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RESEARCH ARTICLE

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SOLIDARITY ECONOMIC ENTERPRISES OF FAMILY AGRICULTURE- REDE DE COOPERAÇÃO SOLIDÁRIA DE MATO GROSSO /RECOOPSOL: ANALYSIS OF SOCIO-ENVIRONMENTAL SUSTAINABILITY INDICATORS

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ABSTRACT

The use of socio-environmental indicators favors the understanding of the dimensions of sustainability, configuring itself as a support tool in the decision-making process and formulation of sustainable actions and practices. Subsidized by this assumption, this article has as main objective to generate qualitative and quantitative indicators on fourteen Solidarity Economic Enterprises - EESof Family Agriculture, linked to *Rede de Cooperação Solidária de Mato Grosso* – RECOOPSOL. The methodological contributions were centered on the following steps: a) review of the approach and theoretical complementarity involving Geography, Economics, Biology and Food Engineering, whose links are the Solidarity Economy and Sustainable Development; b) data collection in the field using as a research instrument the modalities of structured interview and direct observation; c) construction of indicators through the Methodology of the Sustainability Barometer. The results showed that the Index of Socioeconomic Well-being and Environmental Well-being in the context of RECOOPSOL are found in the Sustainability Barometer Scale - SBS as potentially sustainable, as a result, measures are needed to improve the actions of the network seeking to strengthen itself as a form of resilience of family farmers in the context that prevails in the rural environment of the State of Mato Grosso.

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INTRODUCTION

The dynamics of capitalist globalization in rural areas can cause the exhaustion of natural reserves and inequalities generated in access to financial and material resources, because of this, the struggles of family farmers, remnants of *quilombos* and traditional communities in search of access and permanence on earth, improvement of quality of life and conservation of natural elements are observed. Sobreiro Filho (2020) stands that the appropriation of nature occurs due to the action of the accumulation of added value generating social inequalities and destruction of the environment. Thus, it is considered that globalization in general and the globalization of capital have caused exponential increase in material and immaterial flows, the provision of services, consumption and exploitation of natural elements, but has not been able to reduce poverty and economic and social instability. Thus, it is considered that globalization and the globalization of capital have caused exponential increase in material and immaterial flows, the provision of services, consumption and exploitation of

natural elements, but has not been able to reduce poverty and economic and social instability. Castells (2005) points out that the new economy is organized around global networks of capital, management and information, where capital becomes global to enter the process of accumulation of the capitalist economy in electronic network. One of the hallmarks of globalization in rural areas is agribusiness, a system that uses ultra-modern technologies and high volume of resources aimed at the rapid expansion of productive areas and profit maximization. Buhler; Guibert; Oliveira (2016) characterize agribusiness in the South American context highlighting business agriculture, wage, specialized activities, separate decision-making of the productive act and the use of external capital. For the authors, agribusiness is defined as "... value creation that is based on the generation of commodities from indispensable inputs controlled by the actors located upstream and according to the profit orientations and logics of the actors located downstream" (op.cit. p). They also point out that agribusiness encompasses the entire productive and distributive system of agricultural insumos forming a complementary and interdependent network. This network characterized by the concentration of land and income results in the

deepening of exclusion and inequality, in the words of Bernardes (2009) the main characteristic of the dynamics of capitalist development is its unequal development in time and its unequal realization in space. In a complementary way or in opposition to agribusiness, there is family farming and its diversity, composed of multiple forms of land management, access to public policies, but with a common trait, the need to live and produce in a capitalist context where they sometimes suffer to be able to place their production on the market, to withdraw from the land the livelihood and to consolidate themselves as a social category. In a process of adaptation to the current competitive model, family agricultural enterprises seek new business models, such as more sustainable and ecological production, through collective organization, characteristic of the solidarity economy movement, thus contributing to local development. In turn, the solidarity economy movement uses the strategy of building networks for its development, with the objective of proposing social contracts established in solidarity and fraternal economic relations, aiming at equal rights and public and social freedom (MANCE, 2002). As an alternative of resistance to networks formed by the exploratory logics of capitalism, the *Rede de Cooperação Solidária de Mato Grosso -RECOOPSOL* is conceived as a set of interconnected nodes, where nodes are represented by solidarity economic enterprises (EES), support entities, such as extension groups and research of universities, NGOs and government entities. As a result of a historical organizational articulation and initiatives of the solidarity economy movement of Mato Grosso, RECOOPSOL supports the social, economic, institutional and environmental organization of seventy-one ESS in a collective strategy of cooperation between organizations and people.

RECOOPSOL's activities deserve to be highlighted, as the support and promotion of family agricultural enterprises is a challenge for public management, whereas its importance is ensuring the occupation of people in the field and the food and nutritional security of the population of the country. The issue of sustainability is included in the support of family agriculture, incorporating other spheres of society, besides the strictly economic one, such as those developed by RECOOPSOL, the social, institutional and environmental protection issues. RECOOPSOL seeks to establish relationships of trust between solidarity economic enterprises, government sectors and support organizations aimed at the creation, implementation and strengthening of local networks and productive arrangements in the areas of food, crafts, clothing and services through training, technical advice, marketing plan and a combination of marketing strategies, aiming at self-management, fair trade and the improvement of quality of life subsidized by the assumptions of the Solidarity Economy. Nas palavras de Zart (2004), a Economia Solidária ou Socioeconomia Solidária representa uma possibilidade para edificação de uma sociedade diferente da que está posta sob o capitalismo globalizado, conceituando-a como "...uma forma de organização que combina a cultura da cooperação e da solidariedade comunitárias, com regras organizacionais fixadas na vontade própria dos grupos sociais..." (ZART, 2014, p.164-5). In addition to the culture of cooperation and collaborative self-management of Solidarity Economic Enterprises-EES, therefore, the dimension related to social justice, the Solidarity Economy also seeks the conservation and environmental preservation, the autonomy and food and nutritional security of the social groups involved, including family farmers. In Mato Grosso, family farmers seek to live with the concentration of land tenure in the hands of a minority of holders of means of production, whose most recent data, revealed by the Agricultural Census 2017 (BRASIL, 2018), show that the land structure in the state remains concentrated, in addition the economic growth of the state is supported by the international increase in commodity prices and the monoculture of large soybean areas, corn, cotton in the *Cerrado* Biome and advancing towards the Amazon Forest and the *Pantanal Mato-Grossense* – two biomes of high socio-environmental vulnerability evidencing the consolidation of the agribusiness production chain throughout the Mato Grosso territory. Thus, family farmers living in the state seek resilience alternatives to conquer and remain on land, combat food and nutritional insecurity, preserve aspects of their culture, social practices and the natural environment through collective work and

networking, including RECOOPSOL. The EES of family farming surveyed are composed of people from traditional communities (riverside communities, *quilombolas*) and settled by the National Program of Agrarian Reform. Among these peoples, attitudes of trust with conducts of reciprocity and cooperation mark social relations and the logic of uses of nature has remained for generations based on environmental conservation and preservation. It turns out that agribusiness appropriates the *Cerrado* biome and the *Pantanal* Biome with its logic of subordination, offering wage labor and the exploitation of added value; because of this, the social organization of this population, through cooperatives, associations and informal groups, assumes relevance for sustainability. Understanding these dimensions of sustainability is a support tool in the decision-making process and the formulation of sustainable actions and practices. Due to the socio-environmental perspectives that integrate the logic of solidarity economy, this article has as main objective to generate qualitative and quantitative indicators on fourteen EES of family agriculture linked to RECOOPSOL because it is understood that the use of indicators allows the analysis of economic, social and environmental conditions, besides favoring the understanding of the dimensions of sustainability, configuring itself as a support tool in the decision-making process and formulation of sustainable actions and practices.

The use of indicators is recommended by Agenda 21 of the United Nations Conference on Environment and Development (UNCED, 1992), which highlights the need for a solid basis that supports public actions and policies contributing to the integrated sustainability between environment and development. It is therefore considered that the indicator is a quantitative or qualitative measure, endorsed with particular meaning and used to organize and capture the relevant information of the elements that make up the object of observation. It is a methodological resource that empirically informs about the evolution of the observed aspect. (BRAZIL, 2012). Information was collected for the analysis of the economic, social, educational and environmental conditions of solidarity economic enterprises, through indicators, aiming at a greater knowledge of the reality of the ESC, enabling local public managers to strengthen solidarity economic enterprises. In view of the above and to meet the proposed objective, this article is organized into sections. In addition to the present introduction, the second section presents the theoretical concept that permeates the discussion and analysis of the results obtained, the third, explains the methodological trajectory, while the fourth section concerns the presentation and discussion of the results where it aims to build and analyze the indicators, highlight the actions that have already been developed and point out guidelines within the scope of RECOOPSOL aiming at improving the sustainability of the EES in the social dimensions economic and environmental issues. The final considerations highlight the main aspects and highlight future perspectives.

Revisiting concepts: In recent years, difficulties in the context of family farming have been experienced, resulting in conflicts that occur mainly due to the high costs to produce, taking into account the time and physical strength used in production. There is also the devaluation of the agricultural product, which is aggravated by the increase in production resulting, from the modernization of large agricultural establishments that generated gains in rural productivity and a real drop in product prices, consequently traps small establishments with difficulty in technological innovation (NAVARROS; CAMPOS, 2013), resulting in economic unsustainability. According to Milani et al., (2012), discussions on sustainability have great weight in the economic issue of the agrarian sector. Sustainability is defined by many authors, and each concept was created from an analysis and a certain environment, thus justifying so many ways of understanding it. From the perspective of Sachs, (2004) and Bursztyn (2018), sustainability can be conceptualized as the ability of human beings to use the environmental resources existing in the place to meet human needs in the present, preventing or postponing its extinction. That is, not compromising the ability to meet the needs of future generations. Sustainability is also presented by different dimensions, and the main

objective of these dimensions is to point out the relationship between the necessary development and satisfaction, participation and well-being of the population and balance of the environment (RUWER; MOREIRA, 2010). Considering these perspectives, the environmental, social, economic and educational dimensions are considered as essential pillars in the discussion of the sustainability of practices that aim to generate income that guarantees the well-being and participation of those involved with the perspective of continuity for future generations. Discussions about sustainability, therefore, have origins in economic actions, which are involved with the structure of social and institutional relations that may or may not generate concern about the environmental impact represented within organizations. Faced with these challenges, the solidarity economy is a proposal of organization, which involves cooperation, reciprocity and networks formed by local development agents, from various governmental and non-governmental spheres, in the autonomy and self-management of family agricultural entrepreneurs and their solidarity organizations, where people moved by a similar vision of the world, organize themselves in the generation of income for the maintenance of the family, with sustainability (GAIGER, 2009). Thus, the Solidarity Economy is a possibility of confronting, from family farmers to the model of business agriculture, articulating fixed and flows in distance. According to Zart (2014) collective work is sought in the solidarity economy, which generates a culture of solidarity, dynamic and organic, because of this, new relations arise with the market, replacing profit, exacerbated by social values and practices of solidarity and collaboration as founding principles of human relations.

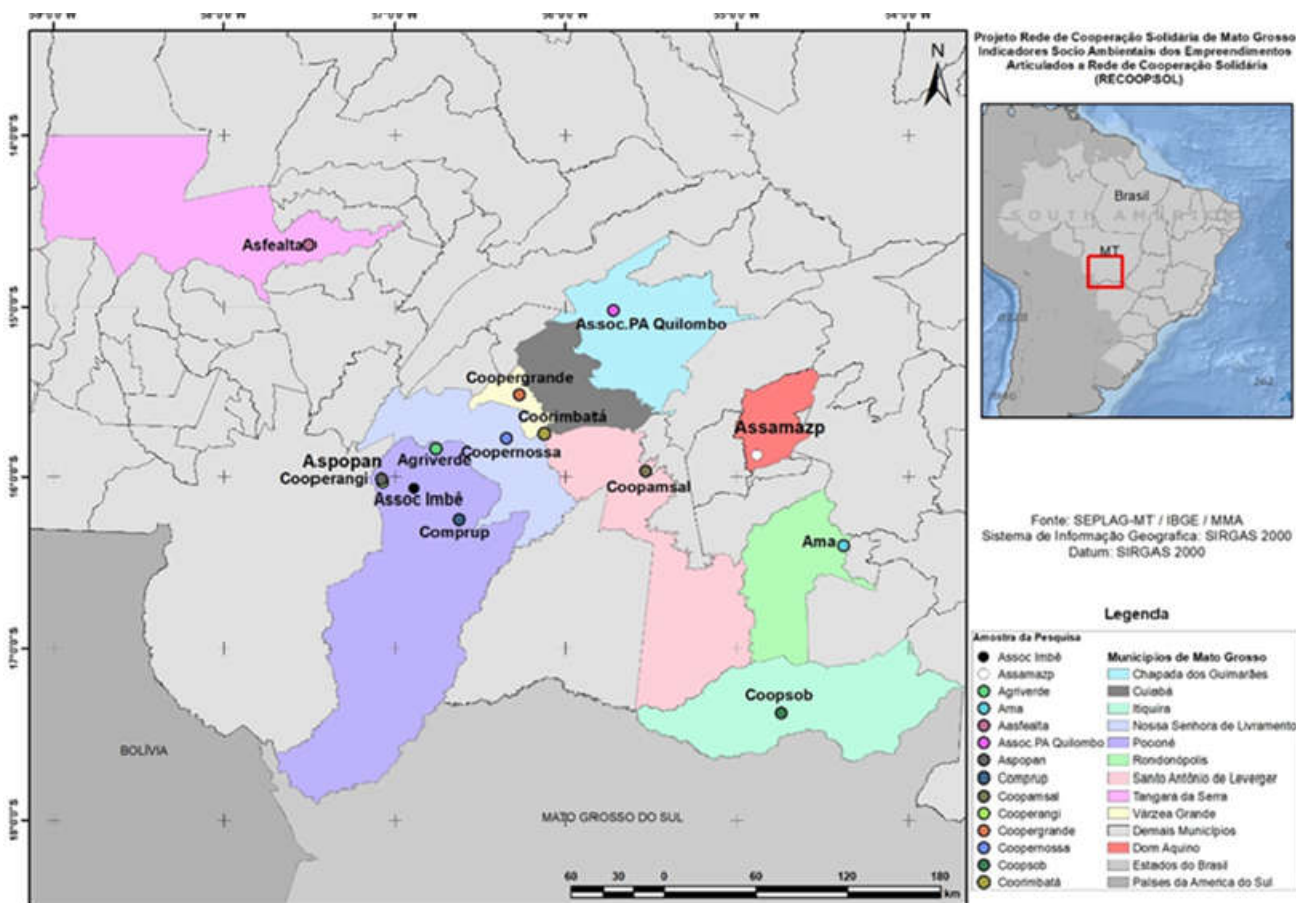
The forms of manifestation of the solidarity economy are found in the production, marketing and financing of products and services that present mutualism, cooperation and self-management as characteristic traits. For Borges (2012) the search for alternatives for small rural producers in Brazil is based on associative or collective principles of agrarian production, with the solidarity economy as inspiration, in the same model defended as an alternative for the sustainability of family agriculture (SINGER, 2002, LOPES; BALDI, 2005). The interactive practices of solidarity economy are associated with environmental conservation practices, because of this, sustainable development and solidarity economy go in an imbricated way to the same objective, which is to propose a mode of development that considers the various dimensions and not exclusively economic, being at the center the present and future human beings and their current and still unknown capacities, in a multidimensional sustainability process. It is common, in the literature, to use the denominations solidarity economy and solidarity socio-economy, in the words of Constantino dos Santos (2006, p. 40) both "... refer to the same thing: the solidary and collective way of managing the economy. The addition of the term socio-partner aims to emphasize the social character, which is proper to the meaning that the economy must have". The economic sector in solidarity economy networks refers to the sustainability of enterprises, so the economy is a fraction of the "totality of life" (COSTA; VAILANT; OLIVEIRA COSTA, 2014) which is integrated into the political and social sectors, however, with autonomy in relation to the other aspects of totality, mainly, the only accounting and financial sense of the capitalist economy. The EES of family agriculture seek to establish relations of reciprocity and fair trade, despite the need to face the multiple conflicts of Brazilian economic duality, where the decapitalized and technologically backward economic entrepreneurs and the modern high-tech holding companies that dominate the national and international markets remain (PINHEIRO, 2010). In addition to the culture of cooperation and collaborative self-management of the EES, therefore, from the dimension related to social justice, the Solidarity Economy also seeks the conservation and environmental preservation, the autonomy and food and nutritional security of the social groups involved, including family farmers, through cooperative work (GAIGER, 2009). Cooperation between farmers is presented as an alternative to sustainability. According to Abbade (2010), in cooperation, individuals choose to act together, united by the same worldview, in favor of common goals, uniting their skills to achieve an increase in efficiency. Therefore, cooperative associations and informal groups collectively organized are presented

as political organizations with the possibility of economic and social development, with less environmental impact. Social or cooperative networks can still be characterized through the existing links between a set of actors. These links are difficult to break and are defined as bonds, which differ in intensity and content. As for intensity, ties can be strong or weak. As for the content, resources, information and affection can be mentioned. Granovetter (1973) explains that strong ties are those in which there is greater proximity and intimacy between people or social groups, and weak ties are constituted by the most dispersed relationships within a network. Both are important in strengthening the network, with strong ties for the strength of the group's internal cohesion and weak ties due to the amount of distant contacts that can be mobilized, in the search for resources, power and in the representation of interests. In any case, these solidarity networks are immersed in a capitalist society in a network of global scope. Castells (2005) described, for this new networked society of the digital age, the fundamental dichotomy between capital and work, which live side by side without relating, since globalized capital depends less and less on specific work and increasingly on generic work, with workers dissolving their collective identity in an infinite variation of individual existences. The author concludes that under the conditions of the new digital network society, capital is coordinated globally, the work is individualized. Therefore, the challenge of solidarity networks is to create the inverse path of that observed by Castells (2005), and following the models of Solidarity Collaboration Networks proposed by Mance (2002), enabling local collective work to generate flows of information and resources that connect in network networks in a local, regional and global integration, welcoming the diversities that promote ethically exercised public and private freedoms.

METHODOLOGICAL PROCEDURES

The first methodological stage of this research, focused on the review of the approach and theoretical complementarity involving Geography, Economics, Biology and Food Engineering, as a correlated, the multidisciplinary formation of the research group and the very fruitful conceptual discussions, established the focus on Solidarity Economy and Sustainable Development as links between the different academic backgrounds. The second stage was performed through data collection in the field using as a research instrument the modalities of structured interview and direct observation. To conduct the interview, a script of questions was used with a sequence of probable answers to be indicated by the interviewee. Marconi & Lakatos (2007) clarify that this type of research allows obtaining information with a certain level of detail and that may be susceptible to classification, quantification, statistical treatment, graphic representation and various analyses, providing relevant and significant interpretations on various social frameworks and contexts. Direct observation, for the authors, means one of the research techniques that allows recording data and facts to classify and understand more complex social issues and relationships, enabling analysis from a qualitative perspective. Thus, fourteen structured interviews were conducted in fourteen EES linked to RECOOPSOL, which corresponds to approximately 20% of the ESS network, located in nine cities of Mato Grosso (Figure 1 - Table 1).

The answers recorded in the interview were transferred from the research instrument to the Database of the Social and Environmental Indicators Subproject of Solidarity Enterprises articulated to RECOOPSOL. For the treatment of data, we used the references constructed by Prescott-Allen (1997; 2001) called Barometer of Sustainability (BS) conceptualized by the author as "a tool to measure and communicate the well-being of a society and progress towards sustainability" (op. quote. p.01). The author points out that the adoption of sustainability indicators allows the elaboration of comparative studies, since they are applicable in multiple geographical contexts, constituting an effective methodology for measuring socio-environmental sustainability. When analyzing the Barometer of Sustainability (BS) method, Bellen (2004; 2007) highlights its importance as an evaluation tool that combines a series



Source: Database of the Subproject Socio-environmental Indicators of Solidarity Enterprises articulated to RECOOPSOL- MT. 2019-2020. Org. Authors

Figure 1. Municipal Location of Family Agriculture Associations and Cooperatives that are part of Rede de Cooperação Solidária de Mato Grosso/RECOOPSOL

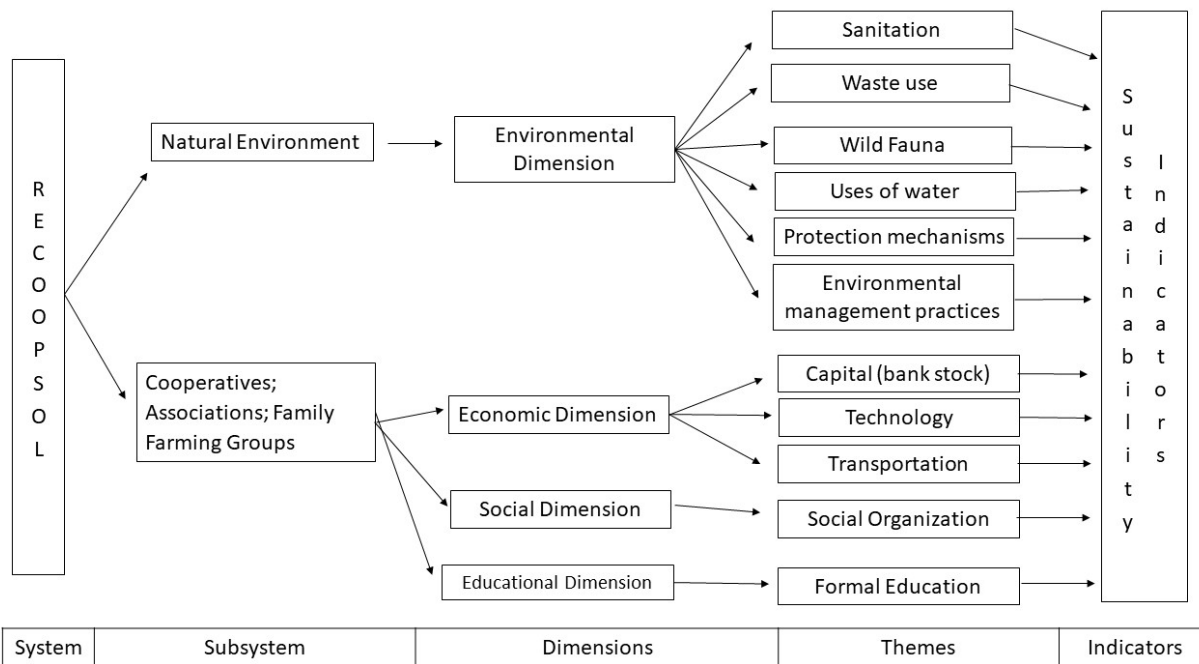
Table 1. Identification of the Modalities of the EES of Family Agriculture -RECOOPSOL - Research Sample

Association(s)		Cooperative(s)	
Name	City	Name	City
Associação dos Pequenos Produtores Rurais da Comunidade do IMBE	Poconé	Cooperativa Agropecuária Mista de Santo Antônio de Leverger – COOPAMSAL	Santo Antônio de Leverger
Associação de Mulheres Afrodescendentes da Gleba Cascata em Defesa das Questões Sócio políticas e Ambientais	Rondonópolis	Cooperativa de Agricultores Familiares de Nossa Senhora do Livramento - COOPERNOSSA SENHORA	Nossa Senhora do Livramento
Associação dos Pequenos Produtores da Gleba Quilombo	Chapada dos Guimarães	Cooperativa Agropecuária Varzeagrandense – COOPERGRANDE	Várzea Grande
Associação dos Produtores Orgânicos do Pantanal- ASPOPAN	Poconé	Cooperativa dos Pequenos Agricultores do Assentamento- Agroana Girau- COOPERANGI	Poconé
Associação dos Agricultores e Agricultoras Afrodescendentes da Comunidade Tradicional de Capão Verde-AGRIVERDE	Poconé	Cooperativa dos Seringueiros de Ouro Branco-COOPSOB	Itiquira
Associação dos Feirantes da Vila Alta ASFEALTA	Tangará Da Serra	Cooperativa Mista de Produtores Rurais de Poconé COOPRUP	Poconé
Associação Zumbi dos Palmares	Dom Aquino	Cooperativa dos Pescadores e Artesãos de Pai André e Bonsucesso-COORIMBATÁ	Várzea Grande

Source: Database of the Subproject Socio-environmental Indicators of Solidarity Enterprises articulated to RECOOPSOL- MT. 2019-2020. Org. Authors

of indicators of varying dimensions, related to human well-being and the environment. It also emphasizes its application from the local to the global scale, allowing comparisons between different locations. The systematic combination of several indicators reveals the situation of the place in relation to sustainable development, also allowing communcations between socioeconomic and natural conditions. In the scope of this article, the procedures under the BS were included in the following phases: a) adaptation and elaboration of the hierarchical structure; b) selection of indicators in the database; c) selection of values for the Construction of the Local Performance Scale (EDL); d) establishment of a Local Performance Scale (EDL) for each indicator, according to the average of the values allocated individually to each of them; e) simple linear transposition.

The adaptation and elaboration of the hierarchical structure consisted of the election of four dimensions of sustainability: environmental, economic, social and educational, considering as a system the Rede de Cooperação Solidária de Mato Grosso/RECOOPSOL; as subsystems, the natural environment and the EES of family farming linked to RECOOPSOL and eleven themes to generate the indicators (Figure 2). Prescott – Allen (1997-2001) points out as criteria for the selection of sustainability indicators, the need to be understandable, unambiguous, conceptually understood, also stresses that indicators must be limited and comprehensive enough to capture the multidimensional nature of sustainable development and that the use of many indicators results in difficulty of interpretation. Therefore, the choice must be judicious to elect central themes that elucidate the



Source: Adapted from Prescott-Allen (1997; 2001). Org. Authors

Figure 2. Hierarchical structure for the selection of sustainability indicators - Solidarity Economic Enterprises of Family Agriculture – RECOOPSOL/MT

Table 2. Selected Themes and Indicators - Survey Sample

Subsystem	Dimensions	Theme	Indicators
Natural environment	Environmental	Sanitation	No. EES with cesspool/sinkhole
		Waste Use	No. EES that reuse the waste generated
		Wild Fauna	No. EES that record the presence of wild animals
		Uses of Water	No. EES that reuse water generated in the EES
		Protection Mechanism	No. EES that use water from artesian wells
		Environmental management practices	No. EES located in the Pantanal Biosphere Reserve
Associations, Cooperatives and Formal Groups	Economic	Capital, Technology and Transportation	No. EES that has no working capital
			No. EES that add value to products
			No. EES that has access to communication technologies
			No. EES that has their own vehicle
	Social	Social Organization	No. respondents who consider the participation of members as regular
			No. respondents who consider the participation of members as bad
	Education		No. de respondents who have completed high school
			No. respondents who have completed higher education
			No. respondents who have only complete elementary school

Source: Database of the Subproject Socio-environmental Indicators of Solidarity Enterprises articulated to RECOOPSOL- MT. 2019-2020. Org. Authors

Table 3. Sustainability Barometer Scale (EBS), where "x" is the indicator studied

0 < x ≤ 20 Bad (Unsustainable)	20 < x ≤ 30 Poor (Potentially Unsustainable)	30 < x ≤ 40 Medium (Intermediate)	40 < x ≤ 70 Good (Potentially Sustainable)	70 < x ≤ 100 Very Good (Sustainable)
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Source: Adapted from Prescott-Allen (1997; 2001).

proposed objectives and some indicators can be positive in one aspect and negative in another resulting in potential conflicts. However, this fact should not be seen as a sign of ambiguity, on the contrary, these cases reinforce the need to interpret results in a balanced and integrated way. Subsidized by these assumptions, within the scope of the chosen themes, sixteen indicators recorded in the research instrument were selected as presented in Table 2. Next, the Sustainability Barometer Scale (EBS) was adapted from Prescott-Allen (1997; 2001) where "x" is the studied indicator (Table 3) and whether they elected the reference values for the Construction of the Local Performance Scale (EDL) (KRONENBERGER et al., 2004, SILVA, 2014, SILVA; VIEIRA, 2016). It is emphasized that in the methodology of the Sustainability Barometer the scales of some indicators follow a direct logic, that is, the higher its value, the more

sustainable the system, other indicators, however, follow the inverse logic, that is, the lower its value, the more sustainable the system, so some scales have the lowest value as maximum and the highest as minimum. Then, for each indicator, we searched the data, called DLx, in the database of the Subproject Socio-environmental Indicators of Solidarity Enterprises articulated to RECOOPSOL. This numerical value DLx was transposed to the Sustainability Barometer Scale (EBS), as shown in Figures 3a and 3b, when the relationship between the indicator and sustainability is increasing and decreasing, respectively. Next, the value of the indicator data in the EDL was located, as well as the anterior (DLA) and posterior (DLP) points. The five numerical values of the two scales (EDL and EBS) were aligned, determining the relative position of the EDL in the EBS scale.

Table 4. Local Development Scale (EDL) of each indicator

Indicators(DLx)	Bad Unsustainable	Poor Potentially unsustainable	Medium Intermediate	Good Potentially sustainable	Very Good Sustainable
No. EES with cesspool/sinkhole	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
No. EES that reuse the waste generated	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
No. EES that record the presence of wild animals	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
No. EES that reuse water generated in the EES	0<DLx≤5	5<DLx≤10	10<DLx≤40	40<DLx≤80	80<DLx≤100
No. EES that use water from artesian wells	100<DLx≤90	90<DLx≤60	60<DLx≤10	10<DLx≤5	5<DLx≤0
No. EES located in the Pantanal Biosphere Reserve	0<DLx≤10	10<DLx≤20	20<DLx≤40	40<DLx≤70	70<DLx≤100
No. EES that have agroforestry system - SAF and/or organic production	0<DLx≤10	10<DLx≤20	20<DLx≤40	40<DLx≤70	70<DLx≤100
No. EES that has no working capital	100<DLx≤90	90<DLx≤60	60<DLx≤10	10<DLx≤5	5<DLx≤0
No. EES that add value to products	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
No. EES that has access to communication technologies	0<DLx≤10	10<DLx≤20	20<DLx≤40	40<DLx≤70	70<DLx≤100
No. EES that has their own vehicle	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
No. respondents who consider the participation of members as regular	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0
No. respondents who consider the participation of members as bad	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0
No. de respondents who have completed high school	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0
No. respondents who have completed higher education	0<DLx≤20	20<DLx≤40	40<DLx≤60	60<DLx≤80	80<DLx≤100
No. respondents who have only complete elementary school	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0

Source: Adapted from Prescott-Allen (1997; 2001). Org., Authors

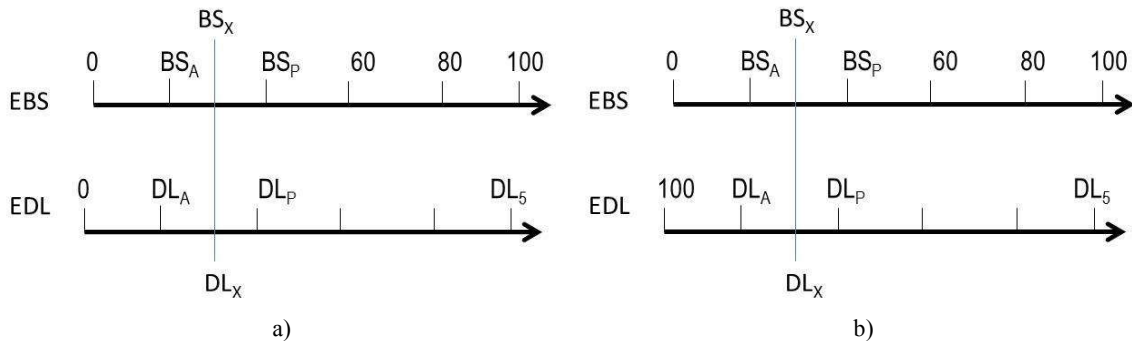


Figure 3. Transposition of EDL to EBS of an indicator of increasing relationship with sustainability

For the determination of the relative position in the EBS scale, the Simple Linear Transposition (Equation 6) was performed through the mathematical process called simple linear interpolation, with which a new data set (BSX) is constructed from a discrete set of previously known point data (DLA, DLP, BSA and BSP and DLX).

$$\frac{DL_A - DL_X}{BS_A - BS_X} = \frac{DL_A - DL_P}{BS_A - BS_P} \quad \text{Equation 1}$$

$$(DL_A - DL_X) \cdot (BS_A - BS_P) = (DL_A - DL_P) \cdot (BS_A - BS_X) \quad \text{Equation 2}$$

$$\frac{(DL_A - DL_X) \cdot (BS_A - BS_P)}{(DL_A - DL_P)} = (BS_A - BS_X) \quad \text{Equation 3}$$

$$-BS_X = \frac{(DL_A - DL_X) \cdot (BS_A - BS_P)}{(DL_A - DL_P)} - BS_A, \text{ times } (-1) \quad \text{Equation 4}$$

$$BS_X = \left[\frac{(DL_A - DL_X) \cdot (BS_A - BS_P)}{(DL_A - DL_P)} \cdot (-1) \right] + BS_A \quad \text{Equation 5}$$

$$BS_X = \left[\frac{(DL_A - DL_X) \cdot (BS_A - BS_P)}{(DL_P - DL_A)} \right] + BS_A \quad \text{Equation 6}$$

$$BS_X = \left[\frac{(BS_A - BS_P) \cdot (DL_A - DL_X)}{(DL_P - DL_A)} \right] + BS_A \quad \text{Equation 7}$$

Where:

- DLX: indicator value according to study data;
- DLA: scale value immediately preceding DLA;
- DLP: scale value immediately after DLA;
- BSX: value that corresponds to the transposition of DLA to EBS;
- BSA: scale value immediately preceding BSX;
- BSP: scale value immediately after BSX.

Calculated all XBSP all indicators received equal weights. The XBSP values of each indicator are called degrees.

The analysis of the Sustainability Indicators was carried out in an integrated manner and according to the values established for the Performance Scale. Meeting the assumptions of the Sustainability Barometer (BS) the dimensions were divided into two components: The Corporate Welfare Index that aggregates the social, educational and economic dimensions and the Ecological Well-being Index, which aggregates the management of natural characteristics (PRESCOTT-ALLEN, 1997; 2001). These indexes were calculated by the arithmetic mean of the indicators that composed them, obtaining indicators of themes, dimensions and subsystems. For this analysis we use the natural environment and associations, cooperatives and formal groups such as the subsystems in question. Next, a two-dimensional graphic was generated that presents the sustainability situation of the EES researched.

RESULTS

Analysis of indicators, developed actions and guidelines within recoopsol system: The system considered in the scope of this article is RECOOPSOL, which seeks to consolidate itself through the *Sistema Integrado de Inovação Tecnológica Social*¹ (SITECS), a process of systemic, networked action, involving the academic sector, private incubation entities, marketing companies, government sectors, solidarity economic enterprises of the handicraft sector, services and family agriculture, totaling 61 EES, thus, seeks to establish relationships of trust between different people and entities, fundamental for local development (SAMPAIO NETO, et al, 2013). Networking is being carried out through the *Fórum Territorial de Segurança Alimentar e Nutricional e de Economia Solidária da Baixada Cuiabana*², named FTSANES-BC, which has as its general

¹ Translator’s Note: Integrated System of Social Technological Innovation

² Translator’s Note: Territorial Forum of Food and Nutrition Security and Solidarity Economy of Baixada Cuiabana

Table 5. Values of local indicators (DLX) and Degrees of the Sustainability Barometer of EES – RECOOPSOL/MT

Subsystem	Dimensions	Theme	Indicators	(DLX)		Degrees		
					(%)	Indicators	EBS	Subsystem
Natural environment	Environmental	Sanitation	No. EES with cesspool/sinkhole	06	42.85	46.28	43.12	43.12
		Waste Use	No. EES that reuse the waste generated	07	50.00	52		
		Wild Fauna	No. EES that record the presence of wild animals	08	57.14	57.71		
		Water Use	No. EES that reuse water generated in the EES	01	7.14	43.57		
			No. EES that use water from artesian wells	11	78.57	32.57		
		ProtectionMechanism	No. EES located in the Pantanal Biosphere Reserve	03	21.42	29.15		
	Environmental management practices	No. EES that have agroforestry system - SAF and/or organic production	05	35.71	40.57			
Associations/cooperatives/formal groups	Economic	Capital/Technology/Transportation	No. EES that has no working capital	09	64.28	38.29	42.85	49.36
			No. EES that add value to products	05	35.71	40.57		
			No. EES that has access to communication technologies	07	50.00	52.00		
			No. EES that has their own vehicle	05	35.71	40.57		
	Social	Social Organization	No. respondents who consider the participation of members as regular	11	78.57	21.43	52.86	
			No. respondents who consider the participation of members as bad	02	14.28	85.72		
	Educational	Education	No. de respondents who have completed high school	05	35.71	64.29	52.38	
			No. respondents who have completed higher education	04	28.57	28.57		
No. respondents who have only complete elementary school			05	35.71	64.29			

Source: Database of the Subproject Socio-environmental Indicators of Solidarity Enterprises articulated to RECOOPSOL- MT. 2019-2020. Org. Authors

Table 6. Position on the Sustainability Barometer Scale (EBS) of local Indicators (DLX) – EES RECOOPSOL/MT

Indicators(DLx)	BadUnsustainable	PoorPotentiallyUnsustainable	MediumIntermediate	GoodPotentiallySustainable	VeryGoodSustainable
No. EES with cesspool/sinkhole	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
Position at EBS	-	-	46.28	-	-
No. EES that reuse the waste generated	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
Position at EBS	-	-	52	-	-
No. EES that record the presence of wild animals	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
Position at EBS	-	-	57.71	-	-
No. EES that reuse water generated in the EES	0<DLx≤5	5<DLx≤10	10<DLx≤40	40<DLx≤80	80<DLx≤100
Position at EBS	-	-	-	43.57	-
No. EES that use water from artesian wells	100<DLx≤90	90<DLx≤60	60<DLx≤10	10<DLx≤5	5<DLx≤0
Position at EBS	-	-	32.57	-	-
No. EES located in the Pantanal Biosphere Reserve	0<DLx≤10	10<DLx≤20	20<DLx≤40	40<DLx≤70	70<DLx≤100
Position at EBS	-	-	29.15	-	-
No. EES that have agroforestry system - SAF and/or organic production	0<DLx≤10	10<DLx≤20	20<DLx≤40	40<DLx≤70	70<DLx≤100
Position at EBS	-	-	-	40.57	-
No. EES that has no working capital	100<DLx≤90	90<DLx≤60	60<DLx≤10	10<DLx≤5	5<DLx≤0
Position at EBS	-	-	38.29	-	-
No. EES that add value to products	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
Position at EBS	-	-	40.57	-	-
No. EES that has access to communication technologies	0<DLx≤10	10<DLx≤20	20<DLx≤40	40<DLx≤70	70<DLx≤100
Position at EBS	-	-	-	52.00	-
No. EES that has their own vehicle	0<DLx≤10	10<DLx≤35	35<DLx≤65	65<DLx≤85	85<DLx≤100
Position at EBS	-	-	40.57	-	-
No. respondents who consider the participation of members as regular	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0
Position at EBS	-	-	-	21.43	-
No. respondents who consider the participation of members as bad	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0
Position at EBS	85.72	-	-	-	-
No. de respondents who have completed high school	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0
Position at EBS	-	-	64.29	-	-
No. respondents who have completed higher education	0<DLx≤20	20<DLx≤40	40<DLx≤60	60<DLx≤80	80<DLx≤100
Position at EBS	-	28.57	-	-	-
No. respondents who have only complete elementary school	100<DLx≤80	80<DLx≤60	60<DLx≤40	40<DLx≤20	20<DLx≤0

objective "to strengthen and disseminate the concepts and practices of Sovereignty and Food and Nutrition Security and Solidarity Economy in Baixada Cuiabana, giving voice to the communities, guaranteeing rights and valuing local culture and collective work, thus meeting the needs of the members of the enterprises and the population...". (FTSANES-BC, 2020, p.1). Thereby, RECOOPSOL and FTSANES-BC act in the formation of networks through training processes that use the assumptions of action research (THIOLLENT,1998) with a perspective of the intervention in the social reality to overcome the limitations and weaknesses, thus, the members of the network seek reciprocity, that is, generate collective knowledge and practices to develop actions in function of the problems encountered, seeking their mitigation or solution. The network in the RECOOPSOL system is understood from the perspective of Santos (1994), which emphasizes its materiality, due to being composed by people and their organizations, by politics, society, economy, messages, in short, by the multiple elements that integrate it. Thus, in the researched network, actions occur through self-management processes covering systematic training activities, technical advice, dissemination of social and management technology, strengthening networks of economic cooperation among the ESAs, support to public policies of solidarity economy, guidance and systematic advice for access to government procurement. Therefore, it seeks the consolidation and conquest of conditions necessary for organizational autonomy and the social, economic and environmental viability of the EESs based on the principles of fair and solidary trade. In the scope of this research, we chose to consider two subsystems: a) a natural subsystem composed of the local physical environment that provides some parameters for analysis of the environmental dimension; b) a subsystem established through cooperatives, associations, indirect groups of family farming linked to RECOOPSOL, which allows the analysis of the economic, social and educational dimensions, thus, the values of local indicators (DLX) under analysis and the respective degrees of sustainability are shown in table 5. Table 6 shows the individual situation of each indicator analyzed.

The environmental dimension is analyzed through the indicators that are related to the forms of use of the natural elements where the SES are located, in this case, the geographic space researched is located in two important Brazilian biomes: the Cerrado and the Pantanal. The cities of Rondonópolis, Várzea Grande, Chapada dos Guimarães, Tangará da Serra and Dom Aquino are in the Cerrado Biome and on the edge of the Pantanal Biome where the cities of Poconé, Santo Antônio de Leverger, Nossa Senhora do Livramento and Itiquira are (VILA DA SILVA; ABDON (1998). According to Rossetto et al. (2020) the Pantanal is an extensive sedimentary plain that receives material from the surrounding high areas, so the waste of monoculture agriculture practiced by agribusiness (among them insecticides and herbicides) present mainly in the Cerrado biome, tend to spread across the plain. The soils of the Pantanal are hydromorphic (92%), with poor drainage, sandy and low fertility (POTT, 1994), while the Cerrado soils in general are characterized by the predominance of Latosols, followed by Podzolic or Argisol soils, present in acidity, high depth and porosity, which allows a greater infiltration of water and a limited capacity of its storage (DA SILVA; KATO,1998). The use of land through infrastructure, such as housing and the disposal of domestic effluents, is a selected indicator that in the EBS was shown in the intermediate position (46.28), due to the number of EES with cesspool/sinkhole. It is understood that, in view of the inefficiency of the public sewage collection system, both in urban and rural areas, the use of cesspool/sinkhole occurs. Research conducted by Amorim; Netto Olive Tree; Gomes (2005), show that the use of the septic cesspool/sinkhole system can increase the risk of contamination of the water table because domestic effluents can pass through the soil, contaminating aquifers, in addition, according to the authors, groundwater pollution that most stands out is associated with the sanitation of areas that do not have sewage networks and agricultural cultivation practices. The environmental dimension is associated with care for the environment, that is, the maintenance and recovery of natural resources, on which human production and reproduction are sustained. This is due to technical innovations that allow the production of healthy foods, without excessive impact on the local

environment (SACHS, 2000; WERBACH, 2010). The number of EES that reuse the waste is linked to the main products generated by the agro-industries surveyed, which process cassava derivatives (flour and sprinkles, among others), sugar cane (*rapadura*, syrup and brown sugar), plantains (banana chips and sweets) and also milk, chicken and fish. The main residues come from the processing of cassava peels, sugar cane, plantain, used oil, chicken waste among others. The destination, according to the interviewees' answer, is soil fertilization and/or animal feeding, being in the intermediate position (52), according to EBS. The field research showed that such use of waste is done in a simple way, without technical guidance generating few results, in addition the oil used in the production of banana chips has no proper destination and is thrown into the soil. The presence of fauna in or near the ESS indicates that biodiversity is at an intermediate conservation level in EBS (57.71). The animals in their natural environments contribute to the continuity of the ecosystems they inhabit, and the fauna is considered as a key part in the functioning of tropical ecosystems, since they influence processes of soil structuring, biomass decomposition, nutrient cycling, plant pollination, seed dispersal, balancing processes acting in population maintenance and pest control. Souza 2002; (Dewalt et al., 2003; Muscarella & Fleming, 2007). However, when family farmers, artisans and rooters, traditional peoples and communities report animal sightings, the citations mostly fall on mammals and birds. The interviewees' citations fall on mammals and birds: such as *lobete* (Cercopithecus), anteater (Myrmecophaga tridactyla), puma (Puma concolor), capybara (Hydrochoerus hydrochaeris), *tatu galinha* (Dasypus novemcinctus), *tatu peba* (Euphractus sexcinctus), deer (Mazama americana), *cateto* (Pecari tajacu), *maritaca* (Pionus maximiliani), *mutum* (Crax fasciolata), *aranquã* (Ortalis canicollis), *tuiuiu* (Jabiru mycteria), and macaws (Ara ararauna and Ara chloropterus). In times of global water crisis, the Indicator No. of EES that reuse the water used in the ESS assumes special relevance, given that in The EBS the degree is considered good (43.57) potentially sustainable. The data collection in the field revealed that, in reality, the reuse of water does not integrate daily practices and there is no infrastructure that allows this fact, what occurs is the casual reuse to irrigate plants, wash the floor of the sheds and other spaces. Indicator 32.57 refers to the number of Enterprises that draw water from artesian wells, in EBS they also obtain intermediate concept. The legislation allows the use, but they are subject to granting by the Public Power the rights of the following uses of water resources I - extraction of water from underground aquifer for final consumption or production process intake (BRASIL, 1997).

Most Enterprises (85.71%) they have semi-artesian wells located in the following Aquifers: 1. *Faturado Centro-Sul* (Asfealta, Coopernossa, Comprup, Imbê, Agriverdi, Coopansal), as the name implies is a fractured aquifer, which has very low productivity; 2. *Pantanal* (Cooperangi, Agroana Girau, Aspopan), porous aquifer, with variable productivity, which generally have good quality waters, but locally have high levels of iron, carbonate, organic matter and salinity. However, because it does not have another source of available water, it is not a factor that prevents consumption; 3. *Furnas (PA Quilombo)* is an aquifer of the type confined in porous environment, with high productivity, being one of the most important aquifers in the state of Mato Grosso; 4. *Furnas/Bauru-Caiúá*, (Coopsob), the *Aquífero Bauru-Caiúá*, is of the porly type, with low to moderate productivity; and 5. *Ponta Grossa* (Ama) porous aquifer, with very low productivity (ANA, 2020). Although the construction of artesian wells bring many benefits mainly to populations living in areas with scarcity of water resources, there are some factors that directly interfere in water quality, in the preservation of underground water reserves and the environment among them, contamination by pesticides. Because they are in a fragile biome, an indicator of environmental protection was sought, the option fell on the Pantanal Biosphere Reserve (RBP) on the BS scale, because it is an area that have international recognition, within the program 'O Homem e a Biosfera'³ (MaB) United Nations Educational, Science and Culture

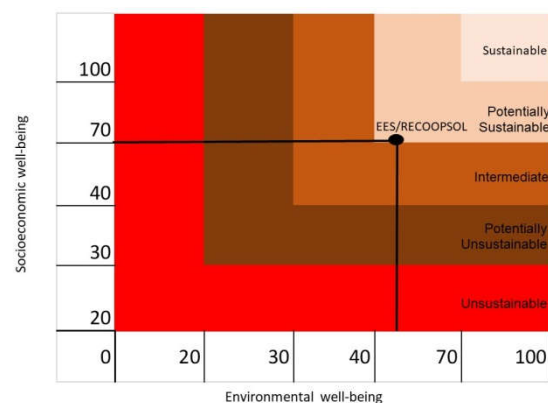
³ Translator's note: Man and the Biosphere

Organization (UNESCO), conceived as a program of international scientific cooperation, seeks to deal with social, economic and cultural aspects, as well as with environmental issues. Each Biosphere Reserve (RB) must have a zoning including a) the core zone: composed of Conservation Units (UC) that focus on the conservation of biological diversity and the maintenance of the ecosystem without human interference; b) the buffer or damping zone: areas that surround the core zones and that can be used for activities that are compatible with correct ecological practices, including environmental education, recreation, ecotourism, applied and basic research; (c) transitional area: areas for sustainable development, which may contain a variety of activities compatible with the geographical region in which they are located (MMA, 2019). In this perspective, the Enterprises that are located, according to the shape available from the RBP, in the transition zone: PA Quilombo, Coopsob, Ama, Coopernossa, Coopansal, Imbê, Agriverdi, Coopergrande e Coorimbataãnd in Amortecimento to Aspopan, Cooperangi and Comprup zones. They are the same compatible with the activities of a Biosphere Reserve. The presence of agroforestry system – SAF and/or organic production on the BS scale is located as potentially sustainable (40.57), the qualitative perspective of the research points out that there is a need to implement the SAFS in more EES, which is irradiated to other communities due to its great potential for income generation, ensuring food security and conserving natural resources. This social technology is an alternative to other production systems that are more impactful to the environment and the biomes of the Cerrado and Pantanal.

Considering that the sustainable development process has multiple aspects, after the analysis of the environmental dimension, it will seek to verify the local indicators (DLX) of the subsystem established through cooperatives, associations, indirect groups of family agriculture that provide elements for discussion of the economic, social and educational dimensions. The economic dimension concerns the ability of an ecosystem to be profitable and productive, without, however, causing excessive damage to the environment. In other words, it is an intersectoral development, offsetting food security, modernization capacity and conservation (SACHS, 2000; PAWLOWSKI, 2008; WERBACH, 2010). Within this dimension, the first indicator analyzed is the number of EES that has working capital, whose position in EBS is in the middle grade (intermediate - 38.29), this fact denotes the reduced access to credit lines and financing programs via public policies, which greatly interfere in the execution of projects, such as access and improvement of technologies, remuneration of associates, inventory, among others. In the context of Solidarity Economy networks, the economy is important for the sustainability of enterprises and is understood as "... part of all life and therefore not subordinate dweller to political or social, but integrated (ZAART; VAILANT, 2014 p. 19). The presence of agro-industries is small among the EES scanned, whose production is centered on fruits, vegetables and vegetables marketed in natura, or with a low degree of industrialization, the indicator in the EBS is in the middle - intermediate position (40.57). Qualitative research has evidenced that agro-industries have a low technological level, or face problems of adaptations in their structures or regularizations with environmental agencies and health surveillance and/or that lack knowledge and technical capabilities for the use and adequacy of these structures and equipment. This also highlights failures in the actions of rural assistance and extension agencies because it is their attribution to the socialization of technologies, especially in associations, cooperatives or informal groups. The precarious technological conditions for the transformation of raw materials hinders the economic viability of the enterprises, however the Indicator No. of EES that has access to communication technologies obtained a grade of 52.00 occupying in EBS the good -potentially sustainable position, a fact that can help in the commercialization of products. In the case of the Indicator Number of EES that has its own vehicle - transport in EBS obtained the grade 40.57 occupying in EBS the good-potentially sustainable position. The social dimension of sustainability is related to the social organization capacity of the participants of the ESS and occupies a level of undeniable importance, since its consideration will affect all other

dimensions. The preservation and recovery of natural resources will only have meaning and relevance depending on how much each will enjoy the products generated in renewable ecosystems equitably (CAPORAL & COSTABEBER, 2002; WERBACH, 2010). The indicator No. of interviewees who consider the participation of members in the ESS as regular in the EBS was considered good – potentially sustainable (21.00) and Number of interviewees who consider the participation of members in the ESS as poor occupied the unsustainable position with the degree in the EBS of 85.72. In general, the associates/members of the Family Farming ESS linked to RECOOPSOL know little about cooperativism/associativism or about self-management. The absence of historical, theoretical and practical knowledge about solidarity economy and collective enterprises is notorious, which requires efforts towards training and training. The reduced organization reflects negatively in relation to the institutional dimension, which refers to the relationship of actors with public authorities through democratic participation in the context of sustainable development, as well as the performance in social organization networks and representations of different segments of the population (SACHS, 1993; CATALISA, 2003; PAWLOWSKI, 2008, CARDOSO, TOLEDO & VIEIRA, 2014). Thus, according to Saraiva et al. (2013); De Camargo et al. (2013), when they are not organized, they lose opportunities for access to the public support and promotion structure, as well as public policies, which are promoted aimed at the sustainability of family agricultural enterprises, with examples of the National School Feeding Program (PNAE) and the Food Acquisition Program (PAA). These programs have a significant impact on the increase in the production of family farmers, as they guarantee demand and commercialization of the goods produced.

The educational dimension of sustainability is related to all other dimensions because access to education is essential to eradicate poverty, obtain equity and inclusion, and improve levels of health and nutrition, income and livelihoods. Education enables the subject to make decisions based on his/her experience by observing the complexity of their social and environmental relations (ROSSETTO; DALLA NORA, 2020). The indicators that portray the educational dimension in the context of RECOOPSOL reveal that the Number of interviewees who have completed high school in EBS is in the intermediate position (64.29); the Number of interviewees who have complete higher education is found in the EBS as poor or potentially unsustainable (28.57), similarly, the Number of interviewees who have only completed elementary school in the EBS (64.29), indicates a poor or potentially unsustainable situation. Therefore, in the scope of this text, the dimensions of sustainability as interrelated are evaluated, because the result of one will depend on the efforts applied in the other (FROELICH, 2014), as a correlated, the synthesis of sustainability indicators for the RECOOPSOL System is presented through the Corporate Welfare Index that aggregates the social, economic and educational dimensions and the Environmental Welfare Index and the Environmental Welfare Index, which aggregates the management of natural characteristics, shown in Figure 3.



Source: Database of the Subproject Socio-environmental Indicators of Solidarity Enterprises articulated to RECOOPSOL- MT. 2019-2020. Org., Authors Adapted from Prescott-Allen (1997; 2001). Org., Authors

Figure 3. Synthesis of Sustainability Indicators for the RECOOPSOL System - Socioeconomic Well-being Index and Environmental Well-being Index

Table 7. RECOOPSOL System: Development Actions and Improvement Guidelines

Sub system	Dimensions	Theme	Actions under development (RECOOPSOL)	Improvement guidelines
Natural environment	Environmental	Sanitation	-----	<ul style="list-style-type: none"> - Articulate joint actions with the State Basic Sanitation Plan; - Strengthen the organization of the EES to claim access to basic sanitation with public institutions; - Train those involved to acquire and/or improve their knowledge about the importance of basic sanitation for health and environmental conservation; - Develop and disseminate Environmental Education materials
		Waste Use	-----	<ul style="list-style-type: none"> - Articulate joint actions with the State Solid Waste Plan; - Perform diagnosis in agro-industries that results in reliable information to subsidize actions; - Train those involved to acquire and/or improve their knowledge about the use of waste as an alternative income.
		Wild Fauna	Articulation for the formation of Rural Voluntary Brigades to Combat Forest Fires.	<ul style="list-style-type: none"> - Build collective knowledge about the protection of local fauna through actions aimed at Environmental Education; - Register traditional knowledge about fauna as a legacy for future generations.
		Water Use	-----	<ul style="list-style-type: none"> - Train those involved to acquire and/or improve their knowledge about the multiple uses of water from the conservation perspective; - Improve water management in the ESC through training and collective search for alternatives for its reuse; - Articulate social technology actions for the reuse of water used in the ESS.
		Protection Mechanism	Pantanal Biosphere Reserve	<ul style="list-style-type: none"> - Train those involved to acquire and/or improve their knowledge about the importance of environmental protection mechanisms; - Develop and disseminate Environmental Education materials
		Environmental management practices	Agroforestry Systems-SAFs	<ul style="list-style-type: none"> - Expansion of SAFs units for a greater number of enterprises; - Articulation with the State Forum to combat pesticides for reapplication throughout the state of Mato Grosso;
			CSA – Community that sustains the Farmer. In this model, consumers, called prosumers (because they are considered as part of producers) finance a group of farmers with seeds, technical assistance and logistics, the counterpart is the delivery of fresh organic food for a price that meets the needs of both those who produce and those who purchase.	Expansion of prosumer groups
Associations/cooperatives/formal groups	Economic	Capital/Technology/Transportation	<ul style="list-style-type: none"> - E-Commerce application - digital marketing, the consumer downloads the application to mobile device and acquires the product offered by the farmer, delivery is made in the consumer's residence. - ECOFEIRA - seeks to market organic products via the short circuit of the economy, that is, from the direct farmer to the consumer, 	<ul style="list-style-type: none"> - Expand to other regions of the state (Tangara da Serra and Rondonópolis) the use of this Social Technology; - improve cost management in logistics and maintenance of food quality
			<ul style="list-style-type: none"> - <i>Capacita Produtor</i> Project- aims to provide to EES the management process in the areas of marketing (access to markets and public policies) and productive and financial management (production control, preparation of productive costs and financial control). 	<ul style="list-style-type: none"> - Perform the diagnosis of the ESEs in relation to the areas of marketing, finance and production to evaluate the main problems and bottlenecks that hinder the management process of the organization; - Propose administrative methodologies to improve the management process of the EES.
			Rotary Solidarity Fund - rotary form used as an emergency contribution with the objectives: a) rescue the collective practices of administration of financial resources that contribute to the development and improvement of the living conditions of families b) foster new enterprises; c) meet the needs of the participants.	- Expand the access of the ESS to the Rotary Solidarity Fund.
	Social	Social Organization	<ul style="list-style-type: none"> - <i>Germinar</i> Program- Promote professional qualification and train leaders facilitating the integrated, organic and sustainable development of people, organizations and social environment. 	Preparation of a project to raise funds with the BB Foundation for new classes
			<ul style="list-style-type: none"> - <i>Fórum Territorial de Segurança Alimentar e Nutricional e de Economia Solidária da Baixada Cuiabana</i> -FTSANES-BC 	Consolidation of the Territorial Forums of Rondonópolis and Tangara da Serra. Reactivation of the State Solidarity Economy Forum
		Formal Education	Elementary school	Stimulate access to formal education by articulating partnerships with the Municipal Departments of Education.
		High school	Propose articulations with face-to-face and semi-face-to-face modalities; Partnerships with technical education institutions;	
		Higher Education	Stimulate access with the institutions present UNEMAT, UFMT and access to Distance Education	

Source: Database of the Subproject Socio-environmental Indicators of Solidarity Enterprises articulated to RECOOPSOL- MT. 2019-2020. Org. Authors

Figure 3 shows that the Index of Socioeconomic Well-being and Environmental Well-being in the context of RECOOPSOL are found in EBS as potentially sustainable, which requires measures to improve individual indicators, aiming at a balance between the dimensions of sustainability. Because of this, table 7 presents the actions under development by RECOOPSOL and indicates guidelines for its improvement. The information in table 7 points out that RECOOPSOL, despite developing multiple actions in the social and economic dimension, has not acted in the environmental dimension of sustainable development, which occurs in the ESS are isolated initiatives based much more on the empirical knowledge of those involved without the use of social technologies or other environmental management instruments. Associated with this fact, we also highlight the importance of Environmental Education actions that could permeate as a cross-sectional theme all the actions developed at RECOOPSOL. RECOOPSOL, based on the results indicated in the course of the research, seeks its improvement, strengthening and constitutes as a form of resilience to the context that prevails in the rural environment of the State of Mato Grosso. As a network formed by people and institutions, we walk paths in search of an economic, social and environmental logic based on social justice, the conservation and preservation of the natural environment, for life in the present and in the future.

Final Considerations: RECOOPSOL can be defined as a network of local agents of solidarity economic development, which, in a process of reciprocity, is intertwined with the network of enterprises, support entities and local public managers, working together in the production, management and marketing. Analyzing the sustainability of the enterprises and the possibilities made by this network can contribute to public policies for this segment, whether at local, regional or national level. Taken together, the ESS surveyed presented indexes Of Socioeconomic Well-being and Environmental Well-being are in the EBS as potentially sustainable, as a correlated, it is inferable that the conditions for their improvement are put, although the environmental and educational dimensions may be compromised by the need for the family farmer to generate immediate and sufficient income for the maintenance of the family, with the precarious support of the institutional structure. It is also necessary to emphasize that the analyzed reality is influenced by multiple factors external to RECOOPSOL, thus, the alternative that is proposed and the continuity of training actions that strengthen social organization, access to knowledge and formal and non-formal education as elements of empowerment of the social actors involved, in the search for alternative solutions for the improvement of the quality of life and the environment. Moreover, it is necessary to emphasize that the use of indicators provides relevant information about defined variables related to patterns or trends of the state of the environment, of human activities that affect or are affected by the environment, constituting an important tool for evaluation and redirection of actions.

BIBLIOGRAPHIC REFERENCES

- ABBADE, Eduardo Botti. Aplicação da teoria dos jogos na análise de alianças estratégicas. *Revista Gestão da Produção Operações e Sistemas*, n. 3, p. 131, 2010.
- AMORIM, Eduardo Lucena Cavalcante de; OLIVEIRA NETTO, Antonio Pedro de; GOMES, Márcio. Análise do comportamento da pluma de efluente de fossa séptica no lençol freático. 2005.
- BERNARDES, J. A.; ARRUIZZO, R. C. (Org.). *Novas fronteiras da técnica no Vale do Araguaia*. Rio de Janeiro: Arquimedes Edições, 2009.
- BORGES, Juliano Luis. Movimentos Sociais e Sustentabilidade: os Desdidos da “Extensão Rural Agroecológica” em Assentamentos de Reforma Agrária. *Revista Cesium—Ciências Humanas e Sociais Aplicadas*, v. 17, n. 1, 2012.
- BRASIL, (2012). *Conceito de indicadores para o IBGE Brasil. Ministério do Planejamento, Orçamento e Gestão. Secretaria de Orçamento Federal. Indicadores - Orientações Básicas Aplicadas à Gestão*. Brasília: MPOG, Secretaria de Planejamento e Investimentos Estratégicos, 2012.
- BRASIL. INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. *Censo Agropecuário 2017. Resultados Preliminares*. Rio de Janeiro, 2017.
- BRASIL. LEI Nº 9.433, DE 8 DE JANEIRO DE 1997. Política Nacional de Recursos Hídricos. Disponível em http://www.planalto.gov.br/ccivil_03/leis/19433.htm
- BRASIL. MINISTÉRIO DO MEIO AMBIENTE. *Agenda 21 brasileira: bases para discussão*. MMA/PNUD, 2000.
- BÜHLER, Eve Anne; GUIBERT, Martine; OLIVEIRA, Valter Lúcio de. *Agriculturas empresariais e espaços rurais na globalização: abordagens a partir da América do Sul*. Editora da UFRGS, 2016.
- CARVALHO, Sônia Marise Salles Carvalho *TRABALHO ASSOCIADO E DEMOCRACIA: A CONSTRUÇÃO DE INSTRUMENTOS DE POLÍTICAS PÚBLICAS* In *TRABALHO ASSOCIADO E DEMOCRACIA: A CONSTRUÇÃO DE INSTRUMENTOS DE POLÍTICAS PÚBLICAS* In:
- Castells, Manuel. *A sociedade em rede. A era da informação: economia, sociedade e cultura*. Vol. 1. São Paulo: Paz e Terra, 2005.
- CONSTANTINO DOS SANTOS, Josivaldo. *Educação e sócio-economia solidária*. Cáceres-MT: Editora Unemat, 2006.
- Costa Dila Lourença da Costa; Clovis Vailant; Patrick de Oliveira Costa. *COLETIVOS EM REDE: REINESCO – REDE DE INCUBADORAS DE EMPREENDIMENTOS ECONÔMICOS SOLIDÁRIOS E SUSTENTÁVEIS DO CENTRO-OESTE*. Laudemir Luiz Zart. Clovis Vailant (orgs.) *Educação e Socioeconomia Solidária: Incubação em Economia Solidária: Empreendimentos em Rede e Resistência Camponesa. Serie Sociedade Solidária*, v.4; Cáceres: Unemat 2014.
- DA SILVA, Cícero Lopes; KATO, Eiyti. Avaliação de modelos para previsão da infiltração de água em solos sob cerrado. *Pesquisa Agropecuária Brasileira*, v. 33, n. 7, p. 1149-1158, 1998.
- DAROLT, M.R. *Conexão Ecológica: novas relações entre produtores e consumidores*. Londrina: IAPAR, 2012.
- DE CAMARGO *et al.*, (2013).
- DISANO, J. A. *Indicators of sustainable development: Guidelines and methodologies*. United Nations Department of Economic and Social Affairs, New York, 2002
- FRAGA, S. SILVA, T. DIAS, L. Identificação das Áreas de Ocorrência do Psitacideo Brotoogeris Chiriri na Área Central da Ilha do Maranhão (MA) pelo método de avistamento. *Revista Casa da Geografia*. Set. de 2019 p. 1049-1059.
- FROELICH, Cristiane. Sustentabilidade: dimensões e métodos de mensuração de resultados. *Desenvolve Revista de Gestão do Unilasalle*, v. 3, n. 2, p. 151-168, 2014.
- GAIGER, Luiz Inácio. Antecedentes e expressões atuais da economia solidária. *Revista Crítica de Ciências Sociais*, n. 84, p. 81-99, 2009.
- GRANOVETTER, Mark S. The strength of weak ties. *American journal of sociology*, v. 78, n. 6, p. 1360-1380, 1973.
- LOPES, Fernando Dias; BALDI, Mariana. *Laços sociais e formação de arranjos organizacionais cooperativos: proposição de um modelo de análise*. *Revista de Administração Contemporânea*, v. 9, n. 2, p. 81-101, 2005.
- MAITELLI, Gilda Tomasini. *A hidrografia no contexto regional. Geografia de Mato Grosso: território, sociedade, ambiente*. Cuiabá: Entrelinhas, 2017.
- MANCE, Euclides André. *Redes de Colaboração Solidária - Aspectos econômico-filosóficos: complexidade e libertação*. 1. ed. Petrópolis, RJ: Editora Vozes, 2002.
- MARCONI, Marina de Andrade; LAKATOS, E. M. *Técnicas de pesquisas 6º Edição revista e ampliada*. São Paulo, Editora Atlas SA, 2007.
- Mitidiero Jr. (2016), *Globalização e agriculturas empresariais na América do Sul* Eve Anne Bühler, Martine Guibert e Valter Lúcio de Oliveira. *Agriculturas empresariais e espaços rurais na globalização: abordagens a partir da América do Sul / organizado por Eve Anne Bühler, Martine Guibert [e] Valter Lúcio de Oliveira*. – Porto Alegre: Editora da UFRGS, 2016
- NASCIMENTO, Jorge Luiz; CAMPOS, Ivan Braga. *Atlas da fauna brasileira ameaçada de extinção em unidades de conservação federais*. ICMBIO. Brasília, 2011.

- OECD - Organization for Economic Co-operation and Development. (1993). Core set of indicators for environmental performance reviews. Environment Monographs N° 83. OECD. Disponível em: <http://www.nssd.net/pdf/gd93179.pdf>. Acesso em: 23 fev. 2018.
- PAWLOWSKI, Lech. The science and engineering of thermal spray coatings. John Wiley & Sons, 2008.
- POTRICH, Rafael; GRZYBOVSKI, Denize; SMOKTUNOWICZ TOEBE, Carlisa. Sustentabilidade nas pequenas propriedades rurais: um estudo exploratório sobre a percepção do agricultor. Estudos Sociedade e Agricultura, v. 25, n. 1, 2017.
- PRESCOTT-ALLEN, R. Barometer of Sustainability: Measuring and communicating wellbeing and sustainable development. IUCN Publication Services Unit. 1997.
- PRESCOTT-ALLEN, Robert. Wellbeing of nations: A country-by-country index of quality of life and the environment. IDRC, Ottawa, ON, CA, 2001
- RECOOPSOL . FTSANES-BC, 2020 FÓRUM TERRITORIAL DE SEGURANÇA ALIMENTAR E NUTRICIONAL E DE ECONOMIA SOLIDÁRIA DA BAIXADA CUIABANA (FTSANES-BC) REGIMENTO INTERNO. <http://recoopsol.ic.ufmt.br/> Disponível em: <https://transforma.fbb.org.br/storage/socialtecnologias/44/files/Projeto-Agroindustrias%20base%20familiar.pdf>
- ROSSETTO, O. C.; DALLA NORA, G. Ações ambientais no processo de gestão de empreendimentos rodoviários na Amazônia Mato-Grossense. Quaestio - Revista de Estudos em Educação, v. 22, n. 2, p. 569-588, 14 ago. 2020.
- ROSSETTO, Onélia Carmem; DALLA NORA, Giseli; SAITO, Carlos Hiroo. Desenvolvimento (in) sustentável do Pantanal brasileiro: regionalização e políticas públicas (1970-2018). Terra Livre, v. 1, n. 54, p. 434-476, 2020.
- RUWER I. M.; MOREIRA, I. S. Mundo do trabalho, Serviço Social e desenvolvimento sustentável. In: Seminário do Trabalho: Trabalho, Educação e Sociabilidade, 7., 2010, Marília. Anais... Marília: Ed. UNESP, 2010. Disponível em: .
- SACHS, I. Caminhos para o desenvolvimento sustentável. Editora Garamond, 2000.
- SACHS, I. Estratégias de transição para o século XXI: desenvolvimento e meio ambiente. Studio Nobel, Fundação do Desenvolvimento Administrativo, 1993.
- SAMPAIO NETO, Oscar Zalla et al. Sistema Integrado de Inovação Tecnológica Social - SITECS, Brasília-DF, Fundação Banco do Brasil, 2013. Disponível em: <http://tecnologiasocial.fbb.org.br/tecnologiasocial/banco-de-tecnologias-sociais/pesquisar-tecnologias/detalhar-tecnologia-58.htm>
- SAMPAIO NETO, PRIANTE FILHO, Nicolau et al. Brapci 2.0. Inclusão Social; v. 6, n. 2 (2013): Desenvolvimento e Inclusão Social: o Brasil pensando a Amazônia, v. 24, n. 2, 2018.
- SANTOS, Josivaldo Constantino dos. (Orgs). Educação e Sócio-Economia Solidária: Interação Universidade – Movimentos Sociais. Cáceres: Unemat, 2006. (Série Sociedade Solidária, 2).
- SANTOS, M. *Técnica, espaço, tempo*: globalização e meio técnico-científico informacional. São Paulo: Hucitec, 1994
- SARAIVA, J. A. Processos culturais e suas manifestações. Novo Hamburgo, 2013.
- SINGER, Paul. A recente ressurreição da economia solidária no Brasil. Produzir para viver: os caminhos da produção não capitalista. Rio de Janeiro: Civilização Brasileira, v. 2, 2002.
- SOARES CARDOSO, Andreza; DE TOLEDO, Peter Mann; GUIMARÃES VIEIRA, Ima Célia. Dimensão Institucional da Sustentabilidade e Gestão Ambiental no município de Moju, Pará: uma aplicação do Barômetro da Sustentabilidade. Sustainability in Debate/Sustentabilidade em Debate, v. 5, n. 2, 2014.
- Sobreiro Filho (2020) Sobreiro Filho José (2020) PEQUENO ENSAIO GEOGRÁFICO SOBRE MOVIMENTOS SOCIAIS, MOVIMENTOS SOCIOTERRITORIAIS E OUTRAS TEORIAS GEOGRÁFICAS PARA A CRÍTICA ECONÔMICA. Geografia e economia : relações e interfaces/ Paulo Fernando Jurado da Silva, Eliseu Savério Sposito, Mateus Ubirajara Silva Santana, organizadores. – Dourados, MS: Editora UEMS, 2020
- SOUZA, Luciane Lopes. Importância da dispersão de sementes por animais na Amazônia. Capes. WWF – Brasil 2002. Canal Ciência.
- THIOLLENT, Michel et al. Metodologia da pesquisa-ação São Paulo: Cortez, 1998
- VAN BELLEN, H. M. Indicadores de sustentabilidade: uma análise comparativa. Rio de Janeiro: Editora FGV, 2007.
- VAN BELLEN, Hans Michael. Desenvolvimento sustentável: uma descrição das principais ferramentas de avaliação. Ambiente & Sociedade, v. 7, n. 1, p. 67-88, 2004.
- VILA DA SILVA, J. S.; ABDON, M. M. Delimitação do Pantanal brasileiro e suas sub-regiões. Revista Pesquisa Agropecuária Brasileira. Brasília, v. 33. n.º. especial, p.1703 -11, out. 1998
- WERBACH, A. The failure of Chevron's new 'We Agree' ad campaign', The Atlantic, 21 October. 2010.
- WEYER, Marlise; DALLA NORA, Giseli. Resíduos sólidos domésticos: estudo de caso do óleo vegetal residual no bairro morada da serra Cuiabá/MT. REVISTA GEONORTE, v. 6, n. 24, p. 62-80, 2015.
- ZART, Laudemir Luiz (Org.). Educação e Sócio-economia Solidária: paradigmas de conhecimento e de sociedade. Cáceres: UNEMAT, 2004. (Série Sociedade Solidária, 1).
- ZART. LAUDEMIR LUIZ. A construção do processo de cooperação e o trabalho associado no campo: incubação e organização de empreendimentos solidários. P.211-234 In: ZART. LAUDEMIR LUIZ; VAILANT, CLÓVIS. (ORGS.) Incubação em economia solidária: empreendimentos em rede e resistência camponesa. Serie Sociedade Solidária. V.4. 2014. Editora da UNEMAT
