Revista Brasileira de Gestão e Desenvolvimento Regional
G&DR. V. 16, N. 1, P. 222-234, jan-abr/2020. Taubaté, SP, Brasil.
ISSN: 1809-239X

Recebimento: 14/06/2019
Aceite: 10/08/2019

SUSTAINABLE DEVELOPMENT INDEX OF MUNICIPALITIES IN MATO GROSSO

Nadja Gomes Machado[1]
Gisele Teixeira dos Santos[2]
Marcelo Sacardi Biudes[3]
Jorge Luiz da Silva[4]
Alencar Garcia Bacarji[5]
Marcelo Ednan Lopes da Costa[6]
Reinaldo de Souza Bilio[7]

Abstract

The objective of this study was to evaluate the sustainable development of the municipalities in the state of Mato Grosso whose economy is based on agribusiness and service provision. The sustainable development of municipalities was assessed by the Sustainable Development Index of Municipalities (SDIM) which is composed of 23 indicators divided into six sustainability dimensions (social, economic, environmental, political-institutional and cultural). SDIM has been rated as critical, alert, acceptable and ideal sustainability. All sustainability dimensions had a critical or alert level in Mato Grosso, except the environmental dimension with an acceptable level that was positively influenced by the water supply service to the population. Sustainability is at alert or critical level in 130 municipalities. Cuiabá, the capital of the State, was the only municipality that presented an ideal level of sustainability. The Eastern portion of Mato Grosso was the region with the largest number of municipalities at a critical level of sustainability, while the South-Central portion had the largest number of municipalities at the acceptable level. This asymmetry in SDIM indicates a vulnerability in the development of the State, demanding specific public policies to improve the social, economic and political-institutional indicators of the municipalities. The municipalities with the highest values in the economic dimension had the highest values in the social dimension. Municipalities with higher values of SDIM had higher values of Municipal Human Development Index (MHDI). Therefore, the good economic development of the municipalities has positively impacted the social services to population.

[1] PhD in Environmental Physics (UFMT). Professor at the Federal Institute of Mato Grosso, Cuiabá - MT, Brazil. Email: nadja.machado@blv.ifmt.edu.br
[2] Technologist in Environmental Management from the Federal Institute of Mato Grosso, Cuiabá - MT, Brazil. Email: gisele_santos_@hotmail.com
[3] PhD in Tropical Agriculture (UFMT). Professor at the Federal University of Mato Grosso, Cuiabá - MT, Brazil. Email: marcelo@fisica.ufmt.br
[4] PhD in Ecology and Biodiversity Conservation (UFMT). Professor at the Federal Institute of Education Science and Technology of Mato Grosso, Cuiabá - MT, Brazil. Email: jorge.silva@blv.ifmt.edu.br
[5] PhD in Environmental Sciences and Agricultural Sustainability (Dom Bosco Catholic University). Professor at the Federal Institute of Education Science and Technology of Mato Grosso, Cuiabá - MT, Brazil. Email: alencar.bacarji@blv.ifmt.edu.br
[6] Master in Forest and Environmental Sciences (UFMT). Professor at the Federal Institute of Education Science and Technology of Mato Grosso, Cuiabá - MT, Brazil. Email: marcelo.costa@blv.ifmt.edu.br
[7] PhD in Tropical Agriculture (UFMT). Professor at the Federal Institute of Education Science and Technology of Mato Grosso, Cuiabá - MT, Brazil. Email: reinaldo.bilio@blv.ifmt.edu.br

Keywords: Sustainability. Social Development. Economic Impacts. Political-institutional Indicators.

Introduction

Growing concern about resource over-consumption, environmental degradation and social inequality have resulted in calls for a transition toward a more sustainable society and economy (ADAMS et al., 2016). Historically, the concept of sustainable development (SD) emerged in the context of environmental concerns as witnessed in the World Charter for Nature (UN, 1982) whose concerns were addressed in Our Common Future (WCED, 1987) and further elaborated in Chapters of Agenda 21 of the Earth Summit in 1992 (UN, 1992). The notion of sustainable development was popularized by the Triple Bottom Line (TBL), in which businesses are exhorted to adopt a responsible approach and give equivalence to environmental, social and economic dimensions in decision-making (ELKINGTON, 1997).

From an early stage of the sustainable development concept it has been clear that information and namely quantitative indicators will play an important role (HÁK; JANOUŠKOVÁ; MOLDAN, 2016). For example, Agenda 21 in Chapter 40 highlighted that indicators should show us whether we are creating a more sustainable world. Indicators are instruments in guiding decision-makers in a variety of ways to conduct public policy, because the information generated by the them facilitates the decision-making process and helps to measure the performance of sustainable development policies (FRAINER et al., 2017). They can be characterized by three overarching attributes: salience (policy and indicator relevance), credibility and legitimacy (PARRIS; KATES, 2003; HEINK et al., 2015). These attributes are important because they are determinants of the effectiveness of environmental assessments (FARRELL; JÄGER; VANDEVEER, 2006). In practice, it is hard to meet all these criteria concurrently (HÁK; JANOUŠKOVÁ; MOLDAN, 2016). However, indicator should be easy-to-understand and provides really important information on SD (KURTZ; JACKSON; FISHER, 2001).

SD involves complex processes that demand indicators capable of capturing all its aspects and, comprehensively describe a changing, dynamic and diverse reality in order to highlight future trends or perspectives (MARTINS; CÂNDIDO, 2012). There are several tools that seek to assess the degree of development sustainability (BELLEN, 2004). Many indicators and indexes have been introduced in Brazil to measure and assess sustainability such as Sustainable Development Indicators developed by Brazilian Institute of Geography and Statistics (IBGE, 2004), Sustainable Development Index for Rural Territories proposed by Sepúlveda (2005), and Sustainable Development Index of Municipalities (SDIM) proposed by Martins and Candido (2008). SDMI gathers a set of information on local sustainability levels, enabling the evaluation of public policies already implemented (MARTINS; CÂNDIDO, 2012), which enables the intervention of specific public policies (VASCONCELOS; CÂNDIDO, 2011). This methodology integrates a set of six dimensions (social, demographic, environmental, economic, political-institutional and cultural), in which each dimension has its respective indicators.

The state of Mato Grosso is in the context of discussions on sustainable development due to its good economic development based on agribusiness activities (DASSOW; COSTA; FIGUEIREDO, 2012) which has caused income concentration (SCHWENK & CRUZ, 2008; AZEVEDO & PAQUIS, 2007) and serious environmental problems such as deforestation, pesticide use and burnings (JUKKA et al., 2015; VIANA; FREITAS; GIATTI, 2016). Thus, the objective of this study was to evaluate the sustainable development of the municipalities of Mato Grosso, applying the Municipal Sustainable Development Index (MSDI) proposed by Martins and Cândido (2012).

Material and methods

Study area

The State of Mato Grosso, located in the Midwest region of Brazil, has 141 municipalities and a territorial extension of 903.378,292 km², with a population of 3,035,122 inhabitants and a population density of 3,36 inhabitants per km² (IBGE, 2019). Tributaries of the Paraguay and Amazon basins are in the Central region of the State. There are Cerrado, Amazon and Pantanal biomes in its territory. According to the Köppen classification, the climate is Am (monsoon) in the Northwest and

Aw (dry winter) in the South and East of Mato Grosso (ALVARES et al., 2013). Its economy is based on agricultural and service sector activities (DASSOW; COSTA; FIGUEIREDO, 2012).

Data Collection

The data used in this study were obtained from three databases (Table 1). Data are indicators that characterize six distinct dimensions of sustainability. The social, economic, environmental, political-institutional and cultural dimensions were defined by 04 indicators each, while the demographic dimension was defined by 03 indicators, totalizing 23 indicators. Aspects of the municipal reality were defined in each dimension to better reflect its sustainability condition, since an isolated indicator is unable to adequately represent the reality (PRESCOTT-ALLEN, 1999). Thus, a set of indicators can provide a more accurate picture of the actual scenario and minimize the lack of essential indicators for which no data are available.

Table 1 – Dimensions, indicators, description and data source of the Municipal Sustainable Development Index (MSDI) for Mato Grosso.

	Indicator	Description	Data Source
Social Dimension	Life expectancy at birth	It represents the average number of years a newborn expects to live.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Child mortality	It indicates infant death rate by frequency of deaths of children under one year of age.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Schooling	It expresses the educational level reached by the population that is out of school age.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Functional illiteracy	It represents the relationship between the adult contingent with up to three years of education and the total adult population.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
Economic Dimension	Gross Domestic Product (GDP) per capita	It indicates the average income level of the population.	Instituto Brasileiro de Geografia e Estatística (IBGE)
	Per capita income	It expresses the distribution of income per person.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Gini Index	It expresses the degree of concentration on the population's income distribution.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Industry's share of GDP	It presents the ratio between the participation of the industry and the sum of the other sectors. It represents industry participation in Gross Domestic Product.	Instituto Brasileiro de Geografia e Estatística (IBGE)
Environmental Dimension	Access to water supply system	It Expresses the number of houses with access to the water supply service.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Water distribution network: untreated water	It indicates the amount of household that has untreated water.	Instituto Brasileiro de Geografia e Estatística (IBGE)
	Basic sanitation: sewage collection system	It expresses whether there is a sewage system in the municipalities.	Instituto Brasileiro de Geografia e Estatística (IBGE)
	Access to garbage collection	It expresses the number of the population with access to garbage collection.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
Demographic dimension	Ratio between urban and rural population	It represents the ratio between urban and rural population.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Demographic density	It consists of the number of people in each geographical area. Represents the number of inhabitants per km2	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Population distribution by age group	It represents the percentage of the population in various age groups in the municipalities.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
Political-Institutional Dimension	Expenses by function	It expresses the amount (R$) spent by the municipality with expenses on social assistance, education, health, culture, urbanism, urban basic sanitation, environmental management and science and technology.	Relatório de Finanças do Brasil (FINBRA) de 2006
	Internet access	It is the number of homes with internet access.	Instituto Brasileiro de Geografia e Estatística (IBGE)
	Access to electricity	It expresses the number of households that have electricity.	Atlas de Desenvolvimento Humano (Censo Demográfico de 2010)
	Access to fixed telephone service	It represents the number of households with access to fixed telephone services.	Instituto Brasileiro de Geografia e Estatística (IBGE)
Cultural Dimension	Number of libraries	It indicates the number of existing libraries in the municipality.	Instituto Brasileiro de Geografia e Estatística (IBGE)
	Number of museums	It indicates the number of museums in the municipalities.	Instituto Brasileiro de Geografia e Estatística (IBGE)
	Number of cinemas	It indicates the number of cinemas in the municipalities.	Instituto Brasileiro de Geografia e Estatística (IBGE)
	Number of cultural centers	It indicates the number of cultural centers in the municipalities.	Instituto Brasileiro de Geografia e Estatística (IBGE)

Sustainable Development Index for Municipalities (SDIM)

The indicators were treated based on the methodology of the Sustainable Development Index for Municipalities (SDIM) proposed by Martins and Cândido (2008). However, indicators were readjusted due to data availability. The SDIM was created to assess the level of sustainable development of a municipality (RÉUS; ANDION, 2018), considering worldwide criteria for choosing sustainability indicators and the specificities of focus on local development (FRAINER et al., 2017). Therefore, its purpose is to assign a "grade" that can locate the municipality in relation to an expected ("ideal") level of sustainable development (RÉUS; ANDION, 2018).

It is necessary to transform indicators into indexes because they have different units of measurement. This transformation based on the proposal of Waquil et al. (2010) enables aggregation of all dimensions to estimate SDIM (MARTINS; CÂNDIDO, 2008). Waquil et al. (2010) use a procedure that adjusts the values of variables on a scale with variation whose minimum value is 0 (zero) and the maximum value is 1 (one).

After choosing the indicators, one must identify whether they measure a situation in which, by increasing their value, it favors or disadvantages the sustainable development process of the municipality (SEPÚLVEDA, 2005). If the indicator is positive, the higher its value, the more it favors the development process, while if the indicator is negative, the higher its value, the more it disadvantages the development process (WAQUIL et al., 2010). The operationalization of the indexes is made according to Equations (1) and (2).

$$x_{(+)} = \frac{obs - min}{max - min} \quad (1)$$

$$x_{(-)} = \frac{max - obs}{max - min} \quad (2)$$

where x(.) = standardized indicator, calculated for each municipality; obs = indicator value in each municipality; min = minimum value of the indicator of all municipalities; max = maximum indicator value of all municipalities.

After the indicators were transformed into indexes, the indexes of each dimension to the municipality were aggregated using the simple arithmetic mean. SDIM estimate to each municipality was made by the simple arithmetic mean of all dimensions. SDIM is classified according to the level of sustainability (Table 2), which generates a ranking of the municipalities of Mato Grosso.

Table 2 – Classification of the sustainability level from the Sustainable Development Index for Municipalities (SDIM) of Mato Grosso.

Index (0–1)	Sustainability Level
0.0000 – 0.2500	Critical
0.2501 – 0.5000	Alert
0.5001 – 0.7500	Acceptable
0.7501 – 1.0000	Ideal

Municipal Human Development Index (MHDI)

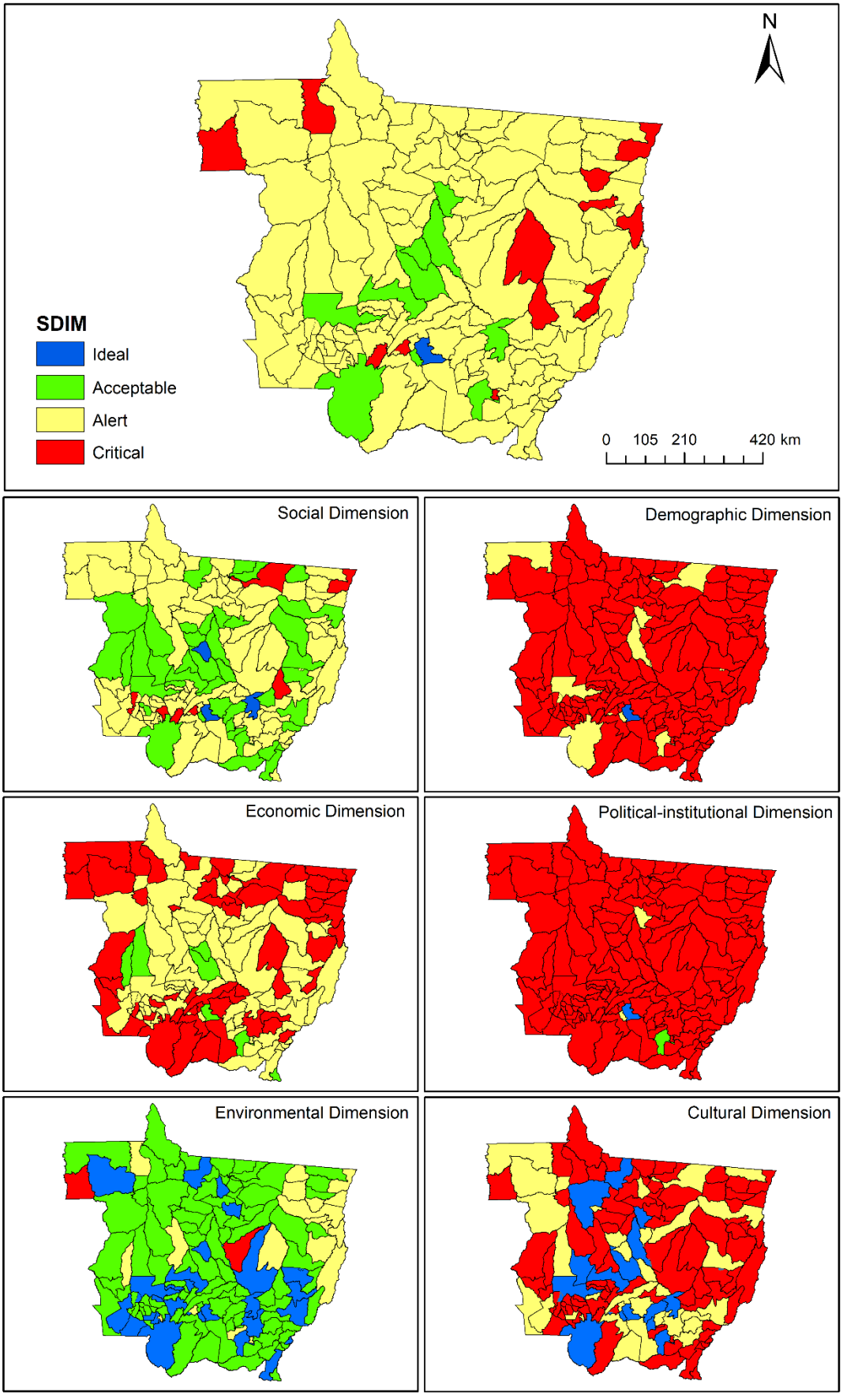
MHDI is a measure composed of indicators of three dimensions of human development (longevity, education and income). The index ranging from 0 to 1 indicates greater human development when its value is closer to 1. MHDI data are available at: [http://www.pnud.org.br/atlas/ranking/Ranking-IDHM-Municipios-2010.aspx].

Results and discussion

The Sustainable Development Index for Municipalities (SDIM) of Mato Grosso is 0.35, which indicates alert level. Approximately 8% of municipalities located in the Center-South of the State are at an acceptable (10 municipalities) or ideal (01 municipality) level of sustainability (Figure 1). Therefore, 92% of the municipalities are at the critical (12 municipalities) or alert (118 municipalities) level. The Eastern portion of the State was the region with the highest number of municipalities at the critical level.

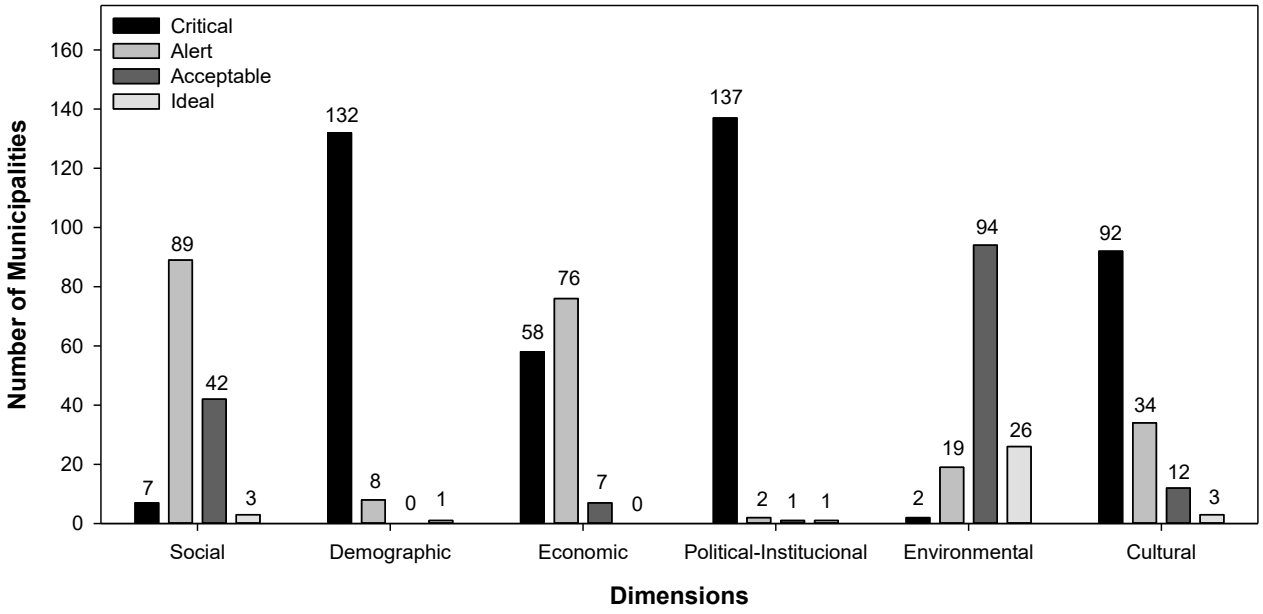
Cuiabá was the only municipality with an ideal level of sustainability (0.85). The municipalities with acceptable level were Rondonópolis (0.72), Várzea Grande (0.58), Primavera do Leste (0.56), Sinop (0.54), Cáceres (0.53), Tangará da Serra (0, 52), Lucas do Rio Verde (0.52), Diamantino (0.51), Nova Mutum (0.51) and Sorriso (0.51). On the other hand, the municipalities with critical level were Nova Nazaré (0.24), Canabrava do Norte (0.24), Gaúcha do Norte (0.24), Novo Santo Antônio (0.24), Cotriguaçu (0, 24), São José do Povo (0.23), Jangada (0.22), Santa Terezinha (0.22), Alto Boa Vista (0.21), Porto Estrela (0.21), Campinápolis (0.20) and Rondolândia (0.19).

Figure 1 – Spatial distribution of the Sustainable Development Index for Municipalities (SDIM) in Mato Grosso state.



The environmental dimension (0.68) was the only one that had a satisfactory result in the SDIM for Mato Grosso. The social (0.45), cultural (0.36) and economic (0.28) dimensions had an alert level of sustainable development, while the demographic (0.19) and political-institutional dimensions (0.11) had a critical level. Demographic, political-institutional and cultural dimensions are at critical level of sustainable development in 94%, 97% and 65% of the municipalities, respectively (Figure 2). The environmental dimension presented an acceptable level in 67% of the municipalities and the social and economic dimensions had an alert level of 63% and 54%, respectively.

Figure 2 – Number of municipalities by level of sustainability for each dimension in Mato Grosso.



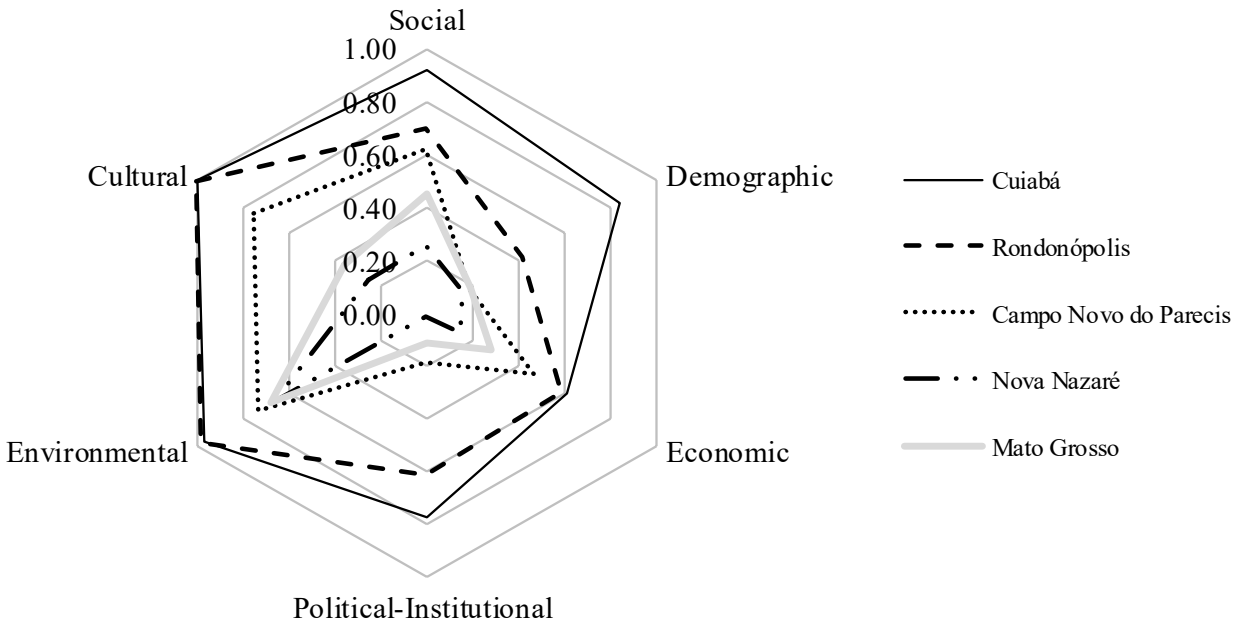
The cultural dimension concerns about the availability of places for knowledge, sport and leisure. In this case, all variables contributed to their unsatisfactory performance, except the amount of library (0.94). The environmental dimension concerns about the sanitation and water supply services provided to the population. The existence of sewerage (0.19) was the only variable that had a critical level. The other variables of the environmental dimension presented SDIM values greater than 0.80.

The political and institutional dimension concerns about the capacity and effort expended by governments in implementing public policies for access to public services and expenses by function. All indicators contributed negatively to the SDIM of the political-institutional dimension, since their values were below 0.05, except for access to electricity (0.91). The economic dimension highlights the economic development with social equality. The indicators Gross Domestic Product (GDP) per capita (0.14) and industry share in GDP (0.04) were the ones that contributed the most negatively to the SDIM of the economic dimension.

The demographic dimension is related to population dynamics. The ratio between urban and rural population (0.11) and population distribution by age group (0.04) were the indicators that most contributed to the unsatisfactory performance of the demographic dimension. The only indicator that had a satisfactory index was access to electricity (0.91). The social dimension corresponds to health care and education. The indicator that most contributed to the unsatisfactory performance of the social dimension was schooling of individuals over 25 years of age in elementary, secondary and higher education (0.25-0.35).

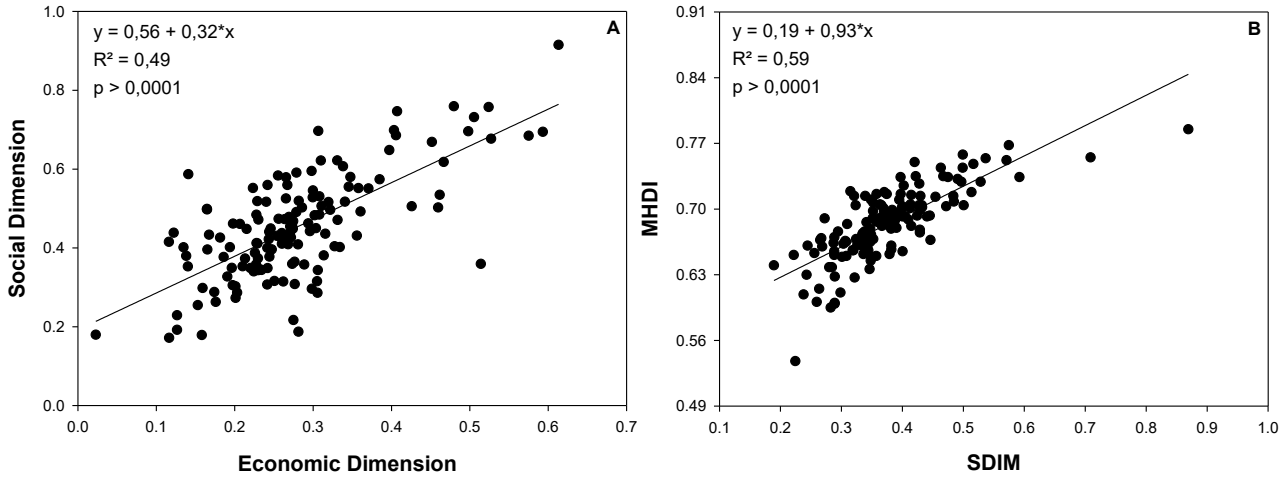
Cuiabá, the only municipality with an ideal level (0.85) of SDIM, had the lowest value in the economic dimension (0.61) (Figure 3). Rondonópolis (0.72) had acceptable level of SDIM with lower value in the demographic dimension (0.42), while Campo Novo do Parecis (0.49) had lower alert level in the political-institutional dimension (0.18). The SDIM pattern of dimensions for Mato Grosso was similar to Nova Nazaré (0.25), whose level was critical with lower value in the political-institutional dimension (0.02).

Figure 3 – Biogram of the dimensions of the Sustainable Development Index for Municipalities (SDIM) of Mato Grosso.



There was an increase in social dimension values as the economic dimension increased (Figure 4A), indicating a 0.70 correlation between these dimensions. There was no relationship between other dimensions. Besides, municipalities with higher SDIM values had higher MHDI values (Figure 4B), indicating a correlation of 0.77 between these indexes.

Figure 4 – Relationship between social and economic dimensions and between the Municipal Sustainable Development Index (SDIM) and the Municipal Human Development Index (MHDI) in Mato Grosso.



SDIM showed the importance of reassessing state public management, since the most municipalities in Mato Grosso State had a sustainability alert level. Therefore, Mato Grosso must rearrange its institutions to guarantee social justice and the rights of its citizens. Although there are high rates of economic growth and high per capita income in Mato Grosso in recent years (DASSOW; COSTA; FIGUEIREDO, 2012), this economic scenario has caused numerous environmental, ecological and social conflicts (SCHWENK; CRUZ, 2008). The State of Mato Grosso achieved the second highest rate of deforestation and pesticide use, in addition to the second lowest observed HDI

evolution among the states of the Legal Amazon from 2002 to 2011 (VIANA; FREITAS; GIATTI, 2016).

Economic growth did not occur homogeneously in all municipalities of Mato Grosso, since the rich regions are in the Midwest and Southeast, and the poor regions in the North, Northeast and Southwest (DASSOW; COSTA; FIGUEIREDO, 2012). Municipalities of the Midwest and Southeast have their economy based on agriculture, while the Northeast and Southwest are based on livestock (DASSOW; COSTA; FIGUEIREDO, 2012; FARIA, 2014). There is a positive relationship between soybean planting and the socioeconomic development of the municipalities in Mato Grosso, since the municipalities that cultivated soybeans were regionally more developed than those that did not plant soybeans from 2000 to 2010 (CASTRO; LIMA, 2016). On the other hand, Azevedo and Paquis (2007) pointed out that the best socioeconomic indicators are found in the municipalities with the worst environmental indicators even though these municipalities receive the largest amount of financing from public and private banks.

This economic division is corroborated by the heterogeneous pattern in land use allocation among microregions in Mato Grosso where in the North, forests and permanent crops predominated, and in the South, temporary crops and pastures are concentrated (DAL PAI; LIMA, 2012). The agricultural, services and industrial sectors contribute positively to the economic growth of Mato Grosso, but the agricultural sector is responsible for the economic oscillation, highlighting its vulnerability, which undermines the possibility of sustained growth (DASSOW; COSTA; FIGUEIREDO, 2011).

Canuto (2004) indicated that agribusiness promotes greater concentration of land and income, generates unemployment, employs slave labor and feeds land grabbing. In addition, it is responsible for the unbridled increase in deforestation in the Amazon and Cerrado which has perverse effects on human health and leaves a trail of conflict and violence (CANUTO, 2004). Azevedo and Pasquis (2007) showed that agribusiness is not an economic cycle that causes changes in social structure, but there are accentuated differences behind a high average GDP, which biases the HDI.

Unlike other Mato Grosso municipalities that concentrate their economy on agribusiness activities, supported by grain and livestock production, Cuiabá and Várzea Grande with 27% of the State's population has an economy supported by the commerce and service sectors (JOSEPH; GUIMARÃES, 2015). In addition, there is a concentration of the industrial sector in Cuiabá and other cities (Sinop, Rondonópolis, Alto Teles Pires and Tangará da Serra) focused on the agro-industrial segment with the presence of food processing, dairy and meat processing industries, and complementary industries. as mechanical, of fertilizers (MONTAGNHANI; LIMA, 2011). Cuiabá for being the Capital of the State of Mato Grosso (political and administrative center) has historically always attracted greater population and financial flows from governments than other municipalities (IPEA, 2015) which explains part of its SDIM performance.

The economic structure composition of a region is a key element for sustained growth. Economic diversification minimizes the effects of long-term economic crises (DISSART, 2003) by creating work and income options and strategies for the population (PERONDI; SCHNEIDER, 2012). On the other hand, some authors emphasize that the specialization of the economy provides greater gains for the cities with higher income (CARVALHO; KUPFER, 2011; KAULICH, 2013). The diversification or specialization of the economy is not mutually exclusive, but they identify which feature is most important for promoting externalities that lead to economic growth and development (DALBERTO; STADUTO, 2013).

The degree of urbanization increased from 38.8% in 1970 to 79.4% in 2000 in Mato Grosso (CUNHA, 2006), but the household coverage of access to the general sewage system was 19% (VIANA; FREITAS; GIATTI, 2015). On the other hand, household coverage of access to the general water network in 2010 was 75% (VIANA; FREITAS; GIATTI, 2015). Besides, infant mortality rate was 19.55 from Mato Grosso in 2013 (VIANA; FREITAS; GIATTI, 2015), indicating a value higher than the Brazilian average. The number of leprosies per 100,000 inhabitants was 85.07 in Mato Grosso in 2013 (VIANA; FREITAS; GIATTI, 2015), much higher than the average of the states of the Legal Amazon and Brazil. These indicators reveal the low investment or inefficiency of the use of public money in health in Mato Grosso.

The illiteracy rate from 25 to 59 years increased from 12.7% in 2000 to 7.3% in 2010 (LEÃO et al., 2015), indicating the highest rate among the Midwestern states. Low schooling affects individual income once income is a growing function of schooling as shown by Daniel and Oliveira

(2012) in Mato Grosso. Thus, it is up to the State to seek solutions to minimize these existing discrepancies in personal income. However, there is already some impact of public policies, as the extreme poverty rate in Mato Grosso fell from 7.83% in 2000 to 4.41% in 2010 (VIANA; FREITAS; GIATTI, 2015), presenting the lowest index among Legal Amazon and then the average for Brazil.

Castro (2012) indicated that the social policy of the public power plays a fundamental role for the development of the country, through the expansion of social justice, favoring growth and income distribution. Discrepancies in social, health and economic indicators across municipalities can be reduced with public sector investments. Therefore, public policies are indispensable and strategic variables not only to face adverse conjuncture situations, but also to create the foundations of an economically and socially stronger and democratic nation (CASTRO, 2012; DEDECCA; TROVÃO; SOUZA, 2014).

Conclusions

The Sustainable Development Index for Municipalities (SDIM) of Mato Grosso indicated an alert level, except 8% of the municipalities located in the Center South are in an acceptable or ideal level. All dimensions presented negative results, except the environmental dimension whose variable related to water supply services to the population influenced the positive result of it. The SDIM pattern of dimensions for Mato Grosso state was like Nova Nazaré, whose level was critical with less value in the political-institutional dimension, which indicates the weakness in the role of the public power in contributing to the sustainable development of the municipalities. The bad performance of SDIM in Mato Grosso is corroborated by the heterogeneous pattern in land use allocation, where there are forests and permanent crops in the North, and temporary crops and pastures are concentrated in the South. Thus, these serious asymmetries in the SDIM indicate the vulnerability of a development where the agricultural sector is responsible for the economic oscillation. In addition, uneven growth among municipalities makes it difficult to formulate uniform policies for the entire State of Mato Grosso, requiring the analysis and identification of municipalities with the lowest development indicators or those needing specific policies to improve economic, social, environmental and political-institutional indexes.

References

ADAMS, R.; JEANRENAUD, S.; BESSANT, J.; DENYER, D.; OVERY, P. Sustainability-oriented Innovation: A Systematic Review. International Journal of Management Reviews, 18: 180-205, 2016.

ALVARES, C. A.; STAPE, J. L.; SENTELHAS, P. C.; GONÇALVES, J. L. M.; SPAROVEK, G. Köppen's climate classification map for Brazil. Meteorologische Zeitschrift, 6: 711–728, 2013.

Atlas do Desenvolvimento Humano. Disponível em: [http://www.atlasbrasil.org.br/2013/]. Acesso em: 08 de abril de 2015.

AZEVEDO, A. A.; PASQUIS, R. Da abundância do agronegócio à Caixa de Pandora ambiental: a retórica do desenvolvimento (in) sustentável do Mato Grosso (Brasil). Revista Internacional de Desenvolvimento Local, 8 (2): 183-191, 2007.

BELLEN, H. M. V. Desenvolvimento Sustentável: uma descrição das principais ferramentas de avaliação. Revista Ambiente e Sociedade, 2(1): 67-87, 2004.

BRASIL. Ministério da Fazenda. Secretaria do Tesouro Nacional. Finanças do Brasil: Dados contábeis dos municípios. Brasília. V. 56, ago, 2011. Disponível em [http://www.tesouro.fazenda.gov.br/pt_PT/contas-anuais]. Acesso em 06 jun. 2015.

CANUTO, A. Agronegócio: a modernização conservadora que gera exclusão pela produtividade. Revista NERA, 7 (5): 1-12, 2004.

CARVALHO, L. B.; KUPFER, D. Diversificação ou especialização: uma análise do processo de mudança estrutural da indústria brasileira nas últimas décadas, Revista de Economia Política, 31: 618-637, 2011.

CASTRO, J. A. Política social e desenvolvimento no Brasil. Economia e Sociedade, 21: 1011-1042, 2012.

CASTRO, L. S.; LIMA, J. E. A soja e o estado do mato grosso: existe alguma relação entre o plantio da cultura e o desenvolvimento dos municípios? Revista Brasileira de Estudos Regionais e Urbanos, 10(2): 177-198, 2016.

CUNHA, J. M. P. Dinâmica migratória e o processo de ocupação do Centro-Oeste brasileiro: o caso de Mato Grosso. Revista Brasileira de Estudos de População, 23 (1): 87-107, 2006.

DAL PAI, C.; LIMA, J. F. Organização Espacial e a Evolução do Uso de Terras em Mato Grosso no Final do Século XX. Revista de Estudos Sociais, 28 (14): 149-167, 2012.

DALBERTO, C. R.; STADUTO, J. A. R. Uma análise das economias de aglomeração e seus efeitos sobre os salários industriais brasileiros. Revista de Economia Contemporânea, 17(3): 539-569, 2013.

DANIEL, L. P.; OLIVEIRA, L. J. Análise dos principais fatores determinantes do nível de renda no estado de Mato Grosso: um estudo com base nos microdados da PNAD 2009. Revista de Estudos Sociais, 27 (14): 68-78, 2012.

DASSOW, C.; COSTA, R. M. G. S.; FIGUEIREDO, A. M. R. Crescimento Econômico Municipal em Mato Grosso: Uma Análise de Convergência de Renda. Revista Brasileira de Economia, 65 (4): 359-372, 2011.

DASSOW, C.; COSTA, R. M. G. S.; FIGUEIREDO, A. M. R. Crescimento Econômico e Clusters Municipais no Estado de Mato Grosso. Revistas Nexos Econômicos, 6 (1): 11-33, 2012.

DEDECCA, C. S.; TROVÃO, C. J. B. M.; SOUZA, L. F. 2014. Desenvolvimento e equidade: Desafios do crescimento brasileiro. Novos Estudos – CEBRAP, 98: 23-41, 2014.

DISSART. J. C. Regional economic diversity and regional economic stability: research results and agenda. International Regional Science Review. 26(4): 423-446, 2003.

ELKINGTON, J. Cannibals with Forks. Oxford: Capstone. 1997.

FARIA, A. M. M. Perspectivas para o desenvolvimento de Mato Grosso. In: CAVALCANTI, I. M.; LASTRES, H. M. M. et al. (Org.). Um olhar territorial para o desenvolvimento: Centro-Oeste. Rio de Janeiro: Banco Nacional de Desenvolvimento Econômico e Social, 2014. p. [394]-423.

FARRELL, A. E., JÄGER, J. AND VANDEVEER, S. D. Overview: Understanding design choices. In: FARRELL, A. E. AND JÄGER, J. (eds). Assessments of Regional and Global Environmental Risks. Designing Processes for the Effective Use of Science in Decision making. Washington DC: Resources for the Future. 2006.

FRAINER, D. M.; SOUZA, C. C.; REIS NETO, J. F.; CASTELÃO, R. A. Uma aplicação do Índice de Desenvolvimento Sustentável aos municípios do estado de Mato Grosso do Sul. Interações, 18(2): 145-156, 2017.

HÁK, T.; JANOUŠKOVÁ S.; MOLDAN, B. Sustainable Development Goals: A need for relevant indicators. Ecological Indicators, 60: 565-573, 2016.

HEINK, U.; MARQUARD, E.; HEUBACH, K.; JAX, K.; KUGEL, C.; NEßHÖVER, C.; NEUMANN, R.; PAULSCH, A.; TILCH, S.; TIMAEUS, J.; VANDEWALLE, M. Conceptualizing credibility, relevance and legitimacy for evaluating the effectiveness of science–policy interfaces: Challenges and opportunities. Science and Public Policy, 5: 1-14, 2015.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. Mato Grosso. Disponível em: [https://cidades.ibge.gov.br/brasil/mt/panorama]. Acesso em: 20 de julho de 2019.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. Estatísticas. Disponível em: [http://www.ibge.gov.br/home/]. Acesso em: 08 de abril de 2015.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. Indicadores de Desenvolvimento Sustentável: Brasil 2004. Rio de Janeiro: IBGE, 2004.

INSTITUTO DE PESQUISA APLICADA E ECONÔMICA – IPEA. Governança Metropolitana no Brasil: Região Metropolitana do Vale do Rio Cuiabá. Rio de Janeiro: IPEA, 2015.

JOSEPH, L. C. R.; GUIMARÃES, R. Inovação no setor de têxteis e confecções de Cuiabá e Várzea Grande. Revista de Estudos Sociais, 33(17): 3-27, 2015.

JUKKA, M.; SHIMABUKURO, Y. E.; BEUCHLE, R.; GRECCHI, R. C.; GOMEZ, M. V.; SIMONETTI, D.; ACHARD, F. On the extent of fire-induced forest degradation in Mato Grosso, Brazilian Amazon, in 2000, 2005 and 2010. International Journal of Wildland Fire, 25: 129-136, 2015.

KAULICH, F. Diversification vs. specialization as alternative strategies for economic development: can we settle a debate by looking at the empirical evidence? Working Paper, UNIDO, Development Policy, Statistics and Research Branch, n. 3, 2013.

KURTZ, J.C.; JACKSON, L.E.; FISHER, W.S. Strategies for evaluating indicators based on guidelines from the Environmental Protection Agency's Office of Research and Development. Ecological Indicators: 1: 49-60, 2001.

LEÃO, M. F.; OLIVEIRA, E. C.; DEL PINO, J. C.; FREITAS, M. C. S. Centros de Educação de Jovens e Adultos: Uma forma de ofertar educação a quem não teve oportunidade na idade própria em Mato Grosso. Revista Thema, 12 (1): 61-73, 2015.

MARTINS, F. M.; CÂNDIDO, A. C. 2012. Índices de desenvolvimento sustentável para localidades: uma proposta metodológica de construção e análise. Revista de Gestão Social e Ambiental, 6(1): 03-09, 2012.

MARTINS, M. F.; CÂNDIDO, G. A. Metodologia para Construção e Análise de Índices de Desenvolvimento Sustentável: uma aplicação no Estado da Paraíba. João Pessoa -PB: Edições SEBRAE. 2008.

MONTAGNHANI, B. A.; LIMA, J. F. Notas sobre o Desenvolvimento do Centro-Oeste e a Economia Brasileira. Revista de Estudos Sociais, 26(13): 157-173, 2011.

PARRIS, T. M.; KATES, R.W. Characterizing and measuring sustainable development. Annual Review of Environment and Resources, 28: 559-586, 2003.

PERONDI, M. A.; SCHNEIDER, S. Bases teóricas da abordagem de diversificação dos meios de vida. Revista Redes, 17(2): 117-135, 2012.

PRESCOTT-ALLEN, R. Assessing progress toward sustainability: the system assessment meted illustrated by the wellbeing of nations. UICN, 1999.

RÉUS, I.; ANDION, C. Gestão Municipal e Desenvolvimento Sustentável: Panorama dos Indicadores de Sustentabilidade nos Municípios Catarinenses. Desenvolvimento em Questão, 45: 97-117, 2018.

SCHWENK, L. M.; CRUZ, C. B. M. Conflitos socioeconômicos-ambientais relativos ao avanço do cultivo da soja em áreas de influência dos eixos de integração e desenvolvimento no Estado de Mato Grosso. Acta Scientiarum. Agronomy, 30(4): 501-511, 2008.

SEPÚLVEDA, S. Desenvolvimento sustentável microrregional: métodos para planejamento local. Brasília, DF: IICA, 2005. 292 p.

UNITED NATIONS – UN. A World Charter for Nature. United Nations, New York, 1982.

UNITED NATIONS – UN. Earth Summit Agenda 21. The United Nations programme of action from Rio. United Nations Department of Public Information, New York, 1992.

VASCONCELOS, A. C. F.; CÂNDIDO, G. A. Índice de desenvolvimento sustentável municipal participativo: uma aplicação no município de Cabaceiras – PB. Revista Capital Científico, 9(2): 83-97, 2011.

VIANA, R. L.; FREITAS, C. M.; GIATTI, L. L. 2016. Saúde ambiental e desenvolvimento na Amazônia legal: indicadores socioeconômicos, ambientais e sanitários, desafios e perspectivas. Saúde e Sociedade, 25 (1): 233-246.

WAQUIL, P.; SCHNEIDER, S.; FILIPPI, E.; RÜCKERT, A.; RAMBO, A.; RADOMSKY, G.; CONTERATO, M.; SPECHT, S. Avaliação de Desenvolvimento Territorial em Quatro Territórios Rurais no Brasil. Redes, 15(1): 104-127, 2010.

WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT – WCED. Our Common Future. Oxford University Press, Oxford, 1987.