

WICKED PROBLEMS, IMPERFECT SOLUTIONS: AN ANALYSIS OF THE FULL REPARATION AGREEMENT FOR THE TRAGEDY OF CÓRREGO DO FEIJÃO DAM

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Introdução

On January 25th, 2019, the tailings dam of the Córrego do Feijão Mine, owned by Vale S.A., in Brumadinho-Minas Gerais, broke, causing the leakage of 12 million cubic meters of tailings. 272 people died and 3 are still missing. 48 municipalities were affected by river pollution. To repair the effects of the tragedy, in February 2021, an Integral Reparation Agreement was signed between the company and the government. However, due to problems since its elaboration, the agreement has been shown to be insufficient to solve the problems faced by the population.

Problema de Pesquisa e Objetivo

Starting from the research question “Has the Integral Reparation Agreement been able to provide quality solutions for the population affected by the Brumadinho tragedy?”, this work aims to analyze the construction process and the text of the agreement, in light of theoretical references on intersectoral relations, governance and socio-environmental tragedies and the guidelines of the Inter-American Court of Human Rights and the United Nations. It also seeks to bring to light the voices of the community about the reparation process.

Fundamentação Teórica

The theoretical review is transdisciplinary and involves: the Epistemologies of the South, proposed by Sousa Santos, the Curse of Natural Resources, by Auty, Gudynas' Neoextractivism, new perspectives on stakeholder theory, by Colvin and colleagues, the dialogue between mutuality and morality in companies, proposed by Rangan, Wicked Problems (by Rittel and Melvin and contemporary theorists) and the Management of Common Goods (Hardin and Ostrom). Brazilian legislation and conditions for Comprehensive Reparation, proposed by the UN and the Inter-American Court of Human Rights were also studied.

Metodologia

The work adopts a qualitative approach, examining aspects of the social process, such as experiences and aspects of the participants' imaginary, the articulation of social processes and their meanings. Data were collected through bibliographic research - from the text of the Integral Reparation Agreement, articles, manifestos and documents published by collectives, social movements and associations of those affected - and by non-participant observation at community meetings. The analysis was divided into two stages: the text of the Agreement and the counterpoint of the voices of the community.

Análise dos Resultados

The data show that, contrary to theoretical definitions, the population was not the protagonist in the construction of the agreement. The document, elaborated without the participation of the community, contains contradictions within the text itself - the theoretical bases for the construction of the process were not taken into account in several of the determinations. The fragility in construction has given rise to problems that have been afflicting the population over time, in a constant process of revictimization.

Conclusão

The Integral Reparation Agreement in the case of the Brumadinho tragedy characterizes an attempt at a linear solution to a wicked problem - which, by nature, does not admit this type of solution. Given that it was not, demonstrably, an accident, the situation is characterized as a result of the actions of a free rider and its consequences. The Agreement sets up a top-down solution, which is inefficient, as demonstrated by the literature, because it does not offer those affected the possibility of organizing themselves and leading the solution to problems.

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Palavras Chave

Mining, Justice, Wicked problems

WICKED PROBLEMS, IMPERFECT SOLUTIONS: AN ANALYSIS OF THE INTEGRAL REPARATION AGREEMENT FOR THE TRAGEDY OF CÓRREGO DO FEIJÃO DAM

Introduction

On January 25, 2019, the debris dam at the Córrego do Feijão Mine, owned by mining company Vale S.A., in the city of Brumadinho, state of Minas Gerais, Brazil, ruptured, causing the leakage of approximately 12 million cubic meters of tailings. 272 people died, and 3 are still missing. 48 municipalities, with a total population of over 1.3 million inhabitants, were affected by river pollution. It is estimated that 24 thousand people were forced to leave their homes as a result of the disaster, considered the biggest dam disaster of the decadeⁱ. Claiming to have been pressured by Vale's team, the consultancy Tuv Sud, hired by the mining company to attest to the safety of the dam issued a Declaration of Stability, pointing out the Stability Factor below normal and justifying it by attaching a single scientific article that defended the acceptability of the parameter. (Arbex 2022, 270).

To repair the effects of the tragedy, in February 2021 an Integral Reparation Agreement was celebrated, mediated by the Judicial Center for Conflict Resolution and Citizenship (Cejus) of the Court of Justice of the State of Minas Gerais (TJMG), involving the Government of Minas Gerais, Vale S.A., the public prosecutor's office, and the public defender's office of the union.

Starting from the research question "Has the Integral Reparation Agreement been able to provide quality solutions for the population affected by the Brumadinho tragedy?", this work aims to analyze the process of construction and the text of the agreement, in light of theoretical references on intersectoral relations, governance and socio-environmental tragedies and the guidelines of the Inter-American Court of Human Rights and the United Nations. It also seeks to bring to light the voices of the community, silenced in the reports published on the recovery process, about how the document was elaborated and the results that are presented so far.

A transdisciplinary theoretical review preceded the analysis of the Agreement. Next, manifestations of the community were brought to the analysis - notably in 2023, marking the fourth anniversary of the tragedy - about the elaboration, text, and results. The analysis demonstrated the weaknesses in the elaboration process, which in turn give rise to problems that revictimize the affected population. In conclusion, lessons and propositions for improvement are pointed out.

Theoretical Review

Globalization, neocolonialism, and neoextractivism

The growth of the Brazilian economy in the 20th century, according to Evans (1986) resulted from an alliance between multinationals, local capitalist elites, and the so-called state bourgeoisie. Sousa Santos (2019, 405) mentions a "national capitalist class", formed by relationships between top management of large companies (national and multinational),

political leaders, senior state officials, and other influential professionals, united by their interest in power relations and socioeconomic privilege – a kind of revolt of the elites against the post-World War II redistribution of wealth. This alliance would be the basis of the industrialization model of the peripheral countries, whose implementation requirements erode institutions and norms in such a way that they affect the State's legitimacy in controlling society; they interfere with class formations and inequality at the world level (Sousa Santos 2019).

Quoting Bob Jessop, Sousa Santos (2019, 411) mentions three trends in the transformation of state power in a globalization scenario: 1) denationalization, through the reorganization of capacities and the emptying of the apparatus, 2) the privatization of political regimes - transition from “government” to “governance” – in which the State moves from the central role in the integration of the economy, society, and culture to that of coordinator (at most) of associations between organizations of various natures, in the name of the integration of economy, society, and culture to the global context; and 3) the internationalization of the national state, especially in economic matters.

Even playing a key role in Latin national economies, mining has been a great object of discussion in Brazil, due to the economic, environmental, and social impacts in the regions in which it operates. Sehnem et al. (2020, 392) state that mining does not always lead to improved social and economic conditions for all, reinforcing the Abundance Paradox or Resource Curse (Auty 1993): regions that are abundant in non-renewable resources tend to have less economic growth and worse development rates compared to places that do not have such resources.

Gudynas (2009) comments that the “old” extractivism, before the 1990s, involved exports, and the world market, advocating a smoother performance by the government. In turn, the modern “neo-extractivism” would, apparently, be characterized by the strengthening of the Government; however, the government operates following business strategies aimed at gaining competitiveness and increasing profitability - state practices reproduce conventional business practices; power is used by the government itself to favor the private initiative, which ends up meeting what Sousa Santos (2019) advocates: the government itself acts to weaken itself, transferring power to the private sector, notably to large multinational companies - which configures a neo-colonial practice.

Neo-extractivism reinforces neo-colonialism by promoting the international insertion of South American countries marked by subordination – a competition to attract international investments. And this dispute implies the competition for the flexibility of social-environmental rules (Gudynas 2009). Thus, social and environmental impacts have increased, while actions to combat them have been weakened by a discourse that social and environmental impacts must be accepted by the surrounding populations as sacrifices, in exchange for benefits to the country. Gudynas points out that, in the name of these benefits, governments reject social protests and accuse affected minorities of impeding development.

According to Sousa Santos (2019, 453), this new articulation between politics and economy implies that national commitments are replaced by pacts with global actors or globalized national actors. Gudynas (2009), additionally, points out that both right-wing and left-wing governments, from which one would expect attitudes to combat the overexploitation of natural resources, end up committing themselves to neo-extractivism since the financing of social investments often happens to depend on the foreign exchange generated by these ventures. Thus, in a contradictory way, social legitimacy becomes an argument for the defense of extractive activities, which, in turn, have a high social-environmental impact. The discussion becomes no longer about inequality and the damages brought about by mining, but about what will be done with the financial resources from this activity; debates fail to contemplate the

development model.

Gudynas highlights cases in which extractive companies enjoy a leading role in local communities, assuming part of the State's role, through the construction of schools, health centers, and other undertakings. This weakens protests against the development model, which in turn makes the discussion about extractive enterprises even more difficult. The discourse of previous decades, exalting progress and job creation is reedited, starting to advocate that extractivism is a necessary condition for combating poverty, as it generates wealth – a reductionist vision that confuses economic growth and development (Gudynas 2009, Bourdieu 1998 75, Resende e Ramalho 2006, 118). Politicians and other local leaders adopt this speech, and the State starts to serve extractivism. Social and environmental costs are transferred to local communities, considering that social inequalities are effects of economic growth and can be solved by compensatory measures, as long as they do not affect market mechanisms, while the benefits are shared on a national scale. The disasters, treated before as natural exceptions, now start being considered merely a consequence of unsustainable development, often described as “accidents” or “fatalities,” as if they did not result from business and could not be avoided. However, nowadays these disasters become part of the business itself, as part of corporate strategies to maximize profits, supported by public policies that make lives precarious and exacerbate vulnerabilities (POLOS-UFMG 2023, in press). Hegemonic globalization is configured, as pointed out by Sousa Santos (2019, 456).

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. In this context, a mining company is called *superficialia* because even if it owns the land, it does not own the minerals, which are property of the Union: they "constitute a distinct property of the soil, for exploration or exploitation, and belong to the Union" (Brasil 1988). When we talk about commons, we refer to the environment, ecologically unbalanced by the company's actions, which directly affects the rivers, cities, and the environment around it. It is both a right and a good that the entire population has the right to enjoyⁱⁱ.

Managing the Commons

In the article *The Tragedy of the Commons*, Hardin (1968, 2), states that, in the management of common goods, present in a social-ecological system, some actors intend to maximize their gains, benefiting from what is common without sharing the costs that this represents to the system – which jeopardizes the survival of the commons, since there is no way to have unlimited gains within a limited system. Hardin (1968, 3) and Ostrom (2000) agree that these actors, known as free riders, deny that maximizing their earnings generates suffering for a part of the society of which they are a part. Hardin (1968, 5) states that to remedy this situation, it is no use appealing to conscience and proposes the use of coercive and corrective rules by the State, stating that "freedom in the case of common goods brings ruin to all" (1968, 2). Ostrom (2000, 2), on the other hand, questions top-down solutions, stating that it is possible for users to spontaneously invest time and energy to promote improved sustainability, being able to self-organize and define rules for the management of common resources. Ostrom considers that good management of the commons is linked to the identification and analysis of relationships between the stakeholders involved.

Managing the commons involves dealing, daily, with a series of wicked problems. Defined in the 1960s as “a class of poorly formulated socio-system problems where information is confusing, there are many customers and decision makers whose values are conflicting, and the ramifications in the system are completely confused” (Rittel and Melvin 1973), this kind of problems have been a great object of discussion nowadays. They are also characterized by: not admitting rational understanding and planning, presenting many stakeholders with different perceptions of values, instability, and continuous evolution, in addition to an irregular knowledge base for defining both the nature of the problems and the scope of the solutions (Bannink and Trommel 2019, 198). Thus, there is a risk that the solutions will turn out worse than the problems themselves, with no definitive and objective answers for them.

The first step in dealing with wicked problems involving social-ecological systems is to recognize them as such. Termeer et al. (2019), reviewing the attempts to adjust the definition and even redefine these problems, point to the fact that they transcend the boundaries of traditional politics and resist solution attempts; they are non-equatable questions along cartesian or linear paths. Christensen et al. (2019, 237) claim that wicked problems do not have an optimal solution, but good collaboration and coordination between different actors, organizations, and levels of action can help governments to deal with them, which leads us to Ostrom and the importance of relationships between stakeholders system’s actors. Termeer et al. (2019) add that trying to transform wicked problems into tame ones, denying their inherent complexity, can even bring some relief, but is not recommended and can lead to the frustration of actors, as it would treat the symptoms without addressing their real causes.

Going beyond the coercive nature of solutions proposed by Hardin (1968), Bannink and Trommel (2019, 198) move towards the thinking of Ostrom (2009) when they point out that dealing with this type of problem requires systemic thinking and the design of decisions must involve the various audiences reached. For this, the literature demonstrates that the stakeholder approach cannot be centered on the organization, as is customary in the business context. Decision-making power must be diffuse and fluid. The voices of stakeholders must be the basis for defining the problem itself and the raw material for developing solutions, which, much more than material losses, need to consider feelings, emotions, and the history of populations and regions. This creates trust between stakeholders, which is essential for the development and maintenance of agreements aimed at dealing with the problems. (Colvin et al. 2020, 1)

Bannink and Trommel criticize the so-called “perfect modes of governance” because they would assume that there is a rational understanding of the issues, in addition to a collective of actors engaged in the search for a joint solution. In the case of wicked problems, they claim that the loss of governability is already inherent in the governance of these problems (Bannink and Trommel 2019, 206). Thus, any governance response tends to be imperfect, and responses must start from the recognition of these limitations and possibilities for action. As a result, making politics would not be about building a better world through utopian problem solving, but making it a little less inhospitable, learning from errors arising from small-scale experiments.

Reparation, mutuality, and morality

Rangan (2018) states that “the demand for profits produced performance, but not always progress (...). And the demand for economic security has produced a welfare state but not economic security. The demand for conservation produced conversations, leaving scientists to worry about the collapse.”.

Mutuality, the exchange of benefits, has been the basic principle of social contracts involving business activity. Rangan (2018) agrees with Evans (1986) when he states that there is, in fact, a mutual relationship between managers, business owners, and regulators (Government) - which seems to be sustained at the expense of society. The author considers that is necessary to overcome this type of relationship, through a philosophical perspective of economics, which embraces moral and normative issues and an expanded scope of humanity. In other words: more than regulating market power, as evoked by Hardin (1968), it is necessary to educate it – a proposition that connects with Ostrom's (2009) premises. This is the only way to avoid the panacea of the protective and mediating state between the market and society, which has resulted in authoritarian measures and unproductive regulations (Rangan 2018, 4).

Mutuality is based on outcomes, defined by Rangan (2018, 5) as a product of power and interest. In other words: if one wants to define the results, it is necessary to pay attention to the structure of power. Corporate responsibility is nowadays geared towards outcomes such as the possibility of attracting brilliant professionals, the overpricing paid by engaged consumers, or the more lenient attitudes of regulators in case of violations. The question would be: is this type of mutuality relationship enough to guarantee social-environmental sustainability as a result?

For Rangan, it is necessary to use power to go beyond self-interest, based on moral reasoning, contemplating philosophical ideals and principles - which today influence legislation and policy, but still go far from inspiring business theories and affecting economic paradigms: "There is more to well-being than income and consumption" (Rangan, 2018, 10). Real sustainability propositions demand companies be protagonists in raising the levels of justice and well-being, sharing the ideals that are traditionally treated by philosophers.

Rangan (2018, 13) reinforces that philosophers and social scientists need to work together to develop economic perspectives combining morality and mutuality, since the capitalist paradigm, based purely on mutuality, does not help economic agents to respond to the demand for justice and well-being; even the state machine remains focused on outputs rather than outcomes. As in the social sciences practice guides theory, the need to incorporate this morality into practice emerges: "Does the pursuit of outputs have to lead to the sacrifice of outcomes?" (Rangan 2018, 15).

Banerjee affirms that regulation by the government and other agencies is needed for businesses to produce socially beneficial results. He then denounces the current influence of big corporations in the design of national laws itself - however, corporations cannot replace governments in the mission of promoting social welfare, because they are driven by economic functions (Banerjee 2008b, 6). While its ability to generate wealth is unquestionable, the social-environmental effects of the actions of large corporations also unquestionably continue to be destructive. Thus, social responsibility, corporate citizenship, and sustainability can configure a form of rationality that, despite an emancipatory intention, marginalizes sectors of society (Banerjee 2008a, 5). According to Rangan (2018), this points to a lack of morality.

Analyzing the assumptions that support the discourse of corporate social responsibility, Banerjee meets Ostrom and Rangan when he highlights three points on which companies should focus: thinking beyond profit, paying attention to social and environmental issues; adopting ethics, integrity and transparency in all its operations, and engage with the community, promoting social well-being and providing support. These processes should take place through dialogue and engagement with stakeholders (Banerjee 2008b, 13); however, social responsibility and sustainability discourses have been used by companies to restrict and silence the dissatisfaction of external stakeholders and legitimize and consolidate their power. In this

context, the Stakeholders Theory can represent a neo-colonial instrument focused on regulating the behavior of these actors. Even appearing to be based on societal interests, these discourses may end up serving corporate interests at the expense of segments of society (Banerjee, 2008b).

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 taken - which demonstrates a clear inequality of power in relationships. Consultations usually do not involve do's or don'ts but at best address the conditions under which the practice should take place. Stakeholders who do not align themselves with company policy end up being co-opted or marginalized (Banerjee, 2008a).

The provisions of the Inter-American Court of Human Rights confirm and reinforce what Rangan proposes in the case of reparation processes for human rights violations: implementation must obey the principle of effectiveness, which includes, in addition to full compliance with the measures, that the needs of the victims are duly taken into account: "taking into account the expectations and participation of the victims in their implementation," in the words of the IACHR (2022). Additionally, the body warns that these measures cannot be confused with humanitarian aid or the satisfaction of other needs. Lozoya et al (2019) point out, however, that, confirming Banerjee, in Brazil, victims have been denied a leading role in repairing their violated rights: "the role reserved for victims and their families in the Brazilian judicial process remains residual, secondary and of little relevance." By criticizing the low effectiveness of the Brazilian judicial system in guaranteeing full reparation for human rights violations, the authors highlight the "patrimonialization of moral damages reparation" - the mere offer of money to the victim, reducing moral damage to monetary figures. Typical of the so-called paradigm of "money as a universal remedy", this attitude, according to the authors, paves the way for those who can "pay the price" to feel entitled to violate fundamental human rights. Thus, according to the authors, compensation for violations of so-called personality rights (which concern people's extra patrimonial sphere - essential attributes to the human condition) end up being accounted for as costs by large companies. This leads to a process of commodification of moral damages: indemnities, which should be exceptional, become operational fees; corporations consciously begin to deliberately opt for harmful practices as long as judicial indemnities do not exceed investment

Methodology

This work adopts the qualitative approach since it proposes to examine aspects of the social process, such as the daily routine, experiences, and aspects of the participants' imagination, the articulation of social processes, and their meanings (Denzin and Lincoln 2006, 17). Magalhães et al (2018, 29), citing Bauer, Gaskell, and Allum, 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. By focusing on the text of the Integral Reparation Agreement and the counterpoint represented by the voices of the local community, this article demonstrates its practical, descriptive, and explanatory nature, seeking to assist in the development of applied solutions for society.

Data collection was done through bibliographic research - reading the text of the Integral Reparation Agreement and careful survey of articles, manifestos, and other documents, published by collectives, social movements, and associations of affected people - and non-participant observation - assistance to events, virtual and face-to-face, between August 2021

and March 2023, during which it was possible to access testimonies from the community about the process of construction and content of the Agreement - especially the event that marked the anniversary of four years since the tragedy, in January 2023. Next, we proceeded to the analysis, divided into two stages: the text of the Agreement and the counterpoint of the voices of the community. The result of the analysis is materialized in the conclusions and contributions.

The Full Reparation Agreement

Before proceeding to the analysis of the provisions of the Agreement, we will briefly describe the main lines of its structure. The document defines *obligations to do*, involving projects that must be executed by Vale S. A., and the *obligations to pay*, which encompass projects to be financed by the company, through the transfer of resources to the Government of the State of Minas Gerais. Of the total amount of R\$ 37.689.767.329,00 (thirty-seven billion, six hundred and eighty-nine million, seven hundred and sixty-seven thousand, three hundred and twenty-nine reais, approximately 7.9 billion dollars), R\$ 15.1 billion (3.15 billion dollars, approximately) correspond to *obligations to do* by Vale and R\$ 22.5 billion (about 4.7 billion dollars) configure *obligations to pay* by Vale. The obligations defined by the agreement are divided into four parts - called, in the document, Annexes, and presented in the table below.

ANNEX	DESCRIPTION	SUBDIVISIONS/DETAILS
Annex I - Socioeconomic Reparation Program Total value: R\$ 11.4 billion	The actions encompass, in addition to Brumadinho, directly affected communities and 25 municipalities also considered affected.	Annex I.1 - Vale's Obligation to Pay: Projects for the demands of affected communities R\$ 3 billion
		Annex I.2 - Vale's Obligation to Pay: Income transfer program for the affected population R\$ 4.4 billion
		Annex I.3 - Vale's Obligation to Do: Projects for the Paraopeba Basin R\$ 2.5 billion
		Annex I.4 - Vale's Obligation to do: Projects for Brumadinho. R\$ 1.5 billion
Annex II - Socio-environmental	Includes the reparation of affected municipalities and	Annex II.1 - Vale's Obligation to Do: Socio-environmental

<p>reparation and Compensation Program for Known and Non-Recoverable Damages</p> <p>Value: approximately R\$ 6 billion. (Not subject to financial ceiling)</p>	<p>communities, with interventions for environmental recovery and compensation for damages considered irreversible.</p>	<p>Recovery.</p> <p>Not subject to a financial ceiling.</p> <p>Annex II.2 - Vale's Obligation to Do: Socio-environmental compensation for damages already known.</p> <p>R\$ 1.55 billion</p> <p>Annex II.3 - Vale's Obligation to Pay: Water Security Projects.</p> <p>R\$ 2.05 billion</p>
<p>Annex III - Mobility Program</p> <p>Total value: R\$ 4.95 billion</p>	<p>Comprises actions for reparation and compensation of impacts caused in the State as a whole. They seek to provide improvement of quality of life and development for the municipalities to raise the mobility conditions of the population. Also involves logistical improvement, the attraction of investments, employment, and income increase. Actions are distributed throughout the State.</p>	<p>Obligation to pay by Vale</p>
<p>Annex IV - Public Service Strengthening Program</p> <p>Value: R\$ 3.65 billion</p>	<p>Actions that also involve the entire State, aiming to compensate for negative economic and social impacts, such as losses of revenue and direction of global public services to attend to the people and regions affected at the time of the disaster.</p>	<p>Obligation to pay by Vale. Improvements in health, economy, security, work, and technology.</p>

Figure 1 - Annexes of the Full Reparation Agreement. Elaborated by author. Sources: Court of Justice of the State of Minas Gerais 2021 and Government of the State of Minas Gerais 2021.

In addition to these values, also are included: the expenses previously incurred by Vale, in the amount of R\$ 6 billion (about one billion euros), and the so-called Special Projects, involving: Term of Adjustment of Conduct (TAC) with the Firefighters, Term of Adjustment

of Conduct (TAC) with Civil Defense, risk assessment, monitoring of water quality for human consumption, the construction of a memorial in honor of the victims and other provisions. These projects will be funded and executed directly by Vale (Government of the State of Minas Gerais 2021). At the end of 2022, Vale's Integrated Report indicated that 58 % of the agreement had been executed, having fulfilled 76 % of the obligations to pay and only 5 % of the obligations to doⁱⁱⁱ.

Regarding the provisions of the document, the Judicial Agreement for Integral Reparation (Court of Justice of the State of Minas Gerais 2021, 31) presents as a guideline the principle number 10 of the United Nations Conference for Development and Environment, concerning popular participation:

“The best way to deal with environmental issues is with the participation of all interested citizens, at various levels. At the national level, every person should have adequate access to information on the environment that public authorities have, including information on materials and activities that pose a danger to their communities, as well as the opportunity to participate in decision-making processes. States should facilitate and foster public awareness and participation, making information available to everyone. Effective access to judicial and administrative procedures should be provided, including compensation for damages and relevant resources.” (United Nations 1993, 5)

This principle ensures to everyone, especially people in situations of vulnerability, in addition to timely and reliable information, meaningful participation in decisions that affect their lives. This determination is closely related to the Sustainable Development Goal (SDG) number 16, which proposes “to ensure inclusive, participatory and representative decision-making”. Brazil is committed to the SDGs, as it is a participant in the 2030 Agenda for Sustainable Development - Resolution A / Res 70/1, of 25.09.2015, of the United Nations General Assembly. Additionally, popular participation” is a right guaranteed to those affected by state law” by the State Policy for Those Affected by Dams (POLOS-UFMG 2023, in press)^{iv}.

The text of the Agreement characterizes it as a “constitutional and legal alternative for the consensual resolution of conflicts (...) in a more agile and efficient way”. It appears as a premise of the document the "responsibility of Vale for the integral reparation of all damages resulting from the Break, already recognized in a judicial sentence, issued on July 9, 2019” (Court of Justice of the State of Minas Gerais 2021, 4). It is also established that the socio-economic reparation provided "will respect the local ways of life, the autonomy of the affected people and the strengthening of public services” (Court of Justice of the State of Minas Gerais 2021, 6)

However, the provision of participation of those affected in the Agreement already brings with it the restriction of their access, as shown by the text:

“3.3. The affected people will have informed participation ensured in the conception, formulation, execution, monitoring, and evaluation of plans, programs, projects, and actions related to **Annex I.1 - Projects for Demands from Affected Communities** (*highlight made by the author*). 3.4. The affected people will act in the prioritization and monitoring of projects **from Annexes I.3 and I.4** (*highlight made by the author*).” (Court of Justice of the State of Minas Gerais 2021, 7).

Finally, it should be noted that in the final provisions of the agreement, “the centrality of those affected” is established, adding that “the execution of this instrument will take into account the specificities and singularities of traditional peoples and communities, through prior, free and informed consultation”. It also established the maintenance of “channels of dialogue and interaction between those affected, the compromisers, Vale, and society, in existing institutional forms” (Court of Justice of the State of Minas Gerais 2021, 20).

Analysis

Proceeding to the analysis of the text of the Agreement, in light of the theoretical framework, it should be pointed out that the negotiations and dealings took place under judicial secrecy - the affected population could not validate, or even access the text, before signing, having the right to participate only in the definition of the actions foreseen in Annex I.1 (whose value corresponds to less than 10% of the total of the Agreement). According to Oliveira (2022, 90), the Federal Public Defender’s Office, which did not participate in the elaboration of the document, publicly confirmed these weaknesses in the construction process, indicating that the collective’s claims were still far from the consensual solution.

Despite extinguishing some lawsuits previously proposed for the reparation of damages, the Agreement does not cover all points addressed by these processes, even because, at the date of signing, the Damage Matrix, which was being done by Instituto Guaicuy, an independent consultancy linked to the Federal University of Minas Gerais, had not been completed (Pontes 2021). According to MAM - Movement for Popular Sovereignty in Mining (2021), the value of the Agreement is insufficient to finance integral reparation. The initial amount proposed by the Government of Minas Gerais, based on technical studies produced by Fundação João Pinheiro and the Public Prosecutor’s Office of Minas Gerais, was R\$ 54.6 billion. Therefore, a discount of almost 20 billion was offered to Vale, already including in the final amount what had been previously spent by the company on emergency actions (R\$ 6 billion). And more: MAM points out that the amounts destined to the affected population are much lower than what was due to the State; of the 37 billion reais, only 20 % (R\$ 7.4 billion) are being directed to those affected. Additionally, considering only the amount destined to the State in general (R\$ 8.6 billion), most (R\$ 4.95 billion) will not be invested in the region victimized by the tragedy, but in road infrastructure works - implementation of a subway in the state capital, highway repairs, bridge construction, and a ring road, which will also facilitate the flow of mining production. ^v.

The text establishes that the mapping of damages - which would previously be done by an academic and independent entity - must now be done by 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, Vale, formally responsible for the tragedy, is also responsible for detailing the projects for the Paraopeba Basin and Brumadinho (Annexes 1.3 and 1.4). According to the text, the company has to present “the analysis of technical and financial feasibility and presentation of detailed scope, schedule, estimated costs, expected results (indicators, goals, and delivery milestones)” (Court of Justice of the State of Minas Gerais 2021,19). 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 Power - was assigned the responsibility of setting objectives and goals and executing projects aimed at overcoming a condition imposed by itself on the population.

Item 6 of the Agreement establishes the hiring of independent external audit companies to evaluate the achievement of objectives and results. Once again, it is surprising that socio-economic and socio-environmental audits are to be hired by Vale S.A.; it is not clear why public power could not hire this audit, at the expense of the company. It should be remembered that right before the tragedy that this study deals with world safety standards were disregarded by an external consultancy, hired by Vale, which allegedly acted under pressure from the company to change the stability factor in a report on the dam (Ragazzi and Rocha 2021, 102 -119).

Still regarding the detailing of programs and projects, item 5.6 of the agreement establishes: “The monitoring and follow-up of the projects will be carried out by those affected. The inspection will be carried out by the compromisers, supported by the Socioeconomic Audit” (Court of Justice of the State of Minas Gerais 2021, 20). At this point, it is not clear how monitoring and follow-up would be done by those affected, nor whether this item refers to any specific Annex, and which one it would be. Getúlio Vargas Foundation, later hired by Vale as auditor, published a website with information, provided by the company, on the progress of the projects^{vi}. However, as of the production of this article (July 2023), the website presents qualitative and very summarized information, without quantitative data that indicates the number of beneficiaries, efficiency or effectiveness evaluation, or data reliability indexes.

Community voices

The Agreement has been the target of many criticisms, by social movements, political representatives, the church, and the affected population itself. We will now address some of them.

Even before the ratification of the Agreement, back in 2020, there were several manifestations. The three Independent Technical Advisory (ATIs)^{vii} that worked in the Paraopeba River basin, with the help of the Methodological and Final Coordination of the Pontifical Catholic University of Minas Gerais, gathered dozens of Organized Commissions of Affected 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 (State Association for Environmental and Social Defense 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.

About the issue of confidentiality, Program Pólos de Cidadania, from the Faculty of Law of the Federal University of Minas Gerais, clarifies:

“This decision, despite being based on the general principle of confidentiality that informs the mediation process (art. 2, VII of Brazilian law No. 13.140/2015 - “Mediation Law”), is incompatible with the collective due process of law. The provision

of confidentiality is designed for cases of individual mediation, which involves private interests available by the parties involved, directly and individually, in the dialogical process. In collective cases, which involve public and collective interests which are owned by a wide multiplicity of people, not all directly represented in the mediation, it is indispensable that the latter can know, at least, of the terms under discussion, so that they can at least exercise their right of manifestation and pressure of their representatives.” POLOS-UFMG (2023, in press)

Returning to the Manifesto for participation in the discussion of the Agreement, it also demands the participation of those affected and technical advisors, chosen by the population, in all phases of reparation, from data collection, planning, management, and oversight, with equal participation and decision-making power among those affected, the State and other institutions. 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.”.

Regarding this, the Programa Pólos de Cidadania of UFMG, in a communication sent to the Ministry of Human Rights and Citizenship, denounces:

“Procedural representation limitations function as organizational principles of jurisdictional provision, but cannot function as obstacles to effective and direct participation in decision-making procedural acts by those who hold the rights claimed. Thus, it is emphasized that mediation in the manner executed does not account for the multiplicity of interferences that the result of self-composition through its representatives can cause in the lives of the population. The exclusion of affected parties from the provision constitutes a restriction on defense and a violation of collective due process of law, and may even lead to the nullity of all acts performed, which contradicts one of the objectives of mediation, to serve as a measure of procedural economy.” (POLOS-UFMG 2023, in press)

On January 9, 2020, at the request of Vale S.A., a decision by the Court of Justice of Minas Gerais 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 thousand reais^{viii} (more than a thousand dollars).

On April 25, 2023, there was a meeting of the External Commission of the Chamber of Deputies of Brazil, aimed at overseeing dam breaches, especially the renegotiation of the Mariana agreement and the reparation of the Brumadinho crime^{ix} (Chamber of Deputies 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 I, but the degree of satisfaction of the affected population was not a topic. It can be inferred that the population was heard after the agreement was homologated 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^x. 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 this meeting, Natália de Oliveira, sister of Lecilda de Oliveira, who died in the tragedy, and representative of victims' families, spoke out about families' suffering and once again stated "We were not heard (...) we feel humiliated, we feel invisible" (Chamber of Deputies 2023). Oliveira mentioned mental illness and highlighted the importance of taking care of the affected people. At another time, the representative of the Federal Public Defender's Office stated that the Public Defender's response to the affected population "is always, within the Law, in the field of compensation". In response to this, we address below manifestations collected during another event, aimed at analyzing and commenting on the post-tragedy: the Seminar 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, four years after the tragedy^{x1}.

Contrary to what is recommended by the final provisions of the Agreement, the affected population complains that they are not being heard: "Without criminal accountability, there is no relief. Life is priceless. When we see the agreement of 37 billion reais, we see the money of our blood and our tears". The speech is by Andresa Rocha Rodrigues, vice-president of AVABRUM - Association of relatives of victims and affected by the rupture of the dam mine Córrego Feijão. Rodrigues, who is the mother of one of the 272 fatal victims, said that the population has been silenced and that the community is not a protagonist in the reparation process (Legado of Brumadinho 2023). She used a play on words, "RE-PARA-AÇÃO" (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. Kenya Paiva Lamounier, Director of AVABRUM, added: "It's been four years and no one has been arrested".

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. (The compromisers) don't answer emails; they show up once a year". Fialho also questioned the abandonment of work carried out by new independent technical advisory services, hired from the celebration of the Agreement: "contracts worth millions, for something that another advisory has already done". Márcio Rodrigues, president of the Brumadinho Leadership Committee, described the events after the 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 of Brumadinho 2023).

At the same event, state deputy Beatriz Cerqueira pointed out that Commitment Terms usually ignore legislation: rules are established, but “they don’t have to comply; we make agreements later” - in her speech, she considered that this type of agreement ends up empowering the mining company. She believes that mining companies are specializing in dividing territories; for this, they assess the risk and decide to run it when it is cheaper than avoiding it. André Luiz Freitas Dias, coordinator of the Programa Pólos de Cidadania at the Federal University of Minas Gerais, agrees: “The criminal controls the crime scene”, pointing out that centrality, autonomy, and protagonism must be of people, not the company (Legado of Brumadinho 2023).

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)

At the end of the event, Kenya Lamounier pointed out an impasse involving the company: the inauguration of the Memorial in honor of the victims, provided for in the Special Projects of the Agreement:

“The Memorial was supposed to be inaugurated on January 25th, but Vale refused to give management of the space to the victims’ families. (...) The Memorial being built needs to be ours, along with our protagonism. The population must take ownership of history, not letting Vale be the protagonist of things and tell the story the way it wants” (Legado de Brumadinho, 2023).

As the victims’ families refused to accept that Vale would manage the memorial, the inauguration, scheduled for January 25th, 2023, was indefinitely postponed. In this regard, Danilo Chamas, a lawyer for RENSER (Região Episcopal Nossa Senhora do Rosário) who works on behalf of the affected population, made a strong comparison: “Imagine if Bin Laden’s people were in charge of taking care of the September 11 Memorial”^{xii}.

Conclusion

The Integral Reparation Agreement in the case of the Brumadinho tragedy characterizes an attempt at a linear solution to a wicked problem - which, by nature, does not admit this type of solution.

Given that it was demonstrably not an accident, the situation is characterized as a result of the actions of a free rider and its consequences. The Agreement configures a top-down, inefficient solution, as demonstrated by the literature since it does not offer those affected the possibility of organizing and leading the solution to problems. The elaboration process, behind closed doors, contradicts the principle of the Inter-American Court of Human Rights contained in its 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. Trying to solve a problem of this nature simply by approaching it as if it were a tame problem and denying its complexity, as seen throughout this work, may have brought some relief in the short term; however, testimonies and manifestos indicate that over time, there is no trust in the relationships; frustration among those involved has been growing as the focus remains on symptoms rather than causes.

The design of the solution made even before the conclusion of the elaboration of the matrix that would point out the damages, did not contemplate mechanisms for listening to the voices of the affected stakeholders. It was based on the vision of the so-called compromisers and on the determinations of the company, which even managed to obtain a reduction in the value of the agreement of almost 20 billion reais - more than 30% of the initial value, proposed by Fundação João Pinheiro and by the Public Prosecutor's Office of Minas Gerais. By excluding those affected from prior debate, public power seems to be not only tutelary rights but also the population itself.

Annex I.1 (whose value corresponds to less than 10% of the total) even provides for consultation with the population, but it should be pointed out that this consultation takes place after the decision on the main lines and values, and that the agreement does not provide for an evaluation of satisfaction among those affected after the execution of reparations. That is: consultations, when they occur, usually do not involve doing or not doing, but at best address the conditions under which practice should be carried out. After consultation, decisions are made privately and then communicated to the population - which confirms the "residual, secondary and of little relevance" role pointed out by Lozoya et al (2019). Additionally, the lack of transparency and scant depth in disseminating reparations open up opportunities for overpricing, as mentioned in the External Commission of the Chamber of Deputies.

The analysis indicates that the company, and not the problem created by the collapse of the dam, occupies the central space of the reparation process - this is evidenced when the text of the agreement gives power to Vale S.A. to establish goals and hire companies that attest to their achievement. It should be noted that before the disaster, the stability of the dam had been certified by a company hired by Vale, which, contrary to international standards and claiming to have been pressured, adopted a different standard in the safety standards in force to issue the report.

In close relation with the State, the company absorbs functions that would be those of public power, and this assumes the classic business vision when moral damages are "patrimonialized" in defining reparation. This contradicts the principle of morality, which points out that corporate protagonism should be exercised in seeking to expand levels of justice,

not in applying justice to problems of its own responsibility. The company again assumes the role of the State when invested with the power to promote social well-being, define goals, and indicators, conduct reparation actions, and attest to their fulfillment. The study shows the replacement of state commitment by agreements with global actors, which offer benefits to affected populations by financing social investments and assuming leadership positions. It ends up positioning extractivism as a condition for economic growth and poverty reduction because it generates income.

The State, in turn, abdicates its position as a leader and becomes a mere coordinator of the reparation work, which is led by the company that caused the disaster itself. Thus, business logic, not public power logic, defines the progress of the process. The fact that justice and well-being continue to be on the agenda of the demands of the affected population demonstrates the prioritization of outputs (mutuality) over outcomes (morality).

As a result of this research, it can be stated that the Integral Reparation Agreement analyzed cannot be considered a tool for providing quality solutions to the problems created by the collapse of the Córrego do Feijão dam. Public power - at all levels and spheres of action - needs to understand the essence and forms of approach to wicked problems, preparing to deal with the consequences of the actions of large multinational companies in Brazil. There are no quick and linear formulas for addressing these problems, nor any guarantee of a solution; however, denying their complexity and taking decisions behind closed doors is the worst-case scenario. The patches for solving wicked problems must be based on iterative processes involving all stakeholders in designing collaborative solutions that contemplate not only material losses but also emotions, feelings, and expectations.

Public power must count on multidisciplinary teams to assume leadership roles, regulate free-rider behavior and ensure that those affected be protagonists from the outset in designing solutions. By preventing disasters from becoming part of the operational costs of large corporations' businesses, it will be possible to prevent tragedies like this from becoming routine in mining territories.

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ⁱⁱ <https://enciclopediajuridica.pucsp.br/verbete/31/edicao-2/uso-de-bem-publico>

ⁱⁱⁱ Information contained in the Integrated Report 2022, prepared by Vale S.A. and available at:

https://vale.com/documents/d/guest/vale_relatointegrado2022-br-final

^{iv} The law that establishes the State Policy for those Affected by Dams is available at: <https://www.almg.gov.br/legislacao-mineira/texto/LEI/23795/2021/>

^v During the Seminar “Cities Affected by Mining”, held in Brumadinho, on January 24, 2023, deputy Beatriz Cerqueira pointed out that even the replacement of the electrical wiring of the administrative headquarters of the Government was included among reparation actions.

^{vi} <https://www18.fgv.br/projetorioparaopeba/>

^{vii} On May 19, 2019, within the scope of the lawsuits filed against Vale by public authorities, those affected chose AEDAS (State Association for Environmental and Social Defense) to provide Independent Technical Advisory (ATI) in Brumadinho. The ATI’s 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 (State Association for Environmental and Social Defense, n.d.)

^{viii} 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.

^{ix} The expression “crime of Brumadinho” reproduces the words of the commission’s president, federal deputy Rogério Correa. The video of the meeting, in full, can be accessed at: <https://www.youtube.com/watch?v=YLiLAWwpEIk>

^x The subject “popular consultation” is detailed on the Pro-Brumadinho Committee website, at <https://www.mg.gov.br/pro-brumadinho/pagina/consulta-popular-reparacao-brumadinho-saiba-tudo-sobre-o-processo-consultivo#Pr%C3%B3ximos%20passos>

^{xi} Speeches by the affected population collected by the author during the Seminar of Cities Affected by Mining, held on January 24, 2023, in Brumadinho, by 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/>.

^{xii} Speech during the Seminar of Cities Affected by Mining, in Brumadinho, on January 24, 2023.