

Sustainable budget: a critical analysis of the budget management of Paragominas-PA (Brazil) in relation to the SDGs

Orçamento sustentável: uma análise crítica da gestão orçamentária de Paragominas-PA (Brasil) perante os Objetivos de Desenvolvimento Sustentável

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ABSTRACT

The study critically analyzes the budget management of the municipality of Paragominas-PA between the years of 2013 and 2023, verifying its alignment with the UN 2030 Agenda and its national adaptation, the SDG Brazil Agenda, focusing on fiscal, social, and environmental sustainability. The key issue lies in the inconsistency between the institutional discourse of sustainability and the effective execution of public resources. The objective of the research was to measure budgetary performance and identify gaps that compromise the effectiveness of municipal policies. Methodologically, a documentary and comparative analysis of secondary data from SICONFI, RREO, and the Pará Sustainable Development Index (IDS-PA) was carried out, allowing for an assessment of the degree of integration between municipal actions and the SDG goals. The results indicate that, although 86.7% of the budget was executed, R\$ 1.09 billion was not invested in priority areas such as health, sanitation, and environmental management. Challenges related to low institutional capacity and the fragmentation of public policies persist. It is concluded that progress toward local sustainability depends on innovation in budgetary governance and the consolidation of integrated planning and monitoring mechanisms.

Keywords: public budget management; governance; sustainability; agenda 2030; paragominas-PA.

RESUMO

O estudo analisa criticamente a gestão orçamentária do município de Paragominas-PA entre 2013 e 2023, verificando seu alinhamento à Agenda 2030 da Organização das Nações Unidas (ONU, 2022) e à sua adaptação nacional, a Agenda ODS Brasil, com foco na sustentabilidade fiscal, social e ambiental. O problema central reside na incoerência entre o discurso institucional de sustentabilidade e a efetiva execução dos recursos públicos. O objetivo foi mensurar o desempenho orçamentário e identificar lacunas que comprometem a efetividade das políticas municipais. Metodologicamente, realizou-se uma análise documental e comparativa de dados secundários do Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro (SICONFI), Relatório Resumido de Execução Orçamentária (RREO) e do Índice de Desenvolvimento Sustentável do Pará (IDS-PA), permitindo avaliar o grau de integração das ações municipais às metas dos ODS. Os resultados demonstram que, embora 86,7% do orçamento tenha sido executado, R\$ 1,09 bilhão não foi aplicado em áreas prioritárias, como saúde, saneamento e gestão ambiental. Persistem desafios ligados à baixa capacidade institucional e à fragmentação das políticas públicas. Conclui-se que o avanço em direção à sustentabilidade local depende de inovações na governança orçamentária e da consolidação de mecanismos integrados de planejamento e monitoramento.

Palavras-chave: gestão orçamentária pública; governança; sustentabilidade; agenda 2030; Paragominas-PA.

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Introduction

In 2017, 5,570 Brazilian municipalities were normatively induced by the Federal Government to incorporate the Sustainable Development Goals (SDGs) into the Multi-Year Plan (PPA), the Budget Guidelines Law (LDO), and the Annual Budget Law (LOA) for the 2018–2021 cycle, according to the National Voluntary Report on the SDGs (Brasil, 2017). This guideline, based on the commitment made to the UN 2030 Agenda and ratified by Decree No. 8,892/2016, redefined public governance by requiring the transition from fragmented budgetary practices to sustainable management models, favoring greater coherence between global goals and local actions (Piketty et al., 2015). The PPA has established itself as a strategic axis of the budgetary system, articulating medium-term guidelines, goals and promoting integration between budget planning and execution. This structure strengthens multilevel governance by aligning public policies and resources among federal entities, supported by analytical processes that ensure legitimacy and consistency in government action.

In the specific case of the municipality of Paragominas-PA, the time frames of 2008 and 2013 were not chosen at random, instead representing moments of institutional transition and the definition of pioneering sustainability policies even before the formalization of the 2030 Agenda in 2015. The year 2008 marks the beginning of the “Green Municipality” program, which symbolized local engagement with innovative environmental practices and the emergence of a model of territorial governance based on the reconciliation of agricultural production and environmental conservation. The period from 2013 to 2023 reflects the maturation phase of municipal public management, in which budget execution began to better highlight the inclusion of sustainability principles in administrative programs and goals systematically. Thus, the analysis of these periods allows us to understand the path of institutionalization of a culture of sustainability-oriented planning, which was later integrated into the logic of the Sustainable Development Goals (SDGs), revealing an evolutionary process between local action and the global agenda (Piketty et al., 2015).

In the public sphere, government action is guided by priorities in the budget, which implies the adoption of control and accountability systems that ensure the consistency and effectiveness of planned actions (Adib et al., 2021; Laine et al., 2021). The materialization of these choices requires budget planning that incorporates efficient execution strategies and, at the same time, considers the risks inherent in local socio-environmental challenges, as pointed out by Berg (2019) and Kump (2021). Thus, it is possible to evaluate the efforts of municipal governments based on public spending behavior, and certainly, a municipality that chooses to become a sustainable territory needs to include actions in the budget aligned with this objective, turning political intentions into concrete achievements (Adib et al., 2021; Asiaei et al., 2022).

On this basis, the main objective of this study is to evaluate the execution of the public budget of Paragominas-PA, based on the understanding that budget performance is an important indicator of the ability of a municipal government to translate political commitments into effective actions (Miscali et al., 2020; FAPESPA, 2024a). As a basis for this discussion, the Sustainable Development Indexes (IDS-PA), developed and published by the Amazon Foundation for the Support of Studies and Research (FAPESPA), was also adopted as a comparative tool between Paragominas, the municipalities of the Rio Capim Integration Region, and the state of Pará. This analysis is especially relevant, as the IDS-PA represents an institutional effort to create parameters capable of supporting sustainability policies at the state level, thus aligning with the concept of polycentric governance systems advocated by Ostrom (2017) and the perspective of institutional legitimacy described by Crossley et al. (2021).

The study seeks to develop methods for assessing the adherence of local public policies to the Sustainable Development Goals (SDGs), prioritizing the government's ability to translate the global goals of the 2030 Agenda into measurable and contextualized results, rather than normative certification of sustainability. The “inconsistency” observed expresses a gap in implementation, reflected in social dependence on income transfer programs and the mismatch between institutional advances and socioeconomic conditions. Sustainability, therefore, requires cultural and social values focused on equity and collective co-responsibility (Piketty et al., 2015).

The analysis of municipal budgetary instruments identified programs in the areas of environment, agriculture, sanitation, social assistance, and governance, revealing efforts to align economic development and environmental conservation. In Paragominas, productive reconversion highlights the challenges of sustainable transition, marked by socio-environmental pressures, inequalities, and the need for institutional strengthening (Piketty et al., 2015).

In this context, the study aims to measure the budgetary performance of the municipality of Paragominas from the years of 2013 to 2023, seeking to identify priorities and inconsistencies in the use of public resources, based on the premise that alignment between the budget and sustainable public policies is an indispensable condition for the effectiveness of government actions (Adib et al., 2021; Laine et al., 2021). In addition, there is a need for innovation in municipal budget planning and execution to better address social inequalities, improve environmental management, and mitigate the impacts of the local production model, aspects that have been identified as fundamental to promoting transformations toward sustainability (Horcea-Milcu, 2022; Sancak, 2023). Finally, a comparison with state indicators, such as the IDS-PA, is promoted in order to highlight the urgency of more realistic, effective, and globally aligned strategies to rigorously and legitimately define a territory as truly sustainable (Guluscio, 2023; FAPESPA, 2024a).

Literature review

agriculture is at the center of the debate on sustainability as it represents a vital economic base and, at the same time, causes one of the greatest pressures on the environment. According to the UN (2021), global support for the agricultural sector reaches about US\$ 540 billion annually, 15% of the total value of production of which 87% distorts prices and intensifies inequalities and environmental impacts. This situation reflects the productivist structure of the agri-food system, sustained by incentives that prioritize economic expansion at the expense of regenerative practices (Piketty et al., 2015). In Brazil, this logic is evident in the Amazon, where rural policies have favored extensive agriculture and livestock farming and exacerbated socio-environmental conflicts.

In Paragominas (PA), a town historically dependent on livestock and timber, the “Municipal Pact for the End of Deforestation” marked an attempt at productive reconversion and strengthening of territorial governance. However, challenges related to social inequality, low productive diversification, and institutional fragility persist (Weber, 1990; Bardin, 2010). Agricultural sustainability requires coordination between economics, politics, and culture, involving interinstitutional cooperation and measurement mechanisms that connect environmental and social goals to budget allocation (Duan et al., 2024; Almeida et al., 2025).

On another front, the performance of the 135 Sustainable Development Goals (SDGs) reveals a worrying picture: only 17% show progress compatible with the targets set for 2030, while 48% show significant deviations, 30% show marginal progress, and 17% show a decline compared to 2015 levels (United Nations, 2023). This scenario reinforces the need to reformulate territorial management and governance mechanisms, promoting more integrated and data-based decision-making processes to ensure the effective achievement of sustainability goals (Kump, 2021; Horcea-Milcu, 2022). Barriers to sustainable action often lie in institutional structures that are resistant to change, highlighting the importance of strategic and transformative interventions (Berg, 2019; Sancak, 2023).

The implementation of the 2030 agenda seeks to ensure sustainable food production systems and the adoption of resilient agricultural practices that not only increase productivity and production but also conserve ecosystems, promoting adaptation to climate change and extreme events (United Nations, 2017). However, the literature shows that business mobilization in favor of sustainability has not increased with the same intensity as production, reflecting an asymmetry between corporate social responsibility and environmental performance (Crossley et al., 2021; Islam et al., 2021). In this context, the importance of the public sector as a driver of the necessary changes to ensure sustainability is reinforced, through robust public policies integrated with planning and control systems (Adib et al., 2021; Laine et al., 2021).

In Brazil, the responsibility for environmental and forest conservation is shared between federal entities and the three branches of government, establishing a complex governance model that requires interinstitutional coordination and cooperation (Ostrom, 2017; Rosenbloom et al., 2022). Thus, practices aligned with the SDGs represent a strategic path for public and private organizations, focusing on the efficient use of resources, the promotion of ethical values, in addition to the adoption of practices that drive transparency and inclusion, thereby strengthening institutional legitimacy and social trust (Guthrie and Parker, 1989; Gulluscio, 2023). Such practices not only mitigate environmental risks but also add economic and social value, consolidating themselves as key elements in the construction of sustainable development models (Gray and Milne, 2015; Asiaei et al., 2022).

The importance of intensifying the focus on the environmental component of the SDG goals in agribusiness management is reinforced by the UN's decision to include agriculture among the most polluting sectors of the global economy due to the intensive use of pesticides, high emissions of nutrients such as nitrogen, phosphorus and potassium, as well as predatory exploitation of the soil, resulting in significant ecological imbalances (ONU, 2022; Stasiskiene, 2022). These impacts highlight the need for better environmental management in the sector, integrating accounting and environmental measurement practices that enable more sustainable and transparent decisions (Adib et al., 2021; Laine et al., 2021). The adoption of Environmental Management Accounting (EMA) systems emerges as a strategic tool for internalizing externalities and improving environmental performance (Asiaei et al., 2022; Stasiskiene, 2022).

Given this scenario, achieving the UN SDGs is a complex and multifaceted challenge, especially considering the climate and environmental urgency that requires immediate and transformative action (George et al., 2016; Berg, 2019). It is essential to mobilize significant amounts of financial resources, whose structuring must go beyond the traditional model of non-reimbursable sources, incorporating new mechanisms that make socio-environmental investments not only viable but also economically sustainable (Crossley et al., 2021; Dorado et al., 2022). The need to integrate economic, social, and environmental aspects into a cohesive financing and planning model is one of the main contemporary challenges in promoting sustainable development (Laine et al., 2021; Sancak, 2023).

The defense of local development, especially in northern Brazil, abstracts from the appreciation of cultural factors, local traditions, the carrying capacity of natural resources, and economic and social interactions, promoting an interdisciplinary approach that addresses the historical challenge of the agriculture/forest binomial (Miscali et al., 2020; FAPESPA, 2024a). This effort requires a systemic transition and a change in the prevailing values that guide productive practices and land use, valuing sustainability as a guiding principle for public and private action (Berg, 2019; Horcea-Milcu, 2022). Strengthening in-

stitutional capacities and developing public policies consistent with territorial specificities are key elements for the success of sustainable development strategies (Ostrom, 2017; Sancak, 2023).

A development perspective focused on sustainability requires the implementation of strategies that are strictly aligned with the SDG goals and integrated at all levels of government: national, regional, and local (United Nations, 2023; FAPESPA, 2024a). At the local level, incorporating sustainable practices into decision-making necessarily involves aligning budget management planning with SDG goals, constituting a strategic mechanism for attracting support and investment, especially for the development of sustainable and inclusive infrastructure (Miscali et al., 2020; Laine et al., 2021). In this process, state intervention plays a central role, directing efforts towards creating institutional and financial conditions that ensure the effectiveness of the sustainability agenda, as emphasized by Adib et al. (2021) and Rosenbloom et al. (2022).

Table 1 was prepared based on a systematic content analysis process, using procedures established by Berelson (1952) and Bardin (2010), which provide the basis for identifying categories, themes, and recurring dimensions in scientific texts and official reports on sustainability, SDGs, and public environmental management in the agricultural sector. The first step was the careful selection of the texts chosen for analysis, prioritizing internationally recognized reference documents, UN reports, as well as recent theoretical and empirical studies that discuss the main challenges, problems, and solutions for sustainability in the agricultural context (George et al., 2016; Dorado et al., 2022). The criteria for inclusion of the texts were: relevance to the object of study, thematic adherence, and academic or institutional representativeness. The research involved academic databases, public policy documents, and specialized literature in order to cover multiple dimensions of the theme.

The dimensions, problems and proposals were identified through categorical content analysis, according to Bardin (2010) and Piketty

Table 1 – Summary of theoretical elements on sustainability, SDGs, and public environmental management in the agricultural sector.

Thematic Dimension	Central Problem	Proposal or Solution	Theoretical Framework	Implications for Public Policy and Management	Challenges for Implementation
Government support for the agricultural sector	Subsidies distort prices and harm the environment and health	Reorient subsidies toward sustainable agricultural practices	George et al. (2016); Dorado et al. (2022)	Reformulate agricultural policies with a focus on sustainability	Resistance from economic sectors and political lobbying
Polycentric governance and natural resource management	Lack of multiscale coordination hinders sustainable management	Strengthen polycentric governance and policy integration	Ostrom (2017); Carmine and De Marchi (2023)	Improve coordination between federal spheres and institutions	Administrative complexity and overlapping responsibilities
Monitoring and achievement of SDG targets	Low overall performance in implementing targets	Reformulate data-driven territorial management mechanisms	Kump (2021); Horcea-Milcu (2022)	Promote integrated and evidence-based planning	Overcome institutional barriers to change and bureaucratic inertia
Sustainability and corporate responsibility	Asymmetry between production and social and environmental responsibility	Strengthening public policies that encourage sustainable practices	Crossley et al. (2021); Islam et al. (2021)	Expand regulation and incentives for corporate sustainability	Overcome corporate resistance and lack of control mechanisms
Agriculture as a polluting sector	Intensive use of pesticides, nutrients, and predatory exploitation of soil	Integrate environmental management and measurement (EMA) practices	Laine et al. (2021); Asiaei et al. (2022)	Promoting more transparent and sustainable production decisions	Lack of technical capacity and resistance to the use of EMA
Financing sustainable development	Insufficient non-reimbursable sources for socio- environmental investments	Create new financial mechanisms that make investments economically viable	Crossley et al. (2021); Dorado et al. (2022)	Establish hybrid and sustainable financial models	Limitations of public resources and difficulty in attracting private capital
Sustainable local development	Conflict between agricultural practices and forest preservation	Promote an interdisciplinary approach that values culture, tradition, and sustainability	Miscali et al. (2020); FAPESPA (2024a)	Develop public policies that are sensitive to territorial specificities	Low institutional capacity and challenges in local governance
Budget planning and management	Disconnect between budget planning and SDG targets	Aligning public budgets with sustainability goals	Miscali et al. (2020); Laine et al. (2021)	Attracting investment for sustainable and inclusive infrastructure	Institutional fragility and lack of intersectoral integration

et al. (2015), based on frequency and relevance in scientific debates. The categories were defined as government support for the agricultural sector, polycentric governance, SDG monitoring, corporate sustainability, polluting agriculture, sustainable financing, local development, and budget management. They emerged from the analyzed texts, articulating central problems and proposals discussed in the literature. This structure reflects the state of the art on public sustainability, according to the criteria of theoretical saturation. Although the citation of few texts per theme does not exhaust the reference, it allows us to outline consensuses and disagreements in the literature, based on recognized authors and reports (Ostrom, 2017; Carmine and De Marchi, 2023).

Table 1 summarizes this articulation, bringing together analytical dimensions, problems, solutions, and policy implications. As reinforced by Laine et al. (2021) and Asiaei et al. (2022), the method combines theoretical foundations and empirical analysis, connecting literature, institutional documents, and management practices. The selection of texts met the criteria of thematic relevance, specificity, theoretical saturation, and conceptual alignment, ensuring consistency between sustainability, governance, and environmental management.

The systematization presented in Table 1 highlights the density and complexity of the relationships between public policies, budget management, and the promotion of a sustainable development model

integrated with the Sustainable Development Goals (SDGs). The analysis reveals the need for systemic and interdisciplinary approaches that articulate institutional, economic, and environmental changes in the agricultural sector and territorial management. Thus, the effectiveness of the 2030 agenda will depend, above all, on overcoming the challenges identified, mobilizing adequate resources, and strengthening institutional capacities at all levels of government and sectors of society.

Methodological Procedures

The analysis of the Municipal Budget was based on information from the Brazilian Public Sector Accounting and Fiscal Information System (SICONFI) published by the National Treasury Secretariat and the Summary Report on Budget Execution (RREO), published annually by the transparency portal of the municipality of Paragominas-PA. The information was structured in accordance with the guidelines of Ordinance SOF/ME No. 2,520 of 2022 (Brasil, 2022), which updates the “budget functions and sub-functions” and the concepts of program, project, activity, special operations, and other measures regarding the breakdown of public expenditures.

The integration between municipal budget functions and Sustainable Development Goals (SDGs) targets, presented in Table 2, represents an original contribution by the authors, going beyond the

Table 2 – Structuring of budgetary functions and sub-functions integrated with SDG targets.

Budgetary Functions	Integration with SDG targets	Budgetary sub-functions
08 - Social Assistance	1 - 2 - 3 - 4 - 5 - 10 - 16 - 17	241 - Assistance to the Elderly; 242 - Assistance to Persons with Disabilities; 243 - Assistance to Children and Adolescents; 244 - Community Assistance; 122 - General Administration and Other Subfunctions.
10 - Health	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 10 - 11 - 13 - 14 - 15 - 16 - 17	122 - General Administration; 301 - Primary Care; 302 - Hospital and Outpatient Care; 304 - Health Surveillance; 305 - Epidemiological Surveillance; 306 - Food and Nutrition; and Other Subfunctions.
11 - Labor	1 - 2 - 3 - 8 - 9 - 10 - 16 - 17	334 - Promotion of Labor and 332 - Labor Relations
12 - Education	1 - 2 - 3 - 4 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17	361 - Elementary Education; 362 - Secondary Education; 364 - Higher Education; 365 - Early Childhood Education; 367 - Special Education; 368 - Basic Education and Other Subfunctions.
14 - Citizenship Rights	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 10 - 16 - 17	422 - Individual, Collective, and Diffuse Rights and 423 - Assistance to Indigenous Peoples.
15 - Urban Planning	3 - 4 - 8 - 9 - 11 - 13 - 16 - 17	451 - Urban Infrastructure; 452 - Urban Services and Other Subfunctions.
16 - Housing	3 - 4 - 6 - 11 - 16 - 17	481 - Rural Housing and 482 - Urban Housing.
17 - Sanitation	3 - 4 - 6 - 9 - 13 - 17	122 - General Administration; 511 - Basic Rural Sanitation; 512 - Basic Urban Sanitation and Other Sub-functions.
18 - Environmental Management	2 - 3 - 4 - 6 - 7 - 9 - 10 - 13 - 14 - 15 - 16 - 17	122 - General Administration; 541 - Environmental Preservation and Conservation; 542 - Environmental Control; 543 - Recovery of Degraded Areas; 544 - Water Resources and 545 - Meteorology
20 - Agriculture	1 - 2 - 3 - 8 - 9 - 11 - 12 - 13 - 16 - 17	122 - General Administration; 605 - Supply; 606 - Rural Extension; 608 - Promotion of Agricultural Production; 609 - Agricultural Defense and Other Subfunctions.
21 - Agrarian Organization	1 - 2 - 3 - 8 - 9 - 11 - 12 - 13 - 16 - 17	122 - General Administration and 631 - Agrarian Reform.
23 - Trade and Services	4 - 8 - 9 - 12 - 17	691 - Trade Promotion; 692 - Marketing; 693 - Foreign Trade and 695 - Tourism.

1: No Poverty; 2: Zero Hunger and Sustainable Agriculture; 3: Good Health and Well-being; 4: Quality Education; 5: Gender Equality; 6: Clean Water and Sanitation; 7: Affordable and Clean Energy; 8: Decent Work and Economic Growth; 9: Industry, Innovation, and Infrastructure; 10: Reduced Inequalities; 11: Sustainable Cities and Communities; 12: Responsible Consumption and Production; 13: Climate Action; 14: Life Below Water; 15: Life on Land; 16: Peace, Justice, and Strong Institutions; 17: Partnerships and Means of Implementation.

Source: SOF/ME Ordinance No. 2,520 of 2022; SDGs (Brasil, 2022).

provisions of the SOF Ordinance. Based on categorical content analysis (Weber, 1990; Bardin, 2010), the method defined social, environmental, economic, and institutional dimensions based on recurrence and relevance in the literature on sustainability and public management. The functions and sub-functions were classified according to official budget codes and aligned with the 2030 Agenda goals, aiming to identify opportunities for innovation in municipal planning. Based on the analysis of legal documents, reports, and scientific studies, a matrix was developed to match the budget with the SDG dimensions (Piketty et al., 2015). The interdisciplinary dialogue on sustainability and governance (Weber, 1990; Piketty et al., 2015) allowed us to propose criteria for linking the budget and SDGs, strengthening sustainable public management.

The measurement of budget execution performance covered a ten-year period (2013 to 2023), separated by their respective budget functions and sub-functions. To increase the margin of efficiency in the execution of the annual budget, the expenditure, the expenses actually paid in the fiscal year, and those recorded in processed outstanding payments were considered. Unprocessed outstanding payments, as well as subfunctions without resource allocation, were defined as a missed opportunity and, therefore, pointed out as an inefficiency in public budget management.

The integration between budgetary functions and Sustainable Development Goals (SDGs) is an original contribution by the authors, based on categorical content analysis (Weber, 1990; Bardin, 2010) and a cross-referencing of specialized literature and official documents. The study established correspondence between budget categories and SDG dimensions, measuring municipal performance between the years of 2013 and 2023. Paid expenses and processed outstanding payments were considered, while unprocessed ones were interpreted as evidence of inefficiency and poor resource allocation (Piketty et al., 2015).

This methodology made it possible to assess the degree of budgetary alignment with sustainability and the 2030 Agenda. In addition, the SDG-PA Monitor (FAPESPA, 2024a) and the Sustainable Development Index (IDS-PA) allowed Paragominas to be compared with municipalities in the Rio Capim Region and with Pará. CadÚnico indicators of income and social vulnerability and data from the Atlas of Violence on firearm-related deaths were also included, linking fiscal, social, and territorial dimensions. This approach allowed us to understand the alignment between public policies, budget allocation, and equity and security goals (Bardin, 2010; Piketty et al., 2015).

Results and Discussion

Municipal public budget management integrated with SDG strategies

In the municipal budget cycle, the executive branch is responsible for preparing the budget proposal, defining priorities and strategies

aligned with multi-year planning and the Sustainable Development Goals (SDGs). The legislative branch deliberates, debates, and approves the bill, possibly proposing amendments that express social, environmental, and economic demands. Cooperation between these branches ensures legitimacy, transparency, and consistency in the allocation of resources (Adib et al., 2021; Laine et al., 2021). After approval, the executive branch implements the planned actions and the legislature oversees their execution, ensuring compliance with the approved guidelines (Berg, 2019; Carmine and De Marchi, 2023). Budget transparency is supported by the disclosure of revenues, expenditures, and results, therefore strengthening social control and public trust (Miscali et al., 2020; Gulluscio, 2023). The institutionalization of transparency and accountability consolidates the budget as an instrument for sustainable development and the promotion of the collective interest (FAPESPA, 2024b).

The adoption of the Sustainable Development Goals (SDGs) as a reference for the allocation of public resources is decisive for strengthening institutional legitimacy and consolidating sustainability as an organizational value (Crossley et al., 2021; Gulluscio, 2023). The analysis shows that municipalities that have incorporated the SDGs into the budget cycle have made progress in articulating the environmental, social, economic, and institutional dimensions. The latter guides governance strategies and positively influences the others, especially in the environmental field, whose cross-cutting nature favors systemic impacts and collective benefits (Asiaei et al., 2022; Horcea-Milcu, 2022). When government planning is transformed into budget execution consistent with global goals, it promotes concrete changes in the territory and reinforces the integration between public policies and sustainability (Miscali et al., 2020; Laine et al., 2021), demonstrating that the adoption of the SDGs increases institutional efficiency and expands the transformative capacity of municipal management.

Table 3 shows that most of the committed budget was executed (86.72%). However, considering the volume of resources involved, the 13.28% non-execution rate corresponds to approximately R\$ 1.09 billion, an amount that could have been allocated to strategic actions throughout the period. This scenario highlights important weaknesses and challenges faced by the municipality in implementing projects aligned with sustainable development goals, reflecting limitations in the capacity for planning, management, and budget execution (Adib et al., 2021; Sancak, 2023). The literature emphasizes that these gaps compromise the effectiveness of public policies and reduce the potential for social and environmental transformation that could be achieved through more efficient budget management guided by sustainability metrics (Berg, 2019; Kump, 2021).

As seen in Table 3, expenditures (except intra-budgetary) accounted for the largest share of public spending in Paragominas (48.91%). This composition directly reflects how the municipal gov-

ernment uses resources to meet the needs of the population, through priorities and public management strategies (Miscali et al., 2020; Laine et al., 2021).

The analysis of the expenditures presented in Table 3 requires their composition to be identified by economic category, nature, and type of application. In Paragominas, current expenditures, especially those related to personnel, charges, and costs, predominated, reflecting the municipality's operational priorities (Miscali et al., 2020; Laine et al., 2021). Capital expenditures, focused on infrastructure investments, were less significant, indicating limitations in the expansion of structural policies. These expenditures, resulting from transactions with suppliers, organizations, and citizens, directly impact the local economy and territorial development (Adib et al., 2021; Asiaei et al., 2022). Meanwhile, efficiency in budget execution strengthens institutional legitimacy and public trust (Crossley et al., 2021; Gulluscio, 2023).

The time frame from 2013 to 2023, although prior to the formalization of the SDGs, is justified by its alignment with the ten-year cycle of the Municipal Master Plan, ensuring consistency in strategic planning, even though it limits the observation of variations between PPAs (Adib et al., 2021; Gulluscio, 2023).

Municipal budget expenditures, excluding intra-budgetary expenditures, are intended for the functioning of public administration and the maintenance of essential services, including salaries, costs, transfers, and investments (Brazil, 2024b). The allocation of approximately 48.91% of the resources to these functions reflects both legal requirements and political choices guided by the need to balance administrative operations and investments in sustainable policies (Laine et al., 2021; Gulluscio, 2023). The targeted allocation of resources to areas such as health, education, housing, and the environment enhances strategic planning, monitoring, and transparency (Guthrie and Parker,

Table 3 – Performance of the Public Budget of Paragominas-PA and respective SDG targets, from 2013 to 2023.

Dimensions SDG	Budget Functions	Committed Expenditures	Expenses Paid + Processed Remaining Payments	% Share of Budget	% of Unspent Expenditures
E, I	Expenses (Except Intra-budgetary)	4,025,002,812.52	3,483,557,133.83	48.91	13.45
S, A, E, I	12 - Education	1,405,137,202.14	1,302,997,349.34	18.29	7.27
S, A, E, I	10 - Health	890,674,868.01	708,482,834.20	9.95	20.46
E, I	04 - Administration	417,965,535.36	354,953,870.66	4.98	15.08
S, A, E, I	15 - Urban Planning	394,160,735.17	321,824,688.12	4.52	18.35
S, E, I	09 - Social Security	215,259,732.87	214,471,951.66	3.01	0.37
E, I	Intra-budgetary expenses	163,338,572.58	155,618,629.07	2.18	4.73
S, A, E, I	17 - Sanitation	184,901,449.83	140,521,684.23	1.97	24.00
S, I	26 - Transportation	124,308,729.14	102,185,235.07	1.43	17.80%
S, E, I	08 - Social Assistance	115,912,516.08	97,484,668.63	1.37	15.90
S, A, E, I	01 - Legislative	74,016,498.13	72,073,853.22	1.01	2.62
S, A, E, I	18 - Environmental Management	72,911,684.44	62,138,390.86	0.87	14.78
S, A, E, I	20 - Agriculture	52,626,921.61	42,915,296.07	0.60	18.45
S, E, I	13 - Culture	46,868,290.86	38,645,649.71	0.54	17.54
I	28 - Special Charges	9,955,259.91	9,520,435.87	0.13	4.37
S, E, I	27 - Sports and Leisure	12,509,553.36	8,340,357.78	0.12	33.33
S, E, I	23 - Trade and Services	7,080,870.14	6,605,300.23	0.09	6.72
S, A, E, I	22 - Industry	340,290.83	310,115.46	-	8.87
S, A, E, I	06 - Public Safety	198,252.00	85,452.72	-	56.90
S, A, E, I	25 - Energy	174,422.64	-	-	100.00
S, A, E, I	16 - Housing	-	-	-	-
S, A, E, I	11 - Work	-	-	-	-
S, A, E, I	14 - Citizenship Rights	-	-	-	-
S, A, E, I	21 - Agricultural	-	-	-	-
Grand Total		8,213,344,197.62	7,122,732,896.73	100.00	13.28

E: economic dimension; S: social dimension; A: environmental dimension; I: institutional dimension.

Source: National Treasury Secretariat (2024).

1989; Gray and Milne, 2015). However, budget fragmentation and rigid spending compromise efficient management, especially in internal transactions between departments, which, when disconnected from strategic planning, lead to overlapping functions and underfunding of priority sectors (Ostrom, 2017; Rosenbloom et al., 2022).

It was also observed that strategic areas related to the SDGs such as health, urban planning, sanitation, social assistance, environmental management, agriculture, leisure, security, and energy have high rates of budget non-execution, ranging from 15 to 100% (FAPESPA, 2024b; Paragominas, 2024), highlighting how fiscal rigidity compromises the ability to convert planning into concrete and sustainable results (Adib et al., 2021; Asiaei et al., 2022). Additionally, the poor budget execution in areas such as energy, housing, labor, citizenship rights, and agrarian organization reveals not only structural rigidity but also political choices, technical limitations, and deficits in administrative capacity (Miscalì et al., 2020; Adib et al., 2021).

Such gaps highlight institutional barriers that compromise the effectiveness of public policies and widen the gap between planning and practice (Laine et al., 2021).

The lack of implementation in strategic sectors undermines the advancement of sustainable development and the guarantee of social rights (Asiaei et al., 2022). Table 4 presents examples of actions based on the analysis of planning instruments (PPA, LOA, and sectoral plans), reworked to indicate gaps and opportunities for improvement. These proposals demonstrate the potential of content analysis as a tool for identifying weaknesses and proposing solutions that strengthen governance, expand institutional capacity, and bring the budget closer to the Sustainable Development Goals (SDGs) (Bardin, 2010; Piketty et al., 2015; Berg, 2019; Horcea-Milcu, 2022).

The allocation of resources to the appropriate sub-functions is the starting point for efficiency and effectiveness in public budget management, as

Table 4 – Possible actions without budgetary execution that could be implemented in Paragominas, PA, from 2013 to 2023.

Subfunction	Possible Actions	Details of Actions
25 - Energy	Energy Infrastructure	Expansion or maintenance of the electrical grid in urban and rural areas.
		Installation of public lighting in new neighborhoods, roads, or public areas.
		Energy efficiency projects, such as incentives for renewable sources, replacement of traditional light bulbs with LEDs in public lighting.
	Social and Inclusive Actions	Programs for rural electrification in areas without access to electricity.
16 - Housing	Construction of low-income housing	Prioritize the construction of housing for low-income families.
	Land regularization	Implement land regularization programs and stimulate urban development.
	Improvement of urban infrastructure	Invest in the construction and maintenance of water, sewage, and electricity networks in low-income housing areas.
	Housing renovation and expansion programs	Offer subsidies and lines of credit so that families can renovate and expand their homes.
11 - Work	Create professional training programs	Offer courses and training to the population, increasing employability.
	Encourage entrepreneurship	Create programs to support entrepreneurship, offering guidance, mentoring, and access to credit.
	Promote decent work	Inspect companies to ensure that labor rights are respected, promoting actions to combat child labor and slave labor.
	Partnerships with the productive sector	Establish partnerships with local companies to create internship and apprenticeship programs.
14 - Citizenship Rights	Expansion of social assistance services	Invest in the expansion and improvement of social assistance services to meet the demands of vulnerable populations.
	Promotion of gender equality	Implement public policies to promote gender equality and combat violence against women.
	Defense of human rights	Strengthen human rights defense mechanisms, such as the Municipal Ombudsman's Office, and promote civil society participation in public policy formulation.
	Access to justice	Facilitate the population's access to justice by creating legal support centers and organizing joint conciliation efforts.
21 - Agrarian Organization	Rural settlements	Support the creation of new rural settlements and the land regularization of existing settlements.
	Technical assistance	Offer technical assistance to family farmers, increasing productivity and income.
	Access to credit and agricultural inputs	Facilitate access to credit and agricultural inputs for family farmers through specific lines of financing.
	Rural infrastructure	Invest in improving rural infrastructure, such as the construction of roads, bridges, and irrigation systems.

it allows budgetary instruments to be aligned with planned public policies and the demands of society (Miscalì et al., 2020; Laine et al., 2021). When the municipal executive adopts this strategy, it increases the possibility of requiring administrative subunits to provide detailed action plans containing goals, deadlines, and performance indicators, thereby strengthening control and accountability in the public sector (Adib et al., 2021; Crossley et al., 2021). In addition, the allocation by subfunction favors qualified social participation, allowing civil society to contribute to the definition of budget priorities, an essential element for the construction of legitimate and socially accepted public policies (Gray and Milne, 2015; Gulluscio, 2023). Due to this context, allocation by subfunction requires the implementation of rigorous mechanisms for monitoring, controlling, and evaluating actions to ensure effective public management and alignment with the Sustainable Development Goals (SDGs) (Adib et al., 2021; Laine et al., 2021).

The analysis of the sub-functions in Table 4 indicates that actions related to energy, housing, labor, citizenship, and agrarian organization were not executed even though they were provided for in municipal planning instruments such as PPA e LOA, characterizing inefficiency in execution rather than conception. The problem lies in the inability to convert planning into concrete results, highlighting the disconnect between the formulation, allocation, and implementation of public policies (Piketty et al., 2015). This inefficiency, defined by the discrepancy between the approved budget and actual expenditures, reflects low institutional effectiveness and the inability of public spending to fulfill its social, economic, and environmental function (Weber, 1990; Bardin, 2010).

More than an administrative deficit, this is a structural failure that compromises the distributive and strategic nature of the budget (Berg, 2019; Sancak, 2023). In Paragominas, approximately R\$ 1.09 billion was left unspent over ten years, highlighting the fragility of fiscal governance and the misalignment with the Sustainable Development Goals (SDGs), directly impacting the achievement of goals 7, 8, 11, and 16 of the 2030 Agenda, which address clean energy, economic growth, sustainable cities, and effective institutions (United Nations, 2023; FAPESPA, 2024b).

Budgetary inefficiency constitutes a structural barrier to sustainable development, limiting the implementation of public policies and progress toward the goals of the 2030 Agenda. Content analysis reveals connections between the non-execution of resources, institutional limitations, and municipal sustainability performance (Piketty et al., 2015). Promoting greater efficiency requires adaptive governance and accountability mechanisms that ensure the conversion of public resources into concrete socio-environmental results (Adib et al., 2021; Laine et al., 2021).

The comparison between Paragominas, the Rio Capim Integration Region, and the State of Pará, presented in Table 5, seeks to understand trends of convergence with the SDGs, recognizing multiple institutional and territorial influences (Bardin, 2010; Piketty et al., 2015). The relationship between budget execution and IDS performance is correlational, as policy effectiveness depends on intersectoral coherence and management capacity (Weber, 1990). Although the IDS-PA

Table 5 – Sustainable Development Index (IDS-PA), according to the SDG-PA Platform, Paragominas, RI Rio Capim, and Pará, through December 2023.

SDG No.	Description	Number of goals evaluated	Paragominas	RI Rio Capim	Pará
1	Poverty eradication	5	60.60	54.90	76.70
2	Zero Hunger through Sustainable Agriculture	3	67.50	55.70	57.60
3	Health and Well-being	9	79.12	74.94	77.24
4	Quality Education	7	66.30	53.40	57.50
5	Gender Equality	2	83.90	89.00%	81.60%
6	Drinking Water and Sanitation	3	65.10	42.80	50.40
7	Affordable and Clean Energy	3	67.20%	64.70	95.00
8	Decent Work and Economic Growth	3	84.50	59.55	74.07
9	Industry, Innovation, and Infrastructure	3	56.48	36.76	57.98
10	Reduction of Inequalities	2	100.00%	20.59	47.83
11	Sustainable Cities and Communities	3	86.76	74.02	69.57
12	Sustainable Consumption and Production	2	52.40	7.00	7.30
13	Action Against Global Climate Change	1	61.80	33.00	43.70
14	Life in Water	1	0.10	0.10	40.50
15	Terrestrial Life	1	36.70	25.70	50.70
16	Peace, Justice, and Strong Institutions	3	81.87	87.14	78.57
17	Partnerships and Means of Implementation	3	56.06	36.40	48.30

Source: FAPESPA (2024a).

shows good results in social and educational areas, its methodology masks shortcomings in critical sectors, such as citizenship and the environment, reinforcing the need for more accurate evaluation systems and improved environmental measurements (Asiaei et al., 2022; Piketty et al., 2015).

The percentage of 61.80% in SDG 13 “Climate action” empirically demonstrates low effectiveness in the implementation of climate policies, since the index remains below the state (68.40%) and regional (64.70%) averages, revealing the insufficiency of investments allocated to environmental and adaptation sub-functions. This gap is confirmed by the analysis of budget data, which shows that less than 0.5% of total expenditures are allocated to actions related to climate mitigation, waste management, and environmental education. This mismatch between planning and budget allocation reinforces the fragility of local climate governance, highlighting the lack of mechanisms for monitoring targets and intersectoral integration in environmental policies (Miscalì et al., 2020; Laine et al., 2021).

A content analysis applied to the budget also reveals that the structural programs linked to the environmental axis were not continued, resulting in low IDS performance and the loss of climate finance opportunities. Thus, the 61.80% indicator represents not only a statistical value but a measurable symptom of institutional inefficiency resulting from a lack of prioritization and systematic monitoring of environmental goals (Piketty et al., 2015).

The literature highlights that addressing climate change requires the incorporation of integrated and planned actions that combine preventive strategies with mechanisms for adapting to extreme events, especially in vulnerable territories such as Paragominas (Adib et al., 2021; Asiaei et al., 2022). The absence of proactive management reinforces the need to institutionalize practices aligned with Environmental Management Accounting (EMA) as a way to strengthen local capacity to respond to climate risks (Berg, 2019; Asiaei et al., 2022).

The criticality of the percentages related to SDG 17 is also noteworthy. “Partnerships and means of implementation” are insufficient at the municipal level (56.06%), in the Rio Capim IR (36.40%), and in the state of Pará (48.30%). These results signal the urgent need to allocate public and private resources to strengthen intersectoral partnerships, foster technical and financial cooperation, as well as developing effective SDG monitoring and evaluation systems (Trucco et al., 2021; ONU, 2022). The literature highlights that building solid partnerships between governments, the private sector, and civil society is essential to ensure the effective implementation of the 2030 Agenda, especially in contexts marked by institutional weaknesses and limited resources (Adib et al., 2021; Crossley et al., 2021). Thus, public governance should be guided by the creation of an environment conducive to the implementation of the SDGs, through broad transparency, accountability, and social control, which are essential elements for reinforcing

the legitimacy of government actions and ensuring their effectiveness (Laine et al., 2021; Gulluscio, 2023).

It is also worth noting that some indicators have high percentages, such as SDG 10 — “Reduced inequalities” — which reached 100% in Paragominas. However, this result requires contextualization, since the municipality, located in the Rio Capim Integration Region, is heavily dependent on social programs and has an economy based on extensive agriculture and livestock farming, which limits productive diversification and income generation. As shown in Table 6, 35.55% of the local population received Bolsa Família benefits in December 2024, demonstrating that, although social programs play an essential role in mitigating the effects of poverty, they are insufficient to transform the structural conditions that perpetuate social inequality in the municipality and the region (Adib et al., 2021; Asiaei et al., 2022).

An analysis of local public policies indicates that broad welfare coverage does not translate into a sustainable reduction in inequalities, but rather reveals a dependence on federal transfers in a context of low economic productivity (Bardin, 2010; Piketty et al., 2015). In Paragominas, approximately 14,223 people live on a household income of up to half the minimum wage, reflecting the social vulnerability associated with land concentration and the fragility of agricultural chains (Berg, 2019; Laine et al., 2021). Although the municipality stands out for its environmental advances, its socioeconomic structure still reproduces regional inequalities. The analyzed performance on SDG 10 reflects welfare compensation rather than effective equity, reinforcing the need for policies that diversify production and strengthen social capital (Horcea-Milcu, 2022; Carmine and De Marchi, 2023). The analysis of data from 2024 confirms the persistence of dependence on income transfer programs, evidencing that budgetary inefficiency from 2013 to 2023 perpetuated vulnerabilities and patterns of socioeconomic exclusion (Weber, 1990; Piketty et al., 2015).

In Paragominas, despite a per capita GDP of R\$ 36,953 in 2021 (IBGE, 2024), the economic growth did not result in a significant improvement in average income. The data from 2024 reveal 37,526 beneficiaries of the Bolsa Família Program, with an average benefit of R\$ 698.32, confirming the persistence of social vulnerability after the 2013–2023 budget cycle (Bardin, 2010; Piketty et al., 2015). The municipality’s agricultural economy generates value in a concentrated manner, reinforcing the paradox between productivity and inequality (Horcea-Milcu, 2022; Carmine and De Marchi, 2023). Although it ranks 13th in GDP per capita and 10th in state GDP, Paragominas has 11.8% of its population dependent on Bolsa Família and 11.68% of families with an income of up to half the minimum wage (Brazil, 2024b; FAPESPA, 2024b). This contradiction highlights a pattern of structural inequality, characterized by the historical reproduction of institutional asymmetries and capital concentration, which limits the redistribution of the benefits of financial growth (Adib et al., 2021; Crossley et al., 2021). The lack of

accountability and social measurement mechanisms deepens these disparities, highlighting that sustainable development depends on distributive public policies, inclusive governance, and the strengthening of social foundations (Laine et al., 2021; Horcea-Milcu, 2022).

Figure 1 shows the percentage distribution by benefit and income profile in the municipalities that make up the Rio Capim Integration Region, an administrative unit in the State of Pará in the Amazon region comprising ten municipalities, among which Paragominas stands

Table 6 – Summary of the Bolsa Família and Auxílio Gás programs, RI Rio Capim, in December 2024.

Municipalities - RI Rio Capim	No. of Bolsa Família beneficiaries	% of BF Beneficiaries/ Total Population	Total Invested (R\$)	No. of Auxílio Gás	Total Gas Assistance (R\$)	No. of Families with up to 1/2 SM*
Tomé-Açu	38,909	57.57	8,992,696	1,818	18,072	12,576
Paragominas	37,526	35.55	8,638,925.00	790	82,160.00	14,223
Capitão Poço	34,023	60.21	9,225,692.00	375	39,000.00	14,629
Ipixuna do Pará	21,794	71.86	5,805,688.00	2,750	286,000	8,198
Concordia do Pará	20,414	75.94	5,370,256.00	3,095	321,880.00	7,634
Irituia	20,396	65.89	5,765,486.00	822	85,488.00	8,590
Bujaru	19,343	79.33	4,798,681.00	3,826	397,904.00	6,460
Mother of the River	19,021	55.37	5,062,538.00	744	77,376.00	7,756
Dom Eliseu	17,099	29.24	4,495,047.00	527	54,808.00	6,708
Aurora do Pará	15,514	65.26	4,299,178.00	1,044	108,576.00	6,272
Nova Esperança do Piriá	15,438	75.39	3,973,584.00	2,851	296,504.00	5,778
Garrafão do Norte	15,409	62.38	3,838,393.00	165	17,160.00	5,694
Rondon do Pará	14,698	27.66	3,704,119.00	1,598	166,192.00	5,759
Ulianópolis	13,334	35.12%	3,514,989.00	2,354	244,816.00	5,452
Ourém	11,096	62.15	3,016,601.00	1,788	185,952.00	4,484
Abel Figueiredo	3,958	64.50	1,063,977.00	721	74,984.00	1,562
Total RI Rio Capim	317,972	51.36	81,565,850.00	25,268	2,456,872.00	121,775

*Families with updated registration.

Source: Bolsa Família Program Report and Cad. Único, MDS (Brasil, 2024d).

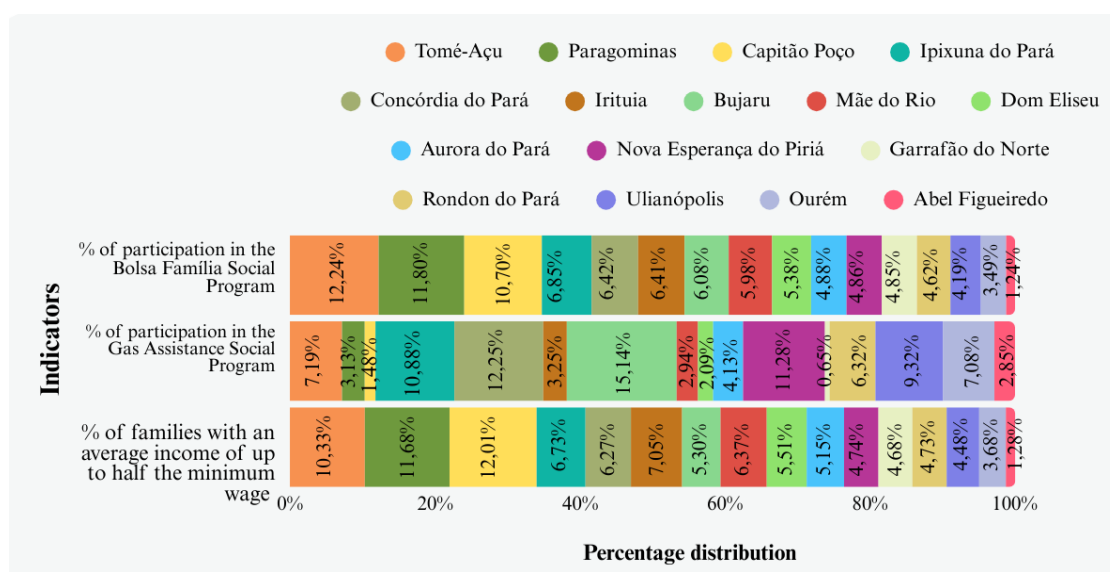


Figure 1 – Percentage distribution by benefit and income profile, across municipalities in the Rio Capim IR, December 2024.

Source: Bolsa Família Program Report and Cad. Único, MDS (Brasil, 2024a).

out as an economic and demographic hub. This contextualization is essential, as it allows us to understand the territorial insertion in a space of strong social and productive heterogeneity (Bardin, 2010; Piketty et al., 2015). The image shows that high rates of dependence on income transfer programs such as Bolsa Família and Auxílio Gás are concentrated in municipalities where the economic structure is anchored in agricultural and extractive activities, marked by low productive diversification and persistent social vulnerability (Weber, 1990; Piketty et al., 2015).

Through the analysis of this context, the expansion of inequality, exclusion, and violence becomes clearer: between the years of 2012 and 2022, the number of deaths of men, young people, and women by firearms in Paragominas-PA contrasts with the positive results declared in SDGs 3, 5, and 16, revealing a mismatch between economic growth and effective social development (Berg, 2019; Laine et al., 2021). The analysis of the data in Table 7 reveals a critical scenario in relation to homicides by firearms, especially among men, in the municipalities of the Rio Capim Integration Region, in which Paragominas-PA is the regional leader in the three categories presented. The correlation between these findings, the budgetary results and social indicators points to a structural relationship between fiscal fragility and the ineffectiveness of public policies on security and social inclusion (Bardin, 2010; Piketty et al., 2015). The absence of consistent budget planning and monitoring mechanisms compromises the effectiveness of programs aimed at preventing violence and promoting social equity, directly reflecting in high crime rates.

The budgetary inefficiency observed in Paragominas and neighboring municipalities is not limited to technical failures in resource allocation, as it reflects a disconnect between the prioritization of public spending and the real social demands of the territory. Throughout the period analyzed, budget execution focused on productive sectors with high fiscal returns such as infrastructure and agriculture, to the detriment of basic social policies, such as education, training, and youth assistance (Weber, 1990; Piketty et al., 2015). This imbalance contributes to the reproduction of cycles of social exclusion, in which vulnerable population groups, especially young people, become more exposed to violence and crime.

At the same time, the data on homicides by firearms between the years of 2012 and 2022 should be interpreted as a synthetic indicator of the multidimensional inefficiency of public management, since violence is the result of interdependent variables: income inequality and social inequality, lack of access to quality education, limited state presence, and insufficient preventive policies (Piketty et al., 2015; Laine et al., 2021). The high incidence of deaths among young males in Paragominas suggests the existence of causal links between budgetary disorganization and loss of social cohesion, especially in territories economically dependent on agribusiness, where economic growth does not translate into redistribution of opportunities (Bardin, 2010; Berg, 2019).

The results show that the violence in the Rio Capim IR is an issue that transcends the field of public security and enters the domain of socioeconomic governance, revealing that poor budgetary performance contributes to the erosion of social indicators and the worsening of regional inequalities. The lack of intersectoral policies that articulate budget, development, and inclusion reinforces the vulnerability of municipalities and perpetuates the gap between economic growth and social justice (Weber, 1990; Piketty et al., 2015). This pattern can be identified as “systemic inefficiency,” in which the disconnect between fiscal and social dimensions generates cumulative effects on community security and cohesion.

The analysis in Table 7, allows us to infer that the incidence of homicides is not an isolated event, but a statistical reflection of institutional fragility. The absence of territorial planning and budget execution guided by empirical evidence contributes to a scenario in which public resources are applied in a reactive and fragmented manner, without structural impacts on the causes of inequality (Piketty et al., 2015). Consequently, the persistence of high rates of violence should be understood as a symptom of inefficiency in public policy management, which not only fails to promote inclusion but also reduces social resilience in the face of economic and institutional crises (Weber, 1990; Bardin, 2010).

The correlation between budgetary inefficiency and social inequality, demonstrated by the empirical analysis of homicides and tax enforcement, reinforces the hypothesis that the lack of integration between budget planning and social policies is one of the critical factors contributing to the worsening of urban violence. In the case of Paragominas, the contrast between favorable economic indicators and the high number of firearm-related deaths exemplifies how economic growth without inclusive governance can deepen disparities and compromise social sustainability (Berg, 2019; Laine et al., 2021). This empirical evidence, therefore, is not mere speculation, but an analytical result based on the observation of concrete correlations between budgetary and social variables, expressing the complexity of the problem under investigation.

It is noteworthy that in 11 municipalities, more than half of the firearm-related deaths among men are young people. This context of lost youth weakens the social fabric, disrupts families and communities, and highlights the need to invest in violence prevention programs, such as promoting a culture of peace, citizenship education, and strengthening family ties, including the use of resources that are no longer being spent on social assistance, as shown in Table 8 below.

The analysis of the data shows that 15.59% of the funds allocated to child and adolescent assistance, 18.19% related to community assistance, and a significant 44.2% in elderly assistance were not executed. These percentages do not merely represent specific failures in financial management, but structural inefficiencies in budgetary governance, the direct consequence of which is the weakening of public

policies aimed at promoting social cohesion and reducing vulnerability (Bardin, 2010; Piketty et al., 2015). Based on this observation, the specific objective of this analysis is to identify the correlations between levels of budget execution and social indicators, demonstrating that low execution capacity compromises not only the delivery of public services but also the achievement of socioeconomic goals set out in municipal planning.

These inefficiencies prevent resources allocated to assistance programs from being translated into structural social projects aimed at income generation, productive inclusion, and strengthening family ties.

The literature points out that execution failures in sensitive social areas reflect deficits in strategic planning and low public accountability, affecting social trust in institutions (Laine et al., 2021; Carmine and De Marchi, 2023). Thus, the non-execution of resources directly compromises SDG 1 (poverty eradication) and SDG 10 (reduction of inequalities), by limiting the State's capacity to promote structural transformations and combat persistent vulnerabilities (Adib et al., 2021; Asiaei et al., 2022).

The results indicate that there is an inverse relationship between budgetary efficiency and social inequality: the lower the percentage of execution in community-based programs, the greater the concentra-

Table 7 – Number of firearm-related deaths, Rio Capim IR, from 2012 to 2022.

Cities in the Rio Capim IR	Homicides of men by firearms	Deaths of young people by firearms	% of youth deaths by firearms in relation to men	Deaths of women by firearms
Paragominas	366	200	54.64	28
Tomé-Açu	245	144	58.78	10
Rondon do Pará	173	74	42.77	4
Capitão Poço	158	83	52.53	9
Bujaru	128	83	64.84%	8
Dom Eliseu	117	67	57.26	7
Mother of Rio	101	76	75.25	13
Ipixuna do Pará	93	45	48.39	0
Concordia do Pará	90	41	45.56	3
Ulianópolis	75	41	54.67	5
Nova Esperança do Piriá	73	41	56.16	6
Garrafão do Norte	61	28	45.90	2
Ourém	51	27	52.94%	0
Aurora do Pará	35	24	68.57%	5
Irituia	32	20	62.50	1
Abel Figueiredo	19	7	36.84%	2
Total RI Rio Capim	1,817	1,001	55.09	103

Source: High levels of violence (Brasil, 2024a).

Table 8 – Budget executed in Social Assistance actions in Paragominas-PA, from 2013 to 2023.

Budget Subfunctions	Committed Expenses	Expenses Paid + Remaining Payments Processed	% Participation by Subfunction	% of Unspent Expenditures
08.122 - General Administration	41,563,626.43	36,900,163.35	37.18	11.22
08.241 - Assistance to the Elderly	944,514.94	526,526.48	0.53	44.25
08.242 - Assistance to Persons with Disabilities	16,720.33	14,964.35	0.02	10.50
08.243 - Assistance to Children and Adolescents	19,980,635.03	16,865,504.65	16.99	15.59
08.244 - Community Assistance	37,959,987.08	31,053,986.91	31.29	18.19
08.999 - Other Social Assistance Subfunctions	11,009,001.91	9,496,745.39	9.57	13.74
FU08 - Other Subfunctions	4,438,030.36	4,397,267.83	4.43	0.92
Grand Total	115,912,516.08	99,255,158.96	100.00	14.37

Source: National Treasury Secretariat (2024).

tion of vulnerabilities and exclusion of priority groups tends to be. The analysis of the non-execution of 44.2% of the resources allocated to assistance for the elderly illustrates a pattern of institutional discontinuity, in which policies aimed at specific segments of the population are interrupted by administrative failures, fragmenting the social protection network (Weber, 1990; Piketty et al., 2015). This situation reinforces the argument that budget management should not be treated merely as an accounting tool, but as a determining variable of social sustainability and institutional performance (Bardin, 2010; Piketty et al., 2015).

By relating social indicators to fiscal execution data, it is possible to identify three levels of impact: immediate, due to the absence of active protection and inclusion policies; intermediate, due to the deterioration of the living conditions of populations dependent on public policies; and structural, due to the consolidation of a cycle of institutionalized inequality, in which budgetary inefficiency perpetuates exclusion and reduces the effectiveness of development goals (Laine et al., 2021; Carmine and De Marchi, 2023). This perspective does not aim to cover all public policies, but rather to analytically circumscribe how budget execution interferes with the realization of social rights and the reduction of regional disparities.

This analysis does not intend to broaden the scope of the investigation, but rather to deepen the causal relationship between budget execution and inequality, demonstrating that the budget is the central vector of public policy. The case of Paragominas shows that fiscal inefficiency directly affects social and institutional sustainability, reinforcing the need to rethink the budget cycle from the perspective of social effectiveness and not just financial efficiency (Laine et al., 2021; Carmine and De Marchi, 2023).

In aggregate terms, the Social Assistance budget had a high execution rate (85.63%). However, when looking at the two specific sub-functions, 08.243 and 08.244, it is evident that in over ten years, approximately R\$ 10 million was not invested, an amount that, when compared to the overall budget, rises to R\$16.65 million not executed in the same period (Paragominas, 2024). These data reinforce the need for more efficient governance strategies capable of ensuring the full application of social resources and expanding the impact of public policies, especially in contexts marked by socioeconomic inequalities (Berg, 2019; Adib et al., 2021).

Forming partnerships with third sector entities can be an effective alternative to overcome these limitations, enhancing the capillarity and effectiveness of social actions through the mobilization of social capital and technical expertise (Crossley et al., 2021; Gulluscio, 2023). In addition, public management practices guided by accountability and transparency are indispensable to ensure the legitimacy and effectiveness of welfare policies (Miscali et al., 2020; Laine et al., 2021).

In line with the environmental sustainability agenda, municipalities are expected to fully implement programs and projects linked to the budgetary function “Environmental Management” and its respective sub-functions. However, when analyzing Table 9, there is a non-execution rate of 12.89%, corresponding to approximately R\$ 9.39 million over ten years, resources that could have been invested in structural environmental actions (Paragominas, 2024). The efficient management of these resources is essential to mitigate environmental impacts, promote adaptation to climate change, and to ensure the quality of life of the population (Asiaei et al., 2022; Horcea-Milcu, 2022).

It should also be noted, as shown in Table 9 below, that the sub-function “Environmental Control” accounted for 69.64% of the funds executed. Despite the high execution rate (90.06%), approximately R\$ 4.88 million was not invested in environmental actions aimed at preventing and controlling water, air, soil, and noise pollution, which could have directly contributed to improving public health and collective well-being (Berg, 2019; Stasiskiene, 2022). The literature emphasizes that effective environmental control policies are essential for promoting environmental justice and reducing health inequalities, especially in vulnerable territories such as Paragominas (Miscali et al., 2020; Carmine and De Marchi, 2023).

The subfunction that ranked second in terms of budget allocation was “Environmental Preservation and Conservation,” accounting for 27.12% of the funds executed. The actions linked to this subfunction are strategic for environmental sustainability, as they involve resources applied to the planning, implementation, coordination, and maintenance of initiatives aimed at protecting the fauna and flora, as well as both urban and rural ecosystems against damage caused by droughts,

Table 9 – Budget executed in Environmental Management actions in Paragominas-PA, from 2013 to 2023.

Budget sub-functions	Committed Expenditures	Expenses Paid + Processed Remaining Payments	% Share per Subfunction	% of Unspent Expenses
18,122 - General Administration	68,003.86	68,003.86	0.11	0
18,541 - Environmental Preservation and Conservation	19,901,801.40	17,222,061.87	27.12	13.46
18,542 - Environmental Control	49,115,754.18	44,231,969.65	69.64	9.94
18,543 - Recovery of Degraded Areas	36,050.00	-	0.00	100.00
18,544 - Water Resources	3,826,125.00	1,990,256.45	3.13	47.98
18,545 - Meteorology	-	-	-	-
Grand Total	72,911,684.44	63,512,291.83	100.00	12.89

Source: National Treasury Secretariat (2024).

floods, and erosion processes (Miscali et al., 2020; Laine et al., 2021). These investments are consistent with Brazil's commitments under the Sustainable Development Goals, especially those related to biodiversity protection and environmental impact mitigation (ONU, 2022; Stasiakienė, 2022). However, the effectiveness of these actions depends on efficient and coordinated budget management, capable of transforming the allocated resources into concrete interventions that promote the conservation of natural resources and the reduction of local environmental vulnerabilities (Berg, 2019; Asiaei et al., 2022).

Failures in budget planning, allocation, and execution are noticeable when analyzing the percentage share of each subfunction in the distribution of resources. The results indicate that no resources were executed in the subfunction "Recovery of Degraded Areas" and there was no allocation for "Meteorology" (Paragominas, 2024). The lack of execution in the first subfunction compromises the application of resources in actions that are fundamental for the ND rehabilitation of areas subject to flooding and erosion, limiting the municipality's capacity to promote the sustainable use and protection of environmentally sensitive areas (Miscali et al., 2020; Asiaei et al., 2022). Insufficient investment in meteorology weakens the local capacity to monitor and predict climate variations, an essential aspect for the development of climate change adaptation strategies and natural disaster prevention (Berg, 2019; Laine et al., 2021). The literature reinforces the absence of investment in these sub-functions, compromising the development of integrated environmental management, an indispensable element for the effectiveness of public sustainability policies (Carmine and De Marchi, 2023; Sancak, 2023).

At the same time, the management of the budget for "Water Resources" proved to be inefficient, with a non-execution rate of 47.98%, resulting in the non-application of approximately R\$ 1.83 million in essential actions for the municipality (Paragominas, 2024). These resources could have been used for planning, coordination, control, and supervision of the harmonious use of water resources, especially in a context of recurring problems related to heavy rains and floods (Miscali et al., 2020; Asiaei et al., 2022), given that the absence of these strategic guidelines may have contributed to the overflowing of the Uraim River in Paragominas-PA, as shown in Figure 2.

The literature shows that inefficient water resource management compromises water security and increases socio-environmental vulnerability, especially in municipalities in the Amazon, where extreme events tend to be increasingly frequent due to climate change (Berg, 2019; Horcea-Milcu, 2022). Thus, the lack of budget execution in this subfunction limits the municipality's ability to implement policies for the prevention and mitigation of hydrological risks, highlighting the need to strengthen institutional mechanisms for the planning and execution of environmental public policies (Adib et al., 2021; Laine et al., 2021). According to the Civil Defense of the State of Pará, in March 2024, eight neighborhoods in Paragominas were affected by flooding

in the urban area and five in the rural area, totaling 27 families affected overall. Fifty other families were displaced and three shelters were made available by the city in order to accommodate them.

This scenario highlights the inadequacy of budget planning directed at the environmental agenda, since the lack of preventive investments ends up overburdening other budgetary functions, especially in the emergency response to socio-environmental disasters (Miscali et al., 2020; Laine et al., 2021). In this context, palliative measures such as donations of food baskets, hygiene and bedroom kits, as well as inclusion in housing programs are necessary but insufficient given the structural complexity of the problem (Berg, 2019; Adib et al., 2021). The literature highlights that failure to anticipate and prevent environmental risks results in the intensification of social and environmental vulnerabilities, compromising the effectiveness of public policies (Asiaei et al., 2022; Carmine and De Marchi, 2023).

During the floods in Paragominas and Ipixuna do Pará on March 14, 2024, a meeting between representatives of civil society organizations and the Public Prosecutor's Office of the State of Pará brought several neglected environmental problems to light, such as irregular construction sites on the banks of the Uraim River, silting of the river basin, lack of rainwater drainage, existence of unlicensed dams, and irregularities in the construction of urban subdivisions (Santos, 2024). These elements constitute classic failures of environmental governance, which affect the resilience of the territory in the face of extreme weather events (Ostrom, 2017; Rosenbloom et al., 2022). In addition, the lack of proactivity in the implementation of environmental recovery projects highlights gaps in local public management, especially with regard to the integration of urban planning and environmental management (Gray and Milne, 2015; Laine et al., 2021). The literature reinforces that these gaps are exacerbated by the absence of adequate environmental monitoring, control, and evaluation mechanisms, compromising institutional performance (Adib et al., 2021; Asiaei et al., 2022).



Figure 2 – Record of the overflowing of the Uraim River in Paragominas, PA, March 2024.

Source: G1 Pará (2024).

Given this context, the R\$ 9.39 million in funds that were not executed between 2013 and 2023 could have been directed to initiatives capable of mitigating the problems that amplify the socio-environmental impacts of the Uraim River floods, going beyond the physical aspects of the basin and the city, as well as directly affecting the provision of essential public services and housing security (Miscali et al., 2020; FAPESPA, 2024b). Inefficiency in budget execution not only compromises the municipality's response capacity but also increases public health risks, mainly due to waterborne diseases, disproportionately affecting the most vulnerable populations (Berg, 2019; Laine et al., 2021). Thus, the literature recommends that public policies prioritize not only reactive damage control measures but, above all, long-term preventive strategies that reduce structural vulnerabilities and promote sustainable development (Horcea-Milcu, 2022; Carmine and De Marchi, 2023).

Given this scenario, one of the most efficient paths would be to plan the actions to be carried out in the respective budgetary functions and sub-functions, aligned with the Environmental, Social, and Governance (ESG) axes, strengthening the articulation between public policies and sustainable development (Adib et al., 2021; Asiaei et al., 2022). This alignment requires governance that recognizes the central role of the State, through due legal process, to enable the application of public resources in programs, projects, and actions strategically chosen for their ability to generate positive socio-environmental impacts (Laine et al., 2021; Gulluscio, 2023). In addition, it is recommended that decision-making processes incorporate participatory and transparent mechanisms, ensuring the legitimacy and effectiveness of public actions, as advocated by contemporary approaches to sustainability and public governance (Ostrom, 2017; Carmine and De Marchi, 2023). The articulation between budget planning and sustainability strategies is indispensable to prevent the recurrence of socio-environmental disasters and promote the systemic transformation necessary for sustainable territorial development (Berg, 2019; Sancak, 2023).

Conclusions

The findings of this study highlight a structural disconnect between the institutional discourse on sustainability and effective budget execu-

tion in the municipality of Paragominas, PA, between 2013 and 2023. Although the average execution rate reached 86.7%, the non-application of approximately R\$ 1.09 billion in strategic areas such as health, sanitation, environmental management, housing, labor, and energy reveals persistent weaknesses in planning, intersectoral coordination, and institutional capacity. These results confirm that formal spending efficiency does not automatically translate into effective public policies or substantive progress in meeting the SDGs.

From a methodological standpoint, this study contributes by proposing a novel matrix for integrating budgetary functions and sub-functions with SDG targets, combining documentary analysis, fiscal data (SICONFI and RREO), and territorial indicators (IDS-PA). This approach goes beyond normative or declarative analyses, offering a replicable tool for critically assessing the alignment between planning, budget execution, and socio-environmental outcomes at the municipal level.

The main question behind this research, regarding the degree of alignment between municipal budget management and the 2030 Agenda, was answered by demonstrating that the alignment is partial and asymmetrical: there are advances in social and educational areas, but significant deficits in structural policies, especially environmental and productive inclusion policies. Thus, the objectives of the article were fully achieved by measuring budget performance, identifying critical gaps, and highlighting their implications for territorial sustainability.

The relevance of the study lies in its dual contribution. For the literature, it reinforces the understanding that local sustainability depends less on formal adherence to the SDGs and more on the integrated, adaptive, and evidence-based budgetary governance. For public managers, it offers concrete subsidies to improve planning, prioritize strategic investments, and strengthen monitoring and accountability mechanisms, reducing the gap between political intention and real impact.

Among the limitations are the focus on a single municipality and the reliance on secondary data, which restricts broader causal inferences. Nevertheless, the results provide a solid basis for future comparative studies and for the improvement of models that assess fiscal and territorial sustainability in Amazonian and peripheral contexts.

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