



Situational diagnosis of the environmental management of the municipalities of Pará and the challenges in achieving the objectives of sustainable development

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ABSTRACT

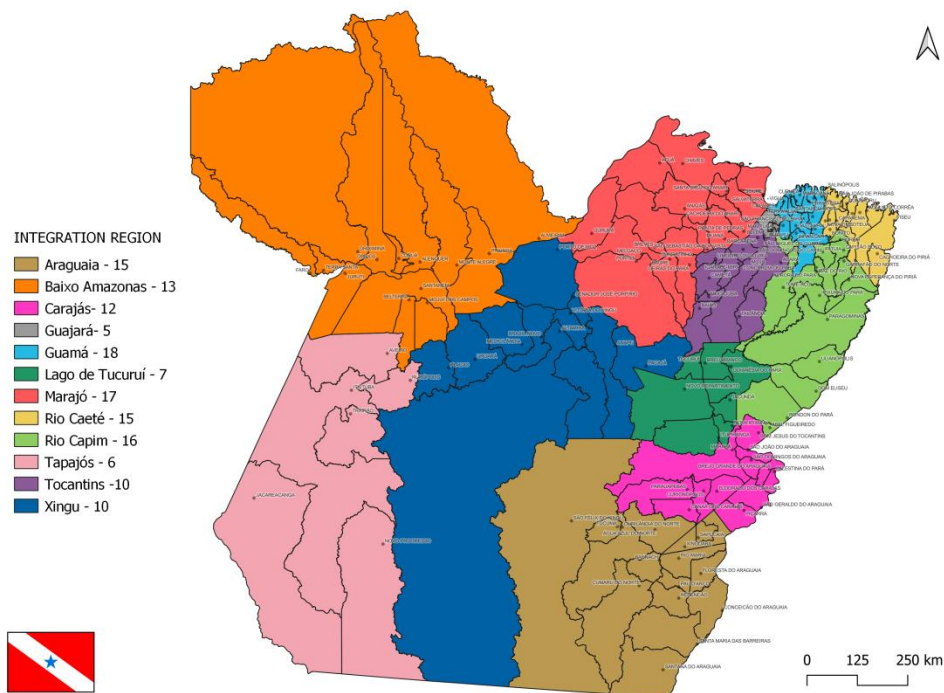
This study identifies the main limitations of the institutional and organizational structures of municipal environmental agencies. This descriptive study used secondary data from SEMAS (PA), which were analyzed using descriptive statistics. Analyzing the literature on environmental management in the state of Pará, no study has yet performed a situational diagnosis of the environmental management of Pará municipalities. There is a research opportunity for investigating whether or not Pará municipalities are implementing environmental management through environmental secretariats. Environmental management monitoring helps identify and correct problems. As a social impact, this study will assist in improving the quality of life of local communities through a sustainable environment. The environmental contribution of this study lies in the insights that can help implement environmental policies.

KEYWORDS: Decentralization, Environmental Management, Amazon.

1 INTRODUCTION

The state of Pará, which is part of the Legal Amazon, is the second largest state in Brazil. It has a territorial area of 1,245,870.704 km² and an estimated population of approximately 8,777,124 inhabitants (IBGE, 2020). Pará comprises 144 municipalities divided into 12 integration regions (RI) showing similarities in occupational, social, and economical levels, aiming to administer and develop public policies adapted to the local reality (AGÊNCIA PARÁ, 2022). Figure 1 shows the RI map.

Figure 1—Map of Integration Regions



Source: Prepared by the authors.

In this context, Complementary Law No. 140 states that environmental protection is a shared responsibility between federal entities, as established in the Federal Constitution of 1988 and regulated by Complementary Law No. 140/2011. In the state of Pará, municipal environmental management is governed by approved and updated regulations, with

Resolution Coema No. 162/2021 being the current legislation. The resolution provides for the possibility of cooperation between the state and its municipalities, allowing a self-declaration of concessions for the practice of municipal environmental management. To date, 138 (96%) of the 144 state municipalities have self-declared themselves capable of practicing municipal environmental management. Four of these municipalities have declared that they will partially exercise the administrative actions provided for in Article 9, paragraph XIV of Complementary Law No. 140/2011, leading to a subsidiary administrative action under the terms of Article 2, III, and Article 16 of Complementary Law No. 140/2011.

Environmental decentralization requires agreements between the Union and the States to be performed through agreements, contracts, cooperation agreements, or federative pacts. These pacts aim to promote technical and administrative cooperation for the shared management of the constitutional competencies of environmental protection and renewable natural resources (SCARDUA; BURSZTYN, 2003). From this scenario, local governments have autonomy (ZHANG; LI, 2020) over the local impact activities established in resolution Coema 162. This process is called decentralization. It was established to achieve participatory development and greater administrative efficiency (BERKES, 2010) through the delegation of competencies (LIU; WANG, 2022). In this context, the United Nations (UN) Sustainable Development Goals (SDGs) help municipalities balance human and environmental needs to ensure sustainable development and environmental protection. Research on environmental management in the state of Pará analyzes different approaches, such as environmental transparency: from availability to access to environmental information (GUERREIRO; VASCONCELOS; SOBRINHO; CONDURÚ, 2021), ICMS Ecológico (TUPIASSU; FADEL; GROS-DÉSORMEAUX, 2019), environmental flow in the rivers of the Amazon (SANTOS; CUNHA, 2018), information management and basic sanitation (CONDURÚ; PEREIRA, 2017), and the “Green Cities” program (COSTA; FLEURY, 2015). Specific regions are investigated, as in the studies on the challenges encountered with regard to environmental management in agricultural frontier areas in the west of Pará (VELASQUEZ; VILLAS BOAS; SCHWARTZMAN, 2006), institutional dimension, sustainability, and environmental management in the municipality of Moju (CARDOSO; DE TOLEDO; VIEIRA, 2014), and the municipalization process of environmental management in the southeast part of Pará (BARROS *et al.*, 2021).

Given this research landscape, we need to understand the institutional and organizational structures of the municipal environmental agencies responsible for environmental management in the state of Pará and how they influence the implementation of policies and programs. This study aims to answer the following question: How can the institutional and organizational structures of the municipal environmental agencies of the state of Pará affect the implementation of environmental public policies to achieve SDGs?

This study is based on the identity of environmental management for sustainable development and the need to identify obstacles that can compromise these policies. A diagnosis of municipal environmental management in the state of Pará is performed to (I) describe the decentralization process of environmental management in the state, (II) analyze the municipalities exercising municipal environmental management, and (III) discuss how the structural and organizational conditions of OMMAs influence the implementation of effective environmental policies and the achievement of SDGs.

2 THEORETICAL FRAMEWORKS

2.1 Brief history of environmental management decentralization in the state of Pará

The environmental management system encompasses the theory of environmental federalism that emerged in the 1970s. It seeks to determine the appropriate distribution of environmental management power among different government levels (FENG, SULING, RONG

ZHANG, 2022). Since the promulgation of the Federal Constitution of 1988, the decentralization of environmental management has been a topic on the Brazilian public agenda. The environmental decentralization process makes the central government responsible for delegating environmental management competence to local governments (RAN; ZHANG; HAO, 2020), while the central government will have some autonomy in making decisions regarding environmental governance (LIU, YANG, 2022).

This decentralization process aims to transfer responsibilities from the central government to municipalities to improve environmental management in a way that is closer to the local reality. This process helps local governments develop stricter environmental regulations and alleviate environmental issues (WU; HAO; REN 2020).

In this sense, the evolution of the institutionalization of the decentralization process of environmental management in Brazil has been gradually but steadily occurring. Law No. 6.938 of August 31, 1981 was created to establish the National Environmental Policy that initiates decentralization as one of the principles of environmental management in the country. This was followed by the creation of the National Environmental System, which is responsible for coordinating and integrating the actions of environmental agencies at the national, state, and municipal levels with the aims of preserving, improving, and recovering environmental conditions.

The institutionalization of the decentralization process of municipal environmental management in the state of Pará began in 1995 with the creation of the State Environmental Policy, which established the State Environmental System, the State Environmental Council, and the State Environmental Fund. From there, the municipalities of Pará began to create their own environmental management structures, including municipal agencies and specific legislations (SILVA; RAMOS, 2016).

This change in municipal environmental management had an important regulatory milestone with Resolution No. 79/2009—COEMA, the first regulation to establish the criteria for municipalities to exercise local environmental management and fixed competencies for the licensing of activities with an environmental impact. Interested municipalities needed approval from the state of Pará through the issuance of the “Habilitation of Municipal Environmental Management” administrative act, where the municipality must initiate an administrative process in the state environmental agency, instruct it with the required documents, and submit itself to the analysis of the state environmental agency’s technical team for approval.

Subsequently, State Law No. 7.389/2010 was created to define the typologies of activities with environmental impact and the procedures for municipal environmental licensing. However, this was replaced by Complementary Law No. 140/2011, which established the municipalities’ attributions in relation to environmental protection. Resolution No. 89/2011 listed the criteria for joining the State Program of Shared Environmental Management in addition to defining the criteria for licensing of enterprises and activities that exceed the scope of local environmental impact. Resolution No. 116/2014 amended Annex Único of Resolution No. 79/2009 and created the “Certificate of Environmental Agency Capacity.” A replacement by Resolution No. 120/2015 was performed to establish the typologies of the local impact that can be licensed by municipalities in Pará and the recommendations characterizing a capacitated municipal environmental agency. Article 8 of this resolution lists the requirements for consideration as a capacitated municipal environmental agency.

Resolution No. 162/2021—COEMA is currently enforced to reorganize local environmental impact activities in the state of Pará, establish recommendations on the concept of a capacitated environmental agency, and determine how each municipality can self-declare itself fit to exercise environmental management. The resolution also establishes cooperation between the entities through the possibility of wishing competence through an

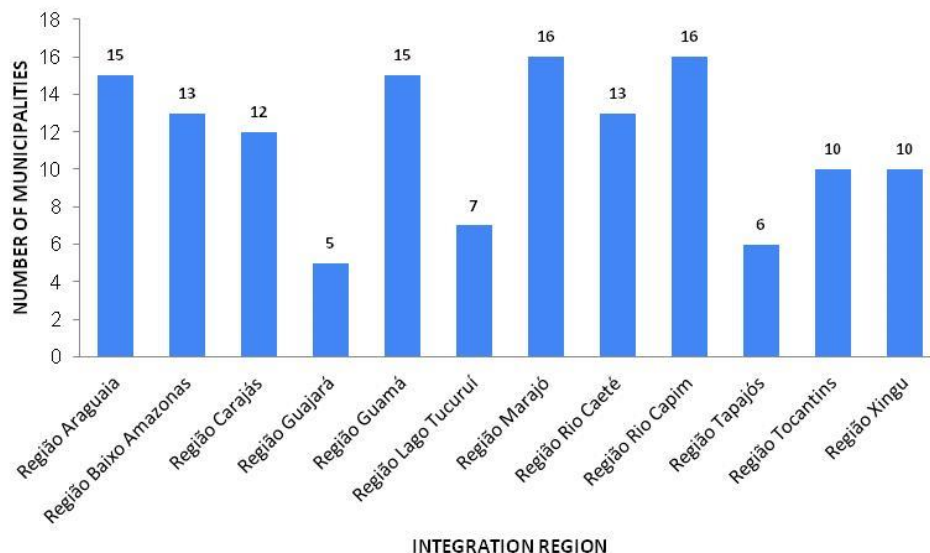
agreement between the state and the municipality.

Resolution No. 162/2021—COEMA reorganized the local environmental impact activities in the state of Pará and established criteria for each municipality to self-declare its capability of environmental management. To do this, the municipality must structure a municipal environmental system with a capacitated environmental agency and an environmental council and meet a series of requirements, including having compatible or consortium technical staff who are duly qualified and can meet the demand for administrative actions to be executed.

States follow federal environmental management guidelines. Some municipalities find it difficult to decentralize similar practices, possibly because of the lack of institutional capacity and social participation. Implementation of federal programs can speed up municipal actions (SCARDUA; BURSZTYN, 2003). Note that environmental decentralization plays a relevant regulatory role and can mitigate the negative effects of restrictions on economic growth have on environmental pollution (REN et al., 2023).

So far, 138 (96%) out of the 144 municipalities in the state of Pará have declared their capacity to exercise municipal environmental management. Four of which declared partial exercise of the administrative actions provided for in Article 9º, paragraph XIV of LC No. 140/2011, as shown in Graph 1.

Graph 1—Number of municipalities exercising municipal environmental management in the state of Pará in 2023 by integration region



Source: Prepared by the authors.

Graph 1 shows an overview of the municipalities exercising municipal environmental management in the state of Pará with different participation levels by the integration regions. This highlights the importance of promoting awareness and engagement in all regions to ensure adequate natural resource protection and environmental conservation.

2.2 Sustainable development goals

Thematic areas related to environmental issues are characterized by diversity. For example, in China, this includes environmental protection, policy formulation, supervision, and enforcement of the environmental protection law (REN et al., 2023). The concept of sustainable development is intrinsically associated with sustainability (ALAIMO, 2020), which

refers to the ability of a system to maintain itself in a continuous manner (CHEN et al., 2023).

In this scenario, the end of the millennium development goals (MDGs) led to the 2030 Agenda with the creation of SDGs that succeeded in the global campaign to end poverty (ELMASSAH; MOHIELDIN, 2020). The 2030 Agenda for Sustainable Development launched by the UN in 2015 established 17 SDGs as a path to achieve sustainable development (UN, 2015).

These SDGs have forms that differ from MDGs, from which they benefit not only from their achievements, but also seek to overcome their weaknesses (GIL, 2018). The UN cites 17 goals with 169 targets and 231 indicators. Of these goals, we have goals 6 (i.e., Ensure access to safe, affordable, accessible, and sustainable water and sanitation for all), 7 (i.e., Ensure access to affordable, reliable, sustainable, and modern energy for all), 11 (i.e., Make cities and human settlements inclusive, safe, resilient, and sustainable), 12 (i.e., Ensure sustainable production and consumption patterns), 13 (i.e., Take urgent action to combat climate change and its impacts), 14 (i.e., Conserve and sustainably use the oceans, seas, and marine resources for sustainable development), and 15 (i.e., Protect, restore, and promote the sustainable use of terrestrial ecosystems, manage forests sustainably, combat desertification, halt and reverse land degradation and halt biodiversity loss), which are environmental goals.

In this context, environmental agencies play a relevant role in promoting the development and implementation of SDGs. The 2030 Agenda document highlights the interconnectedness of 17 SDGs, which should be analyzed according to the social, economic, environmental, and institutional dimensions of sustainable development (DA SILVA, 2015). The main challenge here lies in the effective internalization of SDGs and their targets in a country, such that their potential as sustainable development drivers is realized, and the desired societal benefits are achieved by 2030 (ROMA, 2019).

3 METHODOLOGY

This study was conducted through descriptive research with a quantitative approach. The research was divided into three stages. The first stage was dedicated to theoretical research, in which content analysis of environmental laws and reading of books, articles, magazines, websites, and publications were performed.

The second stage used data provided by the Pará State Secretariat for Environment and Sustainability. These data referred to the goal of the “Perform a Situational Assessment of Municipal Environmental Management in Pará” grant in the 9th Cycle of the Performance Grant for Environmental Management—Period: July 1 to October 31, 2021, according to Ordinance No. 1037/2021-GAB/SEMAS. The goal here was to obtain a general institutional overview of municipal environmental agencies to support the planning, implementation, and improvement of environmental public policies created to promote sustainable development in accordance with the recommendations of the 2030 Agenda of the UN.

To this end, the SEMAS conducted a survey via Google Forms sent to the 144 municipalities of Pará, containing 56 questions divided into three dimensions: the political–institutional dimension with 22 questions; the socio-environmental dimension with 20 questions; and the economic dimension with 14 questions. The questionnaire was divided into open and closed questions, with dichotomous response options of “yes” and “no.”

Considering that sustainable development is a multidimensional concept that seeks to harmonize and balance various dimensions, such as economic, environmental, sociocultural, political, and others that may arise from local needs (DE LIMA et al., 2023). The questionnaire was divided into three dimensions according to Table 1, highlighting the dimensions divided into the questionnaires sent by the Pará State Secretariat for Environment and Sustainability (SEMAS) to the 144 municipalities of Pará, their characteristics, and some criteria that can be

propagated and strengthened to promote a more sustainable development.

Table 1: Dimensions of the questionnaire sent to 144 municipalities of Pará

DIMENSION	CHARACTERISTICS	THEMES
POLITICAL– INSTITUTIONAL	Identify the structure of local legal systems and investigate the physical and technical structures of OMMAs	Municipal environmental policy
		Functional structure of the municipal environmental agency
		Multisectoral partnerships
		Participatory management
ECONOMIC	Identifies the degree of implementation of instruments at the level of experience showing municipalities with more dynamic economic activities	Municipal tax law
		Municipal environmental fund
SOCIO- ENVIRONMENTAL	Seeks to identify mechanisms for the preservation and conservation of the environment, natural and built, resulting from the actions of the public authorities and the participation of society in decision-making in terms of environmental issues at the local level	Rural Environmental Registry (CAR)
		Waste management
		Green areas
		Environmental education

Source: Developed by the authors based on SEMAS (2022).

The final and last stage comprised the analysis of municipalities by groups using the nomenclature of the Municipal Management Effectiveness Index (IEGM) applied in Brazil by the State Court of Auditors. The IEG-M divides municipalities into five bands by effectiveness level. The bands of effectiveness achieved by the municipalities were then analyzed by group according to the achieved percentage (Table 2).

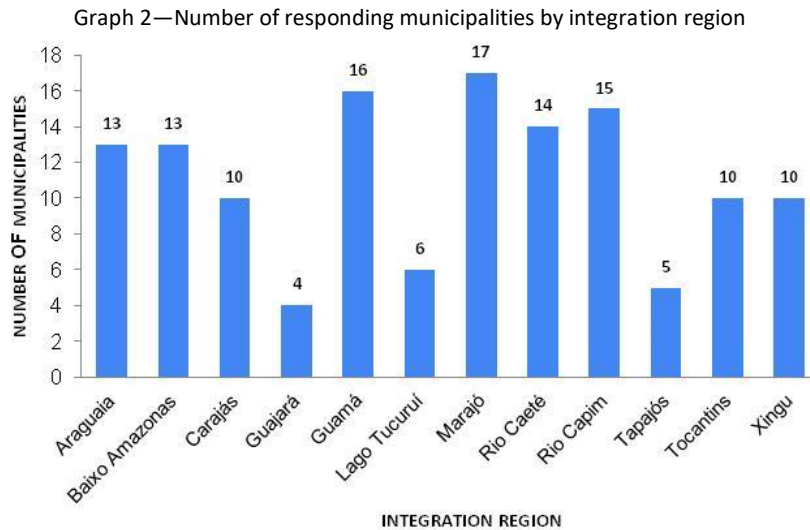
Table 2—Performance bands

BAND	CRITERION
Highly effective	Maior igual a 90% Greater than or equal to 90%
Very effective	Resultado entre 75,0% e 89,9% Result between 75.0% and 89.9%
Effective	Resultado entre 60,0% e 74,9% Result between 60.0% and 74.9%
In the adjustment phase	Resultado entre 50,0% e 59,9% Result between 50.0% and 59.9%
Low Level of Adjustment	Resultado menor ou igual a 49,9% Result less than or equal to 49.9%

Source: Developed by the authors based on the IEGM manual (2022, p. 14).

4 RESULTS

For the data analysis, municipalities that responded to the questionnaires related to the three diagnostic dimensions were considered. A total of 133 municipalities were included, as shown in Graph 2.

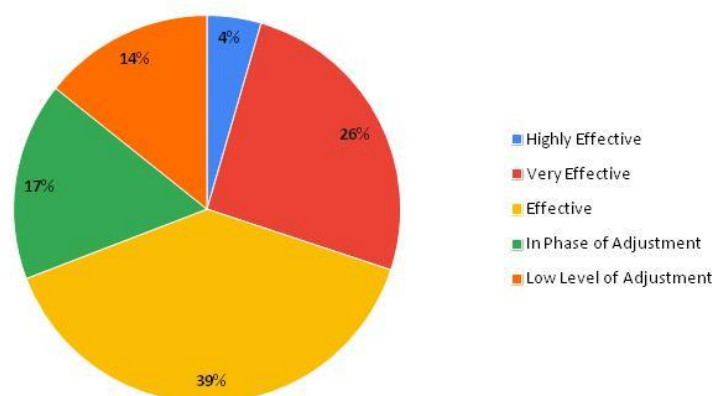


Source: Developed by the authors.

Participation was distributed in a varied manner, with both the Guamá and Marajó integration regions recording 16 responding municipalities and the Rio Capim and Rio Caeté integration regions with 15 and 14 responding municipalities, respectively. This regional diversity in responses must be considered in relation to the total number of municipalities per integration region. In addition, a comprehensive view of the municipal environmental management scenario can be observed in different areas of the territory.

The results of the level of effectiveness of municipalities were obtained after the calculations (Graph 3).

Graph 3—Percentage of the effectiveness range of environmental management in the state of Pará.



Source: Developed by the authors.

The results of environmental management effectiveness revealed that only 5% of the municipalities reached a highly effective range. In addition, 26% of the municipalities were very effective, while 39% were classified as effective. However, 17% of the municipalities were still in the adaptation phase, and 14% showed a low adaptation level. These numbers reflect the need to strengthen environmental management practices in many municipalities by seeking improvements in policies and actions related to the environment.

Agenda 21 assigns governments the responsibility of facilitating the implementation of sustainable development at different scales. It seeks to involve all sectors of society as relevant process partners. This gradual approach aims to establish a progressive consensus for a viable agenda toward a sustainable future, with emphasis on the democratization of decision-making and the formulation of public policies based on strategic agreements (FERNANDES et al., 2012).

Environmental decentralization seeks to harmonize environmental management at the central and local levels to optimize intergovernmental issues and effectively provide environmental protection services (RAN; ZHANG, 2020). Environmental protection increases as the process advances (LIU; YANG, 2022). This consequently strengthens the capacity of environmental public services and improves environmental performance (REN et al., 2023). The lack of commitment can lead to environmental agencies being at a low level or remaining at the adaptation phase considering that, by exercising municipal environmental management, they claim to be competent for exercising such a responsibility.

In relation to SDGs, these represent a comprehensive approach to addressing global environmental challenges. However, achieving these goals necessitates strengthened efforts from OMMAs to overcome barriers such as lack of financial resources, institutional capacity, and socioeconomic inequalities. In addition, integration between environmental and other SDG objectives must be promoted to recognize existing interconnections.

A joint commitment among governments, civil society, the private sector, and international organizations is necessary to realize the effectiveness of environmental management and promote the achievement of SDGs. In addition to being essential to the implementation of sustainable policies and practices, the promotion of technological innovation, strengthening of institutional capacities, and public awareness are key elements in overcoming these challenges.

A melhoria da qualidade institucional pode ajudar na o CO₂ emissões eficientes, melhorando a qualidade ambiental e o crescimento econômico (ZEESHAN ET AL, 2021). Portanto, quanto maior a faixa de efetividade dos municípios, melhor a qualidade de promover a gestão ambiental de forma eficaz, melhorando a qualidade ambiental e o crescimento econômico e capacidade de cumprir as metas ambientais dos ODS.

The improvement of institutional quality can help efficiently reduce CO₂ emissions, which will improve environmental quality and economic growth (ZEESHAN ET AL, 2021). Therefore, the higher the effectiveness range of municipalities, the better the quality of effectively promoting environmental management and improving the environmental quality, economic growth, and ability required to meet environmental SDGs.

5 CONCLUSION

This study investigated the environmental management situation in the state of Pará using secondary data provided by SEMAS (PA) in a sample of 133 municipalities to answer the following question: How do the institutional and organizational structures of the municipal environmental agencies of the state of Pará affect the implementation of environmental public policies to achieve SDGs?

This study aimed to diagnose the status of municipal environmental management in

the state of Pará by measuring the effectiveness of environmental agencies in the region.

In the social sphere, this research seeks to understand how the institutional and organizational structures of environmental agencies influence the implementation of environmental public policies, which can result in better environmental protection, because efficient environmental policies and programs, when implemented well, can guarantee sustainable development and natural resource preservation. In addition, more effective environmental management can contribute to the improvement of the quality of life of local communities and promote a healthier and safer environment.

In the environmental sphere, this study addresses the decentralization of environmental management, which is an important process for environmental protection. By analyzing the current environmental management situation, insights on how to strengthen management are provided to ensure that environmental policies are properly implemented, contributing to the promotion of sustainable practices in the environmental sphere.

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