

**REPARATION MANAGEMENT, CORPORATE SOCIAL RESPONSIBILITY AND
STAKEHOLDER THEORY: RELATIONSHIPS IN BRUMADINHO AFTER THE
COLLAPSE OF THE CÓRREGO DO FEIJÃO DAM**

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Introduction

According to the Brazilian government, in 2022, Brazil was the world's second-largest producer of iron, reaching the production mark of 431 million tons¹. The mining activity accounts for about 2,4% of the Brazilian economy; in the first quarter of 2021, Minas Gerais was responsible for 40% of Brazil's mining sector's revenue.

Vale S.A. is among the five largest mining companies in the world, having recorded a net profit of US\$ 16,73 billion in 2022². Despite the industry's financial success and representation, the company's connection with the local population in its work areas is plagued by major issues. The Observatory of Mining Conflicts in Brazil (Observatório dos Conflitos da Mineração no Brasil 2021) reports that in 2020, conflicts arose from mining activities in 564 Brazilian localities. Vale S.A. (110 conflicts) and Samarco/Vale/BHP (109 conflicts) are the two companies involved in the most disputes with the most localities.

In December 2018, the National Forum of Civil Society in Watershed Management requested the suspension of licensing for the mine in Brumadinho; however, the Environmental Policy Council of Minas Gerais confirmed the recommendation for mine operations, in a document signed by the Brazilian Mining Institute and the Mining Industrial Union, even under criticism and warnings from environmentalists. In just over a month, on January 25, 2019, the tailings dam of the Córrego do Feijão mine, property of Vale S.A., in Brumadinho, Minas Gerais state, Brazil, collapsed, causing the leakage of about 12 million cubic meters of tailings; 272 people died and three are still missing.

The toxic mud contamination extends for more than 300 kilometers in the Paraopeba River, one of the main tributaries of the São Francisco River, which flows through 35 municipalities. The National Human Rights Council (Conselho Nacional dos Direitos Humanos 2019) characterized the disaster as an environmental crime; hundreds of lawsuits are pending for damages. In 2021, an Integral Reparation Agreement was celebrated between the Government of Minas Gerais, Vale S.A., the public prosecutor's office, and the public defender's office of the union for R\$ 38 billion (approximately 8 billion dollars). Negotiations excluded the population and even the public authorities of Brumadinho.

Despite embracing a discourse of progress and abundance, mining activity does not always improve social and economic conditions for the surrounding regions, according to Sehnem et al. (2020). This supports the idea known as the Paradox of Abundance, also known as the Natural Resource Curse (Auty, 1993), which holds that regions rich in non-renewable resources typically have lower economic growth and worse development indicators compared to places that do not have such resources. This is not to mention the enormous damage caused to the environment and populations around them by large-scale disasters, such as the one at hand. Finding solutions to problems of this nature should involve

¹ Source: Boletim do Setor Mineral, published by Ministry of Mines and Energy: [boletim-do-setor-mineral-2013-1-sem2022.pdf \(www.gov.br\)](https://www.gov.br/sem/2022/01/boletim-do-setor-mineral-2013-1-sem2022.pdf)

² Source: <https://www.cnnbrasil.com.br/economia/vale-tem-lucro-liquido-de-us-1673-bilhoes-em-2022-queda-de-324-na-comparacao-com-ano-anterior/>

communities, companies, and governments, avoiding those affected being marginalized in decision-making.

This work focuses on stakeholders' analysis and engagement in the context of environmental and natural resources management (ENRM), notably an environmental disaster involving the operations of a mining company and its surroundings. We aim to answer the research question: "How are stakeholder relationships structured after the collapse of the Córrego do Feijão dam in Brumadinho, Minas Gerais, and to what extent are the specificities of the Environmental and Natural Resources Management (ENRM) context considered by the decision-makers involved?".

We adopt a qualitative approach to examine the social aspects and experiences of the participants involved in the socio-environmental disaster. According to Denzin and Lincoln (2006), qualitative research is ideal for exploring social processes, meanings, and the imagination of participants. Magalhães et al. (2018), citing Bauer et al., highlight the importance of spontaneous expression of people in qualitative research, allowing for a deep understanding of the actions and interactions of the actors involved.

We are dealing with an issue that involves the relationships between the ecosystem and the socio-system, represented by the company, the population living around the dam, and other intervening actors. Therefore, it is an object of study of Human Ecology, defined as "a multidisciplinary social science for the privileged approach of the multiple dependencies between social and natural systems, emphasizing the cultural and technological aspects of managing the environmental impacts caused by human civilization" (Pires 2011, 3). To understand the nuances and complexities of stakeholder relationships after the tragedy, bibliographic searches were conducted in three strands: concepts of human ecology and management, the connection between human ecology and organizational studies, and the application of stakeholder theory in the management of socio-environmental resources. In addition, data were collected through non-participant observation, during events and meetings between August 2021 and January 2024, and through testimonies from the affected community. The process of data and theory triangulation allowed us to analyze stakeholder relationships, using the model proposed by Colvin et al. (2020) to contextualize interactions within the scope of Environmental and Natural Resources Management (ENRM).

This work presents five contributions to the understanding of socio-ecological dynamics and stakeholder relationships in the context of the environmental tragedy in question: i. maps and identifies the main actors involved, showing a complex network of interactions and responsibilities; ii. reveals contradictions and limitations in the process of elaboration and implementation of the Integral Reparation Agreement, highlighting the exclusion of the affected population from crucial decisions; iii. contrasts the proposal of an inclusive and flexible decision-making axis with the observed reality in Brumadinho, where the centralization of power prevails; iv. criticizes governance mechanisms and business practices, highlighting the need for a more equitable and just approach that truly involves and meets the needs of affected communities; and v. incorporates testimonies from events and meetings, offering an enriched and sensitive perspective to the subjectivity of those involved, capturing the nuances of lived experiences and providing practical insights for the formulation of more inclusive and effective public policies.

The article is structured in six sections, which explore socio-ecological dynamics and stakeholder relationships in the context of the Brumadinho environmental tragedy. In the Introduction, we contextualize the economic importance of mining in Brazil and the relationship problems between Vale S.A. and local communities. The Theoretical Foundation addresses concepts of sustainability and Stakeholder Theory, highlighting the need for a more inclusive and equitable approach. The Method section describes the approach adopted, explaining the search strands used in the bibliographic research. The Data Analysis section maps and identifies the main actors involved and examines power relations and contradictions in the Integral Reparation Agreement. The Discussion section addresses the

implications of business and governance practices and offers recommendations for more inclusive and just public policies, based on the testimonies and experiences of those involved. The Conclusion summarizes the main findings and their implications for public policy formulation and business practice.

Theoretical Foundation

Sustainability and Stakeholder Theory

The first definitions of sustainability date back to 1983, as a result of the work of the Brundtland Commission: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs, ensuring a balance between economic growth, environmental care, and social well-being" (World Commission on Environment and Development, 1987).

Ostrom (2000) connects sustainability in social-ecological systems³ to the identification and analysis of relationships between its multiple levels and actors – which may include individuals, public authorities, organizations, and other groups. Freeman (1984) names these actors *stakeholders* and defines them as "any group or individual that can affect or is affected by the achievement of an organization's objectives". Because it was forged in the discipline of business administration, Stakeholder Theory brings with it a firm-centric perspective; the firm defines itself as a hub, articulating stakeholder relationships, holding decision-making power to shape future engagements and act on these relationships (Barnett 2007). That is: actors are defined based on their relationships with the company, and not by their history, habits, needs, and relationship with the environment in which the company operates.

Banerjee (2008a) critically analyzes the Stakeholder Theory and shows relationships controlled by imperatives of capital accumulation, pointing out that the mapping and analysis of these relationships tend to be contaminated by the interests of companies, states, and other institutions that hold great decision-making power. Ostrom (2000) reinforces this perspective and asserts that, in scenarios of imbalance in socio-ecological systems, the best solution is self-organization to create collective benefits; the process is not simple and may require time and effort. She adds that it may even be necessary to establish sanctions to curb the actions of free riders - agents who intend to benefit in a particular way from what is common, without bearing the costs that this represents to the system.

Commons management and wicked problems: a new approach for ENRM context

Article 225 of the Brazilian Federal Constitution (Brasil, 1988) establishes that "everyone has the right to an ecologically balanced environment, a good for common use by the people and essential to a healthy quality of life, imposing on the public authorities and the community the duty to defend and preserve it for present and future generations". When analyzing the tragedy of the Córrego do Feijão dam, we deal with common goods in a social-ecological system affected by the actions of private entities. When we talk about commons, we refer to the environment, ecologically unbalanced by the company's actions, which directly affects rivers, cities, and the environment around it. It is both a right and a good that the entire population has the right to enjoy.

Ecological disasters involving large companies, the environment, and the surrounding community, as well as the conflicts arising from them, have elements that allow them to be classified as wicked problems. These are characterized by Rittel and Melvin (1973) as: not admitting rational

³ Ostrom (2009, 419) defines socio-ecological systems (SES) as arrangements composed of subsystems (resource systems, resource units, governance systems, and users) and internal variables, analogous to living organisms, composed of organs, tissues, and cells, interacting to produce results that in turn affect the system itself and other socio-ecological systems related to it.

understanding and planning, presenting many stakeholders with different perceptions of values, instability, and continuous evolution, as well as an irregular knowledge base for defining both the nature of the problems and the scope of the solutions.

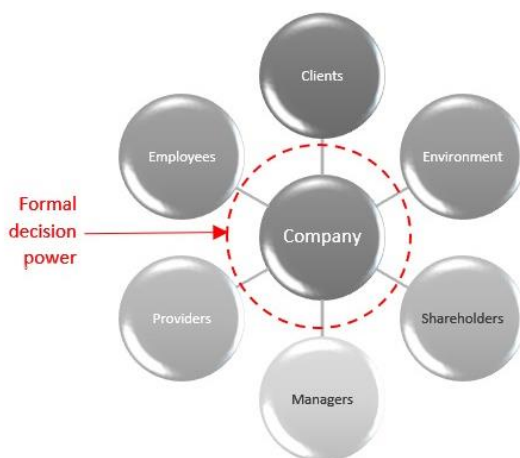
Christensen et al. (2019, p. 237) state that wicked problems do not present an optimal solution, but good collaboration and coordination among different actors, organizations, and levels of action can help governments deal with them, which again leads us to Ostrom and the importance of relationships between stakeholders. Bannink and Trommel (2019, p. 198) also reinforce Ostrom's (2009) thinking when they point out that dealing with this type of problem requires systemic thinking and decision-making design must involve the various affected publics. Citizen participation is a key factor in generating trust and commitment, which are indispensable, in turn, for maintaining sustainability in the socio-ecological context. The sense of ownership helps reduce conflicts since those involved feel responsible for making the plan work. Social exclusion, on the other hand, weakens decision-making processes and exacerbates conflicts (Brody et al 2003).

Colvin et al (2020, 1) point out that it, in the ENRM context, is necessary to move away from the firm-centric approach of the Stakeholder Theory and consider that "stakeholders can mean communities, interest groups, advocacy groups, discourse coalitions, organizations, social constituencies (sections of society with a shared characteristic but without formal membership, e.g. women), and/or individual people" – individuals and groups affected by or that can affect an ENRM issue. Decision-making power must be diffuse and fluid; the voices of stakeholders should be the basis for defining the problem itself and raw material in developing solutions, which, in addition to material losses, need to consider feelings, emotions, and the history of populations and regions.

While in traditional analysis, centered on the company and illustrated in Figure 1, the tendency would be to classify stakeholders in terms of their formal relationship with the organization - employees, suppliers, customers -, the ENRM perspective contemplates several possibilities for engagement, individual or through social structures, formal, informal, implicit, or explicit. Instead of being centered on an organization, this approach focuses on the problem that threatens the sustainability of the system.

Figure 1

Relationships between Company and Stakeholders in the traditional business context



Prepared by authors, based on Colvin et al. (2020).

Colvin et al. (2020, p. 6) point out the main differences between the traditional approach and the ENRM perspective:

Table 2

Relationships between Company and Stakeholders in traditional business context compared to ENRM perspective

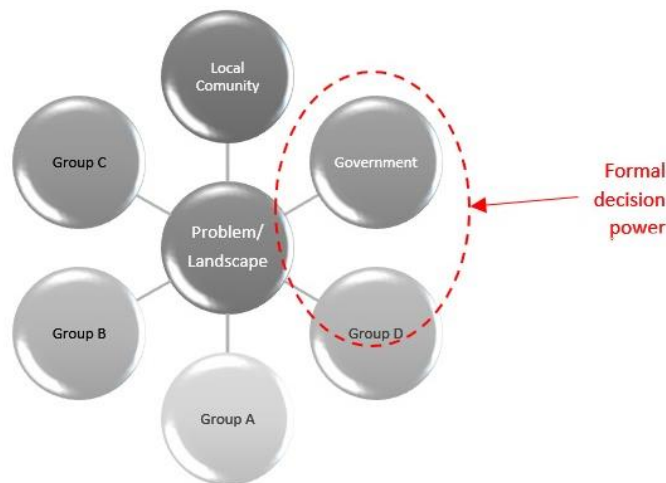
	Traditional ST approach	ENRM perspective
Central hub/subject	The company occupies this position and, from it, defines who the stakeholders are	The landscape/question must be the center, and stakeholders must be defined from it.
Object	The company and its issues are the object and self-defined	The problem/object is defined by the vision and speech of stakeholders.
Decision-making power and determination of legitimacy	Controlled by the company, which determines stakeholder legitimacy	Decentralized, with a privileged stakeholder able to exercise power based on the central issue and legitimized by other stakeholders
Classification of stakeholders	Centered on the company and rationally based on relationships between the firm and stakeholders	Emotional and based on values expressed by stakeholders.

Prepared by authors, based on Colvin et al (2020)

Figure 2 shows the ENRM approach proposed by Colvin and colleagues, with the problem involving the system positioned in the center.

Figure 3

Relationships between Stakeholders in the socio-ecological context



Prepared by the authors, based on Colvin et al. (2020).

According to Colvin et al (2020), decision-making power can be assigned to various stakeholders, depending on the nature of the proposed issue. Decisions are made by the stakeholder who momentarily holds decision-making power and are guided by their perspective, natural and occasionally privileged about other stakeholders. Some decision-makers play a dual role - as adjudicators and privileged stakeholders (this is what happens with government instances). The decision-making processes should be based on dialogue and facilitated by intermediaries capable of dealing with diverse interests and mediating power differences. The shared understanding of the different perspectives and values facilitates the mapping of the causes of misunderstandings and creates trust among stakeholders, indispensable for the development and maintenance of agreements aimed at the sustainability of socio-ecological systems.

The management of socio-ecological relationships in the context of mining activity is complex, with various levels of power, decision-making formats, engagement, and commitment. There are expectations from various actors that need to be considered and aligned, which requires planning and good interaction. This refers to what Colvin et al. (2020) postulate when they recommend that decision-making processes be based on trust and dialogue so that it is possible to develop and maintain agreements that promote the sustainability of territories.

Corporate Social Responsibility, stakeholders and power imbalances

Defined by the United Nations Industrial Development Organization as “how a company achieves a balance between economic, environmental, and social imperatives (Triple-Bottom-Line Approach) while meeting the expectations of shareholders and stakeholders” (United Nations Industrial Development Organization, 2021), Corporate Social Responsibility (CSR) plays a crucial role in sustainability from environmental, social, and governance perspectives. For the European Commission, it is “a concept by which companies integrate social and environmental concerns into their business operations and their interactions with their stakeholders” (European Commission, 2001).

Fontoura et al. comment that even recent CSR approaches still fail to consider the voice of the legitimate stakeholders in the natural resource extraction environment. They tend to position private corporate power at the center of the analysis and neglect other actors, or use them to legitimize decisions made without their participation. Citing Banerjee, the authors comment that conflict usually arises in response to these power asymmetries between corporations and local communities, who end up not having authority in CSR deliberations: “Those who are socially and politically ignored in defining corporate mining strategies are incorporated as cogs in a machine whose interior cannot be seen” (Fontoura et al., 2019, p. 24).

Analyzing the assumptions that underlie the corporate social responsibility discourse, Banerjee (2008b) highlights three points that companies should focus on thinking beyond profit, paying attention to socio-environmental issues, adopting ethics, integrity, and transparency in all their operations, and engaging with the community, promoting social well-being, and providing support. He reiterates that these processes should take place through dialogue and engagement with stakeholders. However, the author denounces that social responsibility and sustainability discourses have been used by companies to restrict and silence the dissatisfaction of external stakeholders, legitimizing and consolidating their power. Often, trivial actions are highlighted and maximized in reports, setting up a form of greenwashing, which cannot be confused with the idea of sustainable development (Banerjee, 2008a); or even remediation actions are positioned as promoting sustainability; the focus is shifted from global sustainability to corporate sustainability. This type of proposal revolves around business-as-usual, only colored green,

without any radical change in the corporate worldview - it is business that defines the parameters of sustainability.

In this context, the Stakeholder Theory may become an instrument focused on regulating the behavior of these actors. Even though they appear to be based on societal interests, these discourses end up serving corporate interests at the expense of segments of society. The question here would be: should socio-environmental issues caused by companies submit to business strategy?

Banerjee denounces the practice of large companies in the illusion of “empowering” the community: it consists of consulting stakeholders (involved/affected communities), making decisions privately, and then informing the community about the decisions made, which demonstrates a clear power imbalance in relationships. The consultations usually do not involve doing or not doing but, at best, address the conditions under which the practice should be carried out. Stakeholders who do not align with the company’s policy end up being co-opted or marginalized (Banerjee, 2008a). These practices pave the way for Corporate Social Responsibility (CSR) to be used as a mechanism for legitimizing predatory business practices. That may even erase the role of the State itself, contributing to making the contradictions between these activities and social well-being invisible. Groups of stakeholders may be left on the sidelines of decisions, perpetuating asymmetrical power relations.

Method

This work adopts the qualitative approach since it proposes to examine aspects of the social process, such as experiences and aspects of the participants’ imagination, the articulation of social processes, and their meanings (Denzin & Lincoln 2006). Magalhães et al. (2018), citing Bauer et al., point out the interest of qualitative research in the spontaneous expression of people, in what they consider important, and in how they reflect on their actions and those of the actors with whom they interact. This choice is justified by the need for a deep understanding of the social processes post-tragedy in Brumadinho, and allows for in-depth exploration of stakeholders’ experiences, capturing nuances and complexities. Qualitative research stands out for its sensitivity to subjectivity, enabling a rich analysis of the perspectives and meanings attributed by participants to events.

Three search strands were defined for the bibliographic research, carried out using the platform EBSCO Discovery Service. The first strand pertains to the definitions and key concepts of human ecology and management applicable to this article. Seminal publications on topics such as wicked problems, abundance paradox, risk society, sustainability, stakeholder management, and commons management were selected.

The second strand involved the connection between human ecology and organizational studies, specifically focusing on the coordination of interinstitutional actors to address wicked problems involving organizations. Three searches were conducted: the first involved the terms “Wicked problems” and “administrative coordination capacity,” yielding three articles. The selected article, by Christensen et al. (2019), was deemed most relevant and chosen for reading due to its exploration of cultural factors influencing coordination in so-called “wicked policy areas”. The second search explored the relationship between wicked problems, public administration, and new governance perspectives. The terms “wicked problems,” “new governance,” “governance challenge,” and “public administration” were used. The search was restricted to the last five years, resulting in 13 findings. All abstracts were read, and also six selected articles. The work of Bannink and Trommel was chosen because it revisits and updates the concept of wicked problems, and also delves into governance mechanisms literature, highlighting that imperfect solutions can be intelligent. The third search focused on understanding how stakeholder theory operates in cases involving not only business management but also socio-environmental resource management. The keywords used were “business management”, “environmental and natural resource

management”, “stakeholder theory,” “values,” and “decision-making”. This search, also limited to the last five years, yielded eight articles. The work of Colvin et al. (2020) was most suitable for the research needs because, besides being the most recent, it specifically addressed the transition of stakeholder theory from a business perspective to a socio-environmental view, proposing the practical framework adopted in this study.

The third strand involved information about the context preceding the tragedy and events immediately following the event. A selection of published articles involving the tragedy of Córrego do Feijão, its antecedents, and post-tragedy was conducted. The analyzed material includes: 1) the Integral Reparation Agreement, signed by Vale, Government of Minas Gerais, the public prosecutor’s office, and the public defender’s office of the Union in 2021, 2) publications from representative associations of the affected population and 3) publications of recognized researchers from the state of Minas Gerais on Mariana⁴ (2016) and Brumadinho dam collapses, such as Simone Sehnem, Andréa Zhouri, and Klemens Laschefski, always focusing relationships between stakeholders, among themselves, and with the socio-environmental problem in focus.

Besides bibliographic research, data were collected during the process of context analysis and immersion in the field to build a doctoral thesis project, through non-participant observation, method in which the researcher acts as an attentive observer, collecting data without directly engaging with the participants or the situation being studied. The primary goal of non-participant observation is to capture and record the maximum amount of relevant facts and details for the study without influencing the behavior or interactions of the participants (Richardson et al 2012). Between August 2021 and January 2024, it was possible to collect testimonies from the community about the reparation process after the tragedy, through assistance to events, virtual and face-to-face. The following events were subject to data collection: a public hearing for the discussion of the Integral Reparation Agreement in 2021, meetings of the Collective of Affected Individuals throughout 2023, and the seminars held in Brumadinho to remember, respectively, four and five years since the tragedy, in January 2023 and January 2024. Qualitative data were recorded in a field notebook: observations, reflections, and experiences in detail, along with information about the context, nuances, reflections, and impressions of the researcher on the physical and social environments. In addition to enabling a deeper and more contextualized view of the phenomenon, the notes assisted in the analysis and interpretation of the collected data, in light of the theoretical framework, aiming to relate the theory involving stakeholders, sustainability, and CSR to the reality of those affected by the tragedy.

A process of triangulation of data and theory allowed authors to work with diverse perspectives of understanding reality, adopting different sources of data about the same object, and evaluating the convergence on the phenomenon analyzed (Denzin 2009). Based on the data collected in literature and field observation, it was possible to understand the context and map the stakeholders involved. Then, we used the model proposed by Colvin et al (2020) to understand the nature of relationships between stakeholders, comparing it to what is proposed by the model for ENRM context.

Analysis And Discussion

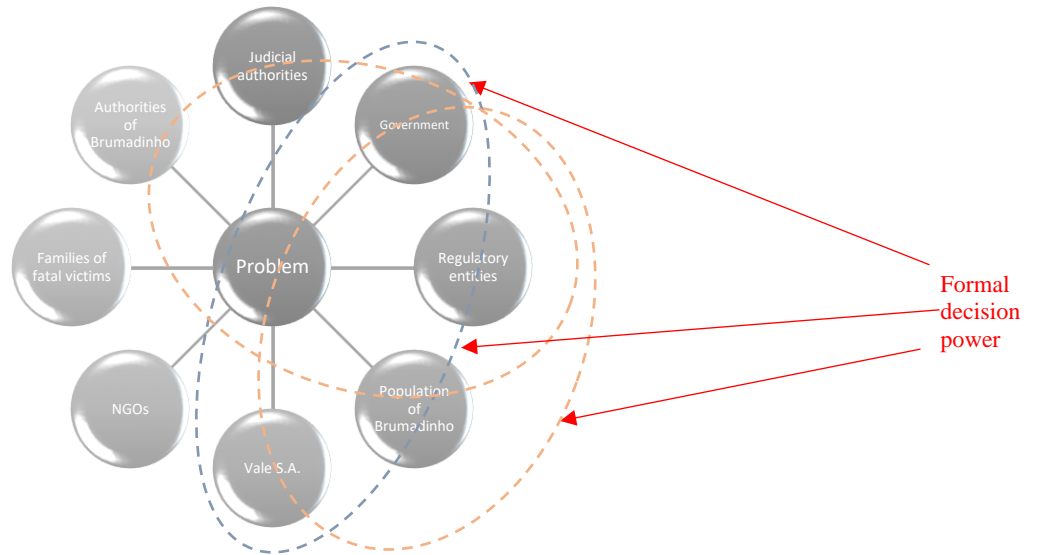
Based on data collected in literature and events, we identified the stakeholders involved in this issue, shown in Figure 3: the public power (Government and judicial authorities - prosecutor’s office and the

⁴ In 2015, a dam property of Samarco, which belongs to Vale and the Anglo-Australian BHP Billington, collapsed in the mining city of Mariana, killing 19 people. The environmental damage in Mariana was considered greater than Brumadinho because the mud reached river Doce, which cuts through two Brazilian states: Minas Gerais and Espírito Santo.

public defender's office of the union), Vale S.A., regulatory entities, family members of fatal victims, local authorities of Brumadinho, NGOs and the population of Brumadinho.

Figure 4

Recommended relationships between Stakeholders in the ENRM context of the environmental tragedy of Vale S.A.



Prepared by the authors, based on Colvin et al. (2020).

As shown in the figure, the decision-making axis should include the stakeholders in flexible arrangements and decisions, which, in turn, should be dialogued with the various groups involved, and privileging different stakeholders, according to the subject focused.

To understand if this proposition applies to the relationships among stakeholders in Brumadinho, we started by studying the Integral Reparation Agreement, and its consequences. The elaboration process, behind closed doors, contradicts the principle of the Inter-American Court of Human Rights contained in its own text, by not involving the affected population to contemplate their expectations and needs systemically. The rational understanding of the issues at hand, which characterizes legal procedures, must be associated with the engagement of the actors involved when dealing with wicked problems. The document establishes that the mapping of damages - which previously would be done by an academic and independent entity - must be the responsibility of a private company hired by Vale. It is also noteworthy that the parameters for measuring Vale S.A.'s obligations are defined, according to the Agreement, by a company "funded and under the responsibility of Vale", although they must later be validated by the compromisers. In addition, the agreement determined that Vale, formally responsible for the tragedy, is also responsible for detailing the projects for the Paraopeba Basin and Brumadinho.

According to the text, the company had to present "the analysis of technical and financial feasibility and presentation of detailed scope, schedule, estimated costs, expected results (indicators, goals, and delivery milestones)" (Tribunal de Justiça do Estado de Minas Gerais, 2021, p. 19). That is: the company is responsible for mapping the damages it caused itself, as well as defining indicators, goals, and milestones for actions to repair these damages. It is also worth noting that among Vale's obligations to do are projects for "Living with mining dependence and transition to a new economy". It is

questionable why a mining company - rather than the public authorities - was assigned the responsibility of setting objectives and goals and executing projects aimed at overcoming a condition imposed by itself on the population.

The Agreement has been the target of many criticisms, by social movements, political representatives, the church, and the affected population itself. The analysis of the document points to what Zhouri et al. (2016) denounce: the management of mining disasters has shifted from the investigation of crimes and legal infractions - eventual sanctions recommended by Ostrom (2000) - to the administrative treatment of socio-ecological conflicts, to build bridges between litigating parties. Agreements signed between the Federal and State Governments and companies, under the justification of speed, end up denying the participation of those affected, as they are not heard in the elaboration of the term. People without access to formal representation, because they do not belong to categories predefined by decision makers (without consultation with the territory), remain unidentified and therefore excluded from access to reparatory measures, having at most been the target of “emergency and welfare actions, without the perspective of autonomous resumption of their lives” (Zhouri et al., 2016, p. 39). Laschefski (2019) adds that mining companies infiltrate public authorities, civil society representative institutions, and even the Public Prosecutor’s Office to manipulate governance, so the victims find themselves forced to negotiate with the mega-entrepreneurs on unequal terms, which aggravates social suffering. As a result, in addition to not suffering sanctions, the companies end up increasing territorial control in the destroyed areas and still have their profit increased.

Even before the ratification of the Agreement, back in 2020 when the draft document was published, there were several manifestations among stakeholders in Brumadinho. The three Independent Technical Advisory (ATIs)⁵, with the help of the Methodological and Final Coordination of the Pontifical Catholic University of Minas Gerais, gathered dozens of organized commissions of affected people and prepared a manifesto for participation in the discussion of the Agreement, approved by those present at the 4th Meeting of the Commissions of Affected and Affected by the Paraopeba Basin. In the text (Associação Estadual de Defesa Ambiental e Social, 2020), the affected population disagrees with the approval of an agreement built without the properly informed participation of those affected, claiming for a broad and transparent process of participation, including traditional peoples and other communities, with revocation of confidentiality, unrestricted access to information and adequate time for appreciation - that is compliance with what the Agreement itself proposes.

The term “polluter pays” deserves attention as it qualifies Vale S.A. in the Manifesto: the affected population argues that the company’s role in reparation should be restricted only to payment of measures, demanding that its participation and that of companies linked to it be prohibited in the management, implementation, and definition of criteria for reparation measures. In addition, those affected demand that Vale be prohibited from using reparation actions for advertising purposes, self-promotion, or any action to improve institutional image. The document criticizes the haste of those involved in “quickly hitting the hammer”, without even waiting for the completion of calculations of the necessary value for reparation. It also condemns the use of resources by the State Government for “diffuse actions not necessarily in the affected territory”.

As predicted by Colvin et al. (2020), the events following the Environmental tragedy of the Córrego do Feijão dam have highlighted a complex dynamic of power relations between mining

⁵ The ATIs are NGOs working in the Paraopeba basin, whose functions are “to carry out studies and participatory processes in which those affected have access to information about the reparation process and can discuss their damages”. It is also up to ATI “to inform, raise and discuss in participatory spaces the proposals of those affected about the best way to repair the losses suffered”, so the Public Prosecutor’s Office and the Public Defender’s Office receive information for the defense of the rights of those affected in judicial proceedings (Associação Estadual de Defesa Ambiental e Social, 2020)

companies, public authorities, and communities. Four years after the disaster, different discourses challenge the understanding of the post-tragedy reality. While advertising campaigns and sustainability and reparation reports disseminated by Vale S.A.⁶ try to position it as committed to the recovery of the system and compensation for the damages caused by the dam explosion, the population claims not having been heard and continues to clamor for justice, denouncing practices different from those propagated by the company.

AVABRUM - The Association of relatives of victims and affected by the rupture of the dam mine Córrego Feijão organized the Seminar “Cities Affected by Mining”, four years after the tragedy, in Brumadinho⁷. During the event, Andresa Rocha Rodrigues, vice-president of AVABRUM, who is the mother of one of the 272 fatal victims, claimed that the population has been silenced and that the community is not a protagonist in the reparation process (Legado de Brumadinho, 2023). She used a play on the words, “RE-PARA-AÇÃÕ” (something like RE-STOP-ACTION), to show that the reparation process “stops us on January 25, 2019”. For her, the lives of families and other affected people remain stagnant while they fight for dignified reparation.

At the same event, Silas Fialho, representative of the Brumadinho Leadership Committee, also criticized the non-listening of the population in the reparation process: “Speaking for me is easy; it’s hard to represent me. Those who represent us don’t listen to us; those who speak for me are not sitting next to me”. Márcio Rodrigues, president of the Brumadinho Leadership Committee, described the events concerning the Integral Reparation Agreement was signed:

“The Justice institutions, the compromisers, do not even call or have called an affected person or want to know if the decisions made are representative. We are not called to participate. The agreement did not have participation. This is wrong and needs to change. So far there has been no reparation. Works that violate the rights of those affected are taking place, causing inconvenience. Call the leaders, listen to the community”. (Legado de Brumadinho, 2023)

On April 25, 2023, a meeting of the External Commission of the Chamber of Deputies of Brazil, was **held**, **aiming** at overseeing dam breaches, especially the renegotiation of the Mariana agreement and the reparation of the tragedy of Brumadinho (Câmara dos Deputados 2023). In the presentation of the actions taken, made by the person responsible for the pro-Brumadinho Management Committee - created by the Government of the State of Minas Gerais to articulate public agencies that deal with the reparation process -, committee meetings were mentioned, but there was no mention of the participation of those affected in these meetings. The progress of works and indemnities were also mentioned, and so was the participation of the population in choosing works and interventions from Annex I⁸, but the degree of satisfaction of the affected population was not a topic. It can be inferred that the population was heard before execution to prioritize a small part of the actions, but there is no provision for listening or evaluation during or after execution; on the committee’s website, the theme “popular consultation” only addresses prior consultation, but does not address instruments for evaluating population satisfaction with reparation. It was also mentioned that the committee, dissatisfied with the speed of the process, investigated very high values in works under Vale S.A.’s responsibility, above market prices, constituting overpricing. The committee has called on justice to have some municipalities take over works instead of the company. At

⁶ <https://vale.com/pt/reparacao>

⁷ Speeches made by the affected population collected by the author during the Seminar of Cities Affected by Mining, held on January 24, 2023, in Brumadinho, by the initiative of AVABRUM - Association of relatives of victims and affected by the rupture of the dam mine Córrego Feijão. The event was attended by the affected population, local, state, and national authorities, and experts in various areas of knowledge. More information at: <https://legadobrumadinho.com.br/blog/seminario-4-anos-da-tragedia-crime-e-os-impactos-em-brumadinho-e-municipios-mineradores/>

⁸ The value of the actions under discussion corresponds to approximately 10% of the total value of the Agreement.

this same meeting, Natália de Oliveira, sister of Lecilda de Oliveira, who died in the tragedy, and representative of victims’ families, spoke out about families’ suffering: “We were not heard (...) we feel humiliated, we feel invisible” (Câmara dos Deputados 2023). Oliveira mentioned mental illness and highlighted the importance of taking care of the affected people.

The mental health of the affected population also suffers during the reparation process; experts draw attention to the growth of impacts. Rodrigo Chaves Nogueira, psychologist and technical reference of the Mental Health Team of Brumadinho, denounced:

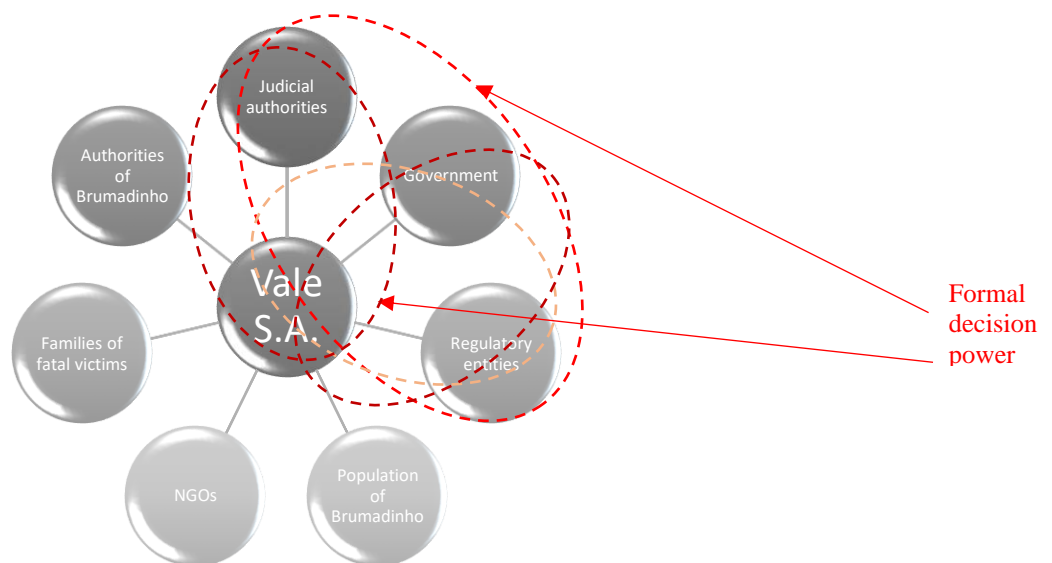
“We have experienced various losses, affecting social, affective, and cultural ties. Four years after emergencies, pseudo-indemnities works, and attempts at reparation, we find that human beings cannot live ‘in a state of war’. People continue to suffer. Material reparation does not cover immaterial damages. One faces a problem with insomnia, another takes medicine, and another falls into alcohol. The disaster continues to produce victims, family conflicts, and violence. (...) Whoever did not step on the mud should not speak for us. Don’t think anything for us without us” (Legado de Brumadinho 2023)

Sehnm et al. (2020) point out that Vale’s performance has been quite disappointing in terms of effective support for victims. The authors denounce that many complaints have not been addressed; even social programs and projects, widely highlighted in the company’s speeches, sustainability reports, and media, are being developed only to serve specific communities. Also, the mining company’s discourse is considered misaligned with organizational processes.

Based on data collected, Figure 4 illustrates current relations mapped in Brumadinho: Vale S.A positioned in the center, defines the profiles of stakeholders, sharing power with the Government and the Public Prosecutor’s Office, which also seem to continue acting as stakeholders of the company, as has been pointed out by the texts analyzed.

Figure 5

Relationships between Stakeholders in the social-ecological context in the environmental tragedy of Vale S.A.



Prepared by the authors (2024), based on Colvin et al. (2020).

According to Bannink and Trommel (2019, p. 206), the so-called regulatory actors (position occupied by the Government of State, the Public Defender's Office and Public Prosecutor's Office in this situation), when leading the process, should integrate governance approaches, both to ensure that stakeholders contribute their expertise to the joint understanding of the problem and to collaborate in building solutions that go beyond their individual preferences, as well as in the implementation of these solutions. However, events demonstrate that the debate has been confined to adjusting interests among participants in meetings held in hermetic decision-making environments. Stakeholders occupy asymmetrical positions, and the unequal distribution of economic, political, and symbolic capital defines their power of action and enunciation. Guaranteed rights are being relaxed by law and vulnerabilities caused by disasters are being aggravated (Zhou et al., 2016).

23 entities supervise and regulate mining in Brazil. However, instead of placing the environmental problem at the center of governance - as recommended in ENRM management scenarios -, these entities, as the government and judicial authorities, seem to help empower the entrepreneur, positioning Vale S.A. as the protagonist and not as a stakeholder. These reproduce the firm-central approach, typical of business context, proposed by the classical Stakeholder Theory. The result: instead of sharing power and quality of life with their surroundings, mining companies end up sharing only losses and risks with the community. The decision-making axes oscillate between: Vale and Government, Vale and judicial authorities and regulatory entities, or between the four actors and, occasionally, involve local authorities. NGOs, families of the fatal victims, and the population of Brumadinho and affected cities remain at the mercy of the actors' decisions. Even the right of the most vulnerable actors to express their discontent was curtailed: on January 9, 2020, at the request of Vale, a decision by the Court of Justice of Minas Gerais⁹ prohibited the residents of Brumadinho from protesting against the company. The company claimed that demonstrations would hinder the progress of the city's restructuring works. According to the decision, each resident who participates in protests will be subject to a fine of 5 5,000 reais (approximately one thousand euros).

As Sehnem et al. (2020) admonished, the lack of rigor in the law and failures in punishment encourage mining companies to violate the legislation. As there has been no efficient assignment of responsibilities, nor limits to expansion or effective punishment, the process of disconnection between companies' actions and sustainable practices has been legitimized, with clear ascendancy of the mining industry in decision-making, contrary to what Colvin et al. (2020) recommend.

Citing Foucault, Banerjee (2008a) states that, in liberal political discourse, the problem is not the antisocial effects of the market, but the anticompetitive effects of society. Instead of reformulating processes and practices to respect nature's logic, sustainable development strategies seem to reverse the process, using market logic to determine nature's future. It would be a "new" paradigm based on old capitalist parameters. Zhou et al. (2016, p. 39) point out that the work of companies in charge of raising and sizing damages, hired by mega-entrepreneurs, has its objective shifted from fair compensation for damages to cost reduction for the contractor.

Final Considerations

⁹ News published on the date of the decision, on the R7 portal.: <https://noticias.r7.com/minas-gerais/vale-pede-e-justica-proibe-protestos-de-moradores-de-brumadinho-mg-09062020>. Accessed on May 22, 2023.

Environmental disasters are wicked problems and, by definition, do not admit linear or cartesian solutions and demand systemic approaches. In the context of environmental disasters, the ENRM approach of the Stakeholder Theory must be applied, recognizing the centrality of the voices of the affected population in defining the problem and formulating solutions. Data shows that this is not happening in the case of Brumadinho.

The relations between stakeholders are structured in a very traditional way, following the firm-centric point of view of Stakeholder Theory. Decision-making power is concentrated in the hands of Vale S.A. and the signatories of the Integral Reparation Agreement, and a gap exists between implemented actions and the actual requirements of the territory. This underscores the previously mentioned failure to adapt the Stakeholder Theory to socio-environmental disaster contexts - or a disconnection between stakeholder voices and decisions made in offices and courts. By trying to simplify an eminently complex problem, excluding the population from the negotiations of the agreement, the Government and judicial authorities end up legitimizing Vale's central position; they share decision-making power with the company, rather than distributing it more equitably among all involved stakeholders.

Solutions designed without considering the voices of the affected population, besides undermining the necessary trust for achieving sustainability, tend to present serious flaws, both in design and implementation, as demonstrated by the statements of the affected population. The solutions tend to focus on material losses, disregarding feelings, emotions, the history of the affected populations, and their connections to the territory. This turns them into palliatives that exacerbate and perpetuate the suffering of those affected. As a consequence, we observe a process of revictimization of the community in Brumadinho; as the solutions are not satisfactory, the population has two alternatives: to conform or to live in an eternal daily wear and tear, trying to make themselves heard. Additionally, the fact that, until the time of this article's production, there has been no punishment for any technician or executive responsible for the tragedy, causes the population of Brumadinho and other regions around the dams a feeling of anguish and fear, due to the risks that other dams may hide.

To address the challenges identified in this study and promote a more effective response to environmental disasters like the one in Brumadinho, it is crucial to adopt public policies that guarantee inclusive and transparent governance. This implies not only expanding the participation of affected communities from the initial stages of planning to the implementation of reparation measures but also establishing robust mechanisms for transparency and accountability. In addition, it is urgent to adopt new perspectives to address emerging issues concerning relationship dynamics among companies, communities, governments, and other stakeholders in the context of ENRM: business practices must be guided by clear guidelines that fully respect human and environmental rights, ensuring that corporate actions not only comply with legal requirements but also contribute to social and environmental justice. This challenging process requires attentive listening and the reconciliation of diverse interests; while it takes time and does not guarantee perfect solutions, this path points toward the evolution of relations between the socio-system and the ecosystem, promoting advances in the pursuit of sustainability and opening doors to a more inclusive economy and social progress.

The broader implications of this study extend beyond the academic realm. They can contribute to theoretical and practical debates on corporate social responsibility and disaster management, inspiring and guiding the application of this model to other situations and improving future actions.

As potential directions for further research, in addition to deeper investigations into the relationships among companies, communities, governments, and other stakeholders, we consider that the relatively recent nature of this proposition still presents opportunities for application to different realities, such as other business segments and surrounding communities. The search for localities, governments, and companies that are successfully applying the model proposed by Colvin and colleagues is also an opportunity to observe different political, social, and economic implications. Considering that this study

was carried out during the first phase of the field approach for a doctoral thesis, we also acknowledge the limitations of this work, including methodological constraints such as potential biases in the selection of analyzed articles, search limitations, and challenges in generalizing to other populations. Additionally, the scarcity of prior studies may impact the findings. These limitations provide opportunities for methodological refinement and more robust investigations in the future.

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