



WHO IS INTERESTED IN ENVIRONMENTAL POLICIES? NETWORKS OF CORPORATE ELECTORAL FINANCING IN THE COMMITTEE ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT (CMADS) OF THE HOUSE OF REPRESENTATIVES

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Abstract: The article exams the networks of corporative electoral financing of the federal deputies who composed the Committee on Environment and Sustainable Development (CMADS) in the 55th Legislature (2011-2014). Two questions guided the study: how is the structure of the financing network of CMADS members? Which groups of political-economic capital are formed and connected into this network? To answer, we have collected data in the Superior Electoral Court (SEC) Electoral Data Repository as well as in the CMADS reports available on the House of Representatives website. Throughout Social Network Analysis (SNA), we found a hierarchic and cohesive structure with a few companies, having clear interests in the environmental agenda, playing a central role in the network by campaign donations.

Keywords: Electoral Finance; Social Network Analysis (SNA); House of Representatives; 55th Legislature; Committee on Environment and Sustainable Development (CMADS).

1 Introduction

In their functioning in the real world, democracies face an ambivalence, which is difficult to overcome, as two classes of principles that are essential to them are in conflict: political equality and freedom of association and expression. The first prescribes that all individuals in a politeia have equal opportunities, formal and substantive, to take part in the decisions that affect them. This implies opportunities to participate, directly or indirectly, in the most free and equitable way possible, in all the stages that constitute decision-making processes, from the construction of public problems and their scheduling to the implementation of public policies, through the formal decision-making processes. The operationalization of this principle means that social actors

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participate in processes such as public deliberation, political party life, elections and decisions themselves, among others¹.

Freedom of association presupposes that social actors are free to organize themselves into groups to promote and / or defend specific goals and interests, which include numerous possibilities, such as the establishment of families and other sociability groups, work organizations, including companies, political party, religious, union action, etc. Such a principle is linked to freedom of expression, whereby actors are free to have, defend and disseminate ideas, beliefs, concepts and ideologies. Presumably, all of these principles are aligned and complementary. Then, why do they clash?

In contexts of profound asymmetries in the distribution of material and symbolic resources, individual and collective social actors have very unequal capacities to exercise the freedoms of association and expression. This is especially true for the financing of the policy, especially when, for example, individuals and companies that concentrate wealth at a much higher level than the average do not find significant constraints on the act of donating, or more precisely investing, financial resources for political parties and candidates. In such a scenario, political equality, an element that originally constituted the very definition of democracy, can be seriously constrained (PRZEWORSKI, 2012).

Daniel Zovatto says that democracy is priceless, but it has costs. In a comparative study of countries in the subcontinent, this author, while defending the need for the policy to be financed, shows that money has become a determining factor in electoral campaigns, so that political financing has become a real headache. (ZOVATTO, 2005). The issue is not limited to the Latin American context, of historic democratic deficits. Studies such as those by Bourdoka (2009), involving 109 countries, or by Falguera, Jones and Ohman (2014), sponsored by the IDEA (International Institute for Democracy and Electoral Assistance), reveal the residual participation of ordinary citizens in election campaign revenues. Where private financing prevails, business donations represent almost the totality of traded resources. As in most cases there are no rules that impose an equal distribution of these resources, the result is that political parties and candidates dramatically need the support of private groups of capital for their campaigns. With this support, there is a potential pressure to defend specific interests of these groups during the term.

Therefore, there is a very practical problem for the democratic regime, notably for the production of public policies that, in the end, will tell where the action of the state apparatus - to allow or block - and public resources will be directed. It is no different with the environmental area. Thus, a basic and initial task for those who research the production of environmental public policies is to identify the interests that are built around the agendas. That is what we propose,

¹ The literature on power is one of the most competent in demonstrating the difficulties of implementing this principle (BACHRACH; BARATZ, 1962; LUKES, 1974; GAVENTA, 1982).

presenting the main research findings on the electoral financing networks of federal deputies that are members of the Committee on Environment and Sustainable Development (CMADS), in the 55th Legislature (2015-2018).

The main objective is to identify the central groups of political and economic capital of the network under examination, formed by the connections between the companies that invest the largest amounts of money and the candidates who receive the majority of this money. At the limit, we seek to show not only who are the actors that ‘hegemonize’ an essential decision-making arena with regard to development models in Brazil, but also the links between these actors. On an ongoing basis, the questions that guide the work are: what is the structure of the financing network of CMADS members? Which groups of political-economic capital are formed and connected into this network?

It is a structural analysis based on relational attributes of the researched actors. The Social Network Analysis (SNA) has consolidated itself as the methodology par excellence for a research with such a design and this work uses its instruments and measures. The data were collected from two sources: for the detection of companies that donated to the federal deputies that were members of the CMADS during the period analyzed (2015-2018), we downloaded the accountability spreadsheets of the candidacies of these members, in the 2014 elections, in the Superior Electoral Court (SEC) Electoral Data Repository (BRASIL, 2019a). For identification of the representatives who make up our object, we consult the commission's activity reports, available on the House of Representatives website (BRASIL, 2015a, 2016, 2017, 2018). The data were organized in a relational database manager, tabulated in Excel® and analyzed using the Gephi Network Analysis tool.

It is worth mentioning that the 2014 election had unique characteristics: at the same time that it was the last one to allow legal donations from legal entities to political parties and candidates², it was the first in which the identification of donors of private resources that pass through the accounts of political parties became mandatory. Thus, for example, in previous elections, if a company donated a certain amount to a party and it passed it on to a candidate, there was no obligation on the candidate to mention the original source (the company) of this resource. It is idle to list the difficulties that this generated for the correct identification of the flow of money in electoral campaigns, especially since most of the donations that the candidates received passed through the parties. In this research, all business donations – direct or indirect (through parties or

² It is necessary to mention that such a ban initially came from the judicial power. In 2015, the Federal Court of Justice, in the judgment of ADI 4.650, filed by the Federal Council of the Brazilian Bar Association (*Ordem dos Advogados do Brasil - OAB*), considered the petition for the ban on business donations to be valid. In the same year, the National Congress tried to reintroduce business financing into the political mini-reform (Law 13,165/2015), but the provision was vetoed by then-president Dilma Roussef and the veto was not overturned. (BRASIL, 2015b).

other committees³ and candidacies) – were duly identified.

To have an idea of the centrality that companies had, in the 2014 elections, R\$ 3.05 billion originated from these organizations, practically three quarters of the R\$ 4.14 billion collected by the campaigns.

The reasons why companies invest such large sums in political campaigns are the subject of several researches that have been composing a robust field of investigation – which we present in the theoretical section of this research. For now, it should be noted that, with this research, we intend to contribute to the field, particularly in the agenda that links electoral financing to payoffs targeted by interest groups. Through the identification and measurement of the links between public agents and electoral financiers, we pursue an initial understanding of how this dynamic is constituted in environmental public policies, from a privileged object for this purpose.

In addition to this introduction, the article has four parts. The first one is a brief theoretical contextualization on the interfaces between environmental issues and development, in addition to social networks and political funding. The second presents the methodological design of the research. In the third part, we present and discuss the empirical results. Finally, we summarize these results, focusing especially on their political senses, for the unveiling of power relations around environmental policies in Brazil.

2 Theoretical-methodological framework

2.1 Interfaces between environment and development

Environmental issues began to gain space on the agendas of national states at the turn of the 1970s (ALIER, 2007). The concept of sustainable development, on the other hand, results from the growing awareness of the link between environmental issues and socioeconomic problems (HOPWOOD *et. al.*, 2005). The first significant use of the term occurred in 1980, in the World Conservation Strategy (IUCN *et. al.*, 1980). Both in this document and in the Brundtland's Report (1987), there is a strong concern with the ability of future generations to satisfy their needs.

Gradually, there are environmental movements opposing the hegemonic discourse that sees humanity external to the environment and celebrates the triumph of man over nature, based on the belief that global prosperity and well-being can be achieved by increasing capital. Contemporaneity points out that this development model has failed to eradicate global poverty, as it does not consider that the ties we establish and the activities that we carry out in life in society

³ In Brazil, committees are organizations created specifically to manage campaign resources during the election period. In general elections, committees are organized by electoral districts (Union and Federative Units/FUs). In addition to a Single Financial Committee per party in each Federative Unit, there are candidacy committees. Thus, there may be a Committee for the Presidency of the Republic for each party that launches or supports candidates for this position, in addition to committees for Governor, Senator, Federal Deputy and State Deputy, also for each party.

are inserted in the environment and, therefore, environmental problems are global, even though they exist locally.

The clash between these two views assumes several classifications. It can be understood, for example, from the distinction between weak and strong sustainability. The first one meets the neoclassical economy and believes that natural capital is replaceable for manufactured capital, with technology capable of filling the gaps resulting from such an exchange. The second argues that manufactured capital cannot replace a multiplicity of processes vital to human existence, such as the ozone layer, photosynthesis and the water cycle. In asserting this, environmentalists defend the economy as an open system, governed by the Law of Entropy, whereby, in the process of transforming raw material into product, a part is always lost (GEORGESCU-ROEGEN, 2012, p. 83).

The need to pay attention to environmental issues did not mean, however, a consensus around them, resulting in different environmental trends. Hopwood *et al.* (2005) map the movements according to the weight that combined environmental factors and economic issues exert on the organizations' agenda. Three distinct views emerge about the nature of the necessary changes in society's policy, economic structures and human-environment relations to achieve sustainable development (HOPWOOD *et al.*, 2005, p. 5): *status quo*, reform and transformation.

Defenders of the *status quo* deny that humanity is on the verge of an environmental or social collapse. They recognize the need for change, but they do not advocate rupture, but adjustments that do not compromise the social structure and its power relations. Development is identified as economic growth, as part of the solution to eradicate problems such as widespread hunger, for example. Consumers are encouraged to adopt more sustainable lifestyles, arguing that changes in the choices made by consumers drive the market to adopt more sustainable models of development. Defenders of the *status quo* would have a weak commitment to sustainability, as well as to life in society and the deconcentration of power, preferring to preserve macroeconomic stability through “friendly reforms” (HOPWOOD *et al.*, 2005).

Reformists are opposed to most companies, governments and trends within the society, but the confrontation is not radical. In general, they assume that profound changes in the politics and lifestyle of societies will be necessary at some point, but they prefer to adopt long-term measures and within the existing social and economic structures. The strategy is to persuade governments and international organizations to introduce the necessary reforms. A group largely dominated by the third sector, it believes in the benefits of technology for the environment, in alternatives to reduce the use of raw materials in the economy and in energy efficiency to use renewable energy sources.

Transformationists, on the other hand, share the view that the growing crises in the environment and in society are interconnected and that socio-environmental systems are at risk of rupture. Such problems have deep roots in today's society and their form of organization, based

on the exploitation of most people and the environment by a small group, which is not really interested in human well-being or environmental sustainability. This field includes movements with exclusively environmental concerns, others concerned only with social changes and those that synthesize the two objectives (HOPWOOD *et al.*, 2005). The strategy, in this case, is to bring marginalized populations such as indigenous groups, the poor, the working class and women to the center of actions (HOPWOOD *et al.*, 2005, p. 8).

There is, therefore, an important transformation in the debate that articulates environmental issues and development, especially when we turn to its primitive constitution, subsumed in the notion of progress (FURTADO, 1978), resulting from the bourgeois revolutions that, from the end of the 18th century, instituted rationalism and empiricism as a new basis for the legitimacy of knowledge, no longer based on faith. On the other hand, progress emerges as a symbol for exercising dominion over other cultures. What constituted nothing but "one among the many forms of social life has by definition become the final stage of a unilinear path to social evolution" (SACHS, 2000, p. 63).

However, "for those who make up the two-thirds of the current world population to think about development - any type of development - it is first necessary that they see themselves as underdeveloped, with the full burden of connotation that the term carries (SACHS, 2000, p. 61). Thus, the concept of "underdeveloped" ends up becoming as strong a symbol as the idea of development, the latter, in its positive sense, "is an eternal reminder of what they are not" (SACHS, 2000, p. 65), with the power to impose enormous sacrifices on nations in the face of the promise of a standard of living displayed in the countries of the "First World".

Furtado's (2013) concern falls on the gap that the accumulation process - inherent in the capitalist system - causes between a center and a constellation of peripheral economies and its pressure effects on non-renewable resources, in face of the increasing homogenization of consumerist standard of living that generates high environmental costs. The author predicts that, at the expense of the depredation of the physical world, any attempt to generalize the lifestyle displayed in central countries would represent the collapse of an entire civilization. Therefore, in these terms, development is nothing more than a myth that decisively helps in promoting the oppression-accumulation dyad dynamic.

Notes suggest that the fruits of development are not equally shared. This unequal flow of resources is projected both in the macro-correlation between national states and within the countries themselves. In this sense, it is possible to glimpse the hypothesis that, in Brazil, groups that benefit from the current development model have a special interest in the matters discussed within the Committee on Environment and Sustainable Development (CMADS).

At the heart of this debate is the quality of governments in ensuring effective institutions in their role, since the state has a mediating and compensating role between society and the correction of disparities caused by the market, in addition to the responsibility for the management

of non-reproducible resources for common use. Thomas *et. al* (2002) recognize the focus on the institutional structure for good government as a principle key for development. According to the authors, good social results are found in countries with effective government institutions, "where the policies and the legal framework have not been taken up by elite capital investments" (THOMAS *et. al*, 2002, p. 142). However, governments have paid insufficient attention to supervision of the financial sector and the environment.

These evidences make the investigation of the possible occurrence of the phenomenon of capture of regulatory policy by interest groups within the CMADS pertinent, since among the functions of the commission it is to regulate policies and the national environment system, environmental law and ecological defense legislation. In addition, the abundance of natural resources, such as water and oil, in Brazil attracts foreign capital. This effect refers to competition and entry processes, and breaking monopolies and facilitating entry and exit could be instruments to combat the undermining of natural resources by a monopoly of companies.

Although the work brings valuable contributions to the debate on how the quality of government affects development results, certain clarifications need to be made. Firstly, because the authors use terms such as "developing countries" and appeal to prescriptions so that countries that fall into this category could reach the level of developed northern countries, reinforcing a North-South dichotomy already challenged by Furtado (2013). Second, in view of the unconvincing concept of "sustainable development", due to the confusion between the terms "development" and "growth", we see the need to conceptualize each one and, therefore, differentiate them.

Whereas Thomas *et. al* (2002, p. 24) warn about the qualitative and quantitative dimensions of growth, Daly (2004) states that these dimensions are so different that the need to give each one a name appears, since growing means increasing in size through assimilation to the addition of material, while developing is about expanding the potential, thus: "When something grows it gets bigger. When something develops it becomes different". (DALY, 2004, p. 198)

Thus, growth refers to the activity of manufacturing natural resources, transformed into products, sold and later discarded. The ecosystem, on the contrary, does not grow, it just develops, while the economy keeps growing, in a world of finite resources. It would then be worth asking whether it is possible to balance unlimited economic growth with preserving the environment. For Cavalcanti (2012) the answer is negative: "growth always implies less environment. In fact, the planet (the global ecosystem) does not grow; if the economy grows - and it is part of the planet - obviously less environment will remain "(CAVALCANTI, 2012, p. 37). Thus, there can be no sustainable growth.

In this sense, Sachs (2000) defines sustainable development as an approach based on harmonizing the social, environmental and economic objectives of development. Criticizing what he calls "wild growth" that explores extractive models of economic growth and non-renewable

environmental resources, but also the protectionist models of environmental fundamentalism, Sachs (2000) urges emerging countries to seek the “middle path”, of reformulated growth in relation to the modality of use, betting on technical knowledge as an “outlet” for the dichotomy between economics and ecology.

2.2 Social networks and Electoral Financing

For the Social Network Analysis (SNA) - also called structural analysis - the social structure is not a given assumption, but a network of relationships and pressures in which the social actors necessarily position themselves and define themselves according to the ties that they establish (or fail to establish) with other actors in the network (DEGENNE; FORSE, 2007). In this sense, the central focus of this methodology is the relational attributes that position individuals and groups in webs of interactions (HIGGINS; RIBEIRO, 2018), instead of its static attributes such as sociodemographic variables (gender, race, income, education, etc.) common to most approaches to social life and with which actors are characterized and even compared, in a more or less aggregated way, but as isolated units in the social fabric.

Embryonic studies with the methodology of networks date back to the 1930s, and its beginning can be established with the sociograms of Moreno (1942), within the scope of experimental psychology, which aimed at identifying ties between small groups/circles of sociability. Technological advances in the area of data storage and analysis have allowed the gradual advance of research for larger and more complex groups. Gradually, the analysis of networks revealed a small world, which connects almost all members of a society, even if indirectly⁴.

Indeed, in light of Georg Simmel's contributions, the SNA showed that around a person, a network (ego network) is formed, made up of concentric social circles formed by other people, who in turn have their own ego networks, with other people, and so on (DEGENNE; FORSE, 2007). A consequence of this discovery is the need to study complete networks, as a sum of multiple networks of interconnected people, with no way to make adequate investigations from samples in the methodology in question.

The analysis of social networks is a paradigm that articulates elements of holistic theories and methodological individualism, as it, despite its structural and systemic character, is based on the assumption that human agency has the capacity to act on the social structure. This, in a feedback process, delimits the actors' field of action, based on their resources and strategies. However, it is altered by the behavior of those coerced by it (MIRZUCHI, 2006). With this, the

⁴ This is demonstrated by the Milgram experiment (1967), carried out in the 1960s and by which volunteers from different regions within the USA had to make a correspondence reach someone unknown in a distant city, sending it to someone they thought they could know the person. Considering the letters that actually reached their recipients, there were an average of five people between the initial senders and the final recipients. A small and impressive number for a mass society, at the time formed by almost 200 million inhabitants dispersed in a territory of more than 9 million km².

SNA enables something that, for a long time, the hegemonic field of political science saw with marked skepticism⁵, which is the empirical identification of power elites based on the closest and most intense relationships among its members.

Power elites are groups that control a society's political agenda. To control means to intentionally want and to influence the results of decision-making processes that involve public policies that, in the end, determine what can and cannot be done and the allocation of public resources. Dominant groups are composed not only by the agents who have the formal prerogative to decide, but also (perhaps mainly) by those who, sometimes acting in other circles, have a great capacity to determine who will be the agents and what topics are worthy of becoming public problems, agendas and decisions (MILLS, 1981 [1956]; SCHATTSCHNEIDER, 1988).

Business conglomerates that finance the policy fit this profile perfectly. Different types of social actors form the power networks and influence and their positions in a network matter to determine their potential influence on other actors and, on an ongoing basis, the agendas themselves (DEGENNE; FORSE, 2007).

When elites are mentioned, it should be done in the plural, as there is not a single individual or collective group of actors who dominate political agendas in an absolute or even permanent way. In this sense, an essential task of those who study decision-making processes in the light of the structural analysis now under discussion is to explore which subgroups are formed within the power networks, insofar as “the actors form blocks among themselves within which relations are positive and among which relations are negative ”(LEMIEUX; OUIMET, 2014, p.58). Grouping is, therefore, an inherent principle to the network theory. Through it, agents tend to approach those with whom they have elective affinities, sharing and sustaining identities (WHITE, 1992).

Regarding this research, it is worth checking whether the groupability phenomena occurs in the financing network that constitutes the bench of deputies that are part of the CMADS, in the 55th legislature (2015-2018). With this, it is possible to know if the political-economic capital groups form communities organized around their interests, when they direct financial resources to one or more candidates/parties in common.

This research is part of the burgeoning research agenda that apply Social Network Analysis to the study of political phenomena in Brazil. From the extensive list of investigated objects, it is worth mentioning the networks of actors who occupy and concentrate positions in State institutions (MARQUES, 1999; PERISSINOTTO *et al.*, 2017), the networks constituted in the interactions between government, public policies and civil society (LAVALLE ; CASTELLO; BICHIR, 2007), the relationships between representatives in the National Congress (WOLF, 2008), the relations of business groups with political agents, in the context of financialization of

⁵ Take, for example, Dahl's early work (1961).

capital (MINELLA, 2013), the networks formed by federal deputies and their propositions (PAZ, 2015), among others.

In the more specific field of political financing, the network methodology has been used in recent years, with a view to prospecting the links established between donors, parties and candidates (CERVI; HOROCHOVSKI; JUNCKES, 2014; HOROCHOVSKI *et al.*, 2016; JUNCKES *et al.*, 2018). It is also worth mentioning researches that, like this one, collect the electoral financing networks and the composition of the permanent commissions of the House of Representatives (HOROCHOVSKI *et al.*, 2017; GEARA *et al.*, 2018).

The introduction of SNA in the field of research on political financing results from the factors that made the very existence of this investigative field in Brazil feasible. Unlike what happened in the USA, for example, where researchers have been demonstrating the strength of the relationship between money and politics for decades (JACOBSON, 1978; WELCH, 1981), studies on the Brazilian situation were scarce until the beginning of the 21st century. The main reason lay in the difficulty of obtaining electoral accountability data in the country. Likewise, it is necessary to highlight pioneering work on elections that took place in the 1990s, notably those by Samuels (2001, 2002).

The turning point was the availability, on the internet, from the 2002 elections, of all data on legal campaign financing in Brazil by the Superior Electoral Court (SEC), in its Electoral Data Repository. Research has multiplied rapidly, so that it is possible to speak in a specific field of investigation, whose best-known balance about Brazilian production is that of Mancuso (2015). This author identified three main investigative currents:

- 1) Relation between financial resources and electoral performance (SAMUELS, 2001; FIGUEIREDO FILHO, 2009; PEIXOTO, 2016; LEMOS; MARCELINO; PEDERIVA, 2010; CERVI; 2010; MANCUSO; SPECK, 2012);
- 2) Association between campaign donations and payoffs sought by donors (ARAÚJO, 2008; ROCHA, 2011; SANTOS, 2011; BOAS; HIDALGO; RICHARDSON, 2014);
- 3) Social and political variables that determine electoral financing (SAMUELS, 2002; MELLO; MARCON; ALBERTON, 2008; SANTOS, 2009; SACCHET; SPECK, 2011).

The research on these three aspects reveals that electoral financing in Brazil is far from being equitable, representing a barrier to the quality of democracy in the terms presented in the introduction to this research. The first demonstrates the strong correlation between the amounts of money and votes received by candidates and parties. The second has been trying to prove that those financed by capital groups are more responsive to the interests of these groups. The third strand, in turn, shows that the candidates and parties that receive the most donations have a determined profile: these are the largest associations, regardless of their position on the left-right ideological spectrum, while those are usually men, whites, rich, highly educated and holders of

prior political capital.

Our investigation is dedicated to contributing to the second aspect pointed out by Mancuso (2015), as we aim precisely to identify business groups linked to federal deputies that are part of an important decision-making arena. Such identification is an initial step, necessary for the denser scrutiny of the performance of representatives most directly involved with environmental public policies vis-à-vis the interests of their funders. In the next section, we describe how the empirical research was carried out.

3. Materials and methods: how empirical research was done

Empirical research started with data collection, from two sources:

1) Superior Electoral Court (SEC) Electoral Data Repository: from this source, we obtained the spreadsheets with the profiles of the candidates and the accountability of campaigns of the federal deputies who were elected in 2014 (BRASIL, 2019a). On the court's website, these data are arranged by federative unit, which results in 54 different spreadsheets. The first task was to compile all the material in a database, with the PostgreSQL manager. On the resulting bank, we applied a filter, selecting all candidates for federal deputy and their direct and indirect business donors⁶.

2) Reports on the legislative activities of the Committee on Environment and Sustainable Development (CMADS), available on the House of Representatives website: with this source, we identified the federal deputies that made up the commission, in the 55th Legislature (2015-2018) and we tabulated them in spreadsheets (BRASIL, 2015a, 2016, 2017, 2018). In this stage, we established a cut line of 180 days of operation. As a result, 68 representatives met this requirement. Next, the names of deputies were filtered in the accountability database and candidacy profile. One of the 68 deputies initially selected declares in his accountability that he has not received any company donation, thus leaving 67 representatives who fulfill both criteria, that is, more than 180 days working at CMADS and receiving funds from companies in the 2014 campaign.

Networks are sets of nodes and edges. In social networks, nodes are the social actors and the edges, the bonds that link them. In the case studied, the actors are the federal deputies who made up CMADS for at least 180 days and the companies that donated to their campaigns, directly or indirectly (via parties, other candidates and committees). Ties are established by donations, which therefore connect representatives to the funders of their campaigns. To process this network, we use the Gephi tool, with which we generate centrality statistics and graphs of the

⁶ As we said earlier, in the 2014 elections, it was possible to identify the original donors from donations that reached candidates via parties or other candidates and committees. For this research, we consider all of these donations and those made directly by companies to the candidates as business donations and all companies that made them were correctly identified.

network.

We also did two other analytical procedures. The first was the detection of communities (clusters) through modularity calculation, with which we operationalized the identification of subgroups of actors with greater proximity to each other, which we referred to in the previous section (BLONDEL et al., 2008). The second, the transformation of the network, which is bimodal - as it presents two types of actors, the donor companies and the receiving deputies - in two unimodal⁷ networks, by suppressing each of the intermediate nodes between two actors of a certain type, connecting them directly. Thus, we built a network with representatives directly linked to each other and another network, with direct connections between funders.

With this, it is possible to obtain a better visualization of meta-relationships between actors of the same type, based on the assertion, quite common in common sense, that “my friend's friend is my friend”.

Thus, for example, deputies financed by the same donors would tend to compose the same circle of sociability and transaction of resources.

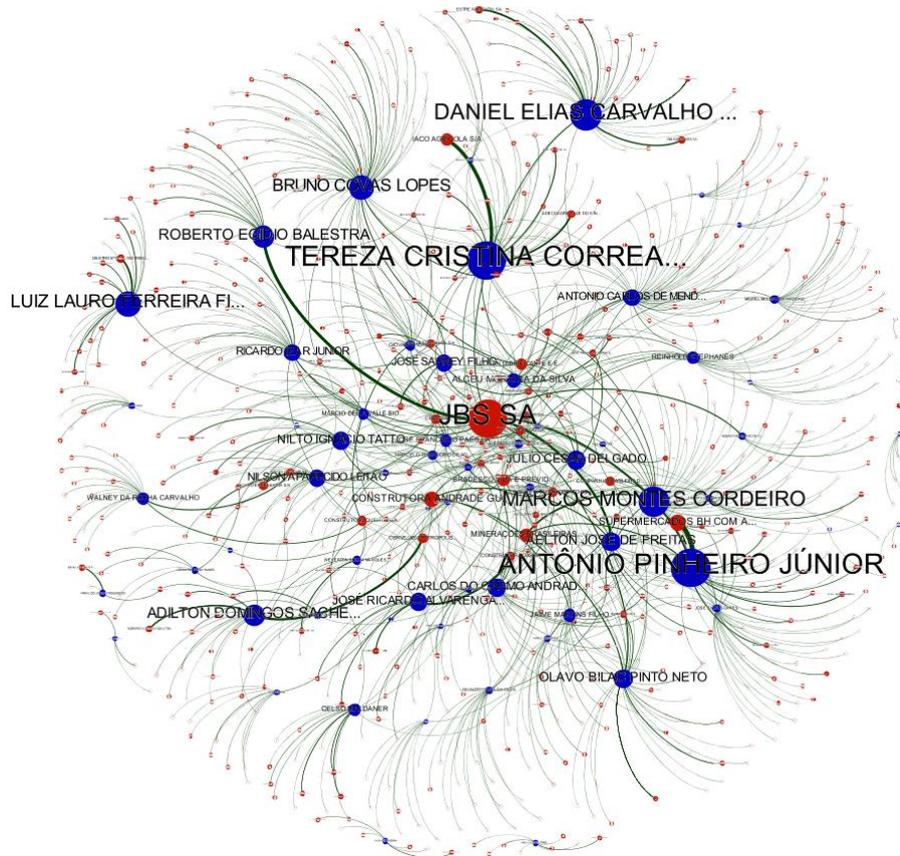
The results of the application of these procedures are presented below, together with more detailed explanations of the variables and network measures.

4. Results: CMADS as a locus of inter-crossing and articulation of business interests

Figure 1 below is the graph of the financing network that connects federal deputies members of the Committee on Environment and Sustainable Development, during the 55th Legislature and the companies that financed it (hereinafter, we call it the CMADS Network). 67 representatives and 860 legal entities, connected by 1,164 edges, form this network. The edges correspond to the grouped donations, all donations from a company to a candidate were joined in a single edge, adding the values, since, for us, what matters are the links between financiers and financiers and their intensity. The volume of resources donated dimensions the size of the nodes or received (weighted degree) and the volume of resources transacted between the nodes dimensions the thickness of the edges.

⁷ About the dual-mode / one-mode conversion consult Newman (2010, p. 124-126).

Figure 1 - CMADS Network



Source: Own elaboration, with data from SEC (BRASIL, 2019a) and the House of Representatives (BRASIL, 2015a, 2016, 2017, 2018).

The added weight of the edges is 59,180,437, which corresponds to the total amount, in Reais (R \$), that the companies donated to the surveyed deputies. Thus, each parliamentarian received an average of R \$ 883.290,00 from legal entities. The amounts are, however, distributed in a very dispersed manner (standard deviation = R \$ 959.576,00), ranging between R \$ 275,00 and R \$ 4.068.302,00, with a median of R\$ 483.910,00. Descriptive statistics already indicate a very uneven, asymmetric and hierarchical network. Subsequent analyzes present the position of the actors in this hierarchy.

The first analysis is that of components, which are sets of nodes connected to each other, directly or indirectly. According to SNA, there is a tendency for large and complex networks to present a giant component, which gathers the great majority or almost all of the nodes, and several smaller components, which connect few nodes or are isolated nodes, without ties to others (FREEMAN, 1979; NEWMAN, 2010). The CMADS Network follows the trend and its giant component concentrates 888 (95.8%) of the 927 nodes in the network (TABLE 1).

Table 1 - Components of the CMADS Network (frequencies)

Base network		06 Insulated Components		% base network	Giant Component		% base network
Nodes Total	927	Nodes Total	39	4,2	Nodes Total	888	95,8
<i>Federal deputies</i>	67	<i>Federal deputies</i>	6	8,9	<i>Federal deputies</i>	61	91,1
<i>Companies</i>	860	<i>Companies</i>	33	3,8	<i>Companies</i>	827	96,2
Edges	1164	Edges	33	2,9	Edges	1.131	97,1
Transacted amount (R\$)	59.180.437	Transacted amount (R\$)	802.028	1,3	Transacted amount (R\$)	58.378.409	98,6

Source: Self elaboration, with data from SEC (BRASIL, 2019a) and the House of Representatives (BRASIL, 2015a, 2016, 2017, 2018).

The other six components, which we call isolated, have between 2 and 12 nodes. We do not dwell on these components any longer. However, their composition indicates an important aspect, which is the completely marginalized actors in the financing network. There are six federal deputies (each in a component) and 33 companies, which constitute their own financing subnets. The presence of the only two representatives of the Socialism and Freedom Party (Partido Socialismo e Liberdade - PSOL)⁸ that makes up the commission in the analyzed legislature - Edmilson Rodrigues (PA) and Ivan Valente (SP) - each one in its own component, draws attention, with the first receiving donations from two legal entities and the second, of only one, the three being small and with no donations to other candidates.

The giant network component is the target of our most detailed examination, the first step of which is the application of a filter, eliminating all nodes with a degree⁹ = 1, that is, that are connected to a single different node, corresponding to a single donation, made or received. We did this because our focus is on companies with a hub capacity through donations made to two or more representatives. In this condition are five federal deputies and 698 legal entities, corresponding to 8.2% and 84.4% of the respective types of component node. Here it is possible to infer the first topological characteristic, which is the centrality of representatives in the network, as the filter preserves almost all of them, while it suppresses the vast majority of companies, almost always of regional scope, that made only one donation. . The removed nodes are, in fact, the peripheral actors of the giant component, those that do not promote any connectivity.

Therefore, we opted for the removal of a superficial layer of the network, placing our

⁸ The parliamentary parties mentioned throughout the work are those for which they were elected in 2014. The list of associations and their names is attached, at the end of the text.

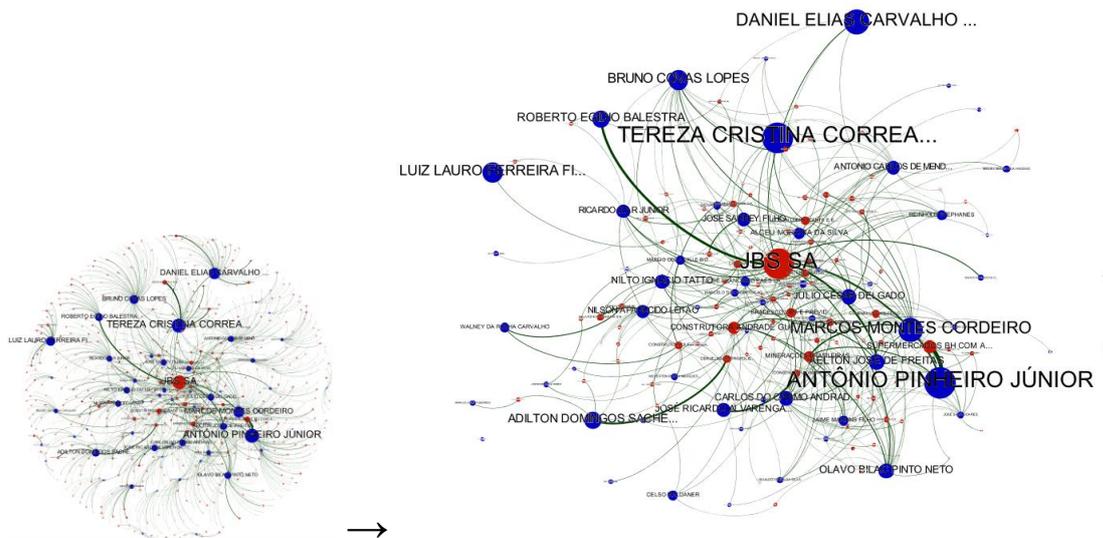
⁹ Degree is the most basic measure of centrality. It simply expresses the number of edges connected to a node, or, to put it another way, the number of other nodes with which one node connects. The set formed by a node and its immediate neighbors is called Ego Network (DEGENNE; FORSE, 2004).

magnifying glass over the other actors, with a degree ≥ 2 and who, therefore, made or received two or more donations, holding some potential for inter-actor connection (if company, connects deputies, and vice versa) and constitute the core. This reduced network has 58 deputies and 115 companies, which donated R\$ 29.130.012,00 to these representatives, corresponding to 49.2% of the total value of the CMADS Network (that is, with all components).

In the graph of the reduced giant component (Figure 2), the nodes are dimensioned by the weighted degree, a centrality measure that considers the weights of the edges - in this case, the volume of money transacted by the actor, whether donating or receiving. Federal deputies stand out visibly. Looking at the group of the 15 main recipients of resources, some characteristics stand out: the Brazilian Democratic Movement Party (Partido do Movimento Democrático Brasileiro - PMDB)¹⁰ is the party with the largest number of representatives (three). Five parties have two representatives: Progressive Party (Partido Progressista – PP), Republic Party (Partido da República – PR), Brazilian Socialist Party (Partido Socialista Brasileiro – PSB), Social Democratic Party (Partido Social Democrático – PSD) and Brazilian Social Democracy Party (Partido da Social Democracia Brasileira - PSDB). Democrats (Democratas – DEM) and Workers Party (Partido dos Trabalhadores – PT) have a deputy in this group. Minas Gerais is the state with the most representatives (six), closely followed by São Paulo (four). A significant part of the most prominent names in the graph (the labels are also dimensioned by the weighted degree) is characterized by having strong links with the defense of agro-business agendas and weak ties with the defense of an environmental preservation and sustainable development agenda.

¹⁰ For the purposes of this investigation, we consider the parties for which federal deputies contested the election in 2014, given that the financing network was constituted in this process.

Figure 2 – Graph of the giant component reduced by degree 2 of the financing network of federal deputies members of CMADS (2011-2014)



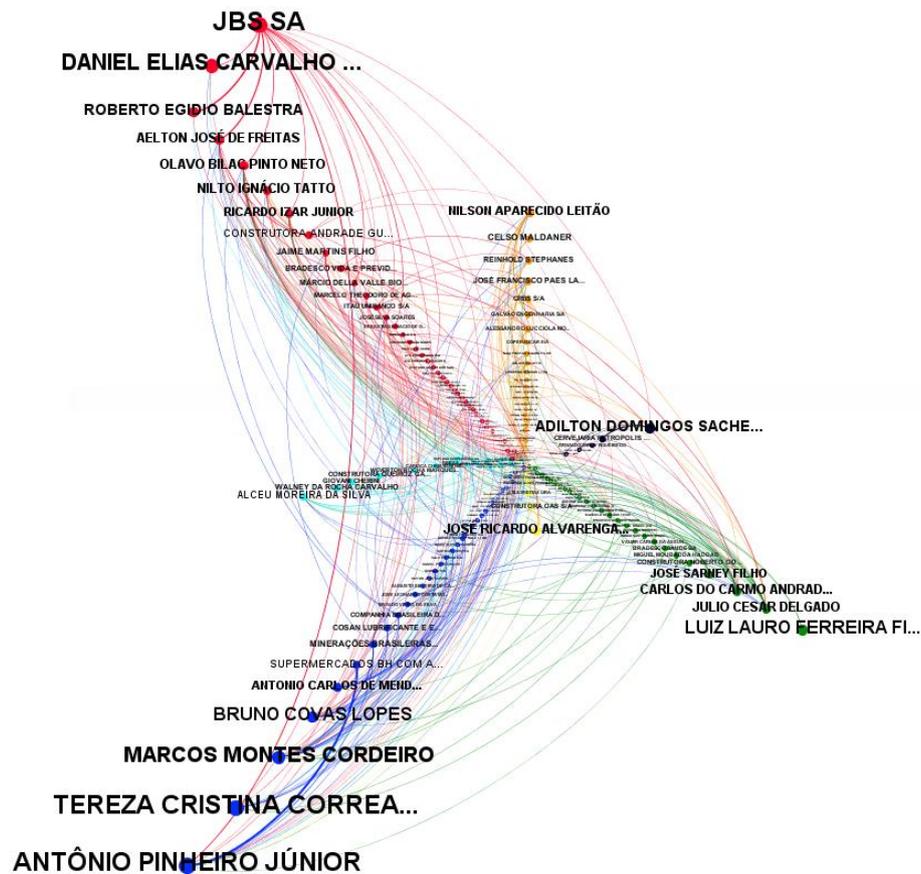
Source: Own elaboration, with data from SEC (BRASIL, 2019a) and the House of Representatives (BRASIL, 2015a, 2016, 2017, 2018).

Among the companies, JBS S/A has a clear centrality, as its donations to the deputies that would make up the CMADS in the 55th legislature added up to just over four million reais. With the exception of one local expression company (Supermercados BH Comércio de Alimentos LTDA), all the others that are among the 15 largest donors comprise large business conglomerates, representing the economic sectors that historically are the main campaign donors in Brazil, such as civil construction, mining, food production and finance¹¹. We mention some of these corporations, all of open capital: Construtora Andrade Gutierrez S/A, Minerações Brasileiras S/A, Bradesco Vida e Previdência S/A, Cosan Lubrizante e Especialidades S/A, CRBS S/A, Construtora Queiroz Galvão S/A and Companhia Brasileira de Metalurgia e Mineração.

Although the hardcore nodes formed by the reduced network compose a single component and, therefore, they are all connected, they do not form a single cohesive group, being able to identify sets of actors, that is, deputies and companies, closer together. For that, we applied the modularity calculation (with resolution = 2.0), obtaining seven different communities. Figure 3 is the graph of this network.

¹¹ Data can be found in Mancuso *et al.* (2016); Mancuso, Horochovski and Camargo (2018).

Figure 3 - Graph of the giant component reduced by degree 2 distributed by modularity



Source: Own elaboration, with data from SEC (BRASIL, 2019a) and the House of Representatives (BRASIL, 2015a, 2016, 2017, 2018).

In the chosen layout of the graph represented in Figure 3, each ray is a community. The most central actors are highlighted by the larger nodes and labels, at the ends of the rays. As expected, the composition of the communities confirms the greater centrality exercised by the representatives in this financing network. With the exception of the red community, whose central node is JBS-SA, all the main positions of the four largest communities (with at least 20 nodes) are held by representatives. Below we list the three deputies and the three companies with the greatest centrality in each community:

- *Red Community:* Daniel Elias Carvalho (PMDB-MG), Roberto Egídio Balestra (PP-GO), Aélton José de Freitas (PR-MG) – JBS-SA, Andrade Gutierrez S/A and Itaú Unibanco S/A.
- *Blue Community:* Antônio Pinheiro Junior (PP-MG), Tereza Cristina Correa da Costa Dias (PSB-MS) and Marcos Montes Cordeiro (PSD-MG) – Supermercados BH Comércio de Alimentos Ltda, Minerações Brasileiras S/A and Cosan Lubrificante e

Especialidades S/A.

- *Green Community*: Luiz Lauro Ferreira Filho (PSB-SP), Júlio César Delgado (PSB-MG) and Carlos do Carmo Andrade Melles (DEM-MG) – Construtora Noberto Odebrecht, Bradesco Saúde S/A and Spal Indústria Brasileira de Bebidas.
- *Orange Community*: Nilson Aparecido Leitão (PSDB-MT), Celso Maldaner (PMDB-SC) and Reinhold Stephanes (PSD-PR) – CRBS S/A, Galvão Engenharia and UTC Engenharia S/A.

From the above description, the question arises as to why companies from such diverse sectors, at first distant from the commission's guidelines, are the main financiers of their members, who are also very diverse, representing parties of different ideologies and positions in relation to the CMADS agenda, even though there are a greater number of deputies from parties from the center-right in the central positions¹².

Apparently, ideological reservations would be linked to the size of the party, given that they turn exclusively to PSOL, the only small left-wing party with representation in the analyzed legislature and that did not even have a representative in the giant component of the CMADS financing network. The presence of deputies from small right-wing parties in prominent positions in this subnet reinforces this impression.

On the business side, the analysis reveals that all occupants of central positions in the communities have interests linked to the aforementioned agenda, with different levels of proximity to it. In the majority, they are the largest private groups in the country, operating in economic sectors highly affected by environmental and development policies that, at the level of the federal legislature, pass through CMADS. Even corporations in the financial system, at first more distant from the aforementioned agenda, when looked at more closely, present themselves as organizations that head capital groups with large investments in areas such as mining, civil construction, agro-food systems and so on.

On the side of federal deputies, the central positions of communities are rarely occupied by defenders of an agenda for the defense of the environment and sustainable development and, consequently, of policies that go in these directions. In contrast, well-known members of the ruralist bench will often be found, for whom public environmental policies are the object of direct interest, as well as their great financiers. In short, the communities of the giant component of the CMADS network are characterized by homogeneity, being, largely, practically undifferentiated from each other.

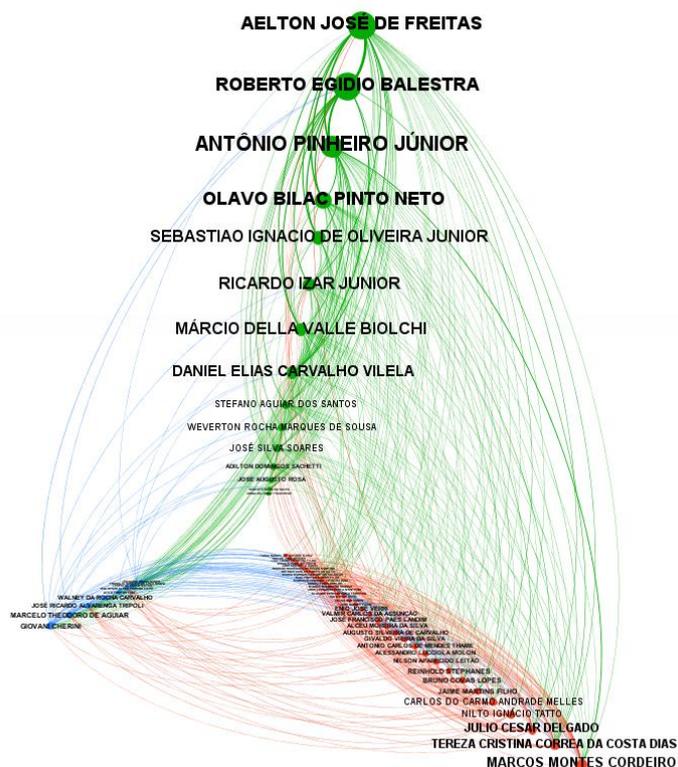
The next step was to build uni-modal networks of deputies and companies, according to

¹² For ideological classification of Brazilian parties, see Zucco Jr. (2011), Tarouco and Madeira (2013) and Scheeffer (2018).

the procedure described in the previous section, which makes the direct connection between nodes of a certain type, by suppressing nodes of the other type. With this, we identified groups of representatives approached by companies and vice versa, in order to verify if the referred homogeneity is maintained or if these groups are heterogeneous and forged from singular characteristics, especially, for the purposes of the study, of groups of specific interests. Here we also apply two filters: we keep only the giant component nodes with a degree ≥ 2 .

Starting with the uni-modal network of representatives, the application of the modularity algorithm (resolution 1.0) resulted in three communities, which can be seen in Figure 5. In the three groups, there are deputies from the most different parties, representing different positions of an ideological spectrum that goes from center-left to right. Due to the CMADS composition itself in the researched legislature, here the pattern repeats again, of representatives more identified with the defense of environmental guidelines appearing in fewer numbers and in the most peripheral positions. The most central positions - which in the chosen layout are at the ends of the axes - are almost always occupied by defenders of business agendas regarding the topics discussed in the committee.

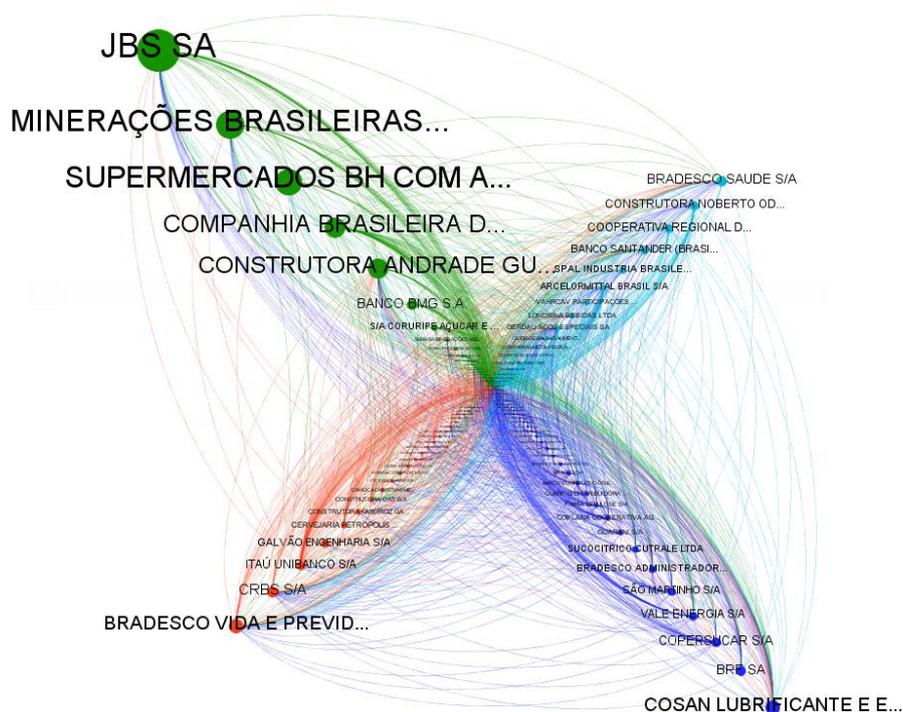
Figure 5 - Graph of the uni-modal network of federal deputies distributed by modularity



Source: Own elaboration, with data from SEC (BRASIL, 2019a) and the House of Representatives (BRASIL, 2015a, 2016, 2017, 2018).

The uni-modal companies' network, obtained by the direct link between them by suppressing the nodes of federal deputies that they both finance, highlights the meta-relationships between the corporations that financed CMADS members in the 55th legislature. Figure 6 shows the graph of this network. Here, too, the tendency of the communities becomes clear, that is, the companies that approach each other through the candidates they support, in being very similar. As a rule, the composition of companies by economic activities is repeated in the communities - with emphasis on the financial, civil construction, mineral extraction, metallurgy and steel sectors, in addition, of course, to food production and industrialization.

Figure 6 - Graph of the uni-modal network of companies distributed by modularity



Source: Own elaboration, with data from SEC (BRASIL, 2019a) and the House of Representatives (BRASIL, 2015a, 2016, 2017, 2018).

Both uni-modal networks confirm, therefore, the homogeneity in the composition of both benches and capital groups in the most central nucleus of the financing network, which, after all, elected the members of CMADS. This topology points to some strategic behaviors on the part of the companies that finance the campaigns of the deputies of the commission, especially those that occupy the privileged positions in the relational web of the network. The most evident is that of “distributing eggs in several baskets”, when financing several competitive candidates, from the most diverse parties, with different doctrinal orientations. Capital here has few ideological prejudices and it can be inferred that it seeks to ensure the presence of those who represent it in

the legislature, a privileged locus for the production of public policies, in general, and environmental policies, for this specific case. As a result, companies from similarly different economic sectors, although always with interests affected by CMADS guidelines, distribute donations to the same politicians, so that there is a clear intersection of interests.

5 Conclusion

The electoral financing networks presented and analyzed in the previous section allow us to answer the questions that guided the research reported in this article. Let us begin with the first: how is the structure of the financing network of CMADS members? Confirming a structural characteristic of complex networks, the CMADS Network has a clearly asymmetric topology. Few actors – whether companies or federal deputies – occupy the central positions of the network, while the vast majority are on the periphery. This finding, important in itself, gains greater importance when one considers that the investigated network is formed by elected federal deputies, that is, a group that has already passed through a filter that excluded the large mass of underfunded candidates and with chances close to zero to get elected.

In other words, even among elected representatives, selected from a specific theme – belonging to the Committee on Environment and Sustainable Development, in the 55th legislature – the hierarchies are placed in a crystalline way, with some federal deputies and some companies playing a prominent role due to the centrality they play in the network.

The topology also answers the second research question: Which groups of political-economic capital are formed and connected into this network? As can be seen in the graphs presented, all the communities of actors closest to each other are similar.

From the companies' point of view, the largest private conglomerates in Brazil almost invariably stand out, representing sectors with more or less direct interests in the agendas that make up the committee's agenda, composed of environmental and development public policies. Among these sectors, activities such as civil construction, finance, mining and food production and processing stand out. From the point of view of the representatives who make up the communities detected in the network, there are practically no names more identified with the defense of more progressive views in relation to the environmental issue, development and sustainability itself among the central actors. Instead, politicians linked to the defense of conservative agendas and agribusiness, for example, abound.

The composition of the network – including its uni-modal derivatives – with companies and deputies with the above characteristics raises the hypothesis that the groups of political and financial capital that form it are committed to a certain development model, synonymous with economic growth, with sustainability (environmental, social and economic) in the background. It is an agenda that maintains its strength in Brazil, a country that has not managed to leave the

semi-periphery of capitalism.

One of the possible strategies to test the hypothesis generated from the results of this research is a dense analysis of the performance of federal deputies that we identify in the financing networks vis-à-vis the interests of their financiers and the different aspects that are constituted around the environmental and development issues.

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