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Forum: Practical Perspectives

State capacity and mining: an analysis of the national regulatory agency

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This work analyzes the administrative capacity of the independent public entity National Mining Agency (ANM), which is responsible for regulating the Brazilian mineral policy. Documentary and qualitative bibliographic research were carried out. Different organizational indicators were collected from the consultation of official management reports, audits of accountability agencies, and reports from Parliamentary Committees. Under a scenario in which administrative capacities should be strengthened (2003-2020), the results counterintuitively demonstrated a continuous organizational weakness of the independent public entity. It is evident a situation that combines restriction of available bureaucrats, reduction in the discretionary budget, a deficit in patrimonial and mobile infrastructure, and outdated technological systems. Low autonomy in the allocation of resources was identified as one of the mechanisms that explain these weaknesses. These conditions (lack of resources and autonomy) contribute to poor public performance in the regulation of mining processes and in mining inspection and control activities, resulting in taxes loss, risks of new disasters, and the expansion of illegal mining.

Keywords: state capacity; bureaucracy; mining; regulation; agency.

Capacidades estatais e mineração: uma análise da agência nacional de regulação

O objetivo deste trabalho é analisar a capacidade administrativa da Agência Nacional de Mineração (ANM), responsável por regular a política mineral brasileira. Para tanto, foram realizadas pesquisas documental e bibliográfica de cunho qualitativa. Coletaram-se e analisaram-se diferentes indicadores organizacionais por meio de consulta a relatórios oficiais de gestão, auditorias de órgãos de controle, bem como relatórios de Comissões Parlamentares. Sob um cenário no qual as capacidades administrativas deveriam ter sido robustecidas (2003-2020), os resultados demonstraram, de forma contraintuitiva, a contínua debilidade organizacional da autarquia. Evidenciou-se um quadro que conjuga restrição de servidores disponíveis, diminuição no orçamento discricionário, déficit na infraestrutura patrimonial e móvel, além de sistemas tecnológicos defasados. A baixa autonomia na alocação de recursos foi identificada como um dos mecanismos que explicam essas fragilidades. Em conjunto, tais condições – escassez de recursos e autonomia – contribuem para o baixo desempenho na regulação dos processos minerários e nas atividades de fiscalização e controle da mineração, podendo resultar em perda de arrecadação pública, riscos de novos desastres e ampliação da mineração ilegal.

Palavras-chave: capacidade estatal; burocracia; mineração; regulação; agência reguladora.

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Capacidades estatales y minería: un análisis de la agencia reguladora nacional

El objetivo de este trabajo fue analizar la capacidad administrativa de la Agencia Nacional de Minería (ANM), responsable de regular la política minera brasileña. Para ello, se realizó una investigación documental y bibliográfica de carácter cualitativo. Se recogieron diferentes indicadores organizativos a partir de la consulta de informes oficiales de gestión, auditorías de agencias de control, así como informes de comisiones parlamentarias. En un escenario en el cual se deberían haber fortalecido las capacidades administrativas (2003-2020), los resultados demostraron, de manera contraintuitiva una continua debilidad organizativa de la autarquía. Se evidenció una situación que combina restricción de servidores disponibles, reducción del presupuesto discrecional, déficit en infraestructura patrimonial y móvil, además de sistemas tecnológicos obsoletos. La baja autonomía en la asignación de recursos se identificó como uno de los mecanismos que explican estas debilidades. En conjunto, las condiciones (escasez de recursos y autonomía) contribuyen a un pobre desempeño público en la regulación de los procesos mineros y en las actividades de inspección y control minero, lo que puede resultar en pérdida de recaudación pública, riesgo de nuevos desastres, además de la expansión de la minería ilegal.

Palabras clave: capacidad estatal; burocracia; minería; regulación; agencia reguladora.

1. INTRODUCTION

Despite the historical relevance of mineral extraction in Brazil, exploration in this sector has been marked by an expressive growth in recent decades, both in the value of the ore and in the quantity extracted. In the period 2001-2013, the value of Brazilian Mineral Production (PMB) increased 950%, from US\$7.7 billion to US\$77.9 billion (R\$168.2 billion) (Departamento Nacional de Produção Mineral [DNPM], 2014). The representation of the mineral sector in the Gross Domestic Product (GDP) went from 1.6% in the 2000s to 4.06% in 2018, equivalent to R\$296.38 billion reais (DNPM, 2014; Instituto Brasileiro de Mineração [Ibram], 2020). At the same time, mining is still one of the main economic activities in the country.

From the point of view of its regulation, the mineral extraction sector is composed of different institutional arrangements that intersect and are responsible for establishing and regulating the distribution of fixed assets, financial institutions, regulatory agencies, and the political identity of groups of interest (Shafer, 1994). In Brazil, following the regulatory model established in the 1990s (Pacheco, 2006; Peci, 2007), the federal government, in December 2017, created the National Mining Agency (ANM), through the conversion of the Measure Provisional (MP) 791/2017 (Medida Provisória nº 791, de 25 de julho de 2017) in Law 13.575/2017 (Lei nº 13.575, de 26 de dezembro de 2017). The ANM is the entity responsible for managing, inspecting, and promoting the mining policy in the national territory.

In this context, considering the importance of the Brazilian mineral sector, which, together with its economic impact, has significant socio-environmental externalities – such as the high number of illegal mines and, ultimately, the occurrence of socio-environmental disasters, this research analyzed the administrative capacity of the ANM, central organization in the regulation of mineral activity in the country. A disaggregated dimension of the concept of state capacity – which involves political, institutional, administrative and technical components (Gomide, Machado, & Albuquerque, 2021; Souza & Fontanelli, 2020) – administrative capacity is defined as “the government’s ability to manage its resources human and physical to fulfill their goals” (Painter & Pierre, 2005, p. 2). Thus, when

analyzing the administrative capacity of the ANM – in its organizational dimension (El-Taliawi & Van der Wal, 2019) -, we sought to identify the level and management of human, physical and technological resources of the autarchy, capable of influencing the achievement of its politically defined goals (Peters, 2015; Souza & Fontanelli, 2020).

Along with resources, dimensions of autonomy are also identified in field studies as important for the performance of public organizations (Carpenter, 2001; Lotta & Santiago, 2018). In this work, autonomy will be investigated in terms of the budgetary management of resources destined to the agency – therefore, organizational autonomy in its financial dimension of analysis. Within the scope of regulation, the autonomy of agencies, especially regarding their budget allocation and allocation, is a key premise of the model (Peci, 2007), ensuring greater choice in the allocation of resources.

In terms of justification, when analyzing the administrative capacity in an important contemporary function of the State, which has been little studied, namely, the state capacity for regulation (Cunha, Pereira, & Gomide, 2017), the study offers practical and theoretical contributions to the field of public administration. In parallel, a specific gap is filled regarding the field of public policies investigated, since, although mining is one of the main economic activities in the country, no research was found on the subject - which may be linked to the recent creation of the agency sector regulator.

2. METHODOLOGICAL PROCEDURES

The research is qualitative, exploratory, and descriptive (Godoy, 1995). The time frame of the analysis was from 2003, the beginning of the *commodity boom*, until 2020. To meet the objectives of the work, we initially sought to identify information on the physical and human resources available to the ANM, as well as indicators of its financial autonomy. However, in order to obtain a more accurate diagnosis of the phenomenon investigated, we also tried to identify proxies of organizational products of the autarchy, in order to complement the analysis.

In order to avoid the possible tautology made a priori between capacity (resources) and results (products) (Gomide, Pereira, & Machado, 2017), this study does not assume that the increase or decrease of resources will necessarily result in the variation of products. This relationship is identified only when the mechanism by which it is evidenced is identified. Mechanisms are understood as “similar classes of events and occurrences that alter the connections between social units” (McAdam, Tarrow, & Tilly, 2001, p. 24). Schematically, this can be presented as $X \rightarrow Y$, where X is the initial conditions, Y the result, and the arrow is the concatenation of events and occurrences, which connect both variables (X and Y) and circumstances (in this case, resources and products).

Regarding collection strategies, data were obtained through documentary and bibliographic research. To select the materials, the official portals of the Ministry of Mines and Energy (MME), ANM, federal control agencies – Federal Court of Accounts (TCU) and Federal Comptroller General (CGU) – and the Ministry of Economy were consulted.

As indicators of organizational resources, the following data were collected: i) total authorized budget; ii) authorized discretionary budget; iii) number of publicly available servers; iv) management tools; and v) results monitoring systems and strategies. Such resources are important for the agency to be able to adequately perform its functions (Gomide et al., 2021). Additionally, we consider the vi) professionalization of the bureaucracy, with meritocratic recruitment and career incentives, given

that a professionalized bureaucracy allows for more accurate decision-making (Fukuyama, 2013; Marengo, 2017), as well as better organizational performance when the bureaucracy has autonomy (Gomide et al., 2021).

To investigate the level of organizational autonomy – analyzing its financial dimension – two indicators were used: i) total budget executed; and ii) discretionary budget executed. In theory, the model of regulatory agencies should provide greater managerial insulation for autarchies (Pacheco, 2006; Peci, 2007). In this sense, the level of executed budgets can be seen as an indicator of the organization's autonomy, avoiding possible dysfunctional interference from groups of interest as well as providing continuity and predictability of the actions of the autarchy (Carpenter, 2001; Oszlak & Felder, 2000).

In turn, the result proxies were identified according to the organizational objectives of the ANM. Pursuant to the legislation, the agency, in the exercise of its powers, will observe and implement the guidelines of the Mineral Code, with the purpose of promoting the management of the Union's mineral resources, as well as the regulation and inspection of activities for the use of resources minerals (Lei nº 13.575, de 26 de dezembro de 2017). Thus, the following proxies were used: i) inspections carried out; and ii) evolution of the number of titles granted.

Finally, documents that help to map possible ANM management bottlenecks were consulted, and the “how” could be identified, that is, the explanatory mechanisms of the process. To this end, the following documents were analyzed: i) sector legislation; ii) annual management reports from the autarchy and audits from control bodies; iii) reports of parliamentary inquiry commissions, which analyzed the causes and context related to the two recent mining disasters in the country: the one in Rio Doce, in November 2015, and the one in Brumadinho (MG) in January 2019; and iv) statements by directors on news portals.

Box 1 summarizes the analysis model used to carry out this study, highlighting the dimensions analyzed, as well as the resources and results indicators.

BOX 1 MODEL FOR ANALYZING THE ANM'S ADMINISTRATIVE CAPACITY

Dimensions	Resources (Indicators)	Results (Indicators)	Authors
• Available human, financial and technological resources; • Organizational autonomy; • Information systems and strategies for monitoring and evaluating actions; • Instruments for intra and intergovernmental coordination.	• Tenure professional available; • Bureaucracy professionalization; • Authorized budget (total and discretionary); • Cooperation and/or partnership agreements.	• Executed budget (total and discretionary); • Mining processes granted; • Inspections carried out.	Carpenter (2001); Fukuyama (2013); Gomide et al. (2021); Oszlak and Felder (2000); Peters (2015); Pires and Gomide (2016); Souza and Fontanelli (2020).

Source: Elaborated by the authors.

In the next section, the search results are presented.

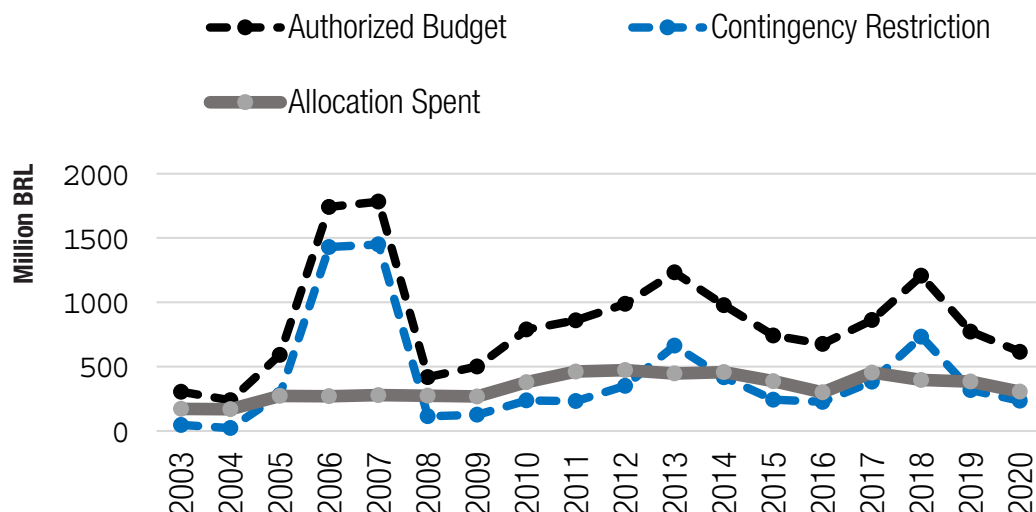
3. RESULTS AND DISCUSSIONS

Administrative capacities contribute for regulation in the mineral area to be implemented in accordance with defined public objectives. The availability of physical and human resources reveals the ANM's capacity to fulfill its role as the main regulatory body in the sector (Oszlak & Felder, 2020).

In the case analyzed, the ANM budget is composed of resources raised through the collection of CFEM; of government transfer; fees, such as the annual fee per hectare of exploration; and the fines applied by the entity. In addition, the budget made available to the ANM depends on the one hand, on the approval of the Annual Budget Law (LOA) and, on the other, on the possible restriction of resources by the Executive Branch. The entity's sources of revenue are consigned to the general budget of the Union (Lei nº 13.575, de 26 de dezembro de 2017) and there are no binding mechanisms that prevent the executive from contingent on the resources of the approved budget. This decision is therefore politically defined.

As the first indicators analyzed, in Graph 1 the budgetary evolution of the DNPM/ANM is shown, in which the following are listed: i) the values for the total authorized budget, represented by the sum of the constant allocation of the LOA and the additional credits raised in the period; ii) the contingency reserve; and iii) the expenses committed by the autarchy (allocation spent).

GRAPH 1 ANM DEFLATED GENERAL BUDGET (IGP-DI) FROM 2003 TO 2020



Source: Elaborated by the authors based in ANM Budget Execution Reports.

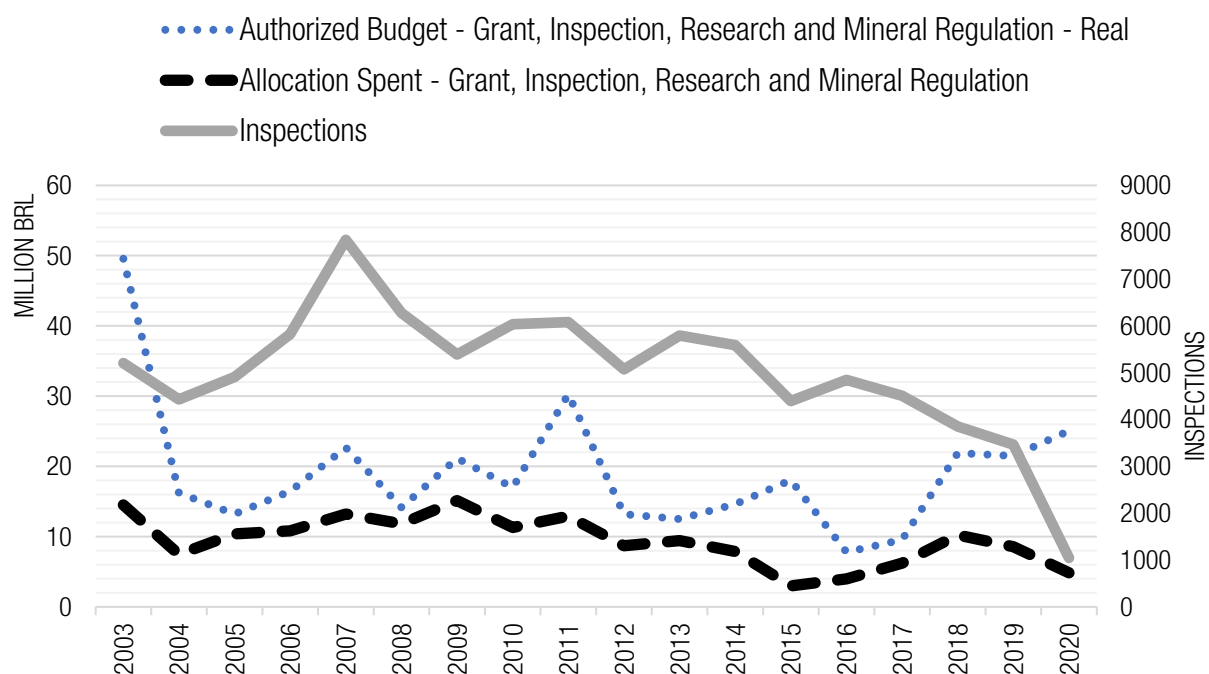
Regarding the total authorized budget, it is initially registered its high fluctuation throughout the analyzed period. To a large extent, this situation is explained by the annual variation in the collection of CFEM, which is the municipality's main source of funding. According to Law 13,575/17 (Lei nº 13.575, de 26 de dezembro de 2017), the government is required to transfer 7% of the tax collected to make up the DNPM/ANM budget. In turn, the fluctuation of the CFEM is linked to the increase or decrease in the prices of minerals in the international market. In 2007, for example, the year with the highest budget approved for the DNPM, the ton of iron ore was quoted at \$190 dollars in December, while the ton of mineral was around \$70 dollars the following year.

Despite its total budget being linked to variations in the price of ore, the expressive contingent resources (dashed blue line) are the result of a political choice by the federal government, which disrespects the very rules that establish the autarchy (Lei nº 13.575, de 26 de dezembro de 2017). On average, considering the 17 years analyzed, the annual expenditure executed by the entity was only 46.5% of the total authorized by law for its budget. More than half of the resources that annually should reinforce its administrative structure were reverted for other purposes.

Considering that the execution rate of this contingent reserve is zero, the best indicator of the actual budgetary condition of the ANM refers to its total expenditure committed, and not the authorized budget. When deflated, the amounts spent vary between R\$170 million in 2003, and R\$304 million in 2020. An increase of 78.8% in the period. The biggest budget increase comprised the years 2010 to 2012, when it reached a peak of more than R\$472 million spent by the entity in 2012. Since then, the committed budget has shown a continuous downward trend in the last eight years.

Among the main activities under the responsibility of the ANM are research and inspection actions. The inspection corresponds to the monitoring activities of the collection of CFEM, security related to tailings dams, the conditions of underground mines and other operations under the entity's jurisdiction. Such activities are part of its discretionary budget, that is, what the ANM has the greatest margin of choice in the resource allocation decision. Although there was an increase in total expenditures over the period analyzed (Graph 1) (2003-2020), with regard to the budget and discretionary actions of the autarchy, a different situation occurred. As a way to expose this issue, in Graph 2 the number of inspections carried out in the period, the data referring to the total budget of discretionary expenses and the discretionary expenses committed.

GRAPH 2 DISCRETIONARY BUDGET (IN MILLIONS) - GRANT, INSPECTION, RESEARCH AND MINERAL REGULATION - DEFLATED (IGP-DI) OF THE ANM, FROM 2003 TO 2020



Source: Elaborated by the authors based in ANM Budget Execution and Management Reports.

Regarding inspection actions, two distinct tendencies stand out. In the initial years, there was an increase in the number of activities until 2007, a year that registered 7,837 inspection actions. Since then, there has been a trend of continuous decline in activities, in which the years 2018, 2019 and 2020 have the lowest number of shares in the entire period (3,850; 3,465; and 1,047, respectively). This highlights the weakening of one of the main functions of the autarchy: monitoring.

The decrease in inspection activities is explained when analyzing the budget authorized for these actions. The year with the highest budget forecast was 2003, the first in the historical series, in which R\$ 49.56 million reais were approved for discretionary activities. On the other hand, the lowest amount was in 2016, with only BRL 7 million foreseen. This discrepancy shows that the total increase in the entity's budget (Graph 1) was, in fact, directed towards the fixed expenses of its structure, mainly with personnel, while the budget for discretionary activities decreased over the analyzed period (Graph 2).

Nevertheless, this weakening scenario of the ANM is amplified when one observes the values actually carried out by the autarchy, which are repeatedly smaller than those approved. As in its total budget, the differences between the authorized and executed budget are the result of the contingency and the non-granting of commitment limits, by the Federal Budget Secretariat, of the Ministry of Planning, Budget, and Management (SOF/MP) (Tribunal de Contas da União [TCU], 2016), currently linked to the Ministry of Economy. In the period analyzed, the highest amount committed was again in 2003, with 14 million reais, and the lowest was, in 2015, with only 2.9 million reais. Again, there is

a low rate of budget execution, in which, on average, 54% of the resources provided for discretionary actions were in fact committed by the organization.

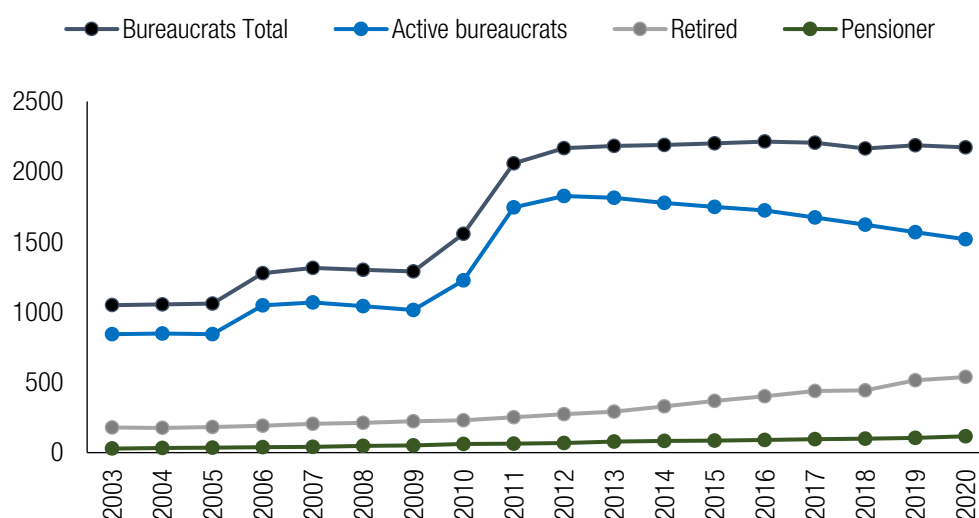
In a 2020 management report, the Agency itself warns that the unrestricted allocation of expenses for risk activities (mining), “can result in irreparable environmental disasters (as occurred in Mariana and Brumadinho), the budgetary restriction prevents the implementation of timely actions and reduces the preventive action of the ANM in its final actions” (Agência Nacional de Mineração [ANM], 2021, p. 100).

The panorama that combines restrictions to discretionary resources; Late values of the daily rates of the civil servants for inspection (base 2006 and not updated); not setting goals; and the infrastructure (vehicles and equipment) in precarious conditions, makes it even more difficult for the efficiency and effectiveness of the monitoring carried out by the entity (ANM, 2021; TCU, 2019). According to data authored by TCU, ANM had 42 vehicles in its fleet for inspection activities of all mining titles. However, 40% of them were in an uneconomical state, requiring immediate replacement (TCU, 2019), which weakened this operation.

Audit reports from the Federal Comptroller General (Controladoria-Geral da União [CGU], 2020) also endorse the results related to the difficulty of inspection by the ANM. When analyzing CFEM’s inspection and collection procedures, CGU found that the poor quality of data, computerized systems, the scarcity of human and material resources and the incipient inspection planning of CFEM, may have generated a smaller collection for the coffers between BRL 5.8 billion and BRL 11.6 billion in fiscal year 2019.

Another important indicator of ANM’s administrative capacity refers to the number of civil servants linked to the entity. In Graph 3, these data are exposed.

GRAPH 3 DNPM/ANM STAFF AND EMPLOYMENT STATUS FROM 2003 TO 2020



Source: Elaborated by the authors based in the Statistical Panel of Personnel.

Regarding the availability of bureaucrats, the data show an evolution of the total staff (black line) of the autarchy from 2009 to 2012, the period in which the positions approved in the public contest of 2009 were nominated. public tenders, which required recourse to outsourced staff. However, after these hirings, there is a decrease in the number of active bureaucrats (blue line), as there were no new competitions. According to data from 2019, 60% of ANM employees are over 50 years old, indicating their imminent retirement and the possibility of weakening the entity (TCU, 2019). Additionally, civil servants face a wage gap of 40% in relation to other regulatory agencies (Oliveira, 2021).

Still on personnel indicators, it is important to observe the percentage of positions held in relation to the capacity authorized by law. In Table 1, it is observed that 62% of the list of positions approved for the agency is unoccupied (TCU, 2019).

TABLE 1 ANM STAFF AGAINST THE AUTHORIZED CAPACITY IN 2019

Position	Occupied		Vacant		Total
	Quant	%	Quant	%	
Specialists in mineral resources	245	29,0%	599	71,0%	844
Administrative analyst	78	39,0%	122	61,0%	200
Technician in mining activities	39	7,7%	466	92,3%	505
Administrative technician	68	34,0%	132	66,0%	200
Special plan of positions	375	100,0%	0	0,0%	375
Total	805	37,9%	1.319	62,1%	2.124

Source: TCU (2019, p. 31).

According to the data in Table 2, the biggest evictions are for the positions of technician in mining activities and specialists in mineral resources, the autarchy's target areas. Only 7.7% of vacancies are filled. However, middle areas also have unfilled positions, as 34% and 39% of administrative technician and analyst positions were occupied in 2019, respectively.

Personnel data indicate deficiencies in the professionalization of the ANM staff, which face difficulties in replacing civil servants through new public examinations, as well as career incentives, such as non-competitive remuneration compared to other regulatory agencies (Oliveira, 2021). This high deficit of civil servants combined with deficiencies in professional training tends to make economic predictability difficult for those that are regulated, as the mining processes required by the entity take time to be analyzed (about 70,000 await analysis by the agency) (ANM, 2021; TCU, 2019).

Added to the personnel deficit, the slowness in the evaluation of the processes is echoed in the fragility of the technical instruments available to the organization, such as: systems of information technology considered outdated and without integration; high level of non-digitized physical processes; and the absence of electronic protocols to receive mining processes, which had only been instituted

on 09/30/2019 (TCU, 2019). Furthermore, to some extent, there is the resistance of its own staff, averse to technological changes and the lack of knowledge of “possible alternative tools or models that enable the performance of their attributions” (ANM, 2021, p. 91).

On the other hand, to overcome the scarcity of resources, the organization has resorted to other actors to minimize its fragility - including agreements with companies and entities related to the regulated sector (ANM, 2021). However, even the achievement of the signed agreements comes up against the low autonomy of the autarchy and its consequent political dependence for the commitment of resources. An example of this situation can be seen in the Conduct Adjustment Term signed by the ANM and the Public Ministry in October 2019, in which the Union committed to allocate 42.7 million reais for dam inspection actions in 2019, 2020 and 2021. A value that, when entering the total budget of the autarchy, was partially restricted by the Ministry of Economy, contrary to all meaning of the negotiation (ANM, 2021).

4. FINAL CONSIDERATIONS

Despite the growth of Brazilian mineral production since 2003 (Ibram, 2020), the general increase in public spending in the federal government (2003-2013), and the transformation from Department to Regulatory Agency (2017), the results of this study showed, counterintuitively, that this contextually favorable window was not accompanied by the strengthening of ANM capacities.

Together, the information collected and triangulated (legislation, organizational indicators, management reports and audits) made it possible to highlight the low autonomy in the allocation of resources as one of the mechanisms that explain the fragility of the autarchy. On average, 53.5% of the authorized annual budget was restricted by the planning ministry (later the economy), even though these resources are legally provided for. The high and perennial restrictions deny the normative assumptions that justify the Regulatory Agencies model itself, which, in theory, should provide greater managerial autonomy to organizations (Pacheco, 2006; Peci, 2007). In addition, it theoretically meets the importance of financial autonomy for better performance of public organizations (Oszlak & Felder, 2000).

This low financial autonomy of the organization appears to be nested (nested) in a scenario in which the following are combined: the restriction of servants, meager career and working conditions at the ANM - although its servants are selected through public examinations and have stability, which would indicate elements of bureaucratic autonomy (Marenco, 2017).

This low financial autonomy of the organization is nested to a scenario in which combine the restriction of employees and meager career conditions, although its employees are selected through public examinations and have tenure, which would indicate elements of bureaucratic autonomy (Marenco, 2017); scarce budget in face of demand; drop in discretionary endowment; deficit in equity and mobile infrastructure, in addition to outdated technological systems, which constrains ANM's scope for action. Such organizational weaknesses contribute to the poor performance in the regulation of mining processes and in inspection and control activities in mining. These situations can result in loss of public revenue, risk of new disasters, in addition to the expansion of illegal mining in which is already spatially larger than industrial mining and advances in indigenous lands and conservation units in the Amazon (Projeto MapBiomass, 2021).

Essa baixa autonomia financeira da organização se mostra aninhada a um cenário no qual se combinam restrição de servidores e poucos incentivos de carreira e de condições de trabalho na ANM, conquanto seus servidores sejam selecionados via concursos públicos e tenha estabilidade, o que indicaria elementos de autonomia burocrática (Marenco, 2017); escasso orçamento frente a demanda; queda na dotação discricionária; déficit na infraestrutura patrimonial e móvel; sistemas tecnológicos defasados, o que constrange a margem de ação da ANM. Tais fragilidades organizacionais contribuem para o baixo desempenho na regulação dos processos minerários e nas atividades de fiscalização e controle da mineração. Essas situações podem resultar em perda de arrecadação pública, riscos de novos desastres e ampliação da mineração ilegal, que já se encontra espacialmente maior do que a mineração industrial e avança em terras indígenas e Unidades de Conservação (UCs) na Amazônia (Projeto MapBiomass, 2021).

By filling the gap in academic diagnoses about the ANM showing its low capacity, this study encourages future research to investigate the reasons why this autarchy, despite its socioeconomic importance, proves to be politically marginal in the Brazilian public apparatus. To unveil these dimensions, the use of the *policy dismantling* perspective, which focuses on the strategies and choices of political elites in the weakening of public policies, is particularly promising.

Finally, it is necessary to recognize the limits of the administrative dimension for a better performance of public regulation. This is because, although the availability of adequate organizational resources is a necessary condition, it is not sufficient (Gomide et al., 2021; Oszlak & Felder, 2000). In addition to administrative capacity, the policy is essential to gain legitimacy for the actions of the regulatory agency. The literature, by the way, points out that state capacities depend on constant political activation to become effective (Gomide et al., 2021) and thus produce better results.

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