

Socio-environmental tragedies from mine tailings dam failures: Capital prevailing over the state and citizen

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ABSTRACT

Peripheral countries with an abundance of mineral wealth are victims of exploratory capitalism based on neo-extractivism. Production of profit is based on the predatory exploitation of mineral commodities, which corrupts the agents of the State and belittles local populations and their traditional values. This establishes what has been called the coloniality of life, i.e. a process of domination, exploitation, and submission, under the pretext that this will be the path to development. This study aims to show the social cost of this development at any price giving rise to onerous liabilities that trample on human dignity and cause environmental disasters. The consequent alterations to quality of life in populations that have become vulnerable through socio-economic conditioning factors have led to emergencies that must be dealt with, onto which bioethics may throw light, in terms of health, ethics, and the environment. Implications of ethics responsibility and absence of social responsibility are discussed based on the tragedy resulting from the failure of two iron ore tailings dams in Brazil.

Keywords: Bioethic, Brumadinho tragedy, Mariana tragedy, Neo-extractivism, Social responsibility, Coloniality, Environmental morbidity.

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Highlights of this paper

- Dam collapse causing human and environmental tragedy.
- Predatory mining exploitation and exhaustion of natural resources.
- Neocolonialism and neo-extractivism still remains in Latin America.

1. INTRODUCTION

1.1. *The Importance of Mineral Extraction for the State of Minas Gerais (Brazil)*

Since colonial times in Brazil, mineral extraction has always been present in the economy of the state of Minas Gerais. The founding of the state and its very name already defined its role in the Brazilian economy. Mining activities began around 1700, with gold and diamond prospection. This gave rise to the construction of highways and the founding of several urban centers (Alves, 2020). Between 1820 and 1830, a conglomerate of six British mining companies started gold extraction in Minas. As gold mines were developed, iron ore deposits were also found, and this led to the emergence of the iron ore smelting industry in this state. The first iron ore blast furnaces came into operation in 1815. Manganese exploration began in 1894 (Alves, 2020).

At the beginning of the 20th century, a British company acquired rights to the iron ore mines of Itabira and participated in the Vitória–Minas railway. In the 1920s, President Artur Bernardes launched incentives for the national steel industry, and the Minas Gerais Steel Company (Companhia Siderúrgica Mineira) became the Belgian–Minas Steel Company (Companhia Siderúrgica Belgo–Mineira). In 1940, the rights to the mines in Itabira were transferred to the Brazilian government and, two years later, the Vale do Rio Doce state company (Companhia Estatal Vale do Rio Doce) was constituted. The 1960s were marked by the opening of the Brazilian mining sector to foreign capital (Alves, 2020). Thus, over time, mineral production has been the main source of wealth for the state of Minas Gerais, and its socioeconomic development has revolved around this (Espindola, Campos, Lamounier, & Silva, 2016).

On November 5, 2015, and on January 25, 2019, mine tailings dams belonging to Companhia Vale do Rio Doce failed. These two tragic accidents caused losses of many lives and an environmental disaster that was unprecedented in Brazil. To understand these tragedies, they need to be placed within the circumstances of the company's privatization process (Espindola et al., 2016).

This study will discuss ethical approaches in the context of developing countries being exploited by international capital in order to supply low-cost raw materials to industries in developed countries. Environmental liability and tragedies in marginal populations are the main consequences of predatory exploitation of natural resources by big corporations, as well as the absence of state responsibility.

2. THE PRIVATIZATION OF COMPANHIA VALE DO RIO DOCE: A CONTROVERSIAL PROCESS

The Vale do Rio Doce company was privatized in May 1997, in a process that was full of suspected fraud that remained under investigation for a year and then became forgotten. The auction process was irregular, given that Banco Brasileiro de Descontos (the major private Brazilian bank Bradesco) not only drew up the announcement of the auction but also competed in the process, through which it became one of the controllers of the company. Vale was sold for 3.3 billion dollars, at a time when its estimated reserves were valued at 100 billion dollars, yet were totally disregarded. In 2008, the company's market value was estimated at 196 billion dollars by the consultancy firm Economática. The company's aim today is just to profit at any price: it now only exports unprocessed ore in large quantities, without any added value, to satisfy the greed of its investors (Carrano, 2020).

The sale of shareholding control over the company was completed by the Brazilian consortium on May 6, 1997. This consortium was led by the National Steel Company (Companhia Siderúrgica Nacional), with financial backing from international bankers, who acquired shareholding control for around 3.3 billion dollars. At that time, this represented 27% of the company's total capital, which had previously belonged to the federal government, and it represented 41.73% of the company's ordinary shares (with voting rights) (Carrano, 2020).

In January 2012, Companhia Vale do Rio Doce was elected as the worst company in the world, in relation to human rights and the environment, in the "Public Eye People's Award", which had been awarded by the NGOs Greenpeace and the Berne Declaration since the year 2000. This title was fully justified through the environmental disasters in Mariana and Brumadinho, in 2015 and 2019, respectively (Greenpeace, 2020).

With the Vale privatization, the most important Brazilian mineral reserves were handed over to international bankers. Privatized, the company started to outsource many of its specialized technical services, without any investment in social programs or personnel training. Investments in environmental safety and protection were completely neglected. The priority of international capital is to maximize profits and, for this, expenditure has to be reduced. The consequences of this policy of neo-extractivism culminated in the tragedies relating to the failure of the mine tailings dams in the municipalities of Mariana and Brumadinho (Carrano, 2020).

3. THE ENVIRONMENTAL TRAGEDY AND NEGLECTED RESPONSIBILITIES

Environmental problems have become a matter of Bioethics because of the need to retrieve the values of humanity concerning nature. This became apparent some decades after Bioethics had become established within clinical care, and it involved an awakening concern for environmental issues (Pessini, 2013; Potter, 1972). Reflection on the role of social and ethical issues in relation to environmental problems is urgently needed, given the range of consequences from the intense, chaotic, and accelerated processes of environmental degradation. Likewise, this ethical view is needed because of the effects of socioenvironmental tragedies like the failure of the mine tailings dams in Mariana and Brumadinho.

Predatory exploitation leads to the exhaustion of natural resources and the extinction of species, which makes this an irreversible process. The principle of responsibility is not only an ethical principle but also provides a perspective of critical dialogue in this technological era (Jonas, 1984). Technical interventions that have an impact on nature should be carried out sustainably, providing the chance for self-restoration. However, within the current scenario of demographic explosion and high demand for manufactured goods, there is no prospect of restoring human actions that affect the environment.

The fundamental problem is not the human misuse of natural resources, but an imbalance in use and the perpetuation of inequalities within human society based on structures of social injustice, exploitation, power, and domination. These scenarios have remained unchanged for centuries in Latin America. The ethical implication is based on the fact that the logic of economic value takes priority over the logic of conserving biodiversity and human lives. In Latin American countries, no development links production with the conservation of natural resources, and the sources of these problems are corruption, poverty, and inefficient governance (Ten Have, 2019).

Animal and plant life, the biosphere, and the stratosphere are part of human responsibility for the maintenance of environmental integrity. Thinking of the environment from the viewpoint of ethics, i.e. including the environment within human responsibilities, in the same way that humans have responsibilities towards other humans, is truly imperative (Aliciardi, 2009).

The environmental impacts caused by the floods from the mine tailings dams in Mariana and Brumadinho affected the biodiversity of all the ecosystems involved, including areas of permanent preservation and the

ichthyofauna. The Doce and Paraopeba rivers suffered extreme degradation through the accumulation of heavy metals, scouring of the riverbeds, and occurrence of physicochemical alterations, thereby impacting the entire trophic chain and leading to irrecoverable damage to the local ecosystems. The intensity of the impacts and the long recovery time needed mean that this degradation will remain present for many generations. Thus, environmental liabilities will be left for the next generations to deal with (Greenpeace, 2020).

Junges (2014) noted that the normative framework for environmental bioethics was the guidelines of Article 17 of the Universal Declaration on Bioethics and Human Rights (UNESCO, 2005). This deals with the protection of the environment, the biosphere, and biodiversity. This declaration forms part of the tradition of documents based on the doctrine of human rights, and its starting point is a conceptualization of health that encompasses social and environmental conditioning factors. Thus, the protection of the environment, the biosphere, and biodiversity is understood in terms of the relationship between health and the environment. In this, health is regarded in terms of an ecosystem, so that healthy environments can be fully understood as a human right.

4. THE HUMAN TRAGEDY AND NEGLECTED RESPONSIBILITIES

Almost 300 human lives were lost through the failure of the two dams, and these victims fit directly into the discussion on the “coloniality of life”. This is the means of creating an ontological view of life, which enables the notion that some lives are more important than others, from a political point of view. In this manner, a hierarchy is created, along with a justification for domination, exploitation, and submission, under the pretext that this would be a way towards better development of life (Nascimento & Garrafa, 2011).

The toxic waste from mining is often dumped near poor and minority neighborhoods. Traditional societies are most vulnerable to biodiversity loss since they often rely directly on ecosystem services. For example, they use herbs as a source of their traditional medicine. Human vulnerability was clearly demonstrated in both disasters. This vulnerability results mainly from the damaging impact of neoliberal logic, in which the State transfers its responsibilities to private corporations.

Modernity was thus created in a direct relationship with coloniality. In other words, industrial development and urban spaces are presented as reference points, demonstrating economic and social superiority concerning agriculture and rural spaces. Along this path, industrialization has also been imposed on family-based agriculture. Forms of the political-social-cultural organization guided by the principle that nature is the main factor sustaining life have become subject to the capitalist system and its development process. This system is governed by the unequal accumulation of wealth and power that arises through the exhaustive exploitation of nature. These tragedies that affected the original populations reveal the entirety of the conflict between the capitalistic vision of the mining industry and the land occupation practices of the subjects involved, i.e. the way of life of the original indigenous populations. Their way had been based on a non-developmental vision, and this shows the incompatibility between these two views of the world (Gilson, 2011). Developing countries do not have opportunities to explore their natural resources technologically, and then they do not receive any benefit when another does so. In fact, the flow of resources is usually in the direction of developed countries in an exploitative and unjust practice.

5. HUMAN AND ENVIRONMENTAL MORBIDITY AFTER THE DAM FAILURES

Studies on disasters that have compared morbidity and mortality patterns from before and after a tragedy have shown that there is a synergic effect between the stress caused by human and material losses and the collapse of the healthcare system after the disaster. In addition, there is the fact that the effects of disasters involving materials of

chemical origin, such as heavy metals, extend for years, decades, or even centuries. Hence, long periods of health research, surveillance, and care are required (Freitas, Barcellos, Heller, & Luz, 2019). In a study on the victims of the two dam failure tragedies, it was found that 63.9% had low schooling levels and 87.6% had family income levels of not more than three minimum monthly wages.

These data are mirrored in the population's various health complaints and diseases. Among the participants in that study, 35% considered that their health was much worse or somewhat worse after the disaster. Among the health problems that they spontaneously reported, 40% were respiratory, 15.8% were skin conditions, 11% were mental and behavioral disorders, 6.8% were infectious diseases, 6.3% were eye diseases, and 3.1% were gastrointestinal problems. Among children aged 0-13 years, respiratory diseases accounted for 60% of the problems (ISS, 2019).

The major discussion within bioethics regarding these episodes relates to the role of the State in protecting vulnerable and excluded individuals, and in constructing public policies aimed toward ensuring their rights, with social justice. This is stipulated in UNESCO (2005)'s Declaration on Bioethics and Human Rights, given that health involves social and environmental dimensions. It includes the right to health, to breathe clean air, to drink clean water, to have adequate food, to have access to medications, and to have protection against infectious diseases. Within the health-environment binomial, ecological sustainability is fundamental for maintaining the quality of life. The destruction of the Doce and Paraopeba rivers removed these rights from hundreds of thousands of people, given that this affected many municipalities along with their watercourses. Moreover, these rivers also supplied rural communities with drinking water for animals, irrigation for small-scale crops, and provision for urban areas.

The destruction of entire communities, caused by the passage of tailings mud, led to the severing of links between individuals and their communities and land, thereby causing drastic lifestyle changes. Bento Rodrigues, a small village, was completely destroyed by a tsunami of mining tailings due to the dam failure in the municipality of Mariana (Brazil). The residents lost not only their homes but also their loved ones and their cultural assets.

This gave rise to the development of psychiatric diseases such as depressive disorders (Neves, Roque, Freitas, & Garcia, 2018). The PRISMMA project (an investigation into mental health realities in Mariana) was developed to trace out the mental health profile of people affected by the dam failure in Mariana. The most important result was that among the psychiatric disorders found, 82% were related to post-traumatic stress. Moreover, 47% of the interviewees were positive for at least one of the mental disorders investigated; and 39.1% of them were positive for depression and anxiety disorders (Neves et al., 2018). There was also a high prevalence of known risk factors for depression in the populations affected by the disasters, including the perception of the risks of death, loss of home, loss of friends and family, discrimination and contamination from the mud; and consequent health risks (Neves et al., 2018).

6. COLONIALITY, NEOCOLONIALISM AND THE BIOETHICS OF PERSISTENT SITUATIONS

Latin America's historical role in the global economic context has always been characterized by labor exploitation, control of production, and appropriation of natural resources. In this process, slavery and servitude have always been used to produce inputs for the world market at low costs. Mercantilist colonization by Europeans began with the control of gold and silver production, exploiting the workforce of indigenous people and other people of color. The colonizer has always been the European white, controlling the world market with the wealth taken from South American countries. Thus, for centuries, the control of trade and the exploitation of the labor force allowed the accumulation of capital. On the other side are the other races in a very unequal capital-labor

relationship, an association of unpaid work with membership of their race. This process of coloniality as part of capitalist power has occurred for centuries and is now visible in the lower wages paid to these lower races compared to whites. Europe represents the civilization of modernity, the colonizer, and South American people the primitive and colonized (Quijano, 2002).

Thus, the question of colonizers and colonized is much more profound and visceral than a mere socio-political condition. According to Quijano (2002) colonialism in South America is the most profound and effective form of social, material, and subjective domination. This is why it is the basis of political domination within the current pattern of power. Furthermore, in Latin American countries, State governance acts as structural authority to maintain this form of collective domination, which is ethically unacceptable.

Even today, transnational corporations still exert huge influence on ex-colonized countries, which is neocolonialism, a colonial-like type of exploitation. The main proposal of Intervention Bioethics is the *Bioethics of Persistent Situations*, established by Garrafa and Porto (2003) referring to these conditions as continuous economic dependence, which produces political dominance. The penetration of transnational corporations in weaker nations, based on economic sanctions by developed countries, still continues to impose the hegemony of the colonizer. These practices remain in place because these corporations operate at a high profit. Intervention bioethics advocates that it is imperative to break this cycle. The State must be ethically and morally questioned if it has knowledge of this persistent situation and does nothing to interfere.

The tragedies of Mariana and Brumadinho represent one more case of coloniality and neocolonialism, where the State was aware of the vulnerability of both dams and was complaisant with the economic power of the Vale Company.

7. FINAL REMARKS

Based on the principles of environmental bioethics established by Potter (1995) in Global Bioethics, human health and ecology are deeply connected. Environmental damage caused by mineral exploration threatens human health, especially that of marginal populations, leading to social injustices. Both environmental disasters – Mariana and Brumadinho – produced habitat destruction and soil and water contamination by toxic metals, which led to the population's health decline. The focus of this process is exporting for profit, without taking responsibility for biodiversity conservation and showing respect for the cultural values of local communities.

In the established world economic order, the role that has been taken on by international capital is to provide commodities to supply the developed world's industries. This has not given Brazilians the right to develop technologies to add value to their own commodities, to generate more knowledge, employment, and income in Brazil. The basis of neo-extractivism is untrammelled exploitation until the reserves have been exhausted, at low cost and in large quantities. Within this scenario, the Brazilian State has shown itself to be negligent and acquiescent, since there is no rigorous oversight of mining companies. In the monitoring that does exist, mining companies present false reports on dam stability, as occurred in Brumadinho. Thus, the ethical crisis has two aspects: the company and the State. These two agents are responsible for the tragedies: the company through its predatory action and the State (funded by the company's capital) through its political support.

From the perspective of intervention bioethics, social progress and affirmation of traditional communities will only be attained through breaking the chain of this process. This will allow new developmental constructions to emerge within the current social organizations. It needs to be emphasized that the State's responsibility is objective, concerning compliance with environmental legislation. Public administrators have the task of ensuring safety and transparency within the information process and concerning active environmental citizenship. It needs to be borne

in mind that most of society does not have sufficient technical knowledge about the risks involved in mining activities, or regarding the risks to the quality of life of people who are exposed to adverse events in the environment.

Intervention bioethics is a tool that aids in interpreting problematic situations of an emerging nature. Economic arrangements should be based on communities' well-being, masked through ideological developmental discourse. In this regard, technology applied to practical ethics may make it easier to cope with dilemmas in constructing social peace and maintaining environmental equilibrium. These vast environmental disasters in Brazil, in which two mine tailings dams failed within a short space of time, gives rise to profound reflection about how the State should deal with situations that limit human development. It also questions the morality of the relationships that are established through the social pact of this model of society that is governed by the supremacy of economic matters.

It needs to be emphasized that both of these tragedies resulted from an irresponsible relationship between the State and a company, considering that the Vale company made large financial contributions to electoral campaigns within different spheres of politics, including those of state governors, state congressmen, and municipal mayors. Furthermore, many municipalities within the zone of influence of this company had received large inputs that strengthened their economies. Thus, it became clear that orchestrated action had occurred, aimed at achieving connivance and backing from the State's agents regarding greater rigor (or its lack) of safety controls for this company.

Regarding the ethics of the principle of responsibility, it can be seen that the Vale Company showed an absence of social responsibility; an absence of responsibility in relation to transparency toward the local population regarding the risks from the dams; and absence of responsibility concerning the environmental legislation. Regarding the ethics of morality, the company enticed politicians through funding contributions to their electoral campaigns, for them to become complaisant towards the company's exploitative actions. Within this scenario of death and desolation, it can be discerned that ethics were negotiated, thereby subjugating human dignity. The State's position as a guarantor should have led to strong action in ensuring the protection of the environment and human health, but instead, its action within its sphere of responsibility was negligent. In both episodes, the Vale Company and the State of Minas Gerais should be held jointly responsible for environmental crimes, as outlined in the law, and for being recklessly culpable for the loss of almost 300 human lives.

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