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Indicators of sustainable development of Santa Catarina mesoregions: a comparative analysis

Indicadores de desarrollo sostenible de las mesorregiones de Santa Catarina: un análisis comparativo

Indicadores de desenvolvimento sustentável das mesorregiões catarinenses: uma análise comparativa

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Abstract

Purpose: This study aims to analyze the sustainable performance of Santa Catarina mesoregions from the sustainable development indicators proposed by the Santa Catarina Federation of Municipalities (FECAM).

Methodology: To analyze the sustainable performance of the Santa Catarina mesoregions, a descriptive, documentary and quali-quantitative research was conducted. The study sample comprised the six mesoregions of the state of Santa Catarina, namely, Serrana, Norte Catarinense, Oeste Catarinense, Sul Catarinense, Vale do Itajaí and Grande Florianópolis. Data from the Municipal Sustainable Development Index - IDMS were collected on the FECAM

website and comprise the year 2018. The analysis considered the descriptive statistics and correlation techniques.

Results: The results reveal a state formed by 5 mesoregions that have a sustainable performance considered low-median, and 1 mesoregion with a sustainable average performance, which consists of the Vale do Itajaí mesoregion whose IDMS was 0.625. This result is generally reflected in the low rates of environmental management, economic dynamism and wealth distribution, demonstrating that the Economic and Environmental dimensions deserve attention from municipal public managers, as they were located between Medium-low and Low sustainable development. Neither of the four dimensions nor the consolidated IDMS of Santa Catarina mesoregions is classified with sustainable performance considered High or Medium-high. Overall, there was a slight worsening in the development of the mesoregions between 2016 and 2018.

Contributions of the Study: By assessing the sustainable development of the mesoregions, the study contributes to the literature on regional indicator systems and sustainable regional development, allowing the understanding of the sustainable performance process of the municipalities that make up these mesoregions, as well as enabling the monitoring and the comparability of this performance. The study also contributes to the implementation of results-oriented management, which is the main indication of the new public management, whose emphasis is on the effective use of information.

Keywords: Sustainable development. Sustainability Indicators. Mesoregions.

Resumen

Objetivo: El objetivo de este estudio es analizar el rendimiento sostenible de las mesorregiones de Santa Catarina a partir de los indicadores de desarrollo sostenible propuestos por la Federación de Municipios de Santa Catarina (FECAM).

Metodología: Para analizar el desempeño sostenible de las mesorregiones de Santa Catarina, se realizó una investigación descriptiva, documental y cualitativa y cuantitativa. La muestra del estudio comprendió las seis mesorregiones del estado de Santa Catarina, a saber, Serrana, Norte Catarinense, Oeste Catarinense, Sul Catarinense, Vale do Itajaí y Grande Florianópolis. Los datos del Índice de Desarrollo Sostenible Municipal - IDMS se recopilaron en el sitio web de FECAM y abarcan el año 2018. El análisis consideró las estadísticas descriptivas y las técnicas de correlación.

Resultados: Los resultados revelan un estado formado por 5 mesorregiones que tienen un rendimiento sostenible considerado de mediana baja y 1 mesorregión con un rendimiento promedio sostenible, que consiste en la mesorregión del Vale do Itajaí cuya IDMS fue de 0.625. Este resultado generalmente se refleja en las bajas tasas de gestión ambiental, el dinamismo económico y la distribución de la riqueza, lo que demuestra que las dimensiones económica y ambiental merecen la atención de los gestores públicos municipales, ya que se ubican entre el desarrollo sostenible Medio bajo y Bajo. Ninguna de las cuatro dimensiones ni los IDMS consolidados de las mesorregiones de Santa Catarina se clasifican con un rendimiento sostenible considerado Alto o Medio alto. En general, hubo un ligero empeoramiento en el desarrollo de las mesorregiones entre 2016 y 2018.

Contribuciones del Estudio: Al evaluar el desarrollo sostenible de las mesorregiones, el estudio contribuye a la literatura sobre sistemas de indicadores a nivel regional y al desarrollo regional sostenible que permite la comprensión del proceso de desempeño sostenible de los municipios que componen estas mesorregiones, así como también permite el monitoreo y La comparabilidad de este rendimiento. El estudio también contribuye a la implementación de la gestión orientada a resultados, que es la principal indicación de la nueva gestión pública, cuyo énfasis está en el uso efectivo de la información.

Palabras clave: Desenvolvimiento sustentable. Indicadores de sostenibilidad. Mesorregiones.

Resumo

Objetivo: Este estudo tem como objetivo analisar o desempenho sustentável das mesorregiões catarinenses a partir dos indicadores de desenvolvimento sustentável propostos pela Federação Catarinense de Municípios (FECAM).

Metodologia: Para analisar do desempenho sustentável das mesorregiões catarinenses, realizou-se uma pesquisa descritiva, documental e com abordagem quali-quantitativa. A amostra do estudo compreendeu as seis mesorregiões do estado de Santa Catarina, a saber, Serrana, Norte Catarinense, Oeste Catarinense, Sul Catarinense, Vale do Itajaí e Grande Florianópolis. Os dados do Índice de Desenvolvimento Municipal Sustentável - IDMS foram coletados no site da FECAM e compreendem o ano de 2018. A análise considerou as técnicas da estatística descritiva e da correlação.

Resultados: Os resultados revelam um estado formado por 5 mesorregiões que possuem um desempenho sustentável considerado mediano-baixo, e 1 mesorregião com um desempenho sustentável mediano, a qual consiste na mesorregião do Vale do Itajaí cujo IDMS foi de 0,625. Esse resultado está refletido, de modo geral, nos baixos índices de gestão ambiental, dinamismo econômico e distribuição de riqueza, demonstrando que as dimensões Econômica e Ambiental merecem atenção por parte dos gestores públicos municipais, pois ficaram localizadas entre as faixas Médio baixa e Baixa de desenvolvimento sustentável. Nenhuma das quatro dimensões, nem o IDMS consolidado das mesorregiões catarinenses classificam-se com desempenho sustentável considerado Alto ou Médio alto. De modo geral, houve leve piora no desenvolvimento das mesorregiões entre 2016 e 2018.

Contribuições do Estudo: Com a avaliação do desenvolvimento sustentável das mesorregiões, o estudo contribui com a literatura acerca dos sistemas de indicadores a nível regional e para o desenvolvimento regional sustentável permitindo a compreensão do processo de desempenho sustentável dos municípios que compõe essas mesorregiões, além de possibilitar o acompanhamento e a comparabilidade desse desempenho. O estudo também contribui para a implantação da gestão com foco em resultados, que é a principal indicação da nova gestão pública, cuja ênfase incide sobre o uso eficaz da informação.

Palavras-chave: Desenvolvimento Sustentável. Indicadores de Sustentabilidade. Mesorregiões.

1 Introduction

There is a latent need to discuss ways to provide sustainable development in municipalities. This need comes from the rapid depletion of natural resources, concerns about disparities in wealth in the community, and the importance of corporate social responsibility (Linnenluecke, & Griffiths, 2010; Dao, Langella, & Carbo, 2011; Guerci, Shani, & Solari, 2013; Genari, Costa, Savaris, & Macke, 2018).

In convergence with this scenario, there is a growing interest in the organizational and academic realms for studies that focus on sustainable development (Linnenluecke, & Griffiths, 2010; Dyllick, & Muff, 2015). Although the number of researches has increased in recent years (Leal Filho et al., 2018) there are still conceptual divergences, that is, it cannot be concluded by a single and comprehensive definition for sustainable development (Van Bellen, & Petrassi, 2016).

What is known is that for development to be planned in an efficient way, it must be measured, that is, that they have tools that point out to public agents whether the public policies and actions adopted allow us to lead the municipality, region or state towards sustainable development (Neuhaus, 2016). In this scenario, the relevance of the development and use of sustainable development indicators stands out.

Sustainability indicators are an effective tool for complex communication processes, which provide information about a particular system, which is the basis for decision making (Köckler, 2008). It aims to evaluate conditions and trends; compare places and situations; evaluate conditions and trends against goals and objectives; provide warning information; anticipate future conditions and trends (Van Bellen, 2008). Therefore, it is a fundamental tool for evaluating the sustainable development of a municipality.

To help municipalities in this challenge, the Santa Catarina Federation of Municipalities (FECAM) created in 2012, the System of Indicators of Sustainable Municipal Development, SIDEMS. This system consists of an online tool aimed at public agents, citizens and researchers, which aims to monitor the development of Santa Catarina municipalities from the perspective of sustainability.

Within the scope of SIDEMS, the Sustainable Municipal Development Index (IDMS) was developed, which aims to evaluate municipalities according to their level of sustainable development and to help public agents to situate themselves in relation to a desirable future scenario and to define local priorities. (FECAM, 2019).

This tool takes into account the need to build adequate conditions of sustainability in the development process, based on improving the reality of four dimensions of sustainable municipal development: Sociocultural, Economic, Political-institutional and Environmental. These dimensions, in turn, are subdivided into sub-dimensions, indicators and variables.

Besides evaluating the municipalities individually, the system also enables monitoring by mesoregions. Mesoregions are subdivisions of the state that bring together several municipalities of a geographical area with economic and social similarities (FECAM, 2019). There are six Santa Catarina mesoregions, namely, Serrana, Norte Catarinense, Oeste Catarinense, Sul Catarinense, Vale do Itajaí and Grande Florianópolis.

In this context, the following research problem emerges: **What is the sustainable performance of the Santa Catarina mesoregions considering the sustainable development indicators proposed by FECAM?** Thus, the objective of the study is to analyze the sustainable

performance of the Santa Catarina mesoregions from the sustainable development indicators proposed by FECAM.

The study is justified due to the importance of sustainability indicators for both municipal public managers who use them as a tool to achieve satisfactory sustainable performance, as well as for society in general, which demands improvements in the sustainable performance of municipalities and benefits from positive reflexes provided to the environment, resulting from the municipal management. Through the sustainability indicators it is possible to verify several phenomena that occurred in the municipalities and, when compared, make it possible to measure the processes and their results, signaling possible failures or demonstrating efficiency (Monteiro, & Kruger, 2017). Moreover, no studies were found in the literature that address the results of regional sustainable development indicators that address the peculiarities of Santa Catarina mesoregions, which contributes to the originality and originality of the study.

By assessing the sustainable performance of the Santa Catarina mesoregions based on FECAM indicators, it is expected to contribute to the literature on regional indicator systems and the efficiency and effectiveness of public management of the municipalities that make up these mesoregions. In addition to contributing to the Santa Catarina scenario, it is expected to generate subsidies for municipal public managers in other Brazilian cities, as, according to Rees and Wackernagel (1999), although the full sustainability of cities can never be achieved, they are the key to global sustainability.

2 Literature revision

This section presents a brief account of the Theory of Legitimacy, as well as the concepts and contextualization of sustainable development and sustainability indicators.

2.1 Theory of Legitimacy

Based on the systemic approach and political economy, the Theory of Legitimacy considers the interrelationship between organizations and the society in which it operates (Deegan, 2002). According to Dias Filho (2007), it is based on the idea that there is a kind of social contract between the organizations and the society in which they operate, representing a set of implicit or explicit expectations of their members as to how they should be. operate.

According to Wilmshurst and Frost (2000), this theory is based on the idea that organizations should conduct their activities within limits considered acceptable by the community in which they operate. That is, it adds that the company must take into account the rights of the public as a whole (Alves, De Luca, Cardoso & Vasconcelos, 2013). Where the activities of organizations have the potential to cause harm to the environment, managers should seek to restore their reputation and disclose social and environmental information to convince society that their activities are acceptable. Thus, according to Deegan and Rankin (1997), if the organization does not operate according to the standard of behavior considered appropriate, society may revoke the right to continue operating.

According to Rover, Tomazzia, Murcia and Borba (2012), the inability of managers to achieve the legitimacy of activities leads to pressure from groups in society, which ultimately result in government intervention, in the form of increased legal restrictions, to regulation, taxes, among others. The costs arising from these restrictions constitute the economic incentive for the continued pursuit of legitimacy.

In this way, legitimacy is gained when the organization delivers something (good or service) desired by society at large and distributes economic, social and political benefits to the

groups from which it emanates its power (Alves et al., 2013). In this sense, managers have a fundamental role in understanding how society views the organization. If operations are not compatible with the social contract, managers will have to introduce corrective strategies, which need to be disclosed to be effective in changing society's view (Deegan, 2002).

Thus, the relevance of this research on the sustainable performance of the Santa Catarina mesoregions is emphasized, since the public entity is constantly being supervised by society and, consequently, needs to pay attention to the legitimacy of its actions.

2.2 Sustainable Development

The term sustainable development has become widespread after the publication of the Brundtland Report from the World Commission on Environment and Development (WCED), which describes sustainable development as meeting the needs of present generations without compromising the possibility of generations. meet their own needs (WCED, 1987).

From this definition, the focus, previously centered on environmental integrity, shifts to the human element, generating a balance between the economic, environmental and social dimensions. Sachs (1993, 2004), for example, points out that the concept of sustainable development has five main dimensions: social sustainability, economic sustainability, ecological sustainability, geographical sustainability and cultural sustainability. Corroborating this definition, Székely and Knirsch (2005) consider that sustainable development is related to the construction of a society that presents a good balance between economic, social and environmental objectives. Pawlowski (2008) adds other dimensions to his concept, claiming to be formed by the environmental, social, moral, economic, legal, technical and political dimensions.

For Silva, Rocha, Wienhage and Rausch. (2009) Sustainable development is defined as a new approach to doing business that promotes social responsibility and reduces the use of natural resources, thereby reducing negative impacts on the environment and preserving the integrity of the planet for future generations. without forgetting the economic and financial profitability of the enterprise.

Therefore, it is observed that the concepts converge to the idea of having an ecologically balanced, economically viable, socially fair, culturally accepted and institutionally capable environment (Alves, Barreto, Rodrigues, & Feliciano, 2016).

However, the concept of sustainability, or sustainable development, although widely used in the last two decades to the point of becoming a mandatory reference in academic, political and cultural debates (Braga, Freitas, Duarte, & Carepa-Souza, 2004), is far from having consensual meaning. In this sense, Zhang and Pu (2018) suggest that so far there is no definite definition of sustainable development; Instead, many experts insist that sustainable development must be promoted by building relative monitoring indicators. And the promotion of sustainable development is increasing as a result of various sustainability indicators (Zhang, & Pu, 2018).

In this context, aiming to bring sustainability into public policies, was created in December 2015 by the United Nations General Assembly, the 2030 Agenda for Sustainable Development, which is a strategic action guide for the achievement of economic, social and social development. and environmental. The 2030 Agenda includes 17 Sustainable Development Goals (SDGs) which encompass 169 more specific goals, and highlights that its themes need to be analyzed from the four dimensions of sustainable development: social, economic, environmental and institutional. It is difficult to analyze the SDGs independently of each other, as they are all correlated, as shown in Table 1.

Table 1
SDGs according to the dimensions of sustainable development

Dimensions	Sustainable development goals
Social	SDG 1 - End poverty in all its forms, everywhere. SDG 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture. SDG 3 - Ensure a healthy life and promote the well-being of all at all ages. SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. SDG 5 - Achieve gender equality and empower all women and girls. SDG 10 - Reduce inequality within and between countries.
Economical	SDG 7 - Ensure affordable, reliable, sustainable and renewable energy access for all. SDG 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all. SDG 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. SDG 12 - Ensure sustainable production and consumption patterns.
Environmental	SDG 6 - Ensure availability and sustainable management of water and sanitation for all. SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable. SDG 13 - Take urgent action to combat climate change and its impacts. SDG 14 - Conservation and sustainable use of oceans, seas and marine resources for sustainable development. SDG 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.
Institutional	SDG 16 - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels. SDG 17 - Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Source: *ONU (2015).*

These objectives are of paramount importance to municipalities (Amin, 2010; Faustino, 2012), as it is at the municipal level that sustainable development is materialized (Faustino, 2012), as this is where social change and opportunities increase. that generate economic growth, environmental preservation, solidarity and commitment to the future (Buarque, 2009). However, according to Amin (2010), the concern is often focused on "how to" and not on the results that actions will bring, generating inefficiency in fulfilling basic duties. Therefore, the need for the adoption of indicators to monitor the results is revealed.

The use of indicators is one of the practical applications of sustainable development that can provide a measure of the sustainability performance of a system (CNUMAD, 1992). For Carvalho and Curi (2016), the sustainable development indicators subsidize and monitor the operationalization of the concept, revealing information from the various dimensions present in society. Therefore, to apply the concept of sustainable development, it is essential to establish indicators that can measure the performance of a municipality in terms of sustainability.

2.3 Sustainability Indicators

Several organizations are increasingly concerned with achieving and demonstrating satisfactory sustainable performance. Concern about sustainable performance evaluation has

been growing in recent decades. In order to achieve this objective, it is necessary to outline indicators to guide and evaluate public policies in order to achieve sustainable development. According to Van Bellen (2004) evaluation tools are needed to verify the development path.

For Van Bellen (2008), indicators are models of reality, pieces of information and signals that seek to simplify information about complex phenomena, therefore, are a simplified portrait of reality. Thus, an indicator serves to make the information on phenomena simplified, more understandable and quantifiable.

According to Buratto (2009), indicators can be used to: define sustainable development; plan sustainable development; measure progress and / or change; set goals; compare different areas; bring sustainable development to public debate; support and encourage cooperation; work preventively; integrate and synthesize aspects of sustainable development.

In this sense, Callado and Fensterseifer (2010) propose seven main characteristics of sustainability indicators: (i) The selectivity that relates the essential factors to the evaluation process; (ii) The representativeness that chooses the indicator to represent the process with satisfaction; (iii) Simplicity arises from the easy understanding of the people involved with the evaluation process; (iv) The low cost and collection, procedures and evaluation without exceeding the benefits granted; (v) Stability as a routine procedure for comparing trends; (vi) External comparison that allows the development of indicators to compare performance with other entities; and (vii) Continuous improvement that periodically evaluates organizational systems.

Therefore, they allow for more effective decision-making, as it enables managers, the government and community members to synthesize information more clearly. Moreover, from the data obtained, it is evident the need for goals to reach the sustainability objectives (Sanches, & Schmidt, 2016).

According to Cândido (2004) the indicators aim, mainly, to systematically understand the process of construction of development, involving from social, economic, political, environmental, even institutional aspects. Thus, they can be an important environmental, economic, social, cultural and institutional management tool as they can guide and measure sustainability by assessing the commitment of public companies to sustainable development (Alves et al., 2016).

Based on the understanding of the need to monitor and evaluate sustainable performance, the Santa Catarina Federation of Municipalities (FECAM) has developed the Municipal Sustainable Development Indicator System, SIDEMS, which is characterized as an information management tool aimed at congregation and simplification. strategic public information for analysis of municipal development, from the perspective of sustainability (FECAM, 2019). The central objective of SIDEMS is to facilitate the access of public agents to the large amount of information spread through the databases of federal and state public agencies, as well as FECAM's own research, treating and consolidating the most strategic contents for municipalities, mesoregions and various territorial clippings used in Santa Catarina. Thus, FECAM promotes the practice of planning, evaluation and decision making guided by technical information (FECAM, 2019).

In this context, the Sustainable Municipal Development Index - IDMS was developed. This index is one of the tools of the Indicator System, which aims to evaluate the municipalities according to their level of sustainable development, besides helping the public agents to situate themselves in relation to an expected future scenario and to define local priorities in order to achieve higher levels. sustainability and social welfare (FECAM, 2019).

IDMS takes into account four basic dimensions of sustainable municipal development, namely Sociocultural, Economic, Environmental and Institutional Political. Currently, these

four dimensions consider nine sub-dimensions, and generate thirty indicators that are derived from the evaluation of eighty-four variables. By dimension, we understand how the perspectives of reality that the system will observe can also be seen as the major fields of sustainable development. Subdimensions are the subareas that make up the dimension. Indicators are tools that capture aspects of complex reality and translate them, making this reality knowable and understandable. And finally, a variable is a set of values whose data vary, in this case, for each municipality.

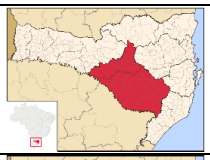
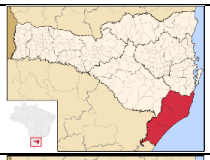
In the end, a "grade" is awarded that locates the municipality in relation to an expected ("ideal") level of sustainable development. These results are published every two years since 2012, and their latest version was published in 2018, allowing an evaluation of the IDMS of the municipalities and mesoregions of the state of Santa Catarina during this period.

Thus, it is clear that IDMS becomes a tool to support public managers and other agents involved in sustainable development, and it is possible to program indicators for combined signal emission showing aggregate results (Monteiro, & Kruger, 2017).

3 Methodological Procedures

Given the objective of analyzing the sustainable performance of the Santa Catarina mesoregions from the sustainable development indicators proposed by FECAM, a descriptive, documentary and qualitative research was conducted. The research sample consists of the 6 mesoregions of Santa Catarina, namely the Serrana, Norte Catarinense, Oeste Catarinense, Sul Catarinense, Vale do Itajaí and Grande Florianópolis, which include the 295 municipalities of Santa Catarina that are part of FECAM, according to Table 2. The IDMS data were collected on the FECAM website and comprise the year 2018.

Table 2
Research Sample

Mesoregion	Number of Municipalities	Location	Mesoregion	Number of Municipalities	Location
Serrana	30		Sul Catarinense	46	
Norte Catarinense	26		Vale do Itajaí	54	
Oeste Catarinense	118		Grande Florianópolis	21	

Source: *FECAM (2019).*

The Sustainable Municipal Development Index (IDMS) seeks to evaluate municipalities according to their level of sustainable development. To measure IDMS, SIDEMS evaluates the balanced development of the Sociocultural, Economic, Political-Institutional and Environmental dimensions. These dimensions, in turn, are subdivided into sub-dimensions, indicators and variables.

The index of each of these dimensions is defined from the weighted average of the sub-dimensions that make up each one of them. Subdimension indices are calculated by the arithmetic mean of the indicators, which, in turn, are calculated by the arithmetic mean of the variables. There are 9, 30 and 84, respectively, the sub-dimensions, indicators and variables that form the IDMS structure, according to Table 3.

Table 3
IDMS Membership

Dimension	Weight	Subdimension	Weight	Indicators	Variables
Sociocultural	25%	Education	45%	4	19
		Cheers	35%	4	16
		Culture	10%	4	11
		Housing	10%	2	6
Economical	25%	economy	100%	3	10
Environmental	25%	Environment	100%	3	6
Institutional politician	25%	Social participation	30%	2	2
		Public administration	30%	5	7
		Public finances	40%	3	7
4		9		30	84

Source: *FECAM (2018).*

The rule was to give all dimensions the same weight, each equaling 25% of the overall index, inferring that all IDMS dimensions are equally valuable and desirable. Within the dimensions, the sub-dimensions have different weights due to limitations in the quality of the indicators, resulting from a remarkable inequality in data availability in different areas (FECAM, 2019). The indicators have equal weights for the composition of the sub-dimensions, and a database composed of a total of 84 variables. The large amount of variables is a strategy to build better indicators and to get closer to the municipal reality.

Thus, the IDMS is obtained by calculating the arithmetic mean of each of the dimensions of municipal development, considering that each dimension contributes equally to local sustainability, ie

$$IDMS = (IDMSsc + IDMSe + IDMSma + IDMSpi) / 4$$

At where:

- IDMS = Sustainable Municipal Development Index
- IDMSSC = Sociocultural Sustainable Municipal Development Index
- IDMSE = Economic Sustainable Municipal Development Index
- IDMSMA = Sustainable Municipal Development Index Environment
- IDMSPI = Municipal Sustainable Development Index Institutional Policy

To classify the municipalities in terms of their level of sustainability, both in the general index (IDMS) and in the dimensions, sub-dimensions, indicators and variables, the rule used by Amartya Sen in the Human Development Index (HDI) was adopted. zero to one. Thus, the equation presented generates an indicator ranging from zero (0) to one (1), and the closer to one (1) is the IDMS value, the greater the sustainability of the municipality, and the closer to zero (0) is the IDMS value, the lower the degree of sustainability of the municipality. Table 4 presents the classification of indicators:

Table 4
Indicator rating scale

Scale	Ranking
Greater than or equal to 0.875	High
Greater than or equal to 0.750 and less than 0.875	Medium high
Greater than or equal to 0.625 and less than 0.750	Medium
Greater than or equal to 0.500 and less than 0.625	Medium low
Less than 0.500	Low

Source: *FECAM (2018).*

FECAM (2018) further argues that in relation to attributes and characteristics, SIDEMS sought to identify indicators that met as many of the following conditions as possible:

- As to its meaning, it must: Be meaningful in relation to the sustainability of the system; be politically relevant; and reveal faithful and synthetic translation of the concern.
- As for its applicability, it should: Allow measurements to be repeated over time; allow an integrated approach by relating to other indicators, and allowing to analyze these relationships; have measurability (time and cost required, and feasibility to measure); and, be replicable and verifiable.
- As for its interpretation, it should: Have clear basic principles as well as clear vision of the objectives to be achieved; be easily interpreted by its user; have a well-determined and transparent measurement methodology; be elaborated through broad participation, representative of all users; and have responsible for the decision-making process, data collection and evaluation process.

Therefore, the IDMS is an index available to Santa Catarina municipalities, which assesses, through indicators, the efficiency and quality of social, cultural, economic, environmental and institutional management, based on public databases.

Therefore, to assess the sustainable performance of the Santa Catarina mesoregions, we used data from the four dimensions of the Municipal Sustainable Development Index - IDMS. These were tabulated in a Microsoft Office Excel spreadsheet. The analysis considered the techniques of descriptive statistics and correlation.

4 Results and Reviews

The results consist of an analysis performed in each of the dimensions that make up the Municipal Sustainable Development Index - IDMS and for each of the mesoregions of the state. Importantly, mesoregions are subdivisions of the state that group several municipalities of a geographical area with economic and social similarities, being used for statistical and public planning purposes.

The metrics used in the IDMS present a state formed by a majority of mesoregions located within the low-median (orange) range of sustainable development, with the exception of the Vale do Itajaí mesoregion which is located in the median (yellow) range, as shown in Figure 1. This classification remained the same when compared to 2016.

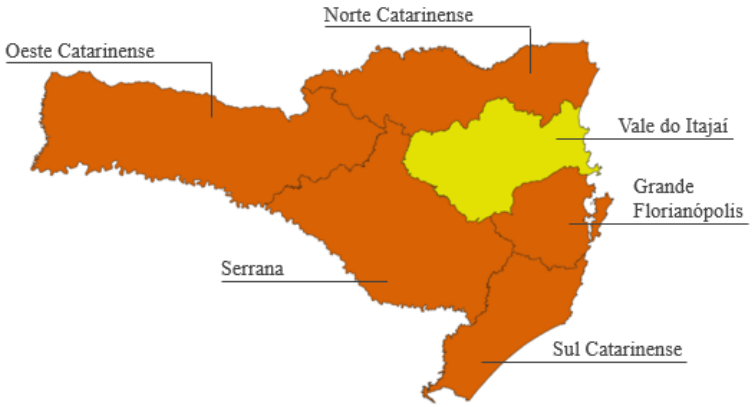


Figure 1 *IDMS of the Santa Catarina Mesoregions – 2018*
Source: *FECAM (2019).*

The results of Table 5 present the descriptive statistics of the four dimensions that make up the Municipal Sustainable Development Index (IDMS) and the consolidated indicator of the mesoregions analyzed.

Table 5
Descriptive statistics

Statistics	IDMS	Sociocultural	Economical	Environmental	Political-Institutional
Average	0,596	0,707	0,522	0,516	0,639
Median	0,596	0,719	0,522	0,521	0,634
Standard deviation	0,019	0,030	0,012	0,078	0,023
Minimum	0,571	0,649	0,508	0,388	0,614
Maximum	0,625	0,729	0,541	0,595	0,674

Source: *Research Data (2019).*

It is observed in Table 5 above that the average IDMS of Santa Catarina mesoregions in the year 2018 is 0.596. This is approximately 2.2% lower than the 2016 IDMS average (0.609). This result identifies the degree of development of the analyzed mesoregions, which in the index classification scale fits the median-low level.

The average values of the dimensions that compose the IDMS in the Santa Catarina mesoregions indicate, in descending order: 0.707 (Sociocultural), 0.639 (Political-institutional), 0.522 (Economic) and 0.516 (Environmental). Among these dimensions, there was a decrease in the Sociocultural, Economic and Political-Institutional indices, however, the Environmental dimension remained with the same result as presented in 2016. Based on the classification of the indicators, the indices of the Sociocultural and Political-institutional dimensions locate in the middle (yellow) range, while the Economic and Environmental dimensions are in the lower-middle (orange) range.

Regarding the standard deviation, which indicates a measure of data dispersion around the mean, it is observed that in general the values are condensed close to the mean, which means that the sample is very homogeneous, a result also verified. in 2016. The Environmental dimension has the highest value with a standard deviation of 0.078 and the Economic dimension has the lowest value, ie with a standard deviation of 0.012.

Table 6 shows Pearson's correlation of the results of the four dimensions that make up the IDMS.

Table 6
Pearson Correlation

Dimension	Sociocultural	Economical	Environmental	Political-Institutional
Sociocultural	1			
Economical	0,173	1		
Environmental	0,126	-0,475	1	
Institutional politician	0,211	0,766	-0,558	1

Source: *Research Data (2019).*

The correlation suggests that the closer to 1 (regardless of the sign) the value, the greater the degree of linear statistical dependence between the variables, and the closer to zero, the lower the strength of this relationship (Dancey, & Reidy, 2006). Thus, the results in Table 6 indicate that the greatest correlation is between the Economic and Political-institutional (0.766) dimensions, followed by the negative Environmental and Political-institutional (-0.558), Economic and Environmental (-0.475), Sociocultural and Political dimensions. (0.211), Sociocultural and Economic (0.173), and finally, by Sociocultural and Environmental correlation (0.126). When compared to the results of the year 2016, it was observed that the Sociocultural and Economic and Sociocultural and Political-institutional correlations reversed their positions, an inversion enhanced by the decrease in the correlation between the Sociocultural and Economic dimensions, which was 0.352 in 2016. The other correlations remained in the same order of classification.

Thus, it can be inferred that there is a moderate linear relationship between the Economic and Political-institutional, Environmental and Political-institutional, and Economic and Environmental dimensions, while the other values indicate a weak linear relationship.

In order to analyze the sustainable performance of the Santa Catarina mesoregions, the consolidated IDMS and the respective dimensions and sub-dimensions for the 6 Santa Catarina mesoregions analyzed are presented in Table 7 below.

Table 7
Indicators of the Santa Catarina mesoregions

IDMS	Serrana	Norte Catarinense	Oeste Catarinense	Sul Catarinense	Vale do Itajaí	Grande Florianópolis
Consolidated IDMS	0,571	0,609	0,581	0,592	0,625	0,599
Sociocultural	0,649	0,729	0,719	0,728	0,719	0,700
Education	0,659	0,767	0,787	0,779	0,754	0,729
Cheers	0,676	0,709	0,677	0,678	0,695	0,692
Culture	0,377	0,517	0,447	0,482	0,481	0,376
Housing	0,782	0,837	0,829	0,916	0,887	0,916
Economical	0,513	0,508	0,541	0,515	0,528	0,528
economy	0,513	0,508	0,541	0,515	0,528	0,528
Environmental	0,491	0,585	0,388	0,485	0,595	0,551
Environment	0,491	0,585	0,388	0,485	0,595	0,551
Political-Institutional	0,630	0,614	0,674	0,638	0,659	0,619
public finances	0,624	0,598	0,671	0,625	0,639	0,618
Public administration	0,734	0,782	0,779	0,747	0,812	0,620
Social participation	0,532	0,469	0,575	0,546	0,532	0,618

Source*: FECAM (2019).*

The results from Table 7 show that the Vale do Itajaí mesoregion, traditionally champion in development indices (Réus, & Andion, 2018), remains as such, with an IDMS of 0.625 (Medium). However, although it is the mesoregion with the highest sustainable

performance, its index considers poorly monitored aspects such as economy (0.528) and environment (0.595). Following are the Norte Catarinense mesoregions, whose IDMS is 0.609 (Medium Low); Grande Florianópolis with 0,599 (medium low); Sul Catarinense with 0.592 (Low Medium); Oeste Santa Catarina with 0.581 (Low Medium); and finally, the one with the lowest sustainable performance is the Serrana mesoregion, with an IDMS of 0.571 (Medium Low). This classification did not change when compared to the previous biennium, however, there was a reduction in the IDMS of all mesoregions analyzed.

Regarding the dimensions of sustainable municipal development, it can be observed that in the Sociocultural dimension composed by the Education, Health, Culture and Housing sub-dimensions, the Norte Catarinense mesoregion stands out with an index of 0.729. This mesoregion also presents the best indices for the Health (0.709) and Culture (0.517) subdimensions. In terms of Education and Housing, the Oeste Catarinense (0.787) and Sul Catarinense (0.916) and Grande Florianópolis (0.916) mesoregions, respectively, obtained the best rates. The mesoregion with the lowest sociocultural index is Serrana (0.649). Therefore, it is noted that in general this dimension presents satisfactory indices of sustainable development, which indicates that basic social policies seem to be being promoted satisfactorily in the municipalities of the mesoregions. In addition, it is the IDMS dimension where all mesoregions have their best index.

Considering the Economic dimension, which is composed by the economy and income of the municipalities, the mesoregion with the highest degree of sustainability for this dimension is Oeste Catarinense, with an index of 0.541. In contrast, with the lowest degree of sustainability is the Norte Catarinense mesoregion, with an index of 0.508. However, as can be seen from Table 7 above, the mesoregion indices for this dimension vary little and indicate a worrying situation, which is reflected in the poor capacity for wealth generation, value addition and income distribution.

The Environmental dimension, as well as the Economic dimension raises concern, as it has the lowest sustainability indices. These findings corroborate the sustainable municipal development literature, where the Environmental dimension is the one that presents less satisfactory indices (Galante, Mazzioni, Di Domenico, & Ronning, 2016; Monteiro, & Kruger, 2017; Réus, & Andion, 2018). Thus, it is observed that the mesoregion with the highest environmental performance is that of Vale do Itajaí with an index of 0.595. This indicates that more economically developed regions also have higher rates of basic sanitation and environmental management. Already the mesoregion with lower environmental performance is the Oeste Catarinense, not considered sustainable, because it has an index of only 0.388.

For the Political-Institutional dimension, which is composed of Social Participation, Public Management and Public Finance, most of Santa Catarina's mesoregions have good sustainable performance indexes. Oeste Catarinense is the mesoregion with the highest political-institutional index (0.674), and it also has the highest index for the Public Finance sub-dimension (0.671). Vale do Itajaí and Grande Florianópolis have respectively the best rates for the Public Management (0.812) and Social Participation (0.618) subdimensions. Conversely, Norte Catarinense is the mesoregion that has the lowest index for this dimension (0.614).

The results presented allow us to infer that not necessarily the mesoregion with the best sustainable performance also has the best performance by sustainable development dimension, because Vale do Itajaí, whose IDMS was the largest, obtained the best index only in the Environmental dimension. Thus, it is observed that to achieve satisfactory sustainable performance, all dimensions of development need to be promoted in a satisfactory and balanced manner. This corroborates what was exposed by FECAM (2017) when it states that sustainability is the expression of the balanced development of these dimensions.

Importantly, part of these results can be explained by the different economic profiles of each of the mesoregions, because the industrial economy of Santa Catarina is characterized by concentration in several poles: ceramic, coal, clothing and disposable plastics in the South; food and furniture in the West; textiles, clothing, naval and crystal in the Vale do Itajaí; metallurgy, machinery and equipment, electrical equipment, auto parts, plastics, clothing and furniture in the North; logger in the Serrana region and technological in the Capital (FIESC, 2015). In this sense, it is clear that the first placed in the IDMS have a diversified economic matrix, even if one of the segments is the flagship. If you consider the Serrana mesoregion, which is characterized by an economic matrix basically focused on the wood industry, one can see the importance of productive diversity, as it was the last one placed in the IDMS. This is because, according to Réus (2012) the dependence of an entire region on only one productive source translates into insecurity and, consequently, low sustainability.

For a better understanding of the results, and according to the classification scale presented in Table 4, Table 8 presents the classification of IDMS and indices of dimensions and sub-dimensions for the investigated mesoregions.

Table 8

Classification of indicators of the Santa Catarina mesoregions

IDMS	Serrana	Norte Catarinense	Oeste Catarinense	Sul Catarinense	Vale do Itajaí	Grande Florianópolis
Consolidated IDMS	Medium low	Medium low	Medium low	Medium low	Medium	Medium low
Sociocultural	Medium	Medium	Medium	Medium	Medium	Medium
Education	Medium	Medium high	Medium high	Medium high	Medium high	Medium
Cheers	Medium	Medium	Medium	Medium	Medium	Medium
Culture	Low	Medium low	Low	Low	Low	Low
Housing	Medium high	Medium high	Medium high	High	High	High
Economical	Medium low	Medium low	Medium low	Medium low	Medium low	Medium low
economy	Medium low	Medium low	Medium low	Medium low	Medium low	Medium low
Environmental	Low	Medium low	Low	Low	Medium low	Medium low
Environment	Low	Medium low	Low	Low	Medium low	Medium low
Political-Institutional	Medium	Medium low	Medium	Medium	Medium	Medium low
public finances	Medium low	Medium low	Medium	Medium	Medium	Medium low
Public administration	Medium	Medium high	Medium high	Medium	Medium high	Medium low
Social participation	Medium low	Low	Medium low	Medium low	Medium low	Medium low

Source: *FECAM (2019).*

From the results of Table 8, it is observed that is 1 the Santa Catarina mesoregion with Medium IDMS (yellow), while 5 are the mesoregions positioned in the low Medium (orange). The presence of 83.33% of Santa Catarina mesoregions classified in the low-sustainability (low-medium) boundary range draws a state conjuncture that requires the attention of citizens and public managers. According to Réus and Andion (2018) when it is in the lower middle range it is as if the system gives a signal of "attention", informing that it is essential that a structuring development project is put into practice or rethought. In addition, there was no evolution of the IDMS of these mesoregions, which remained with the same classification they had in 2016.

From the perspective of the dimensions, it is clear that the worst dimension of the IDMS for these mesoregions is the Environmental. Of the 6, 3 mesoregions are not considered sustainable in this theme, that is, they have an index located in the Low (red) range, being the Serrana, Oeste Catarinense and Sul Catarinense. These results are reflected in the low coverage rates in terms of sanitation, sewerage, treated water, ie essential utilities. In addition, the municipalities that make up these mesoregions generally have a fragile environmental management structure. However, the indicators of environmental preservation have good indices. Importantly, the IDMS of each of the mesoregions for this dimension did not change compared to 2016, remaining at the same level of sustainable development.

The Economic dimension is considered fragile in all Santa Catarina mesoregions, since all of them have a low average index in this dimension, being in the orange range since the results of the last biennium. This indicates that all the mesoregions analyzed present a worrying economic situation, which results mainly from low indicators of income level, economic dynamism and wealth generation capacity (own revenue).

On the other hand, it is noted the good levels of socio-cultural development of these mesoregions, observed mainly in the sub-dimensions of Education and Housing. It is found that 100% of them have an average index in the Sociocultural dimension, which is leveraged by housing and basic education variables. In the housing sub-dimension, the mesoregions have a high or medium high index, while in the education sub-dimension, the indices vary between high medium and medium. However, these mesoregions have, for the most part, unsatisfactory indices in terms of Culture, resulting mainly from the indicators of investment in culture, since the Norte Catarinense mesoregion is in the low middle range of sustainable development, and the others are located in the Low range. Similarly, for this dimension, all mesoregions remained at the same level of development compared to 2016.

Regarding the Political-institutional framework, the mesoregions are located in the yellow (Medium) and orange (Medium Low) bands, being 66.67% with the median classification, which: Serrana, Oeste and Sul Catarinense and Vale do Itajai. This percentage decreased compared to 2016 (83.33%), which included the Grande Florianópolis mesoregion. These mesoregions generally have low Average indices in the Social Participation subdimension, except for the Norte Catarinense mesoregion with IDMS classified as Low for this subdimension, which corroborates the findings of Réus and Andion (2018). In contrast, the Public Management sub-dimension presents satisfactory indices classified in the High and Medium Medium range, except for the Grande Florianópolis mesoregion located in the Low Medium range. This sub-dimension is driven by the high rates of financial management and articulation with the outside. In finance, 50% of the mesoregions have an average index and the other 50% a low average index.

Thus, in general, it can be noted that in none of the four dimensions, nor in the IDMS, was any Santa Catarina mesoregion classified with high sustainable performance. Also evident is the challenge of bringing development to the Serrana and Oeste mesoregions, whose performances were the lowest. Among the analyzes, it is observed that the Environmental dimension requires greater attention from municipal managers, since of the 6 mesoregions under study, 50% had Low rating, being the dimension that most contributed to the low-medium level of sustainable development. Comparing the performance level of the mesoregions of the state between 2016 and 2018, it is noted that the scenario is very similar, however, slightly decreases in 2018.

5 Final Considerations

This research aimed to analyze the sustainable performance of Santa Catarina mesoregions from the sustainable development indicators proposed by the Santa Catarina Federation of Municipalities (FECAM). Therefore, a descriptive, documentary and qualitative research was carried out. The study sample comprised the six mesoregions of the state of Santa Catarina, namely, Serrana, Norte Catarinense, Oeste Catarinense, Sul Catarinense, Vale do Itajaí and Grande Florianópolis. Data from the Municipal Sustainable Development Index - IDMS were collected on the FECAM website and comprise the year 2018.

From the results it can be concluded that the Vale do Itajaí mesoregion had the best sustainable performance in the year 2018, being classified in the Medium range (yellow) with an IDMS of 0.625, while the Serrana mesoregion had the worst sustainable performance. in the Low Medium (orange) range with an IDMS of 0.571. The other mesoregions analyzed also obtained a medium low sustainable performance. Regarding the dimensions of sustainable municipal development, it can be concluded that the Environmental and Economic dimensions deserve attention from municipal public managers, as they were located between the Low Medium (orange) and Low (Red) bands.

It is also concluded that none of the four dimensions, nor the consolidated IDMS of the Santa Catarina mesoregions, were classified as sustainable High (dark green) or Medium high (light green). Overall, there was a slight worsening in the development of the mesoregions between 2016 and 2018, which means that improvements must be made in the environmental, social, cultural, economic and institutional management processes of the municipalities that make up these mesoregions, and that public policies must be implemented. implemented, taking into account the indicators with the lowest levels, such as environmental management in the Environmental dimension and income distribution in the Economic dimension.

Thus, by assessing the sustainable development of the mesoregions, the study contributes to the literature on indicator systems at regional level and to sustainable regional development allowing the understanding of the sustainable performance process of the municipalities that make up these mesoregions, as well as enabling the monitoring and comparability of this performance. The study also contributes to the implementation of results-oriented management, which is the main indication of the new public management, whose emphasis is on the effective use of information.

The highlight of this paper is the fact that it focuses on a description and analysis in the case of Santa Catarina, and cannot be extrapolated to other national realities, often quite different from the reality studied in this research.

For future research, it is suggested to analyze the cause and effect of sustainable development indicators with the improvement in the population's quality of life, as well as the analysis of the determinants of sustainable performance.

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