Chapter 232

Construction of a global sustainability index (GSI): An evaluation tool for public policies aimed at sustainable milk production in contemporary times

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ABSTRACT
The article aims to show methodological criteria for the construction of the Global Sustainability Index (IGS) and its importance in the evaluation of public policies of sustainable milk production in contemporary times. The economic, social, environmental, institutional, and technological dimensions are taken into consideration to better assess the sustainable development of economically active activities. The survey took place in Rondônia with 400 dairy farmers, where the IGS of the activity that reached average sustainability was obtained, IGS = 0.42. The economic dimension presented an index of 0.52, being the most sustainable among the analyzed dimensions. Following the decreasing order, comes social and environmental, with average sustainability of 0,44 and 0,41, respectively, and, with low sustainability, was the technological dimension, which presented an index of 0,39, and the institutional with 0,32 decimal points of sustainability. This result indicates the need for political and technological efforts to improve the sector's performance.

Keywords: Dairy farming, Sustainability, Index.

1 INTRODUCTION

The contemporary age begins in 1789, with the French Revolution, and continues to the present day. A period marked by profound transformations in the organization of society and by conflicts of global scope. Among these is the sustainability of active economic activities based on the responsible management of the environment to develop more efficient production methods, with less and less consumption of natural resources, but without compromising economic growth.

Although contemporary life coexists with globalized actions, which requires increasing integration between nations to the detriment of economic activities and increased competitiveness; which in turn forces changes in habits, induces the use of products, and demands quality, price, productivity, and constant scale of production, causing economic and technological subordination of the underdeveloped countries with the developed ones. However, this process requires technological changes at the world level that provide prosperity and development with environmental preservation.

The public policies established for the agricultural exploitation of cattle ranching in the Brazilian Amazon, a region known as the "lung of the world", could not fail to contemplate the ecological sustainability of the region, considering that the practice of sustainability occurs in the long term, by requiring awareness and change of habits at all levels of society, so that, These avoid risks to nature, ensure the conservation, preservation, and maintenance of natural resources and the survival of the human race on planet Earth.

This importance has already been perceived by the world scientific community, which has disclosed and believed that sustainability to achieve the effects of conservation and environmental preservation requires that economic exploitation, in all aspects, respect the limits and finitude of natural resources, being necessary to articulate human action, economic exploitation and the potentialities that the environment offers. For, the exploitation focused only on maximizing profits will be a paradox to the process of sustainability of the planet.

The indiscriminate use of natural resources and the extractive production of livestock indicates the need to better evaluate this product segment. Also, the evaluations of dairy farming at the level of Brazil have been based on different aspects of its reality, but independently, contemplating economic analysis, productivity, the genetic quality of the breeds, and contribution to the national and regional GDP. However, social, environmental, and institutional technological aspects, which are of great relevance to the current world, have been considered in isolation or irrelevant.

As well, as the absence of management instruments that assess the level of sustainability of milk production and socioeconomic, environmental, institutional, and technological impacts resulting from the disorderly implementation of the agricultural sector, a situation that characterizes the problem of the sector. And the research carried out, from which this article was extracted, seeks to answer the level of sustainability of dairy farming in Rondônia, an experience that can be applied in other Brazilian realities.

Therefore, it is in this context that the article is presented, which aims to show methodological criteria for the construction of a Global Sustainability Index (GSI) that better evaluates the level of sustainability of dairy activity, producing reflections that guide public policies on milk production in contemporary times, making it possible to guide the generation of employment and income in an economically profitable, socially just, environmentally correct, institutionally organized, competitive and technological innovation way.

2 DEVELOPMENT

The term sustainability is relatively old and has had its origin in agriculture since the nineteenth century, but only entered the discussion of modern ecologists in the 80s after the publication of the report Our Common Future brings its content to the concept of sustainable development.

For Ruscheinsky (2003) When it comes to sustainable development and refers to agricultural and industrial activities the understanding of sustainability assumes greater complexity, which requires

economic, social, environmental, institutional, technological, cultural, and geographical emphases to be considered, because what is sustainable for one region may not be for another. Sustainable in the legal Amazon differs from the cerrado, for example.

These reflections led Research Institutions and the Academic Community to notify that one cannot think of development only as an economic factor, it would be necessary to broaden the vision for the sociological, environmental, and technological institutional.

2.1 THEORETICAL FRAMEWORK

In the twentieth century, the post-war period, several environmental problems associated with air contamination, mercury poisoning, deficits in aquatic life, and mortality of birds happen at the world level. Bovo (2007), records some historical facts that draw the attention of the world community in the face of episodes such as air pollution in London and New York in the years 1952 to 1960, the cases of mercury poisoning in Minamata and Niigata, in the years 1953 to 1965, the decrease in aquatic life in North American lakes, the mortality of birds by the side effects of DDT and other pesticides, and, the contamination of the sea caused by the sinking of the foot troleiro Torrei Canyon in 1966.

With these facts occurring between the 1950s and 1960s, Research Institutions and the Academic Community began to notify that one cannot think of development only as an economic factor, it would be necessary to broaden the vision for the sociological and environmental. In this way, Raquel Carson (1962) publishes the work "Silent Spring" - *Silent Spring* and Meadows (1972) "The Limits of Growth". These facts have become references, recording an environmental milestone and an ecological awakening for the various nations of the world. They notify, therefore, that it is not possible to think of development in an isolated, limited way, and that it would be necessary to associate it with factors such as social and environmental.

The economic crisis of capitalism in 1970, was due to low growth rates and high inflation. Triggered, mainly, by the oil crisis and the consequent rise in its price. It was made clear that resources were limited, and that the pace of growth imposed until then would lead to the depletion of oil or its obtaining in a non-economic way. These facts awakened to the finiteness of natural resources and then in 1972, the Stockholm Conference took place. Where a new perception of development emerges giving rise to ecodevelopment, whose concept was launched by Maurice Strong (1973), which referred to the judicious use of local resources without compromising the depletion of nature.

Sachs (1980) elaborates on the concept of ecodevelopment and includes the understanding of sustainability based on the economic, social, ecological, spatial, and cultural dimensions. With the concept of economic efficiency and management of resources, reduction of social differences, understanding and intensification of the use of ecosystems compatible with their deterioration, as well as avoiding geographical concentration of populations, activities, and power in search of a balanced relationship

between countryside and city, and that respects cultural and local differences and the specificities of all ecosystems.

With this the concept of ecodevelopment is known as endogenous development and depending on its forces, submitted to the logic of the needs of the population as a whole, aware of its ecological dimension, and seeking to establish a relationship of harmony between the men and nature (SACHS, 1980).

Still, according to Sachs (2004), the objectives of development go beyond the mere multiplication of material wealth. Growth is a necessary condition, but by no means sufficient - much less a goal in itself, to achieve the goal of a better, more fertile, and more complete life for all.

The United Nations (UN), in 1983, creates the World Commission on Environment and Development (CMMAD)and begins to work on the theme of economic growth with conservation and environmental preservation. And in 1987 the World Commission on Environment and Development (CMMAD) published the report Our Common Future (BRUNDTLAND, 1987). It was in this document that for the first time, the concept of sustainable development was established, as being: "development that satisfies present needs, without compromising the ability of future generations to meet their own needs".

From these and report the term sustainability begins to be introduced in the discourse of development if it becomes "sustainable development", and the world no longer conceives the idea of growth, progress, based only on the economic advancement of society and the increase of the Gross Domestic Product (GDP) and comes to understand the need to associate economic growth to social, environmental conservation and preservation, and promote technological institutional strengthening.

At the United Nations Conference on Environment and Development (ECO-92), held in Rio de Janeiro in 1992, Agenda 21 was produced, a global document with global guidelines for sustainable development, which the concept of sustainable development has acquired its full dissemination and has constituted the axis of all discussions on sustainability up to the present day (BOFF, 2012).

After ECO 92, other major events took place such as the Kyoto Protocol in 1992, Rio + 10 in Johannesburg, and Rio + 20 in Brazil in 2012, which resulted in the document "The Future We Want". Certainly, these events played a fundamental role in the popularization and dissemination of what sustainable development means.

For Cândido et al (2010), the concept of sustainable development has been permanently reconstructed due to the evolution and importance of this theme. However, its indiscriminate use and little discretion hinder the understanding while it opens the margin for different meanings. Buarque (1999) says that development with environmental, social, and economic aspects must be based on ethical assumptions that demand two interconnected solidarities: the synchronic - current generation, and the diachronic - future generations. And finally, Siche et al (2007, p.140) cite that the word "sustainability" comes from the Latin "s*ustenance"* which means to sustain, sustain, endure, conserve in good condition, maintain, and resist. In this way, sustainable is everything that can be supported, and maintained."

Sustainability is the magic word of today, considered as a term not restricted to a few cases that inspire a dynamic perspective and is not characterized as something static. It consists of a very broad concept, but the pure and simple meaning of the word sustainable is what sustains someone or something, which, to which one should pay attention (RUSCHEINSKY, 2003).

In current times, an example of the implementation of sustainable processes is the practice of the Green Economy which represents a change of mentality and cultural profile of society in the search for sustainable procedures.

According to the United Nations Environment Programme (UNEP, 2011) the Green Economy is an economic model that results in improved human well-being and social equality, while significantly reducing environmental risks and ecological scarcity. It is low in carbon footprint, efficient in its use of resources, and socially inclusive. Income and employment growth must be driven by public and private investments that reduce pollution, increase energy efficiency and prevent the loss of biodiversity and ecosystem services. It should be a dynamization of the economy that should happen through the expansion of sectors of low environmental impact, such as the incentive of actions to sustainable agriculture.

The Green Economy refers, therefore, to activities of rational and equitable use of natural resources called socially inclusive, and that emit low rates of greenhouse gases, these so-called decarbonized economy, and their activities minimally harm the environment. It is an economy supported by three strategies: i) reduction of carbon emissions; (ii) greater energy efficiency; iii) prevention of biodiversity and ecosystem services(UNEP, 2011).

It is verified that the concept of "development" and subsequently "sustainable development" depends on the understanding of several segments: economic, social, ecological, spatial, cultural, political, institutional, and technological, without this understanding, it will be compromised, incomplete, to the time in which, it should not be seen in a fragmented way, considering that these segments are configured in the form of inherent dimensions and interdependent with each other in the search for understanding of sustainable development.

In the discussion of the dimensions of sustainable development, there are several authors from different backgrounds who write on the subject. This makes up a complex web of understanding but with the common intention of reaching a single and balanced understanding in favor of the sustainability of the planet and humanity. According to Froehlich (2014), the authors differ when it comes to the types of dimensions that make up sustainable development, but they aim for the same focus: the *sustainability of the planet Earth and the people who inhabit it*.

Table 1, composed of authors and dimensions, makes a synthesis that emphasizes a global and organizational context of the dimensions. In this context, it is verified that all authors conceive the importance of the economic, social, and environmental or ecological dimensions for the balance of sustainable development. Three of these emphasize the importance of the cultural and two of the spatial, the political and the institutional. But they all converge on a single goal, "sustainability on planet Earth."

Table 1 – Authors and Types of Dimensions of Sustainability

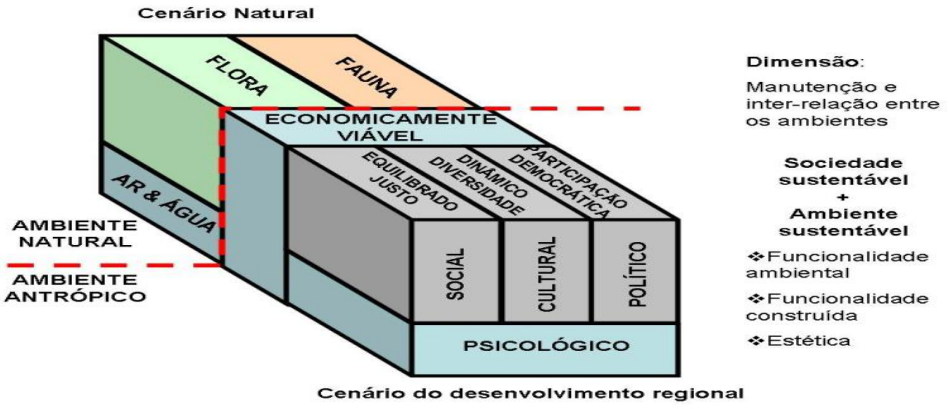
Authors	Dimensions	Emphasis
Sachs (1993)	Economic, Social, Ecological, Cultural and Spatial	Global context
OECD (1993)	Economic,Social, Environmental and Institutional	Global context
Elkington (1997)	Economic, Social and Environmental	Organizational context
Spangenberg and Bonniot (1998)	Economic, Social, Environmental and Institutional	Organizational context
Catalyst (2003)	Economic, Social, Environmental, Cultural, Spatial, Political and Ecological	Global context
Pawlowski (2008)	Economic, Social, Environmental, Moral, Legal, Technical and Political	Global context
Werbach (2010)	Economic, Social, Environmental and Cultural	Organizational context

Source: Froehlich (2014).

Froehlich (2014, p.161) says the following: "It is up to organizations and academics to reassess the need to include the other dimensions in organizational strategies and models for measuring results, as both are interconnected and interdependent and contribute to the pursuit of sustainability." Froehlich (2014) quotes Van Bellen (2008) who says: to present progress toward sustainability is a choice of society, organizations, communities and individuals, and there should be a great involvement of all segments.

Following this dynamic Mendes (2009) cites Sachs (1993) and describes two scenarios: 1) The Natural Scenario represented by the ecological and natural environment – water, air, flora and fauna; 2) The Anthropic Scenario represented by the anthropic environment – economic, social, cultural, political and psychological, which was altered by man in the construction of regional development. These themes of interest to humanity and the planet Sachs are called "dimensions of sustainable development", as shown in Figure 2 prepared by Mendes (2009).

Figure 2: Dimensions of Sustainable Development



Source: Mendes (2009).

For the Brazilian Institute of Geography and Statistics (IBGE, 2010), this new understanding of development goes beyond the domain of economics by integrating the various aspects of sustainability, relying on new paradigms that can culminate in sustainable development capable of achieving full sustainability of nations based on the systemic and balanced exploration of the economic dimensions, social, environmental and institutional.

The understanding of the IBGE (2010), is that Sustainable Development that can achieve full and balanced sustainability must be composed of four dimensions: Economic, Social, Environmental and Institutional and characterized them as follows:

1) Economic Dimension – Comprises the macroeconomic and financial performance of the country through the use and depletion of natural resources, and energy, as well as the production and management of waste.

2) Social Dimension – Comprises the human social fabric about the satisfaction of its needs, improvement in the quality of life, and social justice.

3) Environmental Dimension – Comprises the preservation and conservation of natural resources through their rational use and without degrading the environment, essential for the quality of life of today and future generations.

4) Institutional Dimension – Comprises the political orientation, capacity and effort expended by governments and society in the execution of the changes required for the effective implementation of sustainable development.

Siche Jara (2007), also states that sustainability indices or indicators constitute valid and important alternatives to describe the sustainability of production systems. Therefore, to evaluate sustainable development in its various dimensions, studies were developed to compose indicators and indices that enable the measurement and monitoring of the activity in a unified, global way, facilitating the understanding of the evaluations, analysis and feasibility of the processes in their various dimensions.

Therefore, it is in this purpose that the methodological procedures for the construction and calculation of the Global Sustainability Index (GSI) composed of economic, social, environmental, institutional and technological indicators are presented, extracted from the thesis "Evaluation of Dairy Farming of Rondônia".

2.2 METHODOLOGICAL CONSTRUCTION OF THE IGS

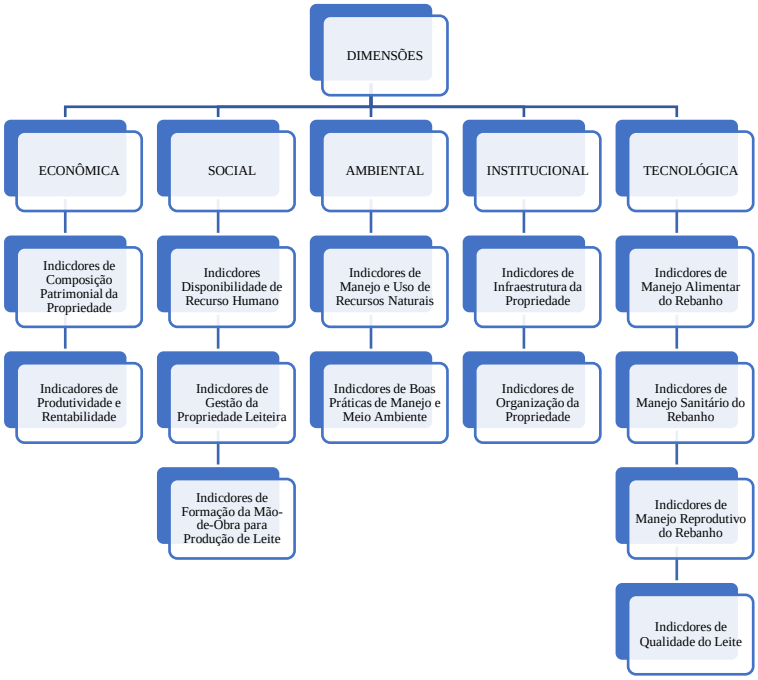
The methodological formulation used for the construction of the Global Sustainability Index (GSI) of dairy farming in Rondônia follows the precepts of the model adopted by the Brazilian Institute of Geography and Statistics (IBGE, 2010), where the aspects worked enable the analysis and evaluation of the development of Brazil in the economic, social, environmental and institutional dimensions. It also follows in part the methodology of González and Carvajal (2002). The references consolidate the choice of dimensions and the way to evaluate the degree of sustainability of the partial and global indices.

The research took place in the state of Rondônia composed of 52 municipalities, of these, 20 was visited, the municipalities that produce 2% or more of the total milk produced in the State, which represents a sample of 38.5% of the existing municipalities. Distributed in these municipalities, it is estimated that there are approximately 40 thousand milk producers in the State, in these, 400 qualitative and quantitative questionnaires were randomly applied, representing 1% of the number of milk producers in Rondônia.

For data treatment and validation of the studied sample, the SPSS Statistical Program (Software Statistical Package for the Social Sciences) was used, ensuring greater reliability of the research and the selected indicators. In carrying out this procedure, it was necessary to transform the answers extracted from the qualitative and quantitative questionnaires into numbers. Where the surveyed indicator was 1 (presents the question of the surveyed indicator) and the other answers were zero (does not present the item of the surveyed indicator).

A total of 123 indicators were established, distributed as follows: economic dimension 14; social 22; environmental 13; institutional 27 and technological 47. These indicators express the understanding of their respective dimensions, a fact that made it possible to construct the index of each dimension, called partial or dimensional index, and the sum of these composed the IGS of dairy farming in Rondônia. See in Figure 1, the arrangement of the dimensions and the composition of their respective indicators.

Figure 1 - Aspects Chosen for the Methodological Sequence and Composition of the Sustainability Dimensions



Source: Research Author (2017).

The set of indicators used to characterize milk production with an environmental sustainability bias was submitted to descriptive analysis and the Cronbach's Alpha test (PESTANA & GAGEIRO, 2008). This test signals the internal consistency of the data, by mediating the correlation of the 123 indicators distributed in the 5 dimensions of sustainability and categorized in a Likert Scale (VIEIRA & DALMORO, 2008;

DALMORO & VIEIRA, 2014), which were evaluated by experts (experts), granting a score from 1 to 5, according to the importance (technological weight) of the indicator in the context of the work of milk production with sustainability.

The value of Cronbach's Alpha varies between 0 and 1 and should be considered satisfactory when above 0.70. In this case, the value found was 0.765, demonstrating valid, satisfactory collection and good consistency of the researched data.

For each producer, the product of the evaluation was determined, as being, the value of each indicator (0 or 1) times the weight assigned by the specialists. The sum of the behavior of all producers results in the note of the dimension, according to the following descriptive formula.

$$D_{ij} = \sum_{k=s_j}^{t_j} N_{ik} \cdot P_k$$

Where:
D_{ij}: is the index of producer i in dimension j;
$N = [N_{ik}]$: is the evaluation matrix (score of producer i in indicator k);
P_k: represents the weight of the importance of the indicator k within the dimension to which it belongs.
$Para\ j = 1, s_j = 1\ e\ \ t_j = 14$ (Dimension 1: economic);
$Para\ j = 2, s_j = 15\ e\ \ t_j = 36$ (Dimension 2: social);
$Para\ j = 3, s_j = 37\ e\ \ t_j = 49$ (Dimension 3: environmental);
$Para\ j = 4, s_j = 50\ e\ \ t_j = 76$ (Dimension 4: institutional);
$Para\ j = 5, s_j = 77\ e\ \ t_j = 123$ (Dimension 5; technological).

The Dij represents the value of the sustainability parameter achieved by producer i in dimension j. The sum of all of the Dij, in dimension j, gives the value of the sustainability of dimension j. Thus, inferences can be made for each producer and all of them in one dimension.

To calculate the IGS, it is enough to determine the simple arithmetic mean of the five dimensions, as described below:

$$IGS = \frac{\sum_{i=1\ldots n, j=1\ldots m}^{n=400\ m=5} Dij}{m} X\ 100$$

The sustainability levels of the IGS were constructed from the relationship between the General Mean (MeanG) and the Standard Deviation (DesvP). As shown in the table below.

Table 2 - Sustainability Criteria and Form of Evaluation of Dimensional Indices (ID)

Criterion	Classification	Sustainability Level
IGS>AverageG+2DesvP **IGS**>0.547420193	Excellent sustainability standard	5
AverageG+1DesvP<IGS<AverageG+2DesvP 0.483903785< IGS<0.547420193	Good standard of sustainability	4
AverageG-1DesvP<**IGS**<AverageG+1DesvP 0.356870969<**IGS**<0.483903785	Medium standard of sustainability	3
AverageG-2DesvP<**IGS**<Average-1DesvP 0.293354562<**IGS**<0.356870969	Low standard of sustainability	2
IGS<MediaG-2DesvP **IGS**<0.293354562	Poor sustainability standard	1

Source: Autor da Pesquisa (2017).

The classification criteria in an excellent, good, medium, low and very poor standard of sustainability, follow the following methodological dynamics: **Level 5** (BLUE), considered an excellent standard of sustainability, corresponds to a value higher than 0.54 decimal points or 54% of performance, which is equivalent to the general average found plus 2 (two) standard deviations, and the closer it gets to 1 or 100% the more sustainable it will be. **Level 4** (GREEN), considered a good sustainability standard, corresponds to a value lower than 0.54 and greater than 0.48 decimal points, that is, lower than the general mean plus 2 (two) standard deviations and greater than the mean plus 1 (one) standard deviation. **Level 3** (YELLOW), considered the average sustainability standard, corresponds to a value lower than 0.48 and greater than 0.35 decimal points, that is, lower than the general mean plus 1 (one) standard deviation and greater than the mean minus 1 (one) standard deviation. **Level** 2 (ORANGE YELLOW), considered a low sustainability standard, corresponds to a value lower than 0.35 and greater than 0.29 decimal points, that is, lower than the general mean minus 1 (one) standard deviation and greater than the mean minus 2 (two) standard deviations. **Level 1** (RED), considered a very bad sustainability standard, corresponds to a value less than 0.29, which is equivalent to the overall average minus 2 (two) standard deviations, and the closer it gets to 0 (zero) the less sustainable it will be.

This classification of sustainability levels was validated by discriminant analysis. For Khattree & Naik (2000), discriminant analysis studies the characteristics of a population by the mediation of two or more classes attending to the separation of the object into parts and its ability to explain. In this case, 5 classes of sustainability levels were used. The discriminant analysis consisted of two random tests based on the total number of selected producers. In the first, 274 producers were selected and the level of correct answers was 90.87% (249 of 274) and in the second it was 70.63% (89 of 126). The total efficiency of the analysis was 84.5%.

2.3 RESULTS OF THE METHODOLOGICAL CONSTRUCTION

The dairy farming of Rondônia had a result of the five dimensions considered, the values shown in Table 3.

Table 3 - Dimensions Performance Indexes

Dimension	Index	Classification	Level
Economic Dimension	0,524918	Good standard of sustainability	4
Social Dimension	0,443069	Medium standard of sustainability	3
Environmental Dimension	0,417758	Medium standard of sustainability	3
Institutional Dimension	0,3201550	Low standard of sustainability	2
Technological Dimension	0,3960377	Medium standard of sustainability	3

Source: Survey Data (2017).

The economic dimension comprises the financial and political dynamics of the dairy activity of Rondônia with a sustainable vision of the milk production systems of the State. In this dimension it was observed Good Standard of Sustainability, level 4, reaching an average of 0.52 4 tenths or 52% of performance, being the best level entrant of the five dimensions studied, showing a positive contribution to the economic segment of dairy farming in Rondônia.

The Social Dimension that comprises the human social fabric of milk production, the needs of the producer and the family, quality of life and social justice, the got index in the order of 0.443 tenths or 44% of performance, classified as Medium Standard of Sustainability, level 3, presenting performance below the economic dimension, but in the general context, achieves the second best level of sustainability among the five dimensions studied.

For the environmental dimension that represents the preservation and conservation of natural resources through the rational use of the environment, essential for the quality of life of current and future generations, you have a performance index of 0.417 tenths or 42%, ranking with Medium Sustainability Standard, Level 3. With this performance, the dimension remains at the third level of sustainability with the five dimensions studied.

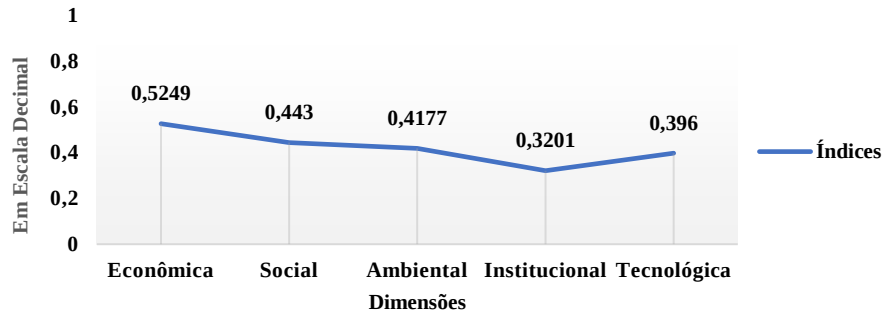
The institutional dimension comprises the political orientation, capacity and effort detached by governments and society in the execution of the changes required for the effective implementation of sustainable development, in general, and sectorally, from the improvement of milk production activities. In this composition, the performance index of the dimension was 0.320 decimal points or 32%. With this performance, the dimension had the worst classification among the dimensions surveyed, classifying itself with low standards and framed in level 2 of sustainability.

Finally, the technological dimension comprises the political orientation, capacity, and effort detached by governments and society in the implementation of research, development, and technological innovation required for an effective change of productive scenarios. The performance of producers in this

dimension took it to level 3 of sustainability, considered a standard average, with a performance index of 0.396 tenths or 39.6% of sustainability, presenting the second worst performance among the dimensions surveyed, being higher only the institutional dimension that presented the lowest performance index of the activities developed.

In summary, graph 2 shows the partial indices of the composition of the Global Sustainability Index (GSI) expressing the different performances of the dimensions studied.

Gráfico 2: Índices de Composição do IGS



Source: Survey Data (2017).

As can be seen in the Global Sustainability Index (GSI) of the Dairy Company of Rondônia, it was constructed by the partial indexes of the economic, social, environmental, institutional, and technological dimensions that participated positively or negatively for the level of sustainability of the activity. See table 4, for the calculation and the contribution index of each dimension in the construction of the IGS.

Table 4 - Calculation of the Global Sustainability Index (GSI)

Dimensions	**Indexes**	$IGS = \frac{\sum_{i=1\ldots n, j=1\ldots m}^{n=400\ m=5} Dij}{m} X\ 100$	**IGS (%)**
Economic	0,5249	0.42038 x 100	42,04
Social	0,4430		
Environmental	0,4178		
Technological	0,3960		
Institutional	0,3202		

Source: Survey Data (2017).

The IGS of 42% is classified as a medium standard of sustainability, level 3, understood as an area of shading, meaning that dairy farming in Rondônia is not in the field of good and excellent sustainability, because the activity will be much more sustainable than the more the index approaches 1 or 100%. The result requires alertness and vigilance of the activities, considering that at any time it can reach a low or very bad level of sustainability, making the extractive activity and characterizing it as unfavorable, and all the actions of the segment should be reviewed.

In this construction of the IGS, the economic dimension made the best contribution among the five dimensions studied. The following contributions come from the social, environmental, and technological dimensions with the second, third, and fourth participation. Unlike these, the institutional dimension presented the worst participation and consequently contribution, influencing an IGS of Medium Sustainability Standard.

Although the economic area has made a good contribution, it has not yet been enough for the IGS to achieve a good or excellent standard of sustainability. These performance levels correspond to the determination and involvement of each producer in the execution of the daily activities of the production unit, thus making it possible to measure and classify the level of sustainability of the producer concerning the general average of the sample surveyed. See Table 5, below, the level of sustainability of producers in the general context of the 400 properties surveyed.

Table 5 – Performance of Producers in the Composition of the Global Sustainability Index (GSI)

Criterion	Classification	Number of Producers	%	Sustainability Level
X>AverageG+2S **X**>0.547420193	Excellent sustainability standard	18	4,5	5
AverageG+1S<X<AverageG+2S 0.483903785< X<0.547420193	Good standard of sustainability	39	9,75	4
AverageG-1S<**X**<AverageG+1S 0.356870969<X<0.483903785	Medium standard of sustainability	289	72,25	3
AverageG-2S<**X**<Average-1S 0.293354562<**X**<0.356870969	Low standard of sustainability	51	12,75	2
X<MediaG-2S **X**<0.293354562	Poor sustainability standard	3	0,75	1
Total		400	100	
IGS	Medium standard of sustainability	0, 42038		3

Source: Research Author (2017).

The general classification of sustainability standards in Table 5 shows that 18 and 39 producers of the total surveyed achieved excellent and good sustainability standards, categories of levels 5 and 4, representing only 4.5% and 9.75% of the surveyed sample, respectively. Meanwhile, 54 producers were classified in levels 2 (51) and 1 (3), with low and very poor standards of sustainability, representing 13.5% of the total producers. The vast majority were at level 3, the average sustainability standard, with a total of 289 producers or 72.25% of the 400 producers interviewed.

The analysis presented through the constructed methodology shows the need for actions that promote the level of organization and infrastructure of producers, as well as technological adoption, activities less aggressive to the environment, qualification of labor, diversification of production, and adding value to the product, among other measures, which should be implemented to improve the institutional, technological, environmental and social conditions of producers involved in milk production in Rondônia to enhance the sustainability of the productive segment.

3 CONCLUSIONS

The Global Sustainability Index (IGS) found for the evaluation of the dairy segment of Rondônia was 42%, this allows us to conclude that the development of Dairy Farming in the State is of the medium standard of sustainability, having surpassed only the low and very bad standard, levels 2 and 1 of sustainability, requiring institutional strengthening and technological innovation so that it can reach levels 4 and 5, considered good and excellent standards of sustainability.

The good economic sustainability and the average environmental conservation of the activity express the perspective of capitalist development with the accelerated growth of cattle farming in the State, where Financial Capital is prioritized over Natural Capital, generating environmental impacts. This evidences the advance of the economic segment about the indiscriminate use of the environment, reflecting the disorganization of the process of occupation and colonization of the State, which occurred randomly, without planning and public policies that directed adequate and rational exploitation respecting the finitude of natural resources.

There was a lack of knowledge about the use of the environment, without causing waste and abuse, guiding present generations to preserve the environment and the survival of future generations.

Perhaps, this is one of the biggest problems of cattle farming when exploited randomly, without planning and correct management of herds and natural resources, done extensively, using large areas of pastures with the felling of native forest, destruction of forest, ecosystems, and instability of conservation and environmental preservation.

To this end, public and private actions are needed that involve, in addition to the institutional and technological dimensions, which are being the most sacrificed in the segment, also the environmental and social, with the conservation and preservation of the Amazon biome and quality of life of present and future generations. As for the economy, the financial flow and viability of the activity must be maintained without harming the intrinsic relationship between the other existing dimensions.

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