



Introducing the Sistema de Acreditação Bem da Terra: a methodology for the guarantee and monitoring the agroecological transition

Apresentando o Sistema de Acreditação Bem da Terra: uma metodologia de garantia e acompanhamento da transição agroecológica

Julhana Pereira FIGUEIREDO¹, Vitor Rodrigues ALEGRINI¹, Eric Weller de ALMEIDA¹, Natasha Koyama de MORAES², Antônio Carlos Martins da CRUZ¹, Eduardo GUATIMOSIM^{2*}

¹ Universidade Federal de Pelotas (UFPeL), Pelotas, RS, Brasil.

² Universidade Federal do Rio Grande (FURG), São Lourenço do Sul, RS, Brasil.

* Contact email: e.guatimosim@furg.br

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ABSTRACT: The Sistema de Acreditação Bem da Terra is a proposal based on agroecology and solidarity economy principles. The System seeks to ensure consumers of the Bem da Terra Virtual Trade Fair the agroecological provenance of commercialized food items. The goal of the present survey was present the development of the System and its application in 3 levels of the agroecological transition (Initial, Transitory, and Recommended), and each level in 3 dimensions (Social, Environmental, and Technical-productive). In each dimension, 3 to 5 indicators are evaluated per level, summing up to 38. The time range between the Initial and the Recommended level is eight years. The scientific bases supporting the proposal are detailed and discussed herein. By bringing up consumers, farmers, and technical support entities committed to agroecology, in direct contact, the Sistema de Acreditação Bem da Terra becomes a tool to perceive the agroecological transition within the territory.

Keywords: agroecology; certification; solidarity economy; responsible consumption groups.

RESUMO: O Sistema de Acreditação Bem da Terra é uma proposta baseada nos princípios da agroecologia e da economia solidária. O Sistema busca garantir aos consumidores da Feira Virtual Bem da Terra a procedência agroecológica dos alimentos nela comercializados. O objetivo do presente trabalho foi apresentar a construção do Sistema e sua aplicação, a partir de três níveis da transição agroecológica (Inicial, Transitório e Recomendado), e cada nível em três dimensões (Social, Ambiental e Técnico-Produtiva). Em cada dimensão,

são avaliados de três a cinco indicadores por nível, totalizando 38 indicadores. O tempo decorrido entre o nível Inicial e o Recomendado é de oito anos. A seguir são descritas e discutidas as bases científicas que dão lastro à proposta. Ao colocar em contato direto famílias consumidoras, famílias agricultoras e entidades de apoio técnico comprometidas com a agroecologia, o Sistema de Acreditação Bem da Terra se torna uma ferramenta de percepção da transição agroecológica no território.

Palavras-chave: agroecologia; certificação; economia solidária; grupos de consumo responsável.

1. Introduction

The adherence of agroecosystems to the agroecological approach supposes a transformative dialectical action, whose process starts from local knowledge, respecting and incorporating popular knowledge, and seeks to integrate it with scientific knowledge, building and expanding with new socio-environmental knowledge, permanently feeding the agroecological transition process (Caporal, 2008). The agroecological transition implies the transition from a process of social reproduction, unsustainable in the long term, to another that does not carry the burden of the destructive tendencies of modern agriculture (Balestro & Sauer, 2009). The agroecological approach becomes central in searching for a process capable of implementing multilinear and gradual changes in managing agroecosystems (Caporal, 2008). It is evident that the intricate process of transitioning to agroecology does not exclude the use of technical advancements and the integration of scientific knowledge. (Caporal & Costabeber, 2000). This discussion centers around significant political, economic, and socio-cultural transformations, including the beliefs and principles of individuals regarding the conservation and maintenance of natural resources and the dynamics of social interactions among stakeholders (Caporal, 2008).

For Gliessman (2008), the transition to agroecosystem management based on agroecological principles - agroecological transition - would result in a set of changes in its ecology. As external input uses are reduced or eliminated, nutrients and biomass generated in the agroecosystem are recycled within itself (Gliessman, 2008).

1.1. The 'Zona Sul' territory of Rio Grande do Sul

In Rio Grande do Sul, Serra dos Tapes covers the municipalities of Arroio do Padre, Canguçu, Morro Redondo, Pelotas, and São Lourenço do Sul, and parts of neighboring municipal units. The different sociocultural and economic characteristics that make up the rural communities of Serra dos Tapes reflect the variety of forms of land appropriation, the vast majority of which are small properties of varying sizes, organized based on family work and polyculture activity (Salamoni & Waskiewicz, 2013). Over the years, the exclusion of family farmers from the main production chains in the region has paved the way for the search for new relationships with the market, such as marketing in short circuits and access to public policies.

During the early 1990s, families residing in the 'Zona Sul' area of RS, Brazil, encountered severe health concerns caused by the usage of pesticides.

Moreover, their work processes involved various forms of psychological distress that were mainly associated with the sorting and treatment of tobacco leaves in tobacco farming. (Riquinho & Hennington, 2014).

1.2. Green fairs and solidarity economy

The emergence of the first "agroecological fairs" in the region marked the beginning of links between farming families in the countryside and consumer families in the city. The increased confidence of consumer units in the authenticity of agroecological production and the solidarity triggered by various forms of urban social awareness and mobilization has led to the construction of "nested" local markets capable of absorbing the growing agroecological production (Ploeg *et al.*, 2011).

In 2002, based on popular pressure - especially from initiatives organized around agroecological production guided by the Rural Landless Workers' Movement - the Ministry of Agrarian Development turned to the construction of public policies related to different demands of family farming, agrarian reform, including the stimulation and support for small ecological-based production (Medeiros & Grisa, 2020), especially in the constitution of institutional markets, which guaranteed the access of organizations in the sector to resources from federal public spending.

Dissociated from contractual markets, the construction of territorialized markets proposes a break with the exclusionary market system, which inhibits the development of the local economy. These markets are considered authentic alternative networks that can favor the inclusion of less capi-

talized farmers and simultaneously allow access to agroecological food for consumers with lower purchasing power (Niederle & Schneider, 2016).

The organizational experiences of the ARPA-SUL Agroecological Fair and the South-Ecological Cooperative in Pelotas, for example, stood out for bringing together pioneering farmers in the agroecological transition in the region. Another strategy used for inserting family farmers with small-scale production in short-circuit markets is the organization through small cooperatives and associations of producers and consumers working with solidarity economy principles (Haverroth, 2016). The solidarity economy can be understood as a set of economic initiatives (such as production, consumption, distribution, and credit) that are characterized by non-capitalist social relations but which are related and expressed economically in the conventional market and whose management is marked by the sharing of ownership of the means of operation, work and its economic results (Cruz, 2006).

Throughout the 1990s, a profound transformation of the world of work resulted from the productive restructuring carried out by economic liberalization policies, the increase in productive automation processes, and the modernization and accelerated concentration of agricultural production. The sustained increase in unemployment rates in urban areas and the growing impoverishment in rural areas produced differentiated social responses: the expansion of the informal popular economy, the economy of violence and transgression, and the return to practices of philanthropy and organic solidarity (Cruz, 2006). There was also the emergence of thousands of solidarity economic initiatives in the countryside and the city to undertake collectively from the culture developed in the social movements

of the 1970s and 1980s, marked by the horizontality of relations and self-management. From this social process, in early 2003, the Brazilian Forum of Solidarity Economy was born, and soon after, as a result of its mobilization and pressure, the National Secretariat of Solidarity Economy was established within the Ministry of Labour and Employment. Although timidly and with few resources, public policy programs for the solidarity economy have also emerged (*ibid.*). As part of this effort, based on experiences promoted by social sectors that have chosen to exercise solidarity through consumption, the Brazilian Network of Responsible Consumption Groups was organized in 2013.

The Responsible Consumption Groups (GCR) are local organizational structures whose premise is the collective and self-managed construction of an unconventional type of consumption, which values not only the quality of the marketed product but also the work of those who produce it, the effects of this circuit on the environment, in addition to the local economy (Calabró, 2016).

In this context, the Bem da Terra Network was created in Pelotas/RS. The Bem da Terra Association - created in 2009 with the support of the Center for Solidarity Economy and Incubation of Cooperatives of the Catholic University of Pelotas (NESIC/UCPel) and the Interdisciplinary Center for Social Technologies and Solidarity Economy of the Federal University of Pelotas (TECSOL/UFPel) - is part of the Network, in which approximately 30 solidarity initiatives participate today (totaling about 180 families); and the Bem da Terra Virtual Fair (FV-BdT) - a GCR created in 2014, which aims to enhance the commercialization of products from the network of productive enterprises.

The pioneering experience of the Bem da Terra Network in Pelotas, with short marketing circuits, enabled a broader effective organization of solidarity economic enterprises (SEEs) in the Serras dos Tapes region (Nunes *et al.*, 2019; Cruz, 2020). Concerning urban and rural enterprises, two basic conditions are required of FV-BdT participants for marketing at the fair:

- (i) that all suppliers are SEEs; and
- ii) that farmers in rural SEEs are agroecological or in agroecological transition.

One of the problems faced by the GCR in its expansion is the frequent questioning by consumers about the "certification" of the products marketed in the group.

The objective of this paper was to present and detail the methodological guidelines related to the Accreditation System of the Bem da Terra Network. This methodology seeks to guarantee to the suppliers and consumers of the FV-BdT that all products (fresh and processed) coming from rural SEEs are produced agroecological. A later paper will address the methodology for the Accreditation of urban SEEs.

2. Methodology

2.1. Preparation of the Accreditation Scheme proposal

The Well of the Earth Accreditation System was developed between August 2018 and December 2020. Eight meetings were necessary to structure the System proposal, held in person between 2018

and 2019 and virtually in 2020 (due to the Covid-19 pandemic). Group participatory tools and methodologies were used throughout the meetings, along with group dynamization techniques, among which round table, brainstorming, working groups, and mobile visualization (Brose, 2010).

At the meetings, about 20 farmers representing the rural EES of the Bem da Terra Network, consumers of the Virtual Fair, as well as three universities and their respective technological incubators of popular cooperatives (INEESOL/FURG, TECSOL/UFPel, and NESIC/UCPel, respectively) and two technical support entities (Support Center for Ecologically Based Agriculture - CEAABE and EMATER/RS), actively participated in the preparation of the proposal, defining the Dimensions, Levels, and Indicators of Agroecological Transition to be evaluated in the Accreditation process (Figure 1). It is worth highlighting the farmers' role in the proposal, who often modulated and changed the indicators to reflect the reality they experienced more accurately.

2.2. Validation of the Accreditation System

The Accreditation System underwent an evaluation of its effectiveness in December 2019 through a theoretical application. This exercise was carried out in three focus groups, taking into account the reality of three different agroecosystems whose farmers took part in building the proposal. To further test the system, two field visits were conducted in December 2020 with subcommittees consisting of a consumer representative, a supplier representative, and a technical support entity representative.

3. Results and discussion

3.1. Dimensions of agroecological transition

The Environmental Dimension suggested by farmers is close to the Ecological Dimension proposed by Caporal & Costabeber (2002) since it considers the use of natural resources available in the agroecosystem (such as soil, air, and water), in addition to the waste generated. The Social Dimension, in turn, contains elements of three other dimensions of sustainability proposed by Caporal & Costabeber (2002), namely the Social, Political, and Cultural dimensions. In the form proposed by farmers, the Social Dimension relates to participation in meetings and training courses, gender equality in relationships, and the education of school-age children and youth. The Technical-Productive Dimension, finally, is close to the Economic Dimension proposed by Caporal & Costabeber (2002) since it details the aspects of the production system, relating concepts of soil fertility, insect and disease management, and animal welfare.

3.2. Levels of agroecological transition

In each of the three dimensions, three Levels of Agroecological Transition will be assessed, namely Initial (minimum), Transitional, and Recommended.

The Initial Level is close to Level 1 of the Agroecological Transition, proposed by Gliessman *et al.* (2007), as it works on reducing the use and consumption of pesticides, soluble chemical fertilizers, and transgenic seeds. In the Accreditation proposal, this level also relates to initial care for the environment, such as knowledge of the quality of



FIGURE 1 - Deliberative meetings for constructing the Bem da Terra Accreditation System Matrices. A) Focus group discussing the Social Dimension. B) Plenaries for presentation and discussion of the indicators evaluated in each Dimension at each Level. C) Environmental Dimension Matrix. D) Team responsible for building the Accreditation System.

SOURCE: authors' elaboration.

water available for consumption and irrigation and the segregation of waste produced on the property. The working methodology during the construction of the Initial Level was always based on an inclusive and non-exclusive orientation to allow the criteria to be achieved at this level to be all already being developed by the farmers or to require little effort for their adequacy. The Transitional Level, in turn, is close to Level 2 of the agroecological transition, proposed by Gliessman *et al.* (2007), since it deepens care for the environment, the health of the agroecosystem, and the people who live in it. Finally, the Recommended Level of Accreditation is close to Level 3 of the agroecological transition pro-

posed by Gliessman *et al.* (2007). This level details the most advanced moment of the agroecosystem when the interventions carried out throughout the transition allow for feedback.

3.3. Indicators of agroecological transition

Three to five Indicators per Dimension, per Transition Level, were raised, discussed, and referenced by farmers and the Accreditation technical support team, totaling 38 indicators. The full list of indicators and their descriptions can be seen in the

Accreditation System matrices (Figure 2) and are discussed below.

3.4. Dimensions of agroecological transition

3.4.1. Technical-productive dimension

The indicators related to the Technical-Productive Dimension, at the Initial Level, guide the non-use of soluble chemical inputs; the non-use of transgenic seeds and seedlings; the non-use of pesticides *in* the management of pests and ants; the non-use of fresh transgenic corn for animal feed; and, finally, the non-use of ingredients from conventional production systems in the manufacture of processed foods, such as cakes and jellies (Figure 2).

It is important to note that almost all the indicators of this dimension at the initial level refer to the abandonment of the use of pesticides and soluble chemical fertilizers, either to ensure soil fertility or to manage insects (including ants) and diseases. The intensive use of pesticides and soluble chemical fertilizers strongly damages the natural fertility and life of soils, compromising not only the beneficial microbiota (fungi and bacteria) but also earthworms, collembola, beetles, and arthropods, among others (Primavesi, 2006). In contrast to the high dependence that conventional agriculture has on the regular purchase of seeds and seedlings, the agroecological transition process suggested by the families involved in the Accreditation System provides, at the Initial Level, care about the origin of these materials by restricting the use of transgenic seeds and seedlings, the production groups are compelled not only to develop actions of exchange of genetic resources and exchange of seeds but also

to stimulate the production of seedlings internally to the property, as already occurs in several localities of the country (Pereira & Dal Soglio, 2020).

Unlike what happens in organic certification systems, in which the use of pesticides - regardless of the specific conditions of each agroecosystem - can lead to the removal of a given enterprise with consequent loss of the organic producer seal (Brazil, 2021), the Accreditation System proposed here provides, at the Initial Level, the possibility of using poison, provided that it is communicated to the Accreditation Commission. This concern relates to the understanding that, at this level, the agroecosystem cannot yet promote an efficient self-regulated management response, making it necessary to resort to chemical products, such as formicidal baits. Over time, with the increase in plant diversity in the cultivation and adjacent areas, the agroecosystem has a greater capacity to manage insects (Aguiar-Menezes, 2004).

During the Transitional Level, in the Technical-Productive Dimension, indicators related to the presence of vegetation cover on the soil; the acquisition of organic or agroecological seeds and seedlings; the use of natural or biological products for the management of insects and diseases; the possibility of using inputs in animal feed of (still) unknown origin; and the delimitation of a percentage of the final ingredient of processed foods to be of organic or agroecological origin (Figure 2).

Regarding plant cover, the use of attractive plant species in the borders of the cultivated space and repellent species in the middle of the main crop has shown great influence on insect diversity because, in addition to exerting the management of harmful insects by attracting natural enemies,

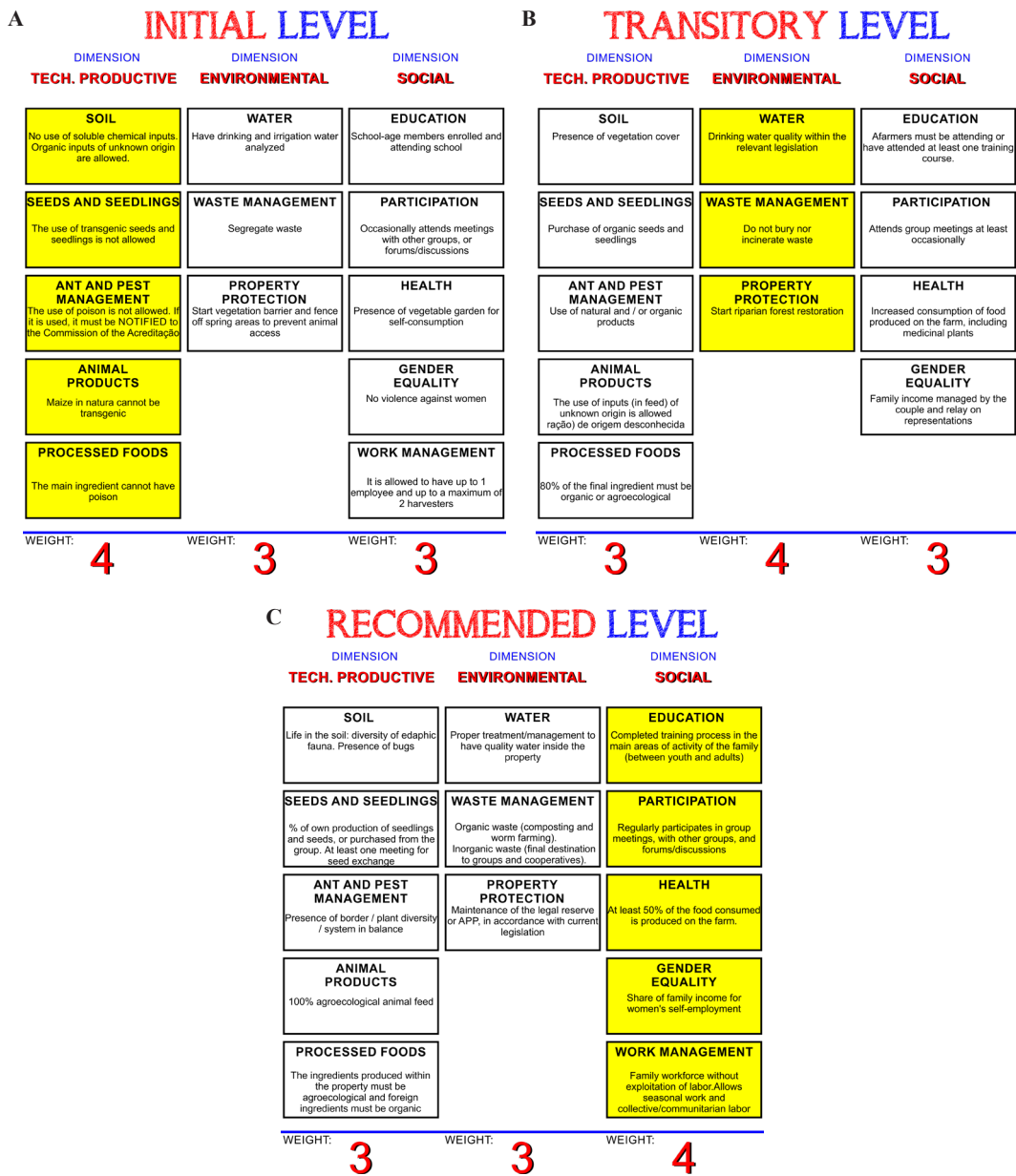


FIGURE 2 - Matrices of the Well Earth Accreditation System. In each matrix, the indicators of each of the transition dimensions assessed are presented, as well as the weights of each Dimension at each Level (denoted in red) and the minimum mandatory indicators at each Level (denoted in yellow).

SOURCE: authors' elaboration.

it also attracts pollinators, allowing an increase in fruit production (Bevilaqua *et al.*, 2012).

On the other hand, the acquisition of organic seeds and seedlings is not so simple. There is little supply of organic seeds in quantity and quality in the Brazilian market. Still, even with difficulties, some families reported producing vegetables, legumes, and Creole corn seeds, while others purchased them from Bionatur (Silva *et al.*, 2014).

In managing insects and diseases, replacing soluble chemical inputs with the bioactive use of plants becomes fundamental to be applied at the three Levels of the Agroecological Transition, simultaneously aiming at phytoprotection (Lovatto, 2020). In the southern half of the state of Rio Grande do Sul, the use of tobacco extract, sulphocalcic syrup, neem oil, and cow urine were efficient in the management and repellency of insects. In contrast, the use of sulphocalcic and Bordeaux mixture and 'supermagro' biofertilizer was efficient for disease control (Nachtigal *et al.*, 2007).

Animal feed with organic (perhaps agroecological) ingredients is a considerable bottleneck in agroecological production systems. Although there are alternatives, such as whole cassava root shavings for poultry (Ferreira *et al.*, 2012) and diversified sources for grazing beef and dairy cattle (Sá & Sá, 2006), much of what is known has limited application and is not widespread for each location in the country. In any case, at this point in the transition, the indicator aims to draw the attention of families to the search for feed (and other inputs) that have an organic or agroecological origin and thus begin to break with the dependence on local markets and agribusinesses.

Finally, at the Recommended Level, the indicators evaluated in the Technical-Productive

Dimension relate to the evidence of life in the soil from the diversity of edaphic fauna, with the delimitation of a percentage of the production of seeds and seedlings produced within the agroecosystem, with the management of diseases and insects from the use of the natural agrobiodiversity of the aggregates. Agroecosystems, with the requirement that all animal feed inputs be of agroecological origin; and, finally, with the requirement that the ingredients used in processed foods produced internally to the property are agroecological and that external ones are organic (Figure 2).

Considering the entire trajectory of the agroecosystems during the Initial and Transitional Levels, the agroecological practices carried out in the agroecosystems should already be fully implemented, given the continuity of the process. In this sense, it is expected that the soils have their fertility recovered, high diversity of edaphic fauna, 100% agroecological animal feed, and intense plant diversity, aiming at the balance of the agroecosystem. Farmers from the Germinar Group and the Colônia São Domingos Family Agricultural Production Group consider fertile soil to be that which "has the presence of bugs." According to Soares *et al.* (2018), the maintenance of soil fertility with an increase in organic matter contributed to the improvement of several soil characteristics, namely, improvement in water infiltration and retention capacity, nutrient supply and retention, and biological activity.

Regarding the acquisition of inputs, a possible alternative to responding to this need is the Rizoma Bem da Terra Network, which articulates consumers and farmers, allowing access to a fair price for grains, flours, and other organic supplies produced under the principles of solidarity economy

and agroecology, reducing transportation and distribution costs (Cruz, 2020).

3.4.2. Environmental dimension

At the Initial Level, the indicators related to the Environmental Dimension concern the verification of obtaining water analysis, segregation of waste, and the start of protecting the vegetation barrier (Figure 2).

Knowledge of the quality of water for consumption and irrigation is a necessary condition for improving the conditions not only of crops but also of family health (Souza & Holanda, 2014). Regarding waste segregation, the Accreditation System proposal operates on two fronts. On the one hand, it increases the sources of soil fertility maintenance through composting (Corrêa, 2015). On the other hand, it favors cooperatives of paper and recyclable material collectors (Umpierre *et al.*, 2018). At the Transitional level, there is also the concern that waste should not be buried or incinerated. Due to the complexity and diversity of substances in its composition, waste, when packaged and disposed of incorrectly, can attract vectors that transmit various diseases, pollute the air by burning, and pollute the soil and surface and groundwater through the release of organic and inorganic compounds contained therein (Schiedeck, 2015).

The start of the vegetation barrier, in turn, relates to the need to initiate conservation practices that, at the next level (Transitional), will be central to the agroecosystem transition. The use of windbreaks and contour cordons, applied as plant barriers aiming at the protection of cultivated areas, is of extreme importance since these barriers act

as shelter for birds and beneficial insects (such as natural enemies and bees), increase the permanence of moisture in the soil and can be a source of energy through the exploitation of wood (Lopes *et al.*, 2016). Like the vegetation barrier, agroecological corridors refer to individual or collective areas, with strips of crops combined, temporally and spatially, with cover plant species and others of local interest, composing a system of consortia and rotations (Machado & Machado, 2015). Both practices ensure the construction of soil fertility by the contribution of organic matter and differentiated exploitation of nutrients, whose recycling is promoted by root systems and associated organisms, in addition to promoting the biological control of weeds, such as insects and phytopathogens (Machado & Machado, 2015; Lopes *et al.*, 2016).

The Transitional level includes indicators related to the protection of springs and the recovery of riparian forests. These indicators are inseparable from each other, as they are related to the availability and quality of water within the agroecosystem, and agroforestry is an important management tool. Agroforestry can be used in soil reclamation through permanent cover, contributing positively to water storage capacity (Grisa *et al.*, 2017). The fencing of springs and areas close to water bodies to prevent animal access and using drinking fountains far from watercourses for their desiccation contribute to the recovery of springs (Carneiro *et al.*, 2017).

Finally, during the Recommended Level, the indicators evaluated in the Environmental Dimension continue to show the focus on adequate water treatment/management to obtain quality water within the property, on the adequate management of waste generated on the property, and on the mainte-

nance of the legal reserve or permanent preservation areas (APP) following current legislation (Figure 2).

Water availability within the farm can be favored through socio-environmental technologies for rural sanitation. Whatever the needs presented by agroecosystems, technologies for environmental sanitation, such as green tanks, biodigester septic tanks, filtering gardens, and family bio-water, are presented as viable and low-cost solutions, approved in the scientific environment and the field for rural basic sanitation (Girão *et al.*, 2019). Sezerino (2006) highlights the feasibility of applying ecological systems in the treatment of effluents since they present efficiency in nutrient cycling, suitability to the natural landscape, low costs of implementation, operation, and maintenance, and efficient disinfection, enabling the reuse of the effluent.

During the Recommended Level, waste management should already be routine within agroecosystems. Thus, among the many possibilities capable of meeting the needs of family farmers in the agroecological transition, worm farming stands out, which uses earthworms systematically to recycle organic waste and generate a source of organic fertilizer (Schiedeck, 2015). Under an integrated analysis, the application of organic waste derived from earthworms to soils is an economically advantageous alternative to other possible managements (Corrêa, 2015) since farmers recognize the environmental services provided by earthworms in agroecosystems and always associate their presence on the property with more fertile and productive soils (Schiedeck *et al.*, 2009). Applying such practices acts in the correct disposal of organic waste and in the system's feedback, generating chemical and biological fertility for crops (Schiedeck, 2015). Thus, as expected in an integrated and dynamic

agroecosystem, actions taken in one Dimension (Environmental in this case) impact several others (such as the Technical-Productive Dimension).

3.4.3. Social dimension

The indicators of the Social Dimension, considered at the Initial Level, concern the education of school-age children, the participation of the family in meetings of other groups and forums, the presence of a vegetable garden for self-consumption, the absence of violence against women; and the possibility of the existence of employees and harvesters.

Education as an indicator of sustainability assists in legal compliance with basic education and in adults' technical and solidarity qualification through training and capacity-building courses (Al-drighi & Fernandes, 2019). Participation in training experiences with an agroecological approach, which stimulates the practice of exchange as a pedagogical tool for the expression and exchange of knowledge, makes it possible to expand the space of action of farmers, putting them in contact with other networks and legitimizing their participation (Pacheco, 2009).

Regarding family health, having plots with cultivation for self-consumption is common among the productive units, emphasizing planting vegetables, tubers, and legumes as the basis for their food. Zabaleta *et al.* (2006) found that implementing vegetable gardens for food diversification brought significant amounts of mineral salts and vitamins to the family table in the form of cabbage (most common), carrots, beets, radishes, and turnips.

At the Transitional Level, gender equality and labor management are placed under an extremely relevant perspective from the agroecological

perspective, as they highlight the emancipation of women in the agricultural family unit and the maintenance of a workforce consistent with the precepts of family farming, curbing the exploitation of child labor and stimulating collective work among the group, which is a fundamental principle for the exercise of the solidarity economy (Aldrighi & Fernandes, 2019). The invisibility of women's work is associated with the hierarchization of productive work over reproductive work. When there is no equal division of domestic and care work, the overload affects women's lives since there is less time to invest in their education, leisure, and social participation (Maronhas *et al.*, 2014).

3.5. Weights of each dimension and minimum mandatory indicators

To balance the importance of each of the three Dimensions, throughout the agroecological transition, each Dimension has a different weight in each of the three Levels, always totaling 10. At each Level, the Dimension in which the actions are most central to the agroecological transition process receives weight four (4), while the others - at that particular Level - receive weight three (3) (Figure 2).

The differentiated weight of the Technical-Productive Dimension during the Initial Level of Transition works as an incentive for farmers to continue in the agroecological transition since, by having greater familiarity and clarity with the indicators of this Dimension, they end up identifying more easily with the actions to be implemented in their agroecosystems.

During the Transitional Level, the dimension with the highest weight is Environmental. This relates to the family's need to direct their attention to this important aspect of the agroecosystem. At this stage, changes such as drinking water quality within the parameters of current legislation, the proper disposal of organic waste, and the recovery of riparian forests will directly impact the agroecosystem's ability to reach the Recommended Level more smoothly.

Over time, the interventions carried out in one Level become mandatory conditions in the next, which is why the Technical-Productive and Environmental dimensions gain less weight in the Recommended Level. At this level, the Social Dimension is given greater weight, highlighting the need for the family to direct its actions toward other points of focus of the transition, such as care for training processes, the need for production for own consumption, and the division of family income for women's autonomous use.

At each Level, the Dimension with the highest weight also has mandatory minimum indicators. These are dual-purpose indicators: on the one hand, they represent the minimum conditions necessary for a given enterprise to be considered at a given Level. On the other hand, they indicate the path enterprises must follow to reach the next level (Figure 2).

Several methodologies have already been applied to measure and give visibility to sustainability indicators applied to agroecological transition, with special emphasis on MESMIS and its visualization in web/target-type graphs (Masera *et al.*, 1999). However, such methodologies, when put into practice, require a highly trained technical team, able not only to raise the situation of the indicators

but also to transform them into attributes, scales, and notes, in addition to the need to use computers and spreadsheets (Moraes *et al.*, 2019). Thus, using a simplified system, listing scores and weights is justified in the desire to facilitate farmers' understanding of the indicators already met and, above all, those that still need attention. The analysis based on the rules of three and the simple sum of points allows the farmers involved to understand and appropriate the evaluation and the final opinion. For a property to be accredited at a given Level, it must have a final score of eight (8) or higher and meet the minimum mandatory indicators for the Level in question.

3.6. System application and field visit

To test the System, as well as the calculation of the scores and the measurement of the minimum mandatory indicators, a practical, theoretical exercise was carried out at the end of 2019. Taking into account the situation of the agroecosystems, described by each farmer present in the focus groups, the System was put to the test, marking as satisfied the indicators that were so described and, as pending, those in which the reality differed from the propo-

sed. At the time, it was possible to realize, albeit theoretically, that the indicators were appropriate to reality and that the methodology could provoke the interest of those present. Once the theoretical application was completed, the system was applied in the field.

Field visits took place in October 2020, and two agroecosystems were visited, both in the municipality of Morro Redondo (Agroecosystem I and II). Starting with the Initial level, the subcommittee assessed all the indicators of each Dimension; once it established that these were met, the property received a partial score equal to the indicator's weight. If any indicator in a given Dimension was unsatisfied, the partial score was given proportionally to the weight (Table 1). The final grade was obtained from the sum of the partial grades.

Note, in this example (Table 1), that both agroecosystems (I and II) were classified at the Initial Level of Accreditation, as they had both a final score higher than eight (8) and all mandatory minimum indicators of the Initial Level (marked in yellow). However, the two families presented different realities concerning possible advancement to the Transitional Level. To move forward, Agroecosystem I will have to satisfy the indicator related to "water

TABLE 1 - Final spreadsheet of agroecosystems (I and II) framing in the Agroecological Transition Levels. Mandatory minimum indicators at each Level are highlighted in yellow.

Dimensions	Levels of Transition			
	Agroecosystem I		Agroecosystem II	
	Initial	Transitional	Initial	Transitional
Technical-productive	4	3	4	3
Social	2	2,6	2	1,3
Environmental	3	3	3	3
Final grade	9	8,9	9	6,7

for consumption and irrigation within the relevant legislation" (Figure 2). Agroecosystem II did not meet two mandatory indicators, namely "quality of drinking water within the relevant legislation" and "proper disposal of waste" (Figure 2). The pilot application of the Accreditation System contributed significantly to reviewing some indicators of agroecological transition that were not consistent with the reality of the families at the time of the visit and thus served as a basis for proposing readjustment.

4. Final considerations

Several authors working on the subject of agroecological transition have concluded that, in many cases, changes implemented only within the agroecosystem are insufficient to reach the most advanced levels in agroecological transitions processes, which would sometimes require a complete social change, altering political relations of market, consumption and the agri-food system as a whole (Gliessman *et al.*, 2007; Caporal, 2008; Gliessman, 2008; Molina, 2012). These authors defend the context of a Political Agroecology capable of moving the family farm unit and the networks of farmers, consumers, and local and regional governance. In this sense, by putting consumers, farmers, and technical support entities committed to agroecology in all its dimensions in direct contact, the Bem da Terra Accreditation System becomes a concrete tool not only for the perception of agroecological transition but also for its consolidation in the territory.

Beyond the core objective, the development of Accreditation work has proven to be a fruitful path of learning and opportunities. For the farmers involved, the System provides a clearer picture of

the current state of the agroecosystem. It gives a possible path of action to be implemented to make the agroecosystem more independent and healthier.

For the technical support entities involved in the proposal, the System has allowed a better perception on the part of the farming family of the importance of agroecological technical assistance, capable of guiding and collectively building the agroecological knowledge necessary for the transformation of reality.

Finally, for universities and research institutes committed to the proposal, many possibilities for studies open up in the dialog of knowledge. Some works have already begun to address the issue, such as Alegrini *et al.* (2019), Aldrighi & Fernandes (2019), and Figueiredo *et al.* (2020).

Unlike Organic Certification, the Bem da Terra Accreditation System was developed based on the local reality of each farming family present in the territory, taking into account the limitations of agroecosystems and their potential (current and future). Another significant difference relates to the active participation of consumers and technical support entities in the processes of evaluation and reflection on the difficulties and possibilities of overcoming the challenges. Thus, in addition to a system for measuring guarantees, symbolized in a seal or certificate of organic product, the Accreditation System, as its name implies, requires a relationship of security between the people who produce and those who consume since it is only possible to believe when there is trust.

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