The Ribeirão Preto Metropolitan Region: allocation of financial resources to SDGs

A Região Metropolitana de Ribeirão Preto: alocação de recursos financeiros em ODS

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Abstract

The present work aims to propose a method for identifying and measuring the allocation of financial resources, between 2016 and 2020, by the 34 municipalities in the Ribeirão Preto Metropolitan Region (RPMR) to achieve the Sustainable Development Goals (SDGs). To test the suitability of the proposed method for the intended objective, SDG 11 was selected – inclusive, safe, resilient, and sustainable cities and communities. As a result of the application of the proposed method, it was possible to highlight, in terms of the volume of allocated financial resources, the relative importance or priority attributed by the RPMR municipalities to meeting the SDGs, in particular, SDG 11. Thus, it was found that the goals 11.1, 11.3, and 11.a represented 78.7% of the total expenditure.

Keywords: metropolitan region; Sustainable Development Goals (SDGs); public administration.

Resumo

Este trabalho visa propor um método de identificação e mensuração da destinação de recursos financeiros, entre 2016 e 2020, por parte dos 34 municípios da Região Metropolitana de Ribeirão Preto (RMRP) para o alcance dos Objetivos de Desenvolvimento Sustentável (ODSs). Com o intuito de testar a adequação do método proposto ao objetivo pretendido, selecionou-se o ODS 11 – cidades e comunidades inclusivas, seguras, resilientes e sustentáveis. Como resultado da aplicação do método proposto, foi possível evidenciar, em termos de volume de recursos financeiros alocados, a importância ou a prioridade relativa atribuída pelos municípios da RMRP para o atendimento aos ODSs, em particular, ao ODS 11. Assim, constatou-se que as metas 11.1, 11.3 e 11.a representaram 78,7% do dispêndio total verificado.

Palavras-chave: *região metropolitana; Objetivos de Desenvolvimento Sustentável (ODS); gestão pública.*

Introduction

The history of metropolitan areas (MAs) in Brazil dates back to the 1970s when they were instituted by the Federal Government to boost the country's development. In 1973, the first Brazilian metropolitan areas were created: São Paulo, Belo Horizonte, Porto Alegre, Recife, Salvador, Curitiba, Belém, and Fortaleza. In 1974, the Metropolitan Area of Rio de Janeiro was established. According to the Institute for Applied Economic Research (Ipea, 2023), Brazil has 77 MAs: three (3.9%) in the Midwest Region; 27 (35.1%) in the Northeast; 10 (13.0%) in the North; 13 (16.9%) in the Southeast; and 24 (31.2%) in the South. The focus of action of MAs in Brazil, as provided by the Federal Constitution (Brazil, 1988) in line with the City Statute (Brasil, 2001) and the Metropolis Statute (Brasil, 2015), must be based on the so-called Common Interest Public Functions (CIPF).

More recently, the institution of MAs has also been used as a policy instrument by subnational governments. The State Government of São Paulo, for example, began using this instrument more emphatically from 2011, aiming to establish a new political-institutional arrangement for the planning and promotion of regional-territorial development. This state, the most relatively developed in Brazil, has nine MAs, instituted between 1973 and 2021. They are: São Paulo; Baixada Santista; Campinas; Vale do Paraíba e Litoral Norte; Sorocaba; Ribeirão Preto; São José do Rio Preto; Piracicaba; and Jundiaí. The Ribeirão Preto Metropolitan Area (RPMA), the subject of this study, was instituted in July 2016, bringing together 34 municipalities and having a population of approximately 1.65 million inhabitants (IBGE, 2022). However, the governance bodies, as well as their main operational and financial instruments, provided for in Law Complementary No. 1.290 of July 06, 2016 (SÃO PAULO, 2016), are still being instituted and/or implemented.

The objective here is to propose a method for identifying and measuring the allocation of financial resources by the 34 municipalities in the Ribeirão Preto Metropolitan Area (RPMA) toward achieving the Sustainable Development Goals (SDGs) based on their respective budget executions. This work aims to test the suitability of the proposed method through SDG 11-inclusive, safe, resilient, and sustainable cities and human settlements. With adjustments, this method can be applied to other SDGs.

As a result of applying the proposed method, it was possible to highlight the importance or relative priority attributed by the RPMA municipalities to meeting the SDGs, particularly SDG 11, in terms of the volume of financial resources allocated. Simultaneously, the verification and monitoring of the resources allocated by municipal and metropolitan authorities can lead to changes in their allocation to enhance their application and maximize the achievement of the SDGs.

To explore relevant aspects of expenditures, two indicators were constructed: the per capita Distribution Effort Indicator (DEI), which corresponds to the total value of expenditures

associated with a particular target divided by the total population of the RPMA, aiming to verify how municipal expenditures are distributed around the targets associated with SDG 11; and the Allocative Capacity Indicator (ACI), which corresponds to the total value of expenditure applied to a particular target divided by the net current revenue in the considered period. The ACI aims to evaluate the effort undertaken by the RPMA municipalities in fulfilling the SDG 11 targets, considering their resource allocation capacity, and indicating the priority given by the municipalities to each of the SDG 11 targets as a percentage of net current revenue.

The importance of this work lies not only in its originality but also in the relevance and economic strength of the Ribeirão Preto Metropolitan Area (RPMA), both within the state and nationally. Though somewhat anecdotal, the RPMA was known nationally, especially from the 1980s, as the "Brazilian California" due to its high economic growth rates, heavily based on agribusiness. This economic dynamism generated numerous business, work, and income opportunities. Despite a significant cooling of this dynamism in recent years, the recent creation of the RPMA renews expectations for promoting a new cycle of regional development. It is important to note that the "rules of the game" have changed: various socioeconomic and environmental conditions and challenges have emerged that were not as prominent before. One of these new elements is the SDGs. This work aims to highlight relevant aspects for both researchers and public managers, identifying gaps, potentials, and weaknesses to improve governance and decision-making at the regional level, not only for the RPMA but also for other Brazilian metropolitan areas.

To fulfill its objective, this work is structured into eight sections, including this Introduction. The second section provides a brief characterization of the RPMA; the third addresses the CIPFs and their intrinsic relationship with Brazilian metropolitan areas. The fourth section discusses aspects of the Brazilian public budget; the fifth provides a brief contextualization of the 2030 Agenda and the SDGs, with greater emphasis on SDG 11 – making cities and human settlements inclusive, safe, resilient, and sustainable. The sixth section presents the procedures used for conducting the research; the seventh presents the results obtained. Finally, the eighth section offers final considerations with indications for future studies.

The Ribeirão Preto Metropolitan Area (RPMA)

The RPMA, established by Complementary Law No. 1,290 on July 6, 2016 (São Paulo, 2016), is located in the state of São Paulo, in the Southeast region of Brazil. It comprises

34 municipalities with a population of approximately 1.65 million inhabitants (IBGE, 2022) and an estimated Gross Domestic Product (GDP) of R$82.5 billion, representing about 3.03% of the state GDP and 0.92% of the national GDP (IBGE, 2021). According to the law that established it, the RPMA aims to promote:

> I – Regional planning for socio-economic development and improvement of quality of life; II – Cooperation among different levels of government through decentralization, coordination, and integration of its agencies and entities of direct and indirect administration operating in the region, aiming at maximizing the use of public resources allocated to it; III – Rational use of territory, natural and cultural resources, and environmental protection through control over the implementation of public and private enterprises in the region; IV – Integration of planning and execution of public functions of common interest among public entities operating in the region; V – Reduction of regional inequalities. (Complementary Law n. 1,290 of July 6, 2016, article 2)

The RPMA includes 34 municipalities, distributed into four subregions, as shown in Chart 1.

Chart 1– Subregions of RPMA and respective member municipalities

Sub-region	Number of municipalities	Municipalities	Population (2022)
I	15	Barrinha, Brodowski, Cravinhos, Dumont, Guatapará, Jardinópolis, Luis Antônio, Pontal, Pradópolis, Ribeirão Preto, Santa Rita do Passa Quatro, São Simão, Serrana, Serra Azul e Sertãozinho	1.140.056
II	6	Guariba, Jaboticabal, Monte Alto, Pitangueiras, Taiúva e Taquaral	199.734
III	6	Cajuru, Cássia dos Coqueiros, Mococa, Santa Cruz da Esperança, Santa Rosa do Viterbo e Tambaú	141.272
IV	7	Altinópolis, Batatais, Morro Agudo, Nuporanga, Orlândia, Sales Oliveira e Santo Antônio da Alegria	167.049

Source: compiled by the author, based on São Paulo (2016) and IBGE (2022).

CIPFs and metropolitan areas

Although the Brazilian Federal Constitution (1988) assigns states the responsibility for creating MAs, it obligates them to be strictly linked to CIPFs, as stated in Article 25, paragraph three:

> § 3º States may, by means of complementary law, create metropolitan areas, urban agglomerations, and micro-regions, composed of groups of neighboring municipalities, to integrate the organization, planning, and execution of public functions of common interest. (Ibid.)

In other words, CIPFs can be considered the raison d'être and therefore an inseparable element of MAs.

Law n. 13,089, dated January 12, 2015, which instituted the Statute of the Metropolis, represents a step forward in the institutionalization process of MAs in Brazil. According to Santos (2018a, p. 55):

> The Statute of the Metropolis can be understood as an innovative normative instrument to foster metropolitan development and, above all, to stimulate and enable integrated actions between the Union, states, and municipalities through the instruments it presents, aiming at urban planning in territories that extend beyond the limits of a single municipality – urban agglomerations (UAs) and MAs. Drawing its foundation from the Federal Constitution, it explicitly establishes the duty of cooperation between federative entities and encourages a reassessment of Brazilian federalism.

In its first article, the Statute of the Metropolis already delineates its scope, associating it with CIPFs, by stating that:

> Art. 1. This Law [...] establishes general guidelines for planning, management, and execution of public functions of common interest in metropolitan areas and urban agglomerations established by the States, general norms on the integrated urban development plan and other intergovernmental governance instruments, and criteria for Union support for actions involving intergovernmental governance in the field of urban development [...]. (Brazil, 2015)

In its second article, the Statute of the Metropolis defines a public function of common interest as "public policy or action included therein whose realization by a Municipality alone is unfeasible or impacts neighboring Municipalities" (ibid.). The law also uses the term 'functional fields' as equivalent to 'public functions of common interest' (ibid.).

In the case of the state of São Paulo, the complementary laws creating state MAs address aspects related to organizational structure and governance, such as: indication of functional fields or CIPFs; establishment of decision-making bodies (Development Councils); institution of management systems, advisory councils, and special thematic chambers; and creation of investment funds.

In general, the functional fields or CIPFs defined in the respective complementary laws that established the nine São Paulo MAs encompass spatial planning and land use, transport and regional road system; housing, environmental sanitation, environment, economic development, social services; sports and leisure, culture; tourism; and agriculture and agribusiness. However, it is noteworthy that the RPMA, recognized for its economic strength as the "Capital of Agribusiness," was not included with the CIPF "agriculture

and agribusiness" in the complementary law that instituted it. Indeed, "culture" was also not included. Nonetheless, recognizing their importance, these fields were included in the analyses conducted by this study.

Brazilian public budget

A budget is a planning instrument, whether for public or private entities, and represents the projected flow of income and resource allocations over a specific period (Brazil, 2016a, p. 16). In the specific case of public budget, it "[...] systematically and organizedly gathers all estimated revenues for a given year and details the expenses the government expects to execute. In essence, it is an accounting document of revenues and expenditures" (Santos, 2015, p. 15). Indeed, "[...] the public budget organizes spending by government area of activity, aligning sectoral plans with government strategic directions" (Santos, 2016, p. 20).

Expense classification

In the current structure of the Brazilian public budget, budgetary allocations are organized into work programs that contain qualitative and quantitative information, whether physical or financial. Qualitative budget programming consists of the following information blocks: classification by sphere (fiscal, social security, or state-owned enterprises investment budgets); institutional classification (department or budgetary unit); functional classification, programmatic structure, and key information on the Program and Action. Quantitative budget programming has two dimensions: physical and financial. The physical dimension defines the quantity of goods and services to be delivered, while the financial dimension estimates the amount necessary for the development of budgetary action according to specific classifiers. Among these classifiers are: Economic Category of Expenditure; Nature of Expense Group; Application Mode, and Expense Element (Brazil, 2016a, p. 32). The following subsections will detail the classifications of greatest interest for this work.

Functional classification of expenditure

The functional classification of expenditure is structured into functions and subfunctions, aiming to indicate the areas of expenditure where government action will take place. Each activity, project, and special operation will identify the function and subfunction to which they are linked (ibid., p. 35). The current Brazilian functional classification was established by Ordinance No. 42, dated April 14, 1999, of the then Ministry of Budget and Management, comprising a list of 28 functions and 109 prefixed subfunctions, serving as an aggregator of public spending by area of government action at the three levels of government. According to the same Ordinance, "subfunctions may be combined with functions different from those to which they are linked" (ibid., p. 35). This is a common and mandatory

classification within Municipalities, States, the Federal District, and the Union, allowing for the national consolidation of public sector expenditures.

Government function and subfunction

> The function can be understood as the highest level of aggregation of various areas of public sector activity. It reflects the institutional competence of the agency, such as culture, education, health [...]. The subfunction represents a level of aggregation immediately below the function and should demonstrate the nature of government action. (Ibid., pp. 35-36)

Economic category of expenditure

Budgetary expenditure is classified into two economic categories: current expenditures and capital expenditures.

Current expenditures

Current expenditures are those that do not directly contribute to the formation or acquisition of a capital asset (ibid., p. 57), or expenses related to service provision, conservation and adaptation of the established public assets, and transfers for maintenance of other entities (Santos, 2015, p. 111). Current expenditures encompass three Nature of Expense Groups: personnel and social charges; interest and debt charges; and other current expenditures. These refer to expenses related to the acquisition of consumables necessary for the production of goods and services delivered to the population and the maintenance of public agencies, payment of allowances, hiring of services from third parties under any form, transfers, contributions, subsidies, obligations arising from monetary policy, food and transport aids, judicial sentences, price equalization, and fees, among others (Garcia, 2015, pp. 152-153; Brazil, 2016a, p. 58; Brazil, 2016b, p. 75).

Capital expenditures

Capital expenditures are those that directly contribute to the formation or acquisition of a capital asset (Brazil, 2016a, p. 57). In other words, they are intended for construction works, equipment purchases, loan grants, and debt amortization (Santos, 2015, pp. 105-111). Capital expenditures are disaggregated into the following Nature of Expense Group: investments, financial investments, and debt amortization. According to the Manual of Applied Accounting to the Public Sector (Brazil, 2016b, p. 75), investments refer to budgetary expenditures on software, planning and execution of works (including acquisition of properties deemed necessary for their realization) and acquisition of facilities, equipment, and permanent materials. Financial investments consist of budgetary expenditures related to the acquisition of properties or capital goods already in use; acquisition of equity securities of companies or entities of any kind already established, when the operation does not increase capital; and capital increase of companies, among other expenses. Finally, debt amortization pertains to budgetary expenditures on payment and/or refinancing of principal and monetary or exchange rate updates of internal and external public debts, whether contractual or mobiliary (Brazil, 2016a, p. 58; Brazil, 2016b, p. 75).

Sustainable Development Goals (SDGs)

The SDGs constitute a global agenda built through extensive negotiation involving representatives and governments of 193 Member States of the United Nations (UN), which began in 2013 and was officially adopted in September 2015 during the UN Summit on Sustainable Development (UNO, 2015).

The reference document titled "Transforming Our World: the 2030 Agenda for Sustainable Development" aims to guide international community actions in the coming years, serving as an action plan to place the world on a more sustainable and resilient path by 2030 (UNO, 2015). Agenda 2030 proposes to achieve 17 goals and 169 targets of global action, subdivided into four areas of activity: social, environmental, economic, and institutional. The SDGs are the core of the Agenda and are to be achieved by 2030 (ibid.).

SDG 11 and its Targets

Among the 17 SDGs, this work focuses on SDG 11 – Make cities and human settlements inclusive, safe, resilient, and sustainable – and its 10 targets, as follows:

> 11.1 Ensure access for all to safe, affordable, accessible and sustainable housing and basic services, and upgrade slums.
>
> 11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety through expanding public transport, with special attention to the needs of people in vulnerable situations, women, children, persons with disabilities and older person;
>
> 11.3 Enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management in all countries;
>
> 11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage;
>
> 11.5 Substantially reduce the number of deaths and the number of people affected by disasters and significantly decrease direct economic losses relative to global gross domestic product, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations;
>
> 11.6 Reduce the adverse per capita environmental impact of cities, including paying special attention to air quality and municipal waste management;
>
> 11.7 Provide universal access to safe, inclusive and accessible green public spaces, particularly for women and children, older persons and persons with disabilities;
>
> 11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas, strengthening national and regional development planning;
>
> 11.b Substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans for inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters; and develop and implement, according to the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.
>
> 11.c Support least developed countries, including through financial and technical assistance, for sustainable and resilient buildings using local materials. (Ibid., pp. 30-31)

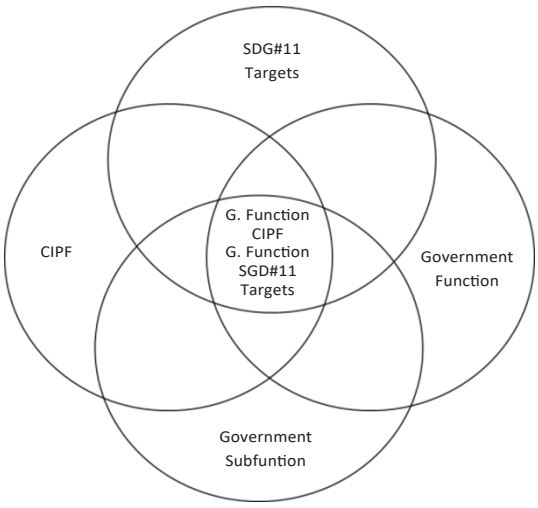
Research procedure

This research consisted of two stages with two distinct approaches: qualitative and quantitative. The first stage, employing a qualitative approach, involved establishing an analytical-qualitative correspondence (matching) between 11 CIPFs[1] and 28 government functions.[2] From this analysis, 17 government functions were selected that corresponded with the CIPFs.[3] Subsequently, a new analytical-qualitative matching was conducted, this time between the 17 functions, their corresponding 109 subfunctions, and the ten targets of SDG 11, resulting in a set of 47 subfunctions[4] with potential correspondence to SDG 11 targets. Figure 1 presents a synthetic overview of the analytical scheme employed in the qualitative stage of the research.

Upon completing the qualitative first stage, the research progressed to the second, quantitative, stage. In this stage, based on the 47 subfunctions selected in the previous stage, efforts were made to identify the committed amount[5] from 2016 to 2020 by the 34 municipalities that comprise the RPMA.

Government functions and subfunctions are mandatory components of the Brazilian public budgetary structure at the federal, state,

Figure 1 – Analytical-qualitative correspondence between CIPFs, government functions, government subfunctions, and SDG 11 targets



Source: elaborated by the author.

and municipal levels and are directly linked to expenditures in various classifications, as well as to several other elements – agency, program, commitment number, expenditure identifier, expenditure description, issuance date, among others.

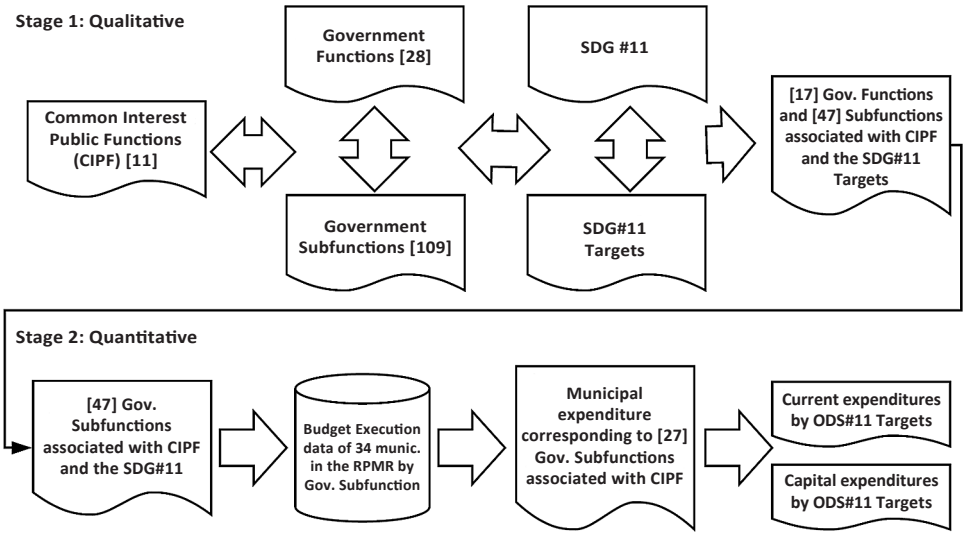
Thus, the budget execution data from 2016 to 2020 for each of the 34 municipalities in the RPMA were obtained from the electronic repository of the São Paulo State Court of Accounts (SPSCA), known as the Municipal Transparency Portal.[6] The electronic files, which are publicly accessible. concerning the annual budget execution of each municipality under SPSCA jurisdiction, are provided by the agency in CSV format. The author converted these data into data spreadsheets in XLSX format compatible with MS Excel. Subsequently, they were processed and tabulated using business intelligence software, specifically Tableau. The columns in the spreadsheets provided by SPSCA represent the 23 variables related to budget execution, and the rows represent the budgetary expenditures[7] of the municipalities. After consolidating the 170 individual spreadsheets (34 municipalities times five years each) for the 34 municipalities of the RPMA into a single spreadsheet, the variables of interest for the research were selected. Thus, the variables used were: 1) government agency name; 2) type of expenditure; 3) expenditure amount; 4) government subfunction; and v) expenditure element.

Regarding the revenue data, the net current revenue for the 34 municipalities of the RPMA from 2016 to 2020 was obtained through access to the Finances of Brazil: Municipal Accounting Data (Finbra) database, managed by the National Treasury Secretariat of the Ministry of Finance. The data used were extracted from the Summary Report of Budget Execution (SRBE).[8]

Regarding government agencies, only budget execution data from municipal governments were considered, excluding data from autarchies, foundations, funds, and municipal councils. Regarding the type of expenditure, the committed amount from 2016 to 2020 was considered. As for government subfunctions, initially, the 47 subfunctions selected in the qualitative stage of the research were considered, which, after undergoing the research procedure alignment with the budget execution of the analyzed municipalities, were reduced to 27. Concerning expenditure classification, only the first digit of the complete classification (of eight digits) was used, referring therefore to the economic category of expenditure (current expenditures and capital expenditures).

The committed expenditure values, as well as the net current revenue values of the municipalities, were monetarily updated to December 2020 using the Extended National Consumer Price Index (IPCA), produced by Brazilian Institute of Geography and Statistics - IBGE. The data were tabulated using Tableau software, employing basic descriptive statistical procedures to highlight aspects related to the potential achievement of SDG 11 targets by the 34 municipalities comprising the RPMA.

Figure 2 – Descriptive scheme of the research procedure in two stages: qualitative and quantitative



Source: elaborated by the author.

Results

In the following section, the results obtained from the research are presented. Table 2 shows the outcome of the qualitative phase of the research, specifically the analytical-qualitative correspondence among CIPFs, government functions and subfunctions, and SDG 11 targets.

In addition to the 16 functions and 44 subfunctions listed in Table 2, the "science and technology" function and its respective subfunctions (Scientific Development, Technological Development and Engineering, and Diffusion of Scientific and Technological Knowledge) were considered cross-cutting due to their characteristics, with significant potential to contribute to the development and achievement of targets associated with SDG 11. Therefore, they were also included. Consequently, a total of 17 government functions and 47 subfunctions were selected as potentially corresponding to the 10 targets of SDG 11. However, as will be shown, the number of subfunctions analyzed in this study is even smaller.

Chart 2 – Qualitative correspondence between CIPFs, function, subfunction, and SDG 11 targets

(To be continued)

Code	CIPF	Gov. Function	Gov. Function + SDG#11 Targets	Gov. Subfunction + SDG#11 Targets
I	Spatial Planning and Land Use	Administration	| 11.3 | 11.5 | 11.a | 11.b |	Planning and Budget | 11.3 | 11.a | 11.b | Land Use Planning | 11.3 | 11.5 | 11.a | 11.b | Social Communication | 11.3 | 11.5 |
		Urbanism	| 11.1 | 11.2 | 11.3 |	Urban Infrastructure | 11.1 | 11.3 | Urban Sevices | 11.1 | 11.3 | Urban Collective Transport | 11.2 |
II	Transport and Regional Road System	Transport	| 11.2 |	Rail Transport | 11.2 | Waterway Transport | 11.2 | Road Transport | 11.2 | Special Transport | 11.2 |
III	Housing	Housing	| 11.1 |	Urban Housing | 11.1 | Rural Housing | 11.1 |
IV	Environmental Sanitation	Sanitation	| 11.1 |	Urban Basic Sanitation | 11.1 |
V	Tourism	Trade and Services	| 11.a |	Commercial Promotion | 11.a | Commercialization | 11.a | Tourism | 11.a |
VI	Environment	Environmental Management	|11.3 | 11.4 | |11.5 | 11.6 | |11.7 | 11.a | |11.b |	Environmental Preservation and Conservation 11.3 | 11.4 | 11.5 | 11.6 | 11.7 | 11.a | 11.b | Environmental Control 11.3 | 11.4 | 11.5 | 11.6 | 11.7 | 11.a | 11.b | Recovery of Degraded Areas 11.3 | 11.4 | 11.5 | 11.6 | 11.7 | 11.a | 11.b | Water Resources 11.3 | 11.4 | 11.6 | 11.7 | 11.a | |11.b |
		Energy	| 11.6 |	Energy Conservation | 11.6 | Electric Energy | 11.6 | Mineral Fuels | 11.6 | Biofuels | 11.6 |
VII	Economic Development	Foreign Relations	| 11.c |	International Cooperation | 11.c |
		Industry	| 11.a |	Industrial Promotion| 11.a | Industrial Production | 11.a | Mining |11.a | Industrial Property | 11.a | Standardization and Quality | 11.a |
		Trade and Services	| 11.a |	Commercial Promotion | 11.a | Comercialization | 11.a | Foreign Trade | 11.a | Tourism | 11.a |
		Energy	| 11.a |	Energy Conservation | 11.a | Electric Energy | 11.a | Mineral Fuels | 11.a | Biofuels | 11.a |

Chart 2 – Qualitative correspondence between CIPFs, function, subfunction, and SDG 11 targets

(Conclusion)

Code	CIPF	Gov. Function	Gov. Function + SDG#11 Targets	Gov. Subfunction + SDG#11 Targets
VIII	Social Services	Public Safety	| 11.1 | 11.4 11.5 | 11.7 | 11.b |	Policing | 11.7 | Civil Defense | 11.1 | 11.4 | 11.5 | 11.7 | 11.b | Information and Intelligence | 11.7 |
		Citizenship Rights	| 11.1 | 11.2 | 11.5 | 11.b |	Individual, Collective and Diffuse Rights | 11.1 | 11.2 | 11.5 | 11.b |
IX	Sports and Leisure	Sports and Leisure	| 11.7 |	Leisure | 11.7 |
X	Culture	Culture	| 11.4 |	Historical, Artistic and Archaeological Heritage | 11.4 |
XI	Agribusiness	Agriculture	| 11.a |	Supply | 11.a | Rural Extension | 11.a | Irrigation | 11.a | Promotion of Agricultural Production | 11.a | Food and Agriculture Defense | 11.a |
		Agrarian Organization	| 11.a |	Agrarian Reform | 11.a | Colonization | 11.a |

Source: elaborated by the author.

Using the list of 47 subfunctions - previously selected in the qualitative phase of the research. As a parameter to query budget execution data (committed amount) from the 34 municipalities comprising the RPMA, results were observed for 27 subfunctions. In other words, 20 subfunctions were not included in these municipal budgets, thus resulting in no occurrences of expenditures (committed amount) by the municipalities of the RPMA. Chart 3 lists the subfunctions not included in the budgets of the municipalities within the RPMA and therefore excluded from the analysis.

Of the total of 109 subfunctions listed in Ordinance n. 42, of April 14, 1999 (Brazil, 1999), the budgets of the 34 municipalities in the RPMA cover 76 of them, representing 69.7% of the total. In aggregate, 91.4% of the expenditures of these 76 subfunctions are related to current expenditures, which cover the operating costs of municipal management, while 8.6% related to capital expenditures. Considering the 27 selected subfunctions, which have potential relevance to SDG 11, current expenditures account for 67.8% of the total and capital expenditures account for 32.2% – representing a participation about

Chart 3 – Subfunctions without expenditure occurrences in municipal budgets

Code	Subfunctions
126	Rail Transport
183	Irrigation
212	International Cooperation
481	Information and Intelligence
481	Rural Housing
512	Urban Services
543	Agrarian Reform
571	Scientific Development
572	Technological Development and Engineering
608	Industrial Property
609	Food and Agricultural Defense

Code	Subfunctions
632	Colonization
661	Water Resources
692	Commercialization
693	Foreign Trade
722	Waterway Transport
751	Energy Conservation
753	Mineral Fuels
754	Biofuels
783	Special Transport
813	Mining

Source: elaborated by the author.

Table 1– Expenses according to economic category (current and capital), by government subfunction (2016-2020)

Economic Category	All Subfunctions		Selected Subfunctions		(%) [c/a	(%) [d/b]
	Value (10^3 R$) [a]	(%) [a/b]	Value (10^3 R$) [c]	(%) [c/d]		
Current expenditures	23.496.946	91,4	1.795460	67,8	7,6	–
Capital expenditures	2.220.591	8,6	851.719	32,2	38,4	–
Total	**25.717.365 [b]**	**100**	**2.647.179 [d]**	**100**	**–**	**10,3**

Source: elaborated by the author.

Table 2 – Government subfunctions by municipalities of RPMA

Government Subfunction	Munic.	%
Urban Infrastructure	28	82,4
Environmental Preservation and Conservation	26	76,5
Urban Basic Sanitation	26	76,5
Road Transport	24	70,6
Policing	20	58,8
Tourism	20	58,8
Urban Housing	18	52,9
Rural Extension	13	38,2
Industrial Promotion	13	38,2
Planning and Budgeting	12	35,3
Social Communication	11	32,4
Civil Defense	11	32,4
Supply	10	29,4
Promotion of Plant Production	7	20,6

Government Subfunction	Munic.	%
Electric Energy	6	17,6
Leisure	6	17,6
Diffusion of Scientific and Technological Knowledge	5	14,7
Commercial Promotion	5	14,7
Environmental Control	4	11,8
Historical, Artistic and Archaeological Heritage	4	11,8
Promotion of Agricultural Production	4	11,8
Urban Collective Transport	4	11,8
Individual, Collective and Diffuse Rights	1	2,9
Standardization and Quality	1	2,9
Territorial Planning	1	2,9
Industrial Production	1	2,9
Recovery of Degraded Areas	1	2,9

Source: elaborated by the author.

3.7 times higher than in the case of the same heading for all subfunctions.

The expenditures made by municipalities in the RPMA on the selected subfunctions demonstrate notable heterogeneity. It can be observed that none of the subfunctions received contributions from all 34 municipalities in the RPMA concurrently. The subfunction that received contributions from the highest number of municipalities was Urban Infrastructure, with 28 municipalities (or 82.4% of the total), followed by Environmental Preservation and Conservation and Urban Basic Sanitation, with 26 municipalities (or 76.5%). Next are Road Transport, with 24 municipalities (or 70.6%), and Policing and Tourism, with 20 municipalities or 58.8% of the total municipalities in RPMA. Also notable are the subfunctions Individual, Collective and Diffuse Rights; Standardization and Quality; Territorial Planning; Industrial Production; and Rehabilitation of Degraded Areas. All of these had expenditures made by only one municipality in RPMA.

Chart 3 provides detailed information on the 27 selected subfunctions with potential correspondence to SDG 11 targets and their respective expenditures (liquidated value) from 2016 to 2020, according to the economic category of expenditure (current and capital).

Regarding current expenditures, which collectively represent 67.8% of the total, the highest amount corresponds to the Urban Infrastructure subfunction, with R$589.8 million (or 47.3% of the total allocated to the subfunction); the lowest observed amount is related to the Recovery of Degraded Areas subfunction, with R$9 thousand. The average current expense was R$66.5 million, with a median of R$8.2 million.

As for capital expenditure, which collectively represents 32.2% of the total, the highest amount is associated with Urban Infrastructure, at R$657 million, or 52.7% of the total allocated to the subfunction. The minimum capital expenditure, with zero allocation of resources, was observed in Territorial Planning and Industrial Production. The average capital expenditure observed was R$3.5 million, with a median of R$900 thousand.

Regarding total expenditure, between 2016 and 2020, the 34 municipalities comprising the RPMA allocated R$2.6 billion, distributed between current expenditures totaling R$1.8 billion (67.8% of the total) and capital expenditures totaling R$852 million (32.2% of the total expenditures in the period under analysis).

Furthermore, the subfunction with the highest relative expenditure was Urban Infrastructure, with R$1.2 billion, consisting of R$590 million in current expenditures (47.3% of the total allocated to the subfunction) and R$657 million in capital expenditures (52.7% of the total allocated to the subfunction). Conversely, the lowest expenditure is related to the Recovery of Degraded Areas subfunction, with R$10 thousand, consisting of R$9 thousand in current expenditures (88%) and R$1 thousand (or 12%) in capital expenditures. The observed average was R$98 million, with a median of R$12.4 million.

Firstly, it is important to mention a methodological aspect whose implications should be considered in the interpretation of the results. In the case of subfunctions common to more than one target, also known as recurring subfunctions, the respective expenditures were equally distributed among the number

Table 3 - RPMA: Expenditure associated with subfunctions potentially corresponding to SDG 11, by economic category of expenditure (2016-2020)

Id.	Subfunctions Selected	Expenses						Pos.
		Current (10^3 R$) [a]	[a/c] (%)	Capital (10^3 R$) [b]	[b/c] (%)	Total (10^3 R$) [c]	[c/d] (%)	
605	Supply	14,680	90.7	1,497	9.3	16,177	0.6	13
131	Social Communication	36,942	99.9	31	0.1	36,973	1.4	10
542	Enviromental Control	2,840	64.5	1,560	35.5	4,399	0.2	19
182	Civil Defense	57,790	96.7	1,972	3.3	59,762	2.3	7
153	Diffusion of Scientific and Technological Knowledge	1,183	99.7	3	0.3	1,186	0.0	21
811	Individual, Collective, and Diffuse Rights	235	98.9	3	1.1	237	0.0	25
392	Electric Energy	34,600	95.2	1,729	4.8	36,330	1.4	11
365	Rural Extension	12,046	98.1	232	1.9	12,278	0.5	15
363	Urban Housing	1,535	4.1	36,123	95.9	37,658	1.4	9
128	Urban Infrastructure	589,845	47.3	657,087	52.7	1,246,933	47.6	1
482	Leisure	8,196	77.7	2,354	22.3	10,550	0.4	16
451	Standardization and Quality	419	97.3	12	2.7	431	0.0	23
545	Territorial Planning	249	100.0	0	0.0	249	0.0	24
665	Historical, Artistic, and Archaeological Heritage	271	21.5	986	78.5	1,257	0.0	20
845	Planning and Budgeting	122,107	91.4	11,448	8.6	133,555	5.1	5
846	Policing	133,520	94.3	8,089	5.7	141,610	5.4	4
181 121	Environmental Preservation and Conservation	191,271	94.3	11,641	5.7	202,912	7.7	3
272	Industrial Production	227	100.0	0	0.0	227	0.0	26
274	Commercial Promotion	4,635	98.6	67	1.4	4,703	0.2	18
601	Promotion of Agricultural Production	462	69.5	203	30.5	664	0.0	22
662	Promotion of Plant Production	24,372	95.6	1,124	4.4	25,496	0.96	12
691	Industrial Promotion	7,885	63.8	4,474	36.2	12,359	0.5	14
601	Recovery of Degraded Areas	9	88.0	1	12.0	10	0.0	27
332	Urban Basic Sanitation	399,389	84.1	75,747	15.9	475,136	18.1	2
847	Road Transport	116,346	94.1	7,286	5.9	123,632	4.7	6
781	Urban Collective Transport	8,228	87.2	1,204	12.8	9,432	0.4	17
	Tourism	26,177	49.4	26,847	50.6	53,024	2.0	8
	Total	**1.795.460**	**67.8**	**851,719**	**32.2**	**2,647,179 [d]**	**100**	**–**
	Máximum	589,845	95.6	657,087	1.0	1,246,933	0.4	–
	Minimum	9,0	0.0	0,0	0.0	10,0	0.0	–
	Average	66,498	4.3	31,545	0.2	98,044	–	–
	Median	8,228	0.9	1,497	0.1	12,359	–	–

Source: elaborated by the author.

of related targets. For example, for the Civil Defense subfunction, which is common to five targets (11.1, 11.4, 11.5, 11.7, and 11.b), the total expenditure (R$59.7 million) was divided by five, resulting in R$11.9 million per target.

Following this methodology, target 11.1 [... safe, adequate, and affordable housing, and basic services and the upgrading of slums...] received the largest allocation of resources. Aproximately R$1.1 billion, representing 43.4% of the total, distributed among six subfunctions, averaging R$191 million per related subfunction. In second position, in terms of resource allocation, is target 11.3 [... inclusive and sustainable urbanization, and the capacity for participatory, integrated, and sustainable human settlement planning and management...]. This target received R$716 million, representing 27.1% of the total, distributed among eight subfunctions, averaging R$89.5 million per related subfunction. In third place is target 11.a [Support positive economic, social, and environmental links between urban, periurban, and rural areas by strengthening national and regional development planning] which received R$218 million, representing 8.2% of the total, distributed among 16 subfunctions. It received R$13.6 million per related subfunction. Together, these three target cover 78.7% of the total expenditure. The other targets were covered with allocations ranging from R$194 million, or 7.3% of the total, to R$118,000, or 0.004% of the total.

It is also worth noting that the total expenditures (R$2.65 billion) related to the 27 selected subfunctions represent about 10.3% of the total expenditure made by the 34 municipalities of the RPMA, considering all 79 government subfunctions included in the respective budgets, totaling approximately R$25.7 billion. Table 5 lists the recurring or common subfunctions for more than one SDG 11 target.

It is observed that 11 subfunctions out of a total of 27, representing 40.7% of the total, are recurrent, or common, to more than one SDG 11 target, with a emphasis on the subfunction "Diffusion of Scientific and Technological Knowledge," which is common to all targets, and therefore having its respective expenditures distributed equally among the ten targets, following the adopted procedure.

In sequence, the subfunctions Environmental Control, Environmental Preservation and Conservation, and Recovery of Degraded Areas, are common to seven SDG 11 targets; Civil Defense, common to five targets; Individual, Collective, and Diffuse Rights and Territorial Planning, are common to four targets; Planning and Budget, are common to three targets; Urban Infrastructure, Social Communication, and Electric Energy, are common to two targets each. The remaining subfunctions (Supply, Rural Extension, Urban Housing, Leisure, Standardization and Quality, Historical, Artistic, and Archaeological Heritage, Policing, Industrial Production, Commercial Promotion, Agricultural Production Promotion, Plant Production Promotion, Industrial Promotion, Urban Basic Sanitation, Road Transport, Urban Collective Transport, Tourism) are not recurring, meaning they correspond

Table 4 – SDG 11 targets, associated subfunctions, and expenditure per target (2016-2020)

(To be continued)

SDG 11 Targets	Subfunctions Associated with Targets	Subfunctions	Total Target (10^3 R$)	(%) [a/b]	Expenditure per Subfunction (10^3 R$)
11.1	6	Civil Defense	11,952	43.4	191,398
		Diff. of Scient. and Techn. Knowledge	119		
		Individual, Collective, and Diffuse Rights	59		
		Urban Housing	37,658		
		Urban Infrastructure	623,466		
		Urban Basic Sanitation	475,136		
		Total Target 11.1	**1,148,390**		
11.2	4	Diff. of Scient. and Techn. Knowledge	119	5.0	33,311
		Individual, Collective, and Diffuse Rights	59		
		Road Transport	123,632		
		Urban Collective Transport	9,432		
		Total Target 11.2	**133,242**		
11.3	8	Social Communication	18,487	27.1	89,534
		Environmental Control	628		
		Diff. of Scient. and Techn. Knowledge	119		
		Urban Infrastructure	623,466		
		Territorial Planning	62		
		Planning and Budgeting	44,518		
		Preservation and Conservation of the Environment	28,987		
		Recovery of Degraded Areas	1,4		
		Total Target 11.3	**716,269**		
11.4	6	Environmental Control	628	1.6	7,158
		Civil Defense	11,952		
		Diff. of Scient. and Techn. Knowledge	119		
		Historical, Artistic, and Archaeological Heritage	1,257		
		Preservation and Conservation of the Environment	28,987		
		Recovery of Degraded Areas	1,4		
		Total Target 11.4	**42,945**		
11.5	8	Social Communication	18,487	2.3	7,537
		Environmental Control	628		
		Civil Defense	11,952		
		Diff. of Scient. and Techn. Knowledge	119		
		Individual, Collective, and Diffuse Rights	59		
		Territorial Planning	62		
		Preservation and Conservation of the Environment	28,987		
		Recovery of Degraded Areas	1,4		
		Total Target 11.5	**60,297**		
11.6	5	Environmental Control	628	1.8	9,580
		Diff. of Scient. and Techn. Knowledge	119		
		Electric Energy	18,165		
		Preservation and Conservation of the Environment	28,987		
		Recovery of Degraded Areas	1		
		Total Target 11.6	**47,901**		

Table 4 – SDG 11 targets, associated subfunctions, and expenditure per target (2016-2020)

(Conclusion)

SDG 11 Targets	Subfunctions Associated with Targets	Subfunctions	Total Target (10^3 R$)	(%) [a/b]	Expenditure per Subfunction (10^3 R$)
11.7	7	Environmental Control	628	7.3	27,693
		Civil Defense	11,952		
		Diff. of Scient. and Techn. Knowledge	119		
		Leisure	10,550		
		Policing	141,610		
		Environmental Preservation and Conservation	28,987		
		Rehabilitation of Degraded Areas	1,4		
		Total Target 11.7	**193,848**		
11.a	16	Supply	16,177	8.3	13,615
		Environmental Control	628		
		Diff. of Scient. and Techn. Knowledge	119		
		Electric Energyy	18,165		
		Rural Extension	12,278		
		Standardization and Quality	431		
		Territorial Planning	62		
		Planning and Budgeting	44,518		
		Environmental Preservation and Conservation	28,987		
		Industrial Production	227		
		Commercial Promotion	4,703		
		Agricultural Production Promotion	664		
		Plant Production Promotion	25,496		
		Industrial Promotion	12,359		
		Recovery of Degraded Areas	1,4		
		Tourism	53,024		
		Total Target 11.a	**217,840**		
11.b	8	Environmental Control	628	3.3	12,333
		Civil Defense	11,952		
		Diff. of Scient. and Techn. Knowledge	119		
		Individual, Collective, and Diffuse Rights	59		
		Territorial Planning	62		
		Planning and Budgeting	44,518		
		Environmental Preservation and Conservation	28,987		
		Recovery of Degraded Areas	1,4		
		Total Target 11.b	**86,328**		
11.c	1	Diff. of Scient. and Techn. Knowledge	119	0,0	118
		Total Target 11.c	**119**		
		Total	**2,647,179**	**100**	–

Source: elaborated by the author.

to only one target each. In Table 6, the targets associated with SDG 11 and the respective economic classification of the committed expenditure (current and capital expenditures) are listed.

As previously mentioned, it is worth reiterating that, in the case of the 11 recurring or common subfunctions to more than one target (Table 5), the respective expenditures were distributed equally among the number of related targets. For the distribution, in each related target of these adjusted values in the economic category of expenditure, the percentage originally observed for each subfunction (Table 3) was respected. For example, the "Urban Infrastructure" subfunction is common to two targets, 11.1 and 11.3, and of its total expenditure, 47.3% refers to current expenditures, and 52.7% refers to capital expenditures. Therefore, the total expenditure of R$1.25 billion (Table 4) was divided between the two targets (R$623.5 million per target), with this value also allocated proportionally between current expenditures (47.3%) and capital expenditures (52.7%) in both targets.

Regarding the economic category of expenditure, it is observed that the maximum allocation in current expenditures is related to target 11.1 [... safe, adequate, and affordable housing, and basic services and the upgrading of slums...], with R$707.6 million, representing 61.6% of the target, 39.4% of the total for this economic category, and 26.7% of the total expenditure. The minimum value observed for the same category was R$119 thousand, related to target 11.c. The observed average was R$179.5 million; the median was R$102.5 million.

Table 5 – Recurring or common subfunctions for more than one SDG 11 target

Recurring Subfunctions	Related Targets
Diffusion of Scientific and Technological Knowledge	10
Environmental Control	7
Environmental Preservation and Conservation	7
Recovery of Degraded Areas	7
Civil Defense	5
Individual, Collective, and Diffuse Rights	4
Territorial Planning	4
Planning and Budgeting	3
Urban Infrastructure	2
Social Comunication	2
Eteric Energy	2

Source: elaborated by the author.

Regarding the capital expenditures category, the largest expenditure is also related to target 11.1 [... safe, adequate, and affordable housing, and basic services and the upgrading of slums...], with R$440.8 million, representing 38.4% of the target, 51.8% of the total for the economic category, and 16.7% of the total expenditure. Conversely, the lowest value observed for the analyzed category concerns target 11.c, with R$300 thousand. The average was R$85.2 million; the median was R$7.3 million.

Considering the total expenditure (current expenditures and capital expenditures), amounting to R$2.6 billion, it is observed that 67.8% (or R$1.8 billion) refer to the category of Current Expenditures and 32.2% (or R$852 million) to the economic category of capital expenditures. Regarding Capital Expenditures, it is relevant to mention that only 1.0% of the total was allocated to debt amortization and financial investments, meaning that 99% of the total was allocated to investments.

In order to verify how the municipal resources are distributed concerning the targets associated with SDG 11, using the selected government subfunctions as a proxy, the DEI was developed, which corresponds to the total value of expenditures associated with a given subfunction, divided by the population of the set of municipalities that carried out

Table 6 – SDG 11 Targets and economic classification of expenditure: current and capital expenditures (2016-2020)

SDG 11 Targets	Expenditures					[a/d] %	[b/e] %	[c/f] %	[a/f] %	[b/f] %
	Current [a] (10^3 R$)	[a/c] %	Capital [b] (10^3 R$)	[b/c] %	Total [c] (10^3 R$)					
11.1	707,582	61.6	440,809	38.4	1,148,390	39.4	51.8	43.4	26.7	16.7
11.2	124,750	93.6	8,491	6.4	133,242	6.9	1.0	5.0	4.7	0.3
11.3	382,008	53.3	334,261	46.7	716,269	21.3	39.2	27.1	14.4	12.6
11.4	39,678	92.4	3,267	7.6	42,945	2.2	0.4	1.6	1.5	0.1
11.5	58,000	96.2	2,297	3.8	60,297	3.2	0.3	2.3	2.2	0.1
11.6	45,150	94.3	2,751	5.7	47,901	2.5	0.3	1.8	1.7	0.1
11.7	181,124	93.4	12,724	6.6	193,848	10.1	1.5	7.3	6.8	0.5
11.a	176,818	81.2	41,022	18.8	217,840	9.8	4.8	8.2	6.7	1.5
11.b	80,231	92.9	6,097	7.1	86,328	4.5	0.7	3.3	3.0	0.2
11.c	118	100	0,30	0.3	119	0.0	0.0	0.0	0.0	0.0
Total	**1,795,459 [d]**	**67.8**	**851,720 [e]**	**32.2**	**2,647,179 [f]**	**100**	**100**	**100**	**67,8**	**32.2**
Maximum	707,582	–	440,809	–	1,148,390	–	–	–	–	–
Mínimum	118	–	0,3	–	118	–	–	–	–	–
Average	179,546	–	85,172	–	264,718	–	–	–	–	–
Median	102,491	–	7,294	–	109,785	–	–	–	–	–

Source: elaborated by the author.

the expenditure. In other words, this indicator expresses the resource made by the set of municipalities in the RPMA in the subfunctions related to the SDG 11 targets per inhabitant, as projected by IBGE for the year 2010. The unit used is therefore reais per capita.

To evaluate the effort made by the RPMA municipalities in meeting the SDG 11 targets, considering their allocative capacity, the ACI Indicator was developed. This indicator corresponds to the total expenditure applied to a given target, also using the selected government subfunctions as a proxy, divided by the net current revenue of the set of municipalities that made the expenditure during the considered period (2016-2020). In essence, the ACI indicates the priority given by the municipalities to each of the SDG 11 targets. Its unit of measurement is percentage. For both indicators, the higher the quotient, the better. Table 7 lists the Distribution Effort Indicator (DEI) and Allocative Capacity Indicator (ACI) applied to the ODS 11 targets in the 2016-2020 fiscal years by the 34 municipalities that make up the RPMA.

It is observed that the target with the highest Distribution Effort Indicator (DEI) refers to target 11.1 [... safe, adequate, and affordable housing, and basic services and the upgrading of slums...], with an expenditure of R$660.8 per inhabitant of the RPMA, followed by target 11.3 [... increasing inclusive and sustainable urbanization...], with an DEI of R$424.6 per capita, considering the 31 RPMA municipalities that made expenditures on the subfunctions corresponding to that target. In third place is target 11.2 [... provide access to safe, affordable, sustainable, and accessible transport systems...], with an DEI of R$160.9 per capita, considering the 26 RPMA municipalities that made expenditures on the subfunctions corresponding to that target. In the last place we have target 11.c [Support the least developed countries, including through financial and technical assistance, for sustainable and resilient buildings...] with a DEI of R$3.9 per capita, considering the five municipalities that made expenditures on the corresponding subfunctions.

Regarding the ACI, the order of the targets is repeated. Thus, in the first position is target 11.1, with an ACI of 3.98%; in the second position, target 11.3, with an ACI of 2.54%; and in the third position, target 11.2, with an ACI of 1.04%. In the tenth and last position is target 11.c, with an ACI of 0.02%.

Final considerations

Although preliminary and subject to adjustments and improvements, the proposed method has proven capable of identifying and measuring the allocation of financial resources by the 34 municipalities that make up the RPMA in meeting the CIPFs, which are also related to the SDGs – particularly the targets of SDG 11. Even though it is not a direct measurement, it was possible to highlight, in terms of the volume of financial resources allocated, the relative importance or priority given by the RPMA municipalities to the SDGs, especially SDG 11.

Overall, the results indicated that target 11.1 [safe, adequate, and affordable housing and basic services, and upgrade slums...] had the highest expenditure by the RPMA municipalities, representing 43.4% of the total, followed by target 11.3 [enhance inclusive and

Table 7 – Distribution Effort Indicator (DEI) and Allocative Capacity Indicator (ACI) applied to the SDG 11 targets (2016-2020)

SDG 11 Target	Municipalities with SDG Expenditures	Population (2020	Net Current Revenue (10^3 R$) (2016-2020)	SDG Expenditure (10^3 R$) (2016-2020)	DEI (R$)	Pos.	ACI (%)	Pos.
11.1	34	1,738,000	28,835,887	1,148,390	660.8	1	3.98	1
11.2	26	827,912	12,865,273	133,242	160.9	3	1.04	3
11.3	31	1,687,026	28,163,197	716,269	424.6	2	2.54	2
11.4	30	1,677,003	28,001,426	42,945	25.6	9	0.15	9
11.5	30	1,677,003	28,001,426	60,297	36.0	8	0.22	8
11.6	27	850,554	13,861,579	47,901	56.3	6	0.35	6
11.7	31	1,687,026	28,163,197	193,848	114.9	5	0.69	5
11.a	33	1,692,356	28,314,016	217,840	128.7	4	0.77	4
11.b	30	1,677,003	28,001,426	86,328	51.5	7	0.31	7
11.c	5	297,983	5,197,916	119	3.9	10	0.02	10

Source: elaborated by the author.

sustainable urbanization...] with 27.15%, and target 11.a [support positive economic, social, and environmental links between urban, peri-urban, and rural areas...] with 8.2%. Together, these three targets accounted for 78.7% of the total expenditure by the RPMA municipalities on SDG 11-related targets.

The government subfunctions that most influenced this result were primarily Urban Infrastructure, with a total expenditure of R$1.25 billion, representing 47.6% of the total, followed by Urban Basic Sanitation, with R$475 million (or 18.1% of the total). Together, these two government subfunctions accounted for 65.7% of the total expenditure (R$2.65 billion) made by the RPMA municipalities on the 27 government subfunctions related to SDG 11 from 2016 to 2020. Another finding from the study is that 67.8% of the total expenditure by the municipalities on SDG 11 targets was on Current Expenditures, while 32.2% was on capital expenditures.

Regarding the continuation of the research, one of the topics to be further explored is the analysis of the impact of current expenditures versus capital expenditures on

achieving SDG 11 targets. Although capital expenditures, especially those related to investment, are considered higher quality or more "desirable" public expenditures, current expenditures, in turn, form the basis for public service provision. In this sense, certain current expenditures can be crucial for municipalities or metropolitan areas to achieve the SDG targets. Another aspect to be explored in future research concerns the more detailed level and implications of expenditures made by target for each of the RPMA municipalities. As shown (Table 7), some municipalities did not make expenditures on certain targets, except for target 11.1, for which all 34 municipalities made expenditures. An example of this heterogeneity is target 11.c, for which only five municipalities made expenditures. Another possibility for future studies would be to conduct disaggregated analyses by municipality, including other municipal executive bodies, such as funds, foundations, and/or autarchies - and perhaps extend the study to other metropolitan areas of the State of São Paulo and Brazil.

Furthermore, another relevant aspect for future refinement of the results of this research is the verification of the correspondence between the 27 subfunctions, government programs, and their respective actions, as listed in the municipal multi-year plans, to promote a better understanding of the potential impacts of these subfunctions on SDG 11 targets. Increasing expenditures in the Policing subfunction, for example, might indicate that cities are becoming "safer" as a result of increased spending, or that there has been an increase in violence and crime rates, leading to increased spending as a reactive measure. In other words, cities might be becoming more violent, not less. Therefore, to achieve a more accurate analysis of reality, it is important to compare budget execution data with other social, economic, and environmental indicators.

Additionally, future studies should explore urban issues associated with SDG 11 targets and their implications for urban and metropolitan management. The studies should also propose a method for systematically monitoring the results of actions and decisions of the metropolitan governance body, and for monitoring and evaluating the changes experienced by metropolitan citizens as a result of meeting or not meeting the targets. Another effort in future research would be to replicate the method used here for other SDGs. In this sense, another challenge to be addressed is verifying the cross-impacts between subfunctions and the targets of other SDGs. Certainly, there are common subfunctions to other targets of other SDGs that need to be identified and have their expenditures properly allocated among related targets.

Last but not least, it is important to recognize the limitations of this study, mainly due to the subjectivity related to the process of matching government subfunctions with SDG 11 targets. To mitigate this aspect and reduce individual bias, it is recommended that, in a real organizational environment, this process be conducted collectively and participatively, involving leaders, managers, and technicians from the municipalities to stimulate debate, encourage the exchange of ideas, and bring different perspectives to converge distinct opinions.

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Notes

(1) There are nine CIPFs included in Complementary Law No. 1,290, of July 6, 2016, which establishes the RPMA; two more were added to them (culture; agriculture and agribusiness) which, although not included in the aforementioned Law, are recognized as regionally relevant (Brazil, 2016).

(2) As established by the Ministry of Budget and Management Ordinance No. 42, of April 14, 1999 (Brazil, 1999).

(3) They are: Administration, Agriculture, Science and Technology, Commerce and Services, Culture, Sports and Leisure, Citizenship Rights, Energy, Environmental Management, Housing, Industry, Agrarian Organization, Foreign Relations, Sanitation, Public Safety, Transport, and Urbanism.

(4) Supply, Biofuels, Colonization, Mineral Fuels, Marketing, Foreign Trade, Social Communication, Energy Conservation, Environmental Control, International Cooperation, Agricultural Defense, Civil Defense, Scientific Development, Technological Development and Engineering, Dissemination of Scientific and Technological Knowledge, Individual, Collective and Diffuse Rights, Electric Energy, Rural Extension, Urban Housing, Rural Housing, Information and Intelligence, Urban Infrastructure, Irrigation, Leisure, Mining, Standardization and Quality, Land Use Planning, Historical, Artistic and Archaeological Heritage, Planning and Budgeting, Policing, Environmental Preservation and Conservation, Industrial Production, Commercial Promotion, Agricultural Production Promotion, Industrial Promotion, Industrial Property, Degraded Areas Recovery, Water Resources, Agrarian Reform, Urban Basic Sanitation, Urban Services, Railway Transport, Waterway Transport, Road Transport, Urban Collective Transport, Special Transport, and Tourism.

(5) Committed Amount: the amount resulting from the commitment stage of the expenditure. At this stage, the government incurs an obligation to pay the expense to the creditor. It consists of a reservation of budgetary appropriation, that is, a reservation of authorized monetary values to meet a specific purpose. The commitment is recorded at the moment of contracting the service, purchasing the material or good, work, or amortizing the debt (Data Dictionary - Expenditure Execution, n.d.).

(6) Available at: https://transparencia.tce.sp.gov.br/. Available on: March 20, 2020.

(7) Expense Identification: Fiscal Year; Full Name of the Municipality; Full Name of the Agency; Reference Month of the Expense; Name of the Reference Month of the Expense; Type of Expense; Commitment Number; Expense Identifier; Description of the Expense; Date of Expense Issuance; Amount of the Expense; Description of the Government Function; Description of the Government Subfunction; Code of the Budget Program; Description of the Budget Program; Code of the Budget Action; Description of the Budget Action; Code and Description of the Resource Source; Code and Description of the Fixed Application Code; Description of the Bidding Modality; Code and Description of the Expense Element; History of the Expense.

(8) Finances of Brazil (Finbra): is the name of the database formed with accounting, budgetary, and financial information sent by the federation entities to the National Treasury, in compliance with art. 51 of Law 101/2000, named Fiscal Responsibility Law. Available at: https://siconfi.tesouro.gov.br/siconfi/pages/public/consulta_finbra/finbra_list.jsf.

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