



Instruments for coordinating the Ecological ICMS in the Legal Amazon: lessons learned for Brazil

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Authors' notes'

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Abstract

Objective: The study analyzes the adoption of the Ecological ICMS in the states located in the Legal Amazon and the instruments mobilized by these regulatory state policies to coordinate the environmental actions in their municipalities.

Methodology: The relevant legislation was reviewed and a bibliographical analysis of the Ecological ICMS was carried out in the six states where the policy is in force as they contain part of the Amazon forest: Amapá, Pará, Tocantins, Mato Grosso, Rondônia, and Acre.

Originality/Relevance: The originality of the article lies in its comparison of the instruments for coordinating the ICMS-E legislation and its results in the states of the Legal Amazon to improve current legislation while encouraging other states in the country to adhere to this policy.

Results: Regulatory and financial coordination instruments guide ICMS-E policies in the Legal Amazon as the essence of this policy is resource allocation according to environmental criteria stipulated by state legislation. However, greater clarity in the ICMS-E objectives could help municipalities adapt their actions to the practices expected by the states. Higher transfer percentages and coordination instruments related to management were also factors identified that could improve the policy's performance.

Social/management contributions: The article contributes to the field of regional planning by offering recommendations for improving ICMS-E policies in states that have already adopted it and for those that have not yet implemented it. The study showed that the more coordination instruments used in the ICMS-E policy, the greater the possibility for states to affect municipal choices for improving environmental management.

Keywords: public policy coordination instruments, legal Amazon, ecological ICMS

Instrumentos de coordenação da política do ICMS-Ecológico na Amazônia Legal: aprendizados para o Brasil

Resumo





Objetivo: O estudo analisa a adoção do ICMS Ecológico nos estados que compõem a Amazônia Legal e os instrumentos mobilizados por essas políticas estaduais regulatórias para coordenar as ações ambientais de seus municípios.

Metodologia: Procedeu-se uma revisão das legislações pertinentes e análise bibliográfica sobre o ICMS Ecológico nos seis estados amazônicos onde a política está vigente (Amapá, Pará, Tocantins, Mato Grosso, Rondônia e Acre).

Originalidade/Relevância: A originalidade do artigo está na comparação dos instrumentos de coordenação das legislações do ICMS-E e os seus resultados nos estados da Amazônia Legal, com vistas a aperfeiçoar as legislações vigentes, bem como estimular outras unidades federativas do país a aderirem a essa política.

Resultados: Os instrumentos de coordenação regulatório e financeiro pautam as políticas de ICMS-E na Amazônia Legal, uma vez que a essência dessa política é a alocação de recursos conforme critérios ambientais estipulados por regulamentos. No entanto, maior clareza nos objetivos do ICMS-E pode contribuir para que os municípios adequem suas ações às práticas esperadas pelos estados. Os maiores percentuais de repasse e instrumentos de coordenação relacionados à gestão também foram identificados como fatores que podem melhorar o desempenho da política.

Contribuições sociais/para a gestão: O artigo contribui para o campo do planejamento regional ao oferecer recomendações para o aprimoramento das políticas de ICMS-E nos estados que já a adotam e para aqueles que ainda não a implementaram. O estudo evidenciou que quanto mais instrumentos de coordenação forem utilizados na política de ICMS-E, maior sua possibilidade de afetar o desempenho ambiental municipal.

Palavras-chave: instrumentos de coordenação de políticas públicas, Amazônia legal, ICMS-ecológico

Instrumentos para la coordinación del ICMS Ecológico en la Amazonía Legal: lecciones aprendidas para Brasil





Resumen

Objetivo: El estudio analiza la adopción del ICMS Ecológico en los estados que componen la Amazonia Legal y los instrumentos utilizados por estas políticas reguladoras estatales para coordinar las acciones ambientales de sus municipios..

Metodología: Se realizó una revisión de la legislación pertinente y un análisis bibliográfico del ICMS Ecológico en los seis estados amazónicos donde la política está en vigor (Amapá, Pará, Tocantins, Mato Grosso, Rondônia y Acre).

Originalidad/Relevancia: La originalidad del artículo reside en la comparación de los instrumentos de coordinación de la legislación del ICMS-E y sus resultados en los estados de la Amazonia Legal, con vistas a perfeccionar la legislación vigente, así como incentivar a otras unidades federales del país a adherir a esta política.

Resultados: Instrumentos de coordinación normativa y financiera orientan la política de ICMS-E en la Amazonia Legal. La esencia de esta política es la asignación de recursos de acuerdo con criterios ambientales estipulados por la legislación estatal. Sin embargo, una mayor claridad en los objetivos del ICMS-E puede ayudar a los municipios a adaptar sus acciones a las prácticas esperadas por los estados. Mayores porcentajes de transferencia e instrumentos de coordinación relacionados con la gestión también son factores que pueden mejorar el desempeño de la política.

Contribuciones sociales/de gestión: El artículo contribuye a la planificación regional al ofrecer recomendaciones para mejorar las políticas del ICMS-E en los estados que ya lo han adoptado y para los que aún no lo han implementado. El estudio demuestra que cuantos más instrumentos de coordinación se utilicen en la política de ICMS-E, más probabilidades hay de que afecte a los resultados medioambientales municipales.

Palabras llave: instrumentos de coordinación de políticas públicas, Amazonia legal, ICMS-ecológico





Introduction

The Legal Amazon corresponds to the area considered to be under the Amazon Development Superintendence (SUDAM). Its objective is to define economic and social proposals and goals that lead to the sustainable development of its delimited area (Complementary Law 124/ 2007). The states that make up the Legal Amazon (Amazonas, Acre, Rondônia, Roraima, Pará, Maranhão, Amapá, Tocantins, and Mato Grosso) correspond to 59% of the Brazilian territory, and much of this area is covered by extensive tropical forests. These states also have high poverty rates and low tax collection capacity (Brambilla & Cunha, 2022). With these characteristics, they face challenges to combine environmental conservation actions with socioeconomic development. Addressing these challenges requires solutions guided by sustainable development by encouraging different subnational actors to improve environmental management, by ensuring quality of life and economic dynamism, and by including the people who live in the forests with their socio-cultural diversity.

The Ecological ICMS, a value-added tax (ICMS-E in Portuguese), has already been used successfully in different Brazilian states and is one of the initiatives that has been promoting significant gains in terms of sustainable development (Castro, Young & Amend, 2022). For Araújo, Silva and Rodrigues (2013), the ICMS-E is also recognized as an efficient model of environmental management, playing a crucial role in raising awareness and preserving the environment for the local community.

It is not a new tax, but a state regulatory policy that establishes environmental criteria for the distribution of revenues from Tax on Operations Relating to the Circulation of Goods and on Provisions of Interstate, Intermunicipal, and Communication Transport Services between municipalities. Its implementation can stimulate nature conservation actions by municipal administrations, reducing the costs of recovering degraded areas, environmental disasters, and health services. It also expands the possibility of sustainable business such as tourism and forest concessions, as well as initiatives in line with the bioeconomy. This scenario generates





improvement in the population's quality of life and contributes to municipal finances (Castro, Young, Costa & Costa, 2019).

The municipal resources obtained by the transfer of ICMS-E are not necessarily allocated to environmental expenses and can be used to supplement municipal accounts and implement welfare policies. However, depending on the criteria established, the ecological ICMS can coordinate environmental policies and stimulate positive competition among municipalities that, by garnering more funds, strive to meet the criteria stipulated, investing more in environmental actions (Castro et al., 2019).

The objective of this article is to present and analyze the adoption of the Ecological ICMS in the states that are part of the Legal Amazon and the instruments mobilized by these regulatory state policies to coordinate the environmental actions in their municipalities. Six states that make up the Legal Amazon have environmental criteria for the transfer of ICMS to the municipalities (Rondônia, Amapá, Mato Grosso, Tocantins, Acre, and Pará) and it is intended to present the current legislation in each of them, as well as the effects observed from its implementation to identify the lessons from the initiatives undertaken. The theoretical framework of the coordination of public policies is used for discussing the instruments mobilized to improve the environmental performance of municipalities according to state interests.

This research is a descriptive study (Gil, 2008) as it should present the characteristics and results obtained by each ICMS-E legislation in the states of the Legal Amazon based on literature review and document analysis. The document analyses were carried out from the relevant state legislations and consultations to the websites of the State Department of Environment and Finance of the six states part of the Legal Amazon that have ICMS-E. Bibliographical research on public policy coordination and Ecological ICMS was also carried out. As we are dealing specifically with ICMS-E, the aim was to point out through comparative analysis the advantages and disadvantages of each state initiative and whether they were effective in achieving the best environmental results.





The uniqueness of this article lies in comparing the ICMS-E legislation and its results in different states of the same region. While most studies on ICMS-E focus on analyzing its implementation in a single state, this research adopts a broader perspective. In addition, the originality of the study is highlighted when approaching the ICMS-E from the theoretical framework related to the coordination of public policies, more specifically, exploring the instruments that can promote coordinating environmental policies among federal entities. For this reason, this study offers an important contribution to the field of sustainability in regional planning since it recommends improving ICMS-E policies in the states that already adopt them, while also guiding the states that have not yet implemented them.

The article has five divisions in addition to this introduction. The second presents the theoretical framework for coordinating public policies and their different instruments. The third division deals with ICMS-E and its existence in Brazil with a focus on experiences in the Legal Amazon. In the fourth division, the ICMS-E initiatives studied are related to the public policy coordination literature. Lastly, the final considerations are stated highlighting the lessons learned from implementing ICMS-E in the states of the Legal Amazon.

Coordination of public policies and their instruments

Brazil is a federal country composed of Union, States, Federal District, and municipalities operating with political, financial, legal, and administrative autonomy. However, the Federal Constitution (Brazil, 1988) established some common competencies among entities such as environmental protection and preservation. This means that everyone has a responsibility for the environment and must carry out environmental policies individually or jointly. In addition, because it has to do with natural resources, the performance of a federative entity affects the whole, indicating high interdependence among these actions.

Thus, the effectiveness of environmental public policies demands coordination among different federal entities. The lack of coordination can generate disarticulation-fragmentation of





different initiatives, reduce the efficiency and effectiveness of the organizations involved, increase operational costs, and negatively impact institutional infrastructure (Santos, 2004).

The coordination of public policies can be understood as the management of interdependence among the activities of a single policy or several (Castro & Young, 2017). This requires understanding what are the interdependent activities carried out among institutions, actors, and policies to manage and improve their results. It is not, therefore, a purely technical issue that involves managerial adjustments. It is also a political issue due to the need to agree on views and perspectives among the actors so that they are translated into integrated public action. In this sense, the political dimension of coordination discusses the what, for whom, why, and with whom. The how is discussed in the technical dimension (Repetto & Fernandez, 2012).

For Bouckaert, Peters, and Verhoest (2010), the coordination of public policies refers to the operation of instruments aimed at increasing voluntary or forced alignment of tasks and efforts of organizations within the public sector, which is able to create greater coherence and reduce "redundancy, gaps, and contradictions within and among policies, implementation, or management" (Bouckaert et al., 2010, p. 16). Coordination would thus imply in the mobilization of strategies and instruments aiming at a vertical or horizontal adjustment of government actions. Instruments often deal with coercion or the use of incentives (Jaccoud, 2020).

Vertical coordination, also called intergovernmental, occurs between different levels of government (Union, states, and municipalities), being a way to generate cooperation, overcome fragmentation, and overlap of actions. Vertical coordination is expected to be able to minimize conflicts between policies and organizations, increase the efficiency of the resources employed, and create some uniformity in citizen rights (Jaccoud, 2020).

Horizontal coordination occurs among organizations and political and bureaucratic actors that make up the same level of government (SOUZA, 2018a). It prevents administrative units that perform the same function from repeating efforts within the same sector or from





competing between administrative units designated for the same function (Repetto & Fernandez, 2012).

This article focuses on vertical coordination by specifically involving the relationship between states and municipalities and by addressing the environmental issue whose responsibility is shared by all federal entities. For this, different instruments are necessary to produce convergence of interpretations, increase the legitimacy of objectives and strategies and to produce alignment of information and management, thus reducing the costs of implementing the policy (Jaccoud, 2020).

The following instruments can be mentioned by the literature to obtain vertical coordination:

- i) Financial instruments that include transfers, resource links, and financial incentives
- ii) Standards related to the rules of operation of the policy
- iii) Organizational structures or forums of negotiation and/or collective decision
- iv) Management such as intergovernmental agreements and plans and measures aimed at strengthening administrative capacity and management
- v) Information, including communication dynamics, content alignment, and training of managers and bureaucracies (Jaccoud, 2020)

According to Bichir (2016), the reduction of the space for discretion at the municipal level is also an instrument of coordination. In this sense, when the state establishes environmental criteria for municipalities to receive greater financial transfers, it is seeking to influence certain behaviors and limit the range of environmental policies available to municipalities.

The instruments to achieve coordination are not incompatible, but complementary: their use depends on the nature of the public policies, the context in which they will be implemented, the resources that can be mobilized, and the demands (Peters, 2018). They also refer to technical-administrative aspects (financial, regulatory, informational, and managerial) and to political aspects (organizational, which depend on authority and negotiations) of coordination.





Trein, Biesbroek, Bolognesi, Cejudo, Duffy, Hustedt & Meyer (2021), however, warn of the difficulty of identifying the results of coordination in public policies. One of the reasons for this is the absence of methodologies to measure the success of coordination. For the authors, there are several interactions and factors between policies and organizations that make it difficult to evaluate the precise effects of coordination.

Given the difficulty of assessing coordination by itself, the present study chose to focus on the different coordination instruments used in each ICMS-E policy and on the results of these same policies over time. It is believed that such analyses can collaborate to identify the best adequacy of the instruments to the policy and their contribution to its success.

The Ecological ICMS and its implementation in the states of the Legal Amazon

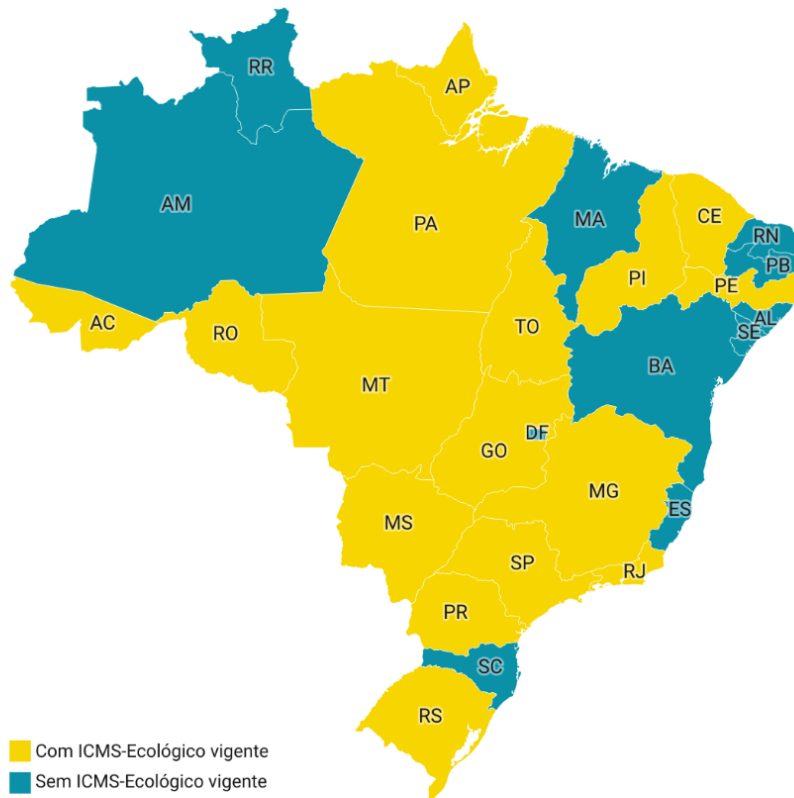
ICMS-E is not a recent initiative and in the pioneer states its implementation took place three decades ago. Even after all these years, the initiative continues to be implemented, resisting political, institutional, and legal changes. This situation highlights the capacity of ICMS-E to meet the interests of legislators, state and municipal representatives of the Executive Branch, as well as of society, being a flexible tool to adapt to the context without losing its characteristic of being an environmental regulatory policy (Castro et al., 2022).

Sixteen states have already implemented ICMS-E in their territory, the last being Pará in 2012. But so far (September 2023), there are still ten Brazilian states where this proposal has not been approved, most of them in the Northeast Region (Figure 1).



Figure 1

Brazilian states with ecological ICMS legislation implemented



Source: Authors' elaboration

Among the states that make up the Legal Amazon, Maranhão, Amazonas, and Roraima do not have ICMS-E policies, even having vast protected areas with a vocation for the development of actions that combine social justice, economic dynamism, and environmental preservation.

According to Merlin and Oliveira (2016), the configuration of the ecological ICMS depends on the state's objective. Different studies show that some states expect compensating



municipalities for delimiting areas in their territory with restrictions of use, such as conservation units. Other states use ICMS-E as a stimulus for municipalities to adopt actions aimed at environmental conservation and sustainable development. An additional view is that the ecological ICMS is an award or payment for environmental service to encourage owners and managers to conserve areas of high biodiversity and ecosystem services (Ferreira & Sobrinho, 2012).

The definition of the ICMS-E transfer criteria is a strategic and political option of each state and must be understood within its specific context. In general, these criteria are quite varied and may include the existence of conservation units, water supply springs, waste collection and recycling systems, along with characteristics and quality of environmental management with a focus on creating municipal environmental councils and funds, as well as the existence of environmental policies of reforestation, firefighting, among others (Castro, Correa, Costa, Costa, Medeiros & Young, 2018). All states of the Legal Amazon adopt the existence of conservation units and indigenous land as a criterion for the distribution of resources from ICMS-E.

The calculations for the distribution of state resources are also quite diverse with proposals for performance rankings or importance of the areas to be preserved. In some cases these calculations are confusing and difficult to understand and the lack of transparency in the disclosure of accounting, criteria, and even transfers does not favor the dissemination of this policy among the municipalities (Uhlmann, Rossato & Pfitscher, 2010).

The various experiences already carried out with ICMS-E show that it is a regulatory policy that has several instruments capable of coordinating municipal environmental actions considering the objectives of the states, whether compensation, stimulus, or awards (Castro et al., 2019). To understand how ICMS-E legislations use different coordination instruments that can lead to different results, the ICMS-E initiatives carried out by the states part of the Legal Amazon will be presented below.





State of Rondônia

In Rondônia, the ecological ICMS was implemented by Complementary Law 147/1996, allocating 5% of the share of the ICMS according to the territorial occupation of the municipalities with federal, state, or municipal conservation units (CUs) and indigenous land (IL) considering their relationship with the total area of protected areas in the state. Decree 11,908/2005 establishes the calculation rules and specifies that the financial contribution received as Ecological ICMS is based on the size of protected areas in each municipality (Carneiro, Chincoviaki, Vidigal & Ademir, 2018).

Complementary Law 147/1996 also points to a concern with the quality of conservation of the CUs. It provides a discount on the amount that will be passed on to the municipality due to the proof of illegal land encroachments or explorations in the CUs. However, as highlighted by Oliveira and Murer (2010) and Rocha and Bacha (2019), there is no information on implementing such a system to evaluate the “quality” of the protected areas. In practice, the municipalities of Rondônia only register their protected areas with the State Department for the Environment to qualify to receive the transfer from the Ecological ICMS, which are not subject to any control over their conservation units.

Another point to highlight in Rondônia is that the share of the ICMS distributed to the municipalities has contradictory criteria. At the same time that it determines 5% for environmental criteria, it directs another 5% to municipalities according to their agricultural production, livestock, and resource extraction. Thus, the expected effect of stimulating environmental conservation in the state is counterweighed by the stimulus to traditional agricultural production.

Studies by Oliveira and Murer (2010) and França (2015) show the impact of these contradictory stimuli. Oliveira and Murer (2010, p. 212) state that: “The municipalities in the state of Rondônia had little participation in creating new conservation units, not acting positively when applying the new criterion for transferring ICMS revenue.” An increase in deforestation





was also identified in this state mainly due to the expansion of agriculture in the period considered.

Carneiro et al. (2018) point out that between 2013 and 2016, 33% of the municipalities of Rondônia did not receive ecological ICMS resources because they did not have any protected area in their territory. This result reveals that after more than 20 years of implementation of this policy, with relatively simple criteria for the transfer of ICMS-E resources, there are still bottlenecks that need to be addressed for its effectiveness: either the Ecological ICMS criteria have not been well communicated to municipal managers or the remuneration passed on has not been enough to stimulate the creation of municipal conservation units compared to the other productive activities performed in the municipalities, which are usually linked to agriculture and deforestation)¹.

Furthermore, the proposal to evaluate the quality of the areas protected has not been carried out, lacking management tools capable of periodically monitoring cases of illegal land encroachments or explorations in these territories.

State of Amapá

Amapá passed its first ICMS-E law in 1996 (Law 0322/1996). This legislation defined the same percentage of transfer (1.4% of the share of the ICMS) to the environmental criterion and to the criterion of cultivated area. This choice may have generated a distortion in achieving the state objectives of stimulating environmental protection with the ecological ICMS because the municipality would receive the transfer of the funds both when protecting the environment and when expanding the pressure on agricultural efforts (Farias, 2017).

Corroborating this statement, Mendes (2009) points out that over time (between 1996 and 2008) there was a higher concentration of the share of the ICMS (including all the state

¹ Subtil, Mayara. Rondônia loses 70,000 km² of forest in almost 30 years, according to Mapbiomas. G1 RO Feb/12/2020. Available at: <https://g1.globo.com/ro/rondonia/natureza/amazonia/noticia/2020/02/12/rondonia-perde-70-mil-km-de-floresta-em-quase-30-anos-aponta-mapbiomas.ghtml>





parameters) in only two municipalities: Macapá and Santana, which received 80% of the resources. These municipalities did not receive resources because of the environmental criterion but did not have their transfers suspended. This situation shows that the percentage of 1.4% of the share of the ICMS divided by environmental criteria is not enough for the policy to have a significant impact.

Mendes (2009) also points out that until 2008, no CUs were created by the municipalities, showing that the policy did not contribute to expanding protected areas in the Amazon. The small amounts contributed to the disinterest of municipal managers in receiving resources coming from environmental preservation.

Due to these criticisms, Law 322/1996 was replaced by Complementary Law 120/2019. The latter changed the percentage of the share of the ICMS to be distributed based on the environmental criterion from 1.4% to 2%, and the criterion of cultivated areas was reduced to 1%. It is believed that this new division has a greater possibility to stimulate environmentally appropriate activities in the face of agricultural production, which generates pressures on natural resources. However, the percentage of 2% is still considered low since most Brazilian states allocate 5% of the share of their ICMS to municipalities based on environmental criteria (Castro et al., 2019).

The new legislation of ICMS-E of Amapá maintained the general rules of the previous legislation, determining that these resources are distributed based on the Municipality's Conservation Index. This index considers both the size of the protected areas (federal, state, municipal, and private) and their quality. In the latter case, calculating the Conservation Index considers the category of management (ecological station, park, indigenous land, etc.) and a quality factor (Complementary Law no, 120/2019/).

The quality factor, also provided for in the previous law, should consider the physical quality of the protected area, the management plan, infrastructure, protective environment, inspection structure, among other parameters. However, it has never been implemented since





the regulation of the law has not been enacted, a situation that continues until now (September/2023).

State of Mato Grosso

Mato Grosso instituted the Ecological ICMS through Complementary Law 73/2000 and Decree 2,758/2001. These regulations have established that 5% of the quota share of ICMS should be distributed according to the existence of conservation units and indigenous lands.

Initially, basic sanitation was among the criteria for the distribution of ecological ICMS in this state, but in 2004 this criterion was extinguished and a social criterion was created with 11% of the share of the ICMS and 5% was maintained for protected areas through Complementary Law 157/2004.

The protected areas criterion is calculated through the percentage ratio between the Protected Areas Index of Municipalities, referred to as the Conservation Factor of municipalities, and the sum of the Protected Areas Indexes of all municipalities of the state, which is called the State Conservation Factor. This is a calculation similar to that carried out by the state of Amapá composed of quantitative factors that consider the area of the CUs and IL in the state and their municipalities along with qualitative factors.

The qualitative criteria for the distribution of ICMS-E were instituted by Normative Instruction (NI) 001/2010 of the State Department for the Environment. This NI establishes minimum and maximum scores for the Conservation Factor of the municipality depending on the land situation of the protected area, characteristics of the surroundings, zoning, management plan, among other criteria, as defined by the Ecological ICMS Technical Council.

This Council was also created by NI 001/2010, which is composed of members of the State Departments of the Environment and Finance of Mato Grosso, representatives of the Mato Grosso Association of Municipalities, FUNAI, Court of Auditors, and non-governmental organizations. The Ecological ICMS Technical Council has the objective of defining the





guidelines of the program in the state, but no information on the current functioning of this council was found.

Spanholi, Young and Videira (2023) showed that there has been a gradual increase in the number of municipalities receiving ICMS-E in the state. In 2002, only 68 of the 141 municipalities received transfers from ICMS-E. This number increased to 91 in 2019, although for most of these municipalities the ICMS-E represented a share of up to 10% of their total revenue. Miranda (2012) revealed that among the 55 municipalities of Mato Grosso that did not receive ICMS-E in 2009 were those with the lowest GDPs, thus losing an opportunity to increase their revenues.

On the other hand, Mattei and Meirelles Neto (2015) said that the municipalities that began to receive the Ecological ICMS in a high proportion compared to their total revenue sought to preserve more and more of their natural resources, given that they receive financial compensation for this. In a more recent study, Spanholi (2022) found that the average spending on environmental management in the municipalities of Mato Grosso benefited from the Ecological ICMS was higher than that of municipalities that do not receive such resources. This result shows that even if the municipality is not obliged to use the resources on environmental policies, receiving ICMS-E is related to expenditure on environmental management

State of Tocantins

In Tocantins, Law 1,323/02 established that 13% of the share of ICMS in the state would be distributed based on environmental criteria. Within this percentage, the distribution was made according to the following criteria: the existence of a Municipal Environmental Policy (2%); controlling and combating fires (2%); soil conservation (2%); conservation units and indigenous land (3.5%); and basic sanitation with waste disposal (3.5%), considering that within each criterion there are quantitative and qualitative indexes.

According to Matsubara (2017), between 2003 and 2016 approximately 145,000 hectares of municipal protected areas were created in Tocantins, a volume 447.38% higher than





the period of 1989 to 2002, which is prior to the implementation of ICMS-E. This data is relevant because it demonstrates the ability of state legislation to influence municipal action. The author also points out that most of the municipal protected areas created were full protection and attributes this result to ICMS-E. This is because the ICMS-E legislation in the state confers a higher score for the conservation units of this group in the calculation of the resource transfer. On the other hand, Matsubara (2017) pointed out that mechanisms for evaluating this regulatory policy lacked the participation of civil society and that adjustments were needed in the legislation.

Thus, in 2015, Law 2,959/2015, later amended by Laws 2219/2017 and 3,348/2018 updated the criteria for distribution of the quota share of ICMS in the state based on the Index of Participation of the Municipalities (IPM). This index maintained the 13% transfer of the quota part of the ICMS under environmental criteria, which is prepared with data from the previous base year and applied to the subsequent year. The legislation also established a special committee composed of members of the state and municipal governments to monitor and discuss the application of the Ecological ICMS.

In the legal order, it was also established that the Institute of Nature of Tocantins (Naturatins) is responsible for listing the requirements and for preparing the environmental indexes that have undergone some changes in relation to the law of 2002, the most significant being: the criterion of conservation units and indigenous land was replaced by the Municipality's Biodiversity Conservation and Indigenous and *Quilombola* Land Index; the criterion related to basic sanitation began to include the conservation of water; and a criterion related to sustainable tourism was created that represented 1% of the percentage of ICMS-E, but it is not yet clear in the current legislation how this index is calculated².

² Decree 5,264/2015 explains how to calculate all the indexes in its annex III, but in the case of the Sustainable Tourism Index, it is only stated that it must be appointed by the Department of Economic Development, Science, Technology, Tourism, and Culture of Tocantins, taking into account only those municipalities that are part of the Brazilian Tourism Map.





Decree 5,264/2015 explains how to calculate these indexes, which have quantitative and qualitative information. Data for calculating the transfers are taken from both official statistics and questionnaires answered by the municipalities and forwarded to the state government.

According to Mitye (2021), there has been a considerable increase in the number of municipalities in the state that received financial transfers throughout the implementation of ICMS-E. Matsubara (2017) corroborates this information pointing out that the policy of the Ecological ICMS was assimilated by all the municipalities of the state of Tocantins, radically improving the distribution of ICMS to the municipalities that have more than 30% of their territory occupied by indigenous land.

State of Acre

Acre instituted the Ecological ICMS from Law 1,530/2004, but only started its implementation in 2010. This legislation defined that 5% of the share of ICMS would be passed on to municipalities that contained areas of environmental preservation, indigenous land, and a municipal environmental system. According to Decree 4,918/2009, the municipal environmental system would be composed of a council and municipal environmental fund and the administrative body implementing the municipal environmental policy.

The calculations and indexes for applying the Ecological ICMS in Acre were established by Ordinance 091/2010 of the State Department for the Environment. The ordinance decided that the existence of a CU (a weight of 0.9) and indigenous land (a weight of 0.1) as adjusted by a correction factor according to the area and population would offer the participation index corresponding to the ICMS-E of each municipality. However, the municipal environmental system was not considered among the transfer criteria defined in the ordinance, even with its provision in the relevant regulations. This ordinance remained the basis for distributing ICMS-E in the state until 2018, but already in 2014 authors such as Maia, Saccaro Júnior, Gómez, Roper e Pires (2014) advocated the need for definitive regulation of indexes, which faced political resistance.





Thus, in 2019, Law 3,532/2019 was enacted that established new parameters for distributing the quota share of ICMS in Acre, which changed from 5% to 2.5% the percentage to be distributed to municipalities according to environmental criteria. The new criteria defined were the area occupied in the municipalities by conservation units, indigenous land, and environmental preservation areas, whether public or private property, and the Index of Effectiveness of Municipal Management (IEGM in Portuguese)³ of each city in terms of environmental issues.

The IEGM is determined by the Court of Auditors of the State of Acre (TCE/AC), relieving the management of the state Executive Branch in terms of data collection and analysis. The IEGM seeks to evaluate the effectiveness of municipal public policies related to solid waste, basic sanitation, environmental education, as well as considering the municipal environmental management structure. The indexes that make up the environmental criterion are calculated by the percentage ratio between the data of each municipality and the total of the State as obtained by the sum of the data corresponding to each index.

Law 3,532/2019 also created the Deliberative Council of the Municipality Participation Index in ICMS (CODIP/ICMS) with representatives from state and municipal governments. This body must make decisions regarding the distribution of the quota part of the ICMS in the state.

The reduction of the percentage destined for ICMS-E in Acre is a setback for the policy because the transfer of a lower proportion of resources can discourage municipalities to improve their environmental performance. However, the first legislation on the subject in the state was ineffective in considering the changes in environmental management over time since the calculation stipulated by Ordinance 091/2010 for the distribution of ICMS-E remained

³ IEGM is a process indicator that measures the performance of municipal management in seven areas: education, health, fiscal management, planning, environment, civil defense, and governance in information technology. The performance of the municipalities, as estimated from the level of adherence to certain processes and controls, is measured from the score assigned to the questionnaires answered annually by the municipalities and analyzed by the Court of Auditors of each state.





unchanged for eight years based only on the existence of protected areas. That is, since the distribution of resources remained unchanged regardless of the improvement of environmental management, the municipalities had no reason to compete and increase their environmental quality.

It is expected that with the modifications introduced by Law 3,532/2019, this situation will be changed bringing greater possibilities to identify changes in the environmental quality of the municipalities while promoting engagement with the municipalities. If legislation is better applied even at low percentages, it is possible to expect more satisfactory environmental results.

State of Pará

In the state of Pará, Law 7,638/2012 establishes as a prerequisite for the municipality to participate in the distribution of ICMS-E the existence of a municipal environmental system composed of a council and a municipal environmental fund, an implementing body, and other instruments necessary for implementing municipal environmental policies.

The indexes are calculated annually and 8% of the quota value of the ICMS is allocated according to environmental criteria. The criteria in force until July 2016 included the percentage of the municipal territory occupied by protected areas (CUs, indigenous land, and *quilombola* territories), the amount of vegetation cover in the municipalities, and the environmental regularization through the Rural Environmental Registry (Decree 775/2013).

Since 2016, the State Department for the Environment and Sustainability of Pará has been adjusting the criteria for the distribution of resources among municipalities based on multivariate statistics. It also publishes annual ordinances that establish the index for the transfer of the Ecological ICMS from the state for the following year. In 2021, Ordinance 747 established the distribution parameters for the year 2022 with the following variables and weights:

- I - Rural Environmental Registry (14.16%)
- II - Permanent Preservation Areas (11.06%)





- III - Legal Reserve Area (10.70%)
- IV - Anthropized Area, negatively computed in the model (13.12%)
- V - Reserve for Native Vegetation (13.87%)
- VI - Areas of Restricted Use (12.02%)
- VII - Areas of Sustainable Use (12.48%)
- VIII - Analysis of CAR in the Municipality (12.61%)

This methodology is quite elegant but requires annual updating of the weights and not only of the variables. The main component method used for assigning the weights requires complex statistical treatment. In other words, the coefficient is not fixed a priori, and the weight of each criterion is given endogenously in the model.

The change in the methodology has reduced the criticism of the criteria practiced previously. According to Merlin and Oliveira (2016), the first year of applying the Ecological ICMS in Pará generated a concentration of transfers to a few municipalities, including ones with high levels of deforestation. This same criticism was formulated by Ferreira (2016) who emphasized the misconception of including protected areas of different categories with the same weight in the calculation of transfer given the conflicts of use in areas set aside for protecting the Amazon biome. The author also questions the use of CAR among the environmental criteria of transfer of the ICMS-E: "The integrity of the environment is not measured by the simple calculation of the area of a conservation unit or the area inserted into the Rural Environmental Registry" (Ferreira, 2016, p. 120).

On the other hand, Merlin and Oliveira (2016) assured that the reasons for this discrepancy between the objectives set with the Ecological ICMS and its practical results seem to have elapsed from the incomplete implementation of the environmental management system in the state.

Table 1 summarizes the data presented:



Table 1

Characteristics and results of the implementation of ICMS-E in the states of the Legal Amazon*

States of the Legal Amazon that have ICMS-E	Year of the first ICMS-E law	ICMS-E Percentage	Environmental criteria	Characteristics and results
Rondônia	1996	5%	Conservation units and indigenous land	No new municipal protected areas have been created over time. The system to assess the quality of the protected areas has not been implemented. There are contradictory ICMS distribution criteria.
Amapá	1996	2%	Conservation units and indigenous land	No new municipal protected areas have been created over time. The system to assess the quality of the protected areas has not been implemented. There are contradictory ICMS distribution criteria.
Mato Grosso	2000	5%	Conservation units and indigenous land	The system to assess the quality of the protected areas has not been implemented. An ICMS Technical Council was established. The results of the policy were positive because the ICMS-E induced the municipalities to greater spending on environmental management.
Tocantins	2002	13%	Municipal Environmental Policy; Controlling and combating fires; Conservation and management of soils; Conservation units, indigenous land, and <i>quilombolas</i> ; Basic sanitation and water conservation; Sustainable tourism.	There is a system to evaluate the quality of environmental management annually; an ICMS-E committee is in place; and there has been an increase in the municipal protected areas and an improvement in the distribution of ICMS-E, evidencing the improvement in the environmental results of the municipalities.
Acre	2004	2.5%	Conservation units, indigenous land, and Municipal Environmental Management Effectiveness Index.	No positive results from the ICMS-E policy were identified prior to the new law. The new legislation created an ICMS council, rules to add value to municipal environmental management, but it reduced the percentage for transferring the share by environmental criteria.
Pará	2001	8%	Rural Environmental Registry; Permanent Preservation Area; Legal Reserve Area; Anthropized Area, negatively computed in the model; Native Vegetation Reserve; Areas of Restricted Use; Areas of Sustainable Use; Analysis of CAR in the municipality.	There is no ICMS-E council. The municipal environmental system is a requirement to participate in the policy. A complex system for calculating transfers has been established, but is still in implementation, which seems to have generated distortions in the policy's results.

*Amazonas, Roraima, and Maranhão do not have Ecological ICMS. Source: Authors' elaboration

Discussion of the results

In the experiments analyzed it was verified that the main ICMS-E policy coordination instrument is the regulation, establishing the specific criteria for the transfer of resources between states and municipalities. In this sense, the states restrict the space of discretion in terms of environmental policies of the municipalities that aim to expand their transfer of ICMS-E.

However, when using this coordination mechanism, it is important that the states present simple and unequivocal guidelines to the municipalities, leaving no doubt about the objectives of the ICMS-E policy (compensate, encourage, or reward). In addition, it is appropriate that the legislation not benefit contradictory actions such as rewarding environmental performance while promoting agricultural production in the distribution of the quota part of the ICMS. Because they are activities that usually compete in the territory, the ICMS-E policy may not achieve its objectives since the city halls do not know which actions to privilege. This contradiction of objectives was seen in the states of Rondônia and Amapá and the ICMS-E policy had little effectiveness.

The financial instrument of coordination is used by all ICMS-E initiatives precisely because the policy is guided by tax transfers based on environmental criteria. It is known that the amounts collected in terms of ICMS in the states are unequal (Ministry of Finance, 2023). This disparity is correlated with factors such as the economic situation, the population size, and other specific variables of each region. This circumstance justifies the assessment of ICMS-E transfers based on proportions of the total value transferred by the state rather than considering absolute values.

Thus, in the ICMS-E initiatives analyzed, there is a variation between 2% and 13% in the transfer percentages. This variation generates unequal results in environmental quality and in the increase of protected areas. In states with the lowest proportional percentage of transfer such as Amapá, there is little significant impact from the ICMS-E policy. Recently Acre reduced the percentage of ICMS transfer by environmental criteria from 5% to 2.5%, which may



discourage municipalities to improve their environmental performance, especially in municipalities where there is greater economic dynamism and depend less on state transfers.

If the state's objective is to induce environmental improvement, including creating new protected areas, it is necessary that the percentage of the transfers be higher or that other instruments of coordination of public policies be used so that the municipality is stimulated to do so.

All states of the Legal Amazon with an ICMS-E policy attach importance to conservation units and indigenous land in the transfer of resources. This measure is a relevant environmental action since protected areas are instruments of biodiversity conservation, making it possible to maintain the integrity of species, populations (including humans), and ecosystems (Medeiros, Coutinho, Martinez, Alvarenga & Young, 2018). The criterion of protected areas in the ICMS-E legislation encourages municipalities to see the maintenance of these areas as a source of revenue, not as a hindrance to their development. This is because the Ecological ICMS resources may be higher than the revenues from activities that are harmful to the environment (Carneiro et al., 2018).

The constitution of collective bargaining forums is also an instrument for coordinating the ICMS-E policy used by the states of Mato Grosso, Tocantins, and Acre. The councils set up allow the participation of various segments of society that are mobilized to discuss the functioning of the ICMS-E. This action contributes to the negotiation, supervision, and monitoring of the policy, thus allowing its improvement. It also generates the dissemination of knowledge about it, contributing toward the municipalities adapting the criteria and expectations established by the state government to transfer resources. It is believed that these instruments have contributed to the good performance of ICMS-E in Mato Grosso and Tocantins. In the case of Acre, it is difficult to analyze its results due to the recent creation of the space of participation.

Since the creation of the ICMS-E policy in the states of the Legal Amazon there has been an expectation of passing the state resources to the municipalities not only for the





existence of conservation units and indigenous land, but also for their quality. This would mean assessing whether good environmental management is taking place in these areas, whether deforestation was controlled, whether there is land encroachment going on, etc. However, the qualitative analysis is much more complex than the simple transfer based on the existence or not of these areas, requiring periodic follow-up. It also demands a management capacity from the states and municipalities, monitoring methodologies, qualified employees, and exchange of information among agents, which are skills that are not necessarily readily available in all states and municipalities.

It is known that in Brazil there is an inequality in administrative capacity among the entities, which impacts the way policies are implemented (Papi, Aguiar, Lima e Lui, 2021; Souza, 2018b, *Atlas do Estado Brasileiro*, no date). Thus, in Rondônia, Acre, Amapá, Pará, and Mato Grosso the Ecological ICMS policies were not implemented in their entirety, and it is still necessary to develop regulations and stable systems for data collection and processing.

Because of this states such as Tocantins and Pará are seeking to include in the ICMS-E law a management coordination instrument aimed at strengthening the administrative capacity of the entities. On the other hand, the state of Acre has partnered with the TCE/AC in gathering and analyzing the municipal information that makes up the IEGM in the environmental dimension. This index can capture annually the changes in the management by the city halls, favoring with higher transfers those with better environmental performance while encouraging others to improve their conditions.

According to Xerente and Bilac (2018), the criteria related to environmental management have encouraged municipalities to build policies for the area, being an important pedagogical tool. It is also a means to enhance the actions of environmental agencies, providing opportunities to work together with different institutions so that the criteria defined by the state legislation are met. The authors also point out that the requirement to set up municipal environmental councils for the transfer of the Ecological ICMS in some states favors the





participation of the local population in the decisions and in the supervision of environmental policies. However, these councils need to allow the participation of various segments of society without compromising the speed of decision-making (Xerente & Bilac, 2018).

These criteria seem to be appropriate to states that have an interest in encouraging or rewarding the environmental actions of the municipalities. But as mentioned, they demand that the management tools of coordination be mobilized both in the states, which evaluate the environmental results of the municipalities, and within the municipalities themselves.

The information coordination instruments, including content alignment and training of managers and bureaucracies, were identified in some states. In Tocantins, for example, training courses were held for municipalities specifically about the ICMS-E (Mitye, 2022). In Amapá the course taught dealt with the general distribution of ICMS (Amapá, 2019). In Pará, training courses were identified for filling out the Rural Environmental Registry, which impacts the distribution of the ICMS-E in the state (Pará, 2023). It is understood that for the Ecological ICMS to be an effective policy, it is necessary to provide broad communication regarding its objectives, criteria, calculations, and transfers to the municipalities. If these cities do not understand the policy, they will not engage in reaching their purposes, which implies that fewer incentives will occur for municipalities to meet the environmental criteria stipulated by the state, therefore compromising its effectiveness (Castro et al., 2019).

In this research, it was possible to verify that the policy coordination instruments can be used separately. However, when combined, they present a greater chance of contributing to the success of the policy. This is demonstrated by the more satisfactory results from the ICMS-E policy achieved in Tocantins where different coordination instruments are combined and an increase in municipal protected areas has been noticed in addition to an improvement in the distribution of the ICMS-E, evidencing the positive environmental results of the municipalities in this state.





Thus, when dealing with federal coordination, it is possible to assume that a clear objective by the state and the mobilization of informational, normative, financial, managerial, and organizational instruments stimulate the actions of the municipalities toward the state's interest. In the specific case of ICMS-E, depending on the criteria and the use of coordination instruments, it is believed that the policy can optimize its results. This is because if it uses environmental criteria that are verified annually and coordination instruments that are able to measure the quality of municipal environmental management, ICMS-E will generate positive competition among municipalities because as they work toward obtaining greater financial transfers, they need to achieve better environmental results.

However, it is known that despite the better results that ICMS-E policies have had in recent years, they have not been able to prevent high rates of deforestation in the states of the Legal Amazon. Different factors compete for this result that fall short of the ability to influence this state regulatory policy (Young, 2021). Nevertheless, the policy's stimulus to maintain protected areas and to strengthen the municipal institutional capacity for carrying out environmental policies have effects that mitigate the factors that stimulate the activities that degrade the environment.

Final Considerations

This study aimed to present and analyze the adoption of the Ecological ICMS in the states that make up the Legal Amazon and the instruments mobilized by these regulatory state policies to coordinate the environmental actions of their municipalities.

The states of Maranhão, Roraima, and Amazonas are the only ones in the Legal Amazon that have not implemented an Ecological ICMS policy. In the other states, it is possible to observe different environmental criteria for distributing resources of the quota part of the ICMS, being more usually the criteria related to the existence of protected areas and indigenous land.





All ICMS-E policies in these states use regulatory and financial instruments, even by their very nature, which are based on the transfer of resources based on environmental criteria. The organizational coordination instruments were also mobilized by different states generating different results from the policy. These instruments include the formation of negotiation forums, providing information including training about ICMS-E, and managerial ones dealing with the technical-administrative capacities of the states and municipalities.

Some lessons can be learned from the ICMS-E policies in the states of the Legal Amazon:

- A lack of clarity was identified regarding the objectives that the state contributes to lower the effectiveness of the ICMS-E. In this sense, the inclusion of criteria compromising the environment in the distribution of the share of the ICMS such as an incentive to agriculture impairs its effectiveness because it does not adequately direct the stimulus to the municipal environmental preservation.
- The creation of ICMS-E follow-up councils composed of actors from different segments can be an important space for the negotiation and alignment of the policy, contributing to its coordination.
- Coordination instruments related to management are very important either as a stimulus for municipalities to improve their environmental management or to increase the capacity of states to analyze such improvements.
- The tax transfer should be carried out given a percentage to be transferred as a quota part of the Ecological ICMS that encourages municipal preservation actions. When dealing with the financial instrument of coordination, it is verified that the higher the percentage set aside for the transfer of the ICMS-E, the higher the positive response by the municipalities to the state's stimulus toward environmental preservation.

Finally, it should be emphasized that the analysis of the coordination of public policies based on their instruments proved to be correct since it allowed to identify which instruments





most induced municipalities to meet the environmental criteria stipulated by the states. It was observed that these instruments can be employed independently, but it was concluded that a greater number of coordination instruments in the state policies of ICMS-E resulted in more satisfactory performances of municipal environmental policies.

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