and land income of the cocoa farmers.

Figure 8. *Witch's Broom Disease (Vassoura-de-Bruxa)*

Source: Available in pictures of cocoa region in Bahia Google Search. [Accessed 27 September 2021]

The complex and complete regional systemic crisis have comprehended factors of irreversible environmental imbalance in the time, beyond economic and technological factors destroying the productive structures, and creating the conditions to expand the rural social movements and to consolidate the agrarian reform settlements, through expropriate policy of rural properties, abandoned or became not productive or less productive. The unemployed workers in the countryside that had gone to the regional urban centers with the appearance of the new "favelas" saw, with the agrarian reform, an opportunity to have a space to live, to feed themselves, and to produce for their family.

Although the social crises, the geographical landscape changed with the deforestation that transformed the tropical forest areas, necessaries to plant the cocoa culture under the forest, forming the agro-forest cabruca system. New pastures were appeared as the cattle-breeding (Nellore breed or milk mix) and new areas cultivated also with Conillon coffee.

The partially productivist standard that had introduced the technological packages during the 1960s with the CEPLAC, during the regional systemic crises, showed more one the endogenous auto-destructive aspect that had consisted the intensification of the deforestation of the cocoa plantation and tropical forest, implying the replacement of the cocoa culture by little intensive technologies with the extensive cattle breeding or relatively intensive coffee culture.

The rural social movements had implemented intense actions to diffuse the agroecologies and propose alternatives to the productivist package during the crises, in front of the favorable macroeconomic and politic conjuncture, during the Brazilian governments between 2003 and 2014, having the origin during the middle of 1990s with the policies destined to finance the family agriculture. In following, during the middle of 2000s, other public programs were designed as Food Purchase Program (PAA - Programa de Aquisição de Alimentos), National Program for Food in Schools (PNAE - *Programa Nacional de Alimentação nas Escolas*), being 30% for the municipal government purchase, from the local family farmers organizations, together with the territorial development policy, aiming to enforce the rural identity territories and, after, the Brazil without Misery Plan. All these policies answer these pressions and needs of the family farmers and traditional communities.

The recent movement around the cabruca cocoa recognition as a geographical indication is convergent to the set of irreversible transformations in the cocoa region in the south of Bahia, today without to reproduce the technological packages of the productivism from the Green Revolution, but consolidating a new paradigm that conserves the tropical forest, the *cabruca* system, and values, as the regional product, the *cabruca* cocoa as a geographical indication (*appellation d´origine*), preserving the traditional and secular knowledge that consolidated, mainly, an agrarian system historically important to the State of Bahia, Brazil and world, structured in family affectivity ties and social diffusion of technical and technological knowledge through reflexive expectations between the economic and social agents. **There are transformations that change from partially productivist agriculture to multifunctional agriculture.**

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