


## ARTICLE

## Manipulating Disclosure to Repair Corporate Image After an Environmental Disaster: A Study of the Impact of the Dam Failure on Samarco's Sustainability Reports

Fernando César Bezerra de Amorim<sup>1</sup>  
fceamorim@gmail.com |  0000-0003-3408-9261

Maria Tereza Saraiva de Souza<sup>1</sup>  
mtereza@fei.edu.br |  0000-0003-4514-2021

### ABSTRACT

The objective of this paper is to analyze how Sustainability Reports (SR) are strategically manipulated after the occurrence of an environmental accident, aiming at neutralizing damages and repairing the company's image. This is a qualitative study, having collected data through a documental research technique, from consultations with the Brazilian Institute for the Environment and Renewable Natural Resources IBAMA's reports, news published in the press, and SR published by Samarco S. A., involved in a major environmental disaster that occurred in November 2015. The analysis of the environmental disclosure of texts and images exposed the contradictions and inconsistency of the SRs in relation to the reports from official agencies and the news published in the media. We found that the environmental accident severely impacted the company's environmental disclosure, modifying reporting patterns based on deterrence strategies with a view to omitting, and at the same time repairing the objective reality. Thus, the company resorted to defensive arguments through which it sought to evade responsibility, with the manipulation of negative environmental disclosure, in order to divert the outside public's attention from adverse information.

### KEYWORDS

Environmental Disclosure, Manipulation, Omission, Sustainability Reports, Legitimation

<sup>1</sup>Faculdade de Engenharia Industrial – FEI,  
São Bernardo do Campo, SP, Brazil

Received: 10/06/2020.  
Revised: 03/22/2021.  
Accepted: 09/18/2021.  
Published Online: 07/14/2022.  
DOI: <http://dx.doi.org/10.15728/bbr.2022.19.4.3.en>



---

## 1. INTRODUCTION

Companies operating in sectors of high environmental impact are under public scrutiny from prominent groups in society, regulatory bodies, global governance institutions and the general public, which contributes to the expansion of disclosure and the adoption of universal reporting standards (Vigneau et al., 2015). The pressures arising from these audiences influence their strategy, considering that organizations seek to maintain congruence with the social values perceived by society (Deegan, 2002).

The occurrence of environmental accidents also impacts the reports in the SR of companies, which respond to threats to legitimacy with increased positive disclosure and suppression of negative information. Thus, instead of focusing the reports on the implications of the accident, companies use disclosure to show skills in dealing with the situation, resorting to expansion and omission strategies in order to neutralize contrary negative feelings (Fooks et al., 2013).

The mining sector is among the most polluting, generating environmental impacts that can cause water quality degradation, noise and air pollution, the lowering of the earth's surface, and major environmental disasters. The National Water Agency report (ANA, 2020) points to an increase in the number of dams in operation in the country considered critical, totaling 156 dams in 22 states, including mining tailings dams.

The occurrence of disasters has been increasing and in the last decades more than fifty tailings dams have broken in the world (WISE, 2019), like what involved Samarco in Mariana (MG) in 2015. It is the disaster acknowledged as the biggest in mining in Brazil (Demajorovic et al., 2019; Saes & Muradian, 2021), when evaluated by the territorial extent of environmental damage 47,000km<sup>2</sup> (IBAMA, 2017), and by the volume of 43 million m<sup>3</sup> of tailings, the highest volume ever recorded in the world (Carmo et al., 2017; Sanchez et al., 2018).

Samarco's case is relevant and emblematic. It triggered changes in the sector's legislation (Santos & Milanez, 2017), and a broad debate in society about the performance of mining companies in Brazil. It is noteworthy that after three years it was succeeded by the Brumadinho disaster, the seventh tailings dam disaster in Minas Gerais (Neves et al., 2016), causing the death of 270 people (Vale, 2019), and whose dam belonged to Vale, the controlling company of Samarco.

This succession of negative events draws attention to the strategy of omitting risks and impacts through the manipulation of information in the reports published by the companies. It is noteworthy here that Samarco was a reference in the sector it operated. It was the 10th largest exporter of minerals in Brazil (GRI, 2016), the best mining company, and the second largest mining company in the country for two years in a row (Estadão, 2017). However, with the stoppage of activities as a result of the accident and large indemnity payments that already total BRL 4.12 billion (<https://www.fundacaorenova.org/dadosdareparacao/>, retrieved on July 7, 2021), the company came to accumulate debts totaling USD 8.8 billion (Lucchesi, 2021).

Thus, this study intends to answer the following research question: how has a company with a recognized reputation modified its environmental disclosure strategies after the occurrence of a disaster in order to legitimize itself in society? The research aims to identify how SR can be manipulated after the occurrence of events of a negative nature, aiming to repair corporate reputation.

The study of environmental disclosure is justified in the context of a country where major environmental disasters have occurred. Although Brazil is among the countries with the most SR publications according to the guidelines of the Global Report Initiative (GRI, 2016), SR credibility is questioned (Fleming et al., 2013). The theme is relatively unexplored, motivating

research focused on analyzing not only what is disclosed, but, above all, the information omitted from the reports (Leung et al., 2015).

The methodology we used in this research is qualitative and is classified as descriptive and explanatory. In the collection of text and image data, we used the documentary research technique on SR, reports from the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA), and in news published in the press.

The contribution of this work confirms the manipulation of disclosure in SR, designed to divert the reader's attention from adverse information and protect the company from its guilt (Flyverbom & Reinecke, 2017). What calls into question the reliability of these reports, that can serve more the strategic interests of legitimizing and repairing the image of companies than the impartial disclosure of information. Their reports are aimed at idealizing the company's image among people and not at the impartial disclosure of information in a clear, objective, and interest-free manner. The research shows its lack of consistency, and brings to light the omitted reality, tragically revealed in avalanches of tailings, how it came to confirm the environmental disaster in Brumadinho.

## 2. LITERATURE REVIEW

The strategies used for disclosure are responses to the different types of pressures which are presented in the following topics. They comprise institutional pressures from relevant social groups (topic 2.1), pressures from the media (topic 2.2), and from the regulatory environment (topic 2.3), as well as pressures from high environmental impact sectors (topic 2.4).

### 2.1. SOCIETY AND THE LEGITIMATING RESPONSES OF ENVIRONMENTAL DISCLOSURE

Companies operate in a broad social context and their activities affect various social groups including employees, suppliers, customers, government, and citizens in general, and the perpetuation of their existence depends on addressing the issues pertaining to this audience (Cormier et al., 2005). These groups are prominent in society and play a relevant role in relation to disclosure (Khlif et al., 2015), as they generate the need for companies to be responsive (Deegan, 2002; Vigneau et al., 2015), which makes the reports in SR to be influenced by the social values of the community (Deegan & Rankin, 1996).

The institutional forces of society are factors in companies' commitment to the environment (Albertini, 2014). They generate social pressures around public demands and become objects of questioning from the scrutiny of pressure groups, media and authorities (O'Donovan, 2002), which makes companies act preventively to avoid negative reactions (Villiers & Alexander, 2014).

Most of the pressures trigger legitimizing responses of strategic importance (Khlif et al., 2015), and corporations try to change people's perceptions, aiming to repair or defend their legitimacy (Suchman, 1995; O'Donovan, 2002), through omission (Leung et al., 2015), and expansion of disclosure (Vourvachis et al., 2016), considering that the disclosure of information draws the attention of different audiences around the company's reputation (Longoni & Cagliano, 2018).

In this way, such institutional pressure factors contribute to the expansion and omission of environmental disclosure, exposing companies to the public (Etter et al., 2018); (Longoni & Cagliano, 2018), and increasing corporate vulnerability (Roberts, 2003).

---

## 2.2. VISIBILITY OF CORPORATIONS IN THE MEDIA: OMISSION AND EXPANSION OF ENVIRONMENTAL DISCLOSURE

The expansion of social media in people's daily lives has given autonomy to ordinary citizens who manifest themselves autonomously in public arenas, where the activities of organizations are continually judged and evaluated (Etter et al., 2017).

The media is the most prominent source of perceived legitimacy (Cormier & Magnan, 2015). Published news influences the public's perception of businesses, and ordinary citizens use this discourse as a source of information to assess the adequacy of organizational actions. Positive evaluations and judgments can be considered as legitimizing organizations, however, negative evaluations delegitimize companies. Therefore, news broadcasts in the media constitutes the most extensively explored source of organizational legitimacy (Etter et al., 2018). They address issues that generate concern among opinion-forming groups (Christensen et al., 2013), and the more the media reacts to a company's activities, the greater its susceptibility to pressure (Dienes et al., 2016).

Research has paid special attention to the influence on the environmental disclosure of media publications, whether favorable or neutral or unfavorable (Cormier & Magnan, 2015). They shape the public agenda and the greater prominence and attention they give to specific themes results in increased community concerns impacting public attitudes. Furthermore, approaching issues from a negative perspective is recognized by society as being of utmost importance. For this reason, a negative media agenda has a greater effect on public opinion in relation to an issue with a positive or favorable focus (Deegan et al., 2002).

A study in Australian companies identified that executives used annual reports (AR) to respond to inquiries made by the public. Which caused media reports, particularly negative or unfavorable ones, to result in responses in corporate reports, by the fact that executives consider publications made by newspapers when preparing the AR (O'Donovan, 1999).

In this way, the media influences society's perception of the image of companies, because news reports subject companies to pressure, leading them to expand positive disclosure in response to negative news.

## 2.3. REGULATORY STIMULUS FOR THE EXPANSION OF ENVIRONMENTAL DISCLOSURE

The regulatory environment and the adoption of global reporting standards create demands that encourage the conformation of institutions, influencing environmental disclosure (Barbu et al., 2014), being recognized as one of the main factors for expanding and encouraging disclosure (Villiers & Alexander, 2014). In this sense, the efforts of companies to follow standards such as the GRI for the preparation of SR, has as its main objective to cultivate a positive image of the companies (Beck et al., 2010).

Specific legislation often obliges companies to assume responsibility for the remediation of hazardous waste and more recently has led to the recognition of significant environmental liabilities (Cho et al., 2015). What has made organizations ensure their legitimacy by responding to the growing institutional pressure they are subjected to through environmental norms and standards (Christensen et al., 2013). Regulatory stimuli have led executives to voluntarily report environmental information in accordance with community expectations. In this way, they respond to the negative repercussions that arise in the media, in order to avoid the introduction of new restrictive regulations to the operations of companies (Deegan, 2002).

In this sense, there is greater voluntary disclosure in firms that operate in environments with weak regulation and the same level of globalization. The regulatory environment also creates

demands for voluntary disclosure by multinational companies, more prone to informational asymmetry due to the size and complexity of operations (Webb et al., 2008). As a result, large companies disclose more than smaller companies and the level of environmental disclosure is greater in countries whose governments have chosen to establish stricter environmental laws. Thus, the level of environmental disclosure depends on the legal system, as well as the social and financial contexts of the country in which companies operate (Barbu et al., 2014).

#### 2.4. SECTORS OF HIGH ENVIRONMENTAL IMPACT: OMISSION AND EXPANSION OF DISCLOSURE

Industries that operate in high environmental impact sectors have become hot spots and face more stringent regulatory environments (Hassan & Guo, 2017), which helps them to increase environmental disclosure (Albertini, 2014; Clarkson et al., 2011; Al-Shaer et al., 2017; Arora & Lodhia, 2016). The environmental impacts of their activities expose them and threaten their legitimacy, leading them to act defensively with ostensive actions to repair and increase environmental disclosure (Cormier & Magnan, 2015).

However, the quality of disclosure is lower in these firms (Cormier & Magnan, 2015), characterized by being of the more extensive type (Braam et al., 2016), showing environmental information with a lower degree of specificity (Albertini, 2014). Such polluting industries reduce specific disclosure, preferring to disclose more general information, fearing that this will be harmful to their reputation (Villiers & Staden, 2006).

In response to the institutional pressures they receive, companies operating in potentially polluting sectors are more inclined to selectively disclose environmental information (Leung et al., 2015). They expand environmental disclosure after an accident (Patten, 1992), emphasizing corrective actions taken because of this (Arora & Lodhia, 2016), without, however, specifying the impacts caused.

Thus, the environmental disclosure of potentially polluting sectors is directly related to pressures from society, the media, and the regulatory environment. It may be associated with periods when sectors became targets of criticism from conservationists for damage to the environment (Guthrie & Parker, 1989). This indicates reactive approaches by companies, in a negative relationship between environmental performance and disclosure (Hassan & Guo, 2017).

This reaction was verified in research investigating the 1989 Alaskan oil spill, which aimed to detect the impact of the accident on environmental disclosure. The study found that the oil company Exxon gave special coverage to the spill and the clean-up work in the SRs of that period, devoting 3.5 pages to the accident and another 2.5 pages of environmental disclosure which was unrelated to the accident. In contrast, only 0.6 pages of environmental information was included in the company's SR in the year before the disaster (Patten, 1992).

Research in RA and SR found that the level and nature of disclosure was related to environmental performance, because the firms that pollute the most publish the most environmental information, relying also on hard disclosure (Clarkson et al., 2011). Another study showed that environmental disclosure was significantly higher in the years where companies had been sued, in order to neutralize the effects of litigation (Deegan & Rankin, 1996), confirming that the level of disclosure is a function of the company's exposure to pressures. Therefore, companies with poorer performance have greater environmental disclosure (Cho & Patten, 2007), Table 1.

**Table 1**  
*Environmental disclosure in sectors with high environmental impact*

| Drivers                                 | Outputs - Environmental Disclosure   | Authors  |
|---|--|--|
| Adverse events, environmental accidents | - Companies operating in high environmental impact sectors are subject to greater public scrutiny and stricter controls, and thus publish more positive or neutral environmental information.  | Albertini (2014); Delgado-Márquez et al. (2015); Ahmadi and Bouri (2017); Al-Shaer et al. (2017) |
|   | - Expansion of environmental disclosure in response to external pressures, after the occurrence of environmental accidents, and in firms that have been sued by a government agency.<br>- Negative incidents lead companies to report negative information superficially, expanding positive disclosure to shift the focus from adverse information. | Guthrie and Parker (1989); Patten (1992); Deegan and Rankin (1996); Arora & Lodhia (2016)        |
|   | - Companies with threatened legitimacy use abstract soft-type statements, to demonstrate commitment to the environment.  | Clarkson et al. (2011); Braam et al. (2016)  |
| Environmental Performance               | - Companies with the worst environmental performance that operate in sectors with high environmental impact have a higher level of environmental disclosure.   | Cho and Patten (2007); Clarkson et al. (2011); Braam et al. (2016); Hassan and Guo (2017)        |
|   | - Companies with better environmental performance and operating in sectors with high environmental impact have a higher level of voluntary environmental disclosure.   | Clarkson et al. (2008); Ahmadi and Bouri (2017)  |
|   | - Industries that cause negative impacts on the environment prefer to disseminate less specific content and more general content, of lower quality.  | Albertini (2014); Villiers and Staden (2006); Cormier and Magnan (2015)                          |
|   | - Companies that pollute the most and with the worst performance, use more objective and verifiable information (hard disclosure), than firms that emit less pollutants.   | Clarkson et al. (2011); Braam et al. (2016)  |

*Source:* Authors

It appears, then, that research on environmental disclosure in high-impact sectors indicates a trend of information expansion (Albertini, 2014; Ahmadi & Bouri, 2017). Companies operating in these sectors are subject to greater public scrutiny (Delgado-Márquez et al., 2015), to tighter controls (Hassan & Guo, 2017), although some have lower environmental performance (Braam et al., 2016; Hassan & Guo, 2017). Industries in these sectors expand environmental disclosure after the occurrence of adverse events (Guthrie & Parker, 1989), as a result of processes (Deegan & Rankin, 1996), and tend to report negative information superficially (Albertini, 2014). They omit specific content (Villiers & Staden, 2006), expanding positive disclosure to shift the focus from adverse information (Arora & Lodhia, 2016).

### 3. METHODOLOGY

In this research, we used the document search technique based on consultations to the SR published by the company, IBAMA reports and news published in the press. We used SR as a source of environmental disclosure, as its use has been growing gradually (Stubbs & Higgins,

2014). SR offers the most complete content of information about the environment (O’Donovan, 2002), covering the company’s relationship with the community, employees, in addition to its economic and financial performance (Hooks & Staden, 2011; Wong & Millington, 2014).

The strategy adopted is based on content analysis (Bardin, 2009), of the “ex-post facto” type, which is the predominant technique in research that seeks to relate the legitimizing intention to disclosure (O’Donovan, 2002). It has validity as a research tool in the field of socio-environmental reporting studies (Hooks & Staden, 2011), since it allows one to assess the extent of disclosure (Verbeeten et al., 2016).

We selected the Samarco mining company due to the large-scale disaster that caused the death of humans and animals, as well as the destruction of ecosystems (IBAMA, 2015; Demajorovic et al., 2019). Due to the wide repercussion of the accident, we tried to verify the disclosure of the fact in newspapers and magazines of great circulation, as they adequately reflect the public’s concerns regarding the issue, being more adept at pointing out in depth the significance of an issue (Deegan, 2002).

Data related to the dissemination made in the national media were obtained from an internet search and the news broadcast was classified according to the nature of its content as neutral, positive, or negative. Positive news is that that emphasizes the positive aspects of a company’s activities (Cormier & Magnan, 2015), negative news indicates that the mining company’s actions were harmful and in disharmony with the environment (Brown & Deegan, 1998).

The data collection included textual information and visual data, and the classification process included the analysis of the expansion and omission of disclosure related to the units of analysis: number of sentences, pages, page proportions, and photographs, which are essential elements in the research design of content analysis (Hooks & Staden, 2011), Table 2.

**Table 2**  
*Categories, subcategories and elements of analysis*

| Categories             | Subcategories/Elements   | Units of Analysis            | Authors  |
|------------------------|--|------------------------------|--|
| Expansion and Omission | - Positive disclosure<br>- Neutral disclosure<br>- Negative disclosure | Sentences, pages, page ratio | Albertini (2014); Delgado-Márquez et al. (2015); Ahmadi and Bouri (2017); Al-Shaer et al. (2017) |

*Source:* Authors.

We measured the environmental disclosure of images in relation to the “number of pages in percentage” (Patten, 1992, p. 473). We selected all photographs published in SR from 2012 to 2016, which were proportionally measured (Hooks & Staden, 2011; Deegan et al., 2002), in relation to the size of a page with dimensions of 21 cm by 29.7 cm. We measured textual disclosure with paragraph counts also measured proportionally (Hooks & Staden, 2011), in relation to the number of pages (Gray et al., 1995; Beck et al., 2010; Abed et al., 2016).

#### 4. RESULTS

The survey results regarding expansion and omission strategies are presented in the amount of environmental information disclosed in SR, which implied searching for and identifying the impact of an environmental disaster on the amount of information disclosed in various sources.

#### 4.1. IMPACT OF THE ENVIRONMENTAL DISASTER ON SOCIETY AND MEDIA

The rupture of the containment structure at the Fundão dam released 43.7 million m<sup>3</sup> of tailings (GRI, 2016). Enormous damage was caused to indigenous peoples, surrounding populations and distant cities within a radius of up to 663 km from the dam (Demajorovic et al., 2019), extending across two states of the federation. The disaster forced the company to halt its operating activities causing unemployment (GRI, 2016), and loss of income for families. There was a sudden stoppage of essential services with surprising demand for rescue and rescue services, health care, as well as social and psychological assistance to the affected population (IBAMA, 2015).

Due to the wide repercussion of the accident in the media, only news published on websites of newspapers, magazines with large national circulation, and the communication agency of the federal government, were verified. The survey, which covered the period of one year from the date of occurrence of the disaster, identified that 86.6% of the news were predominantly of a negative nature and only 9.8% were positive. It is also noteworthy that due to the damage caused, only 3.7% of the news published were neutral and without positive or negative bias, such was the polarization that the disaster generated, Figure 1.

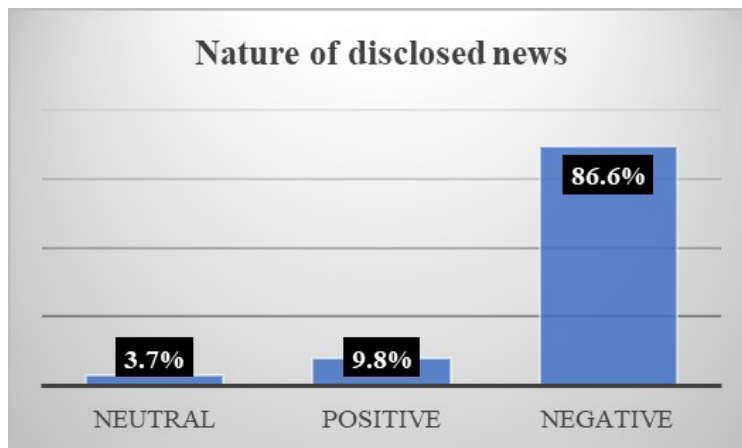


Figure 1. Nature of disclosed news

Source: Authors

Note: Research data.

The Fundão dam broke at 4:20 pm on November 5, 2015 and the fact was quickly reported by the media. In the days that followed the disaster, the reports were reported in the newspapers. The printed newspaper *O Estado de São Paulo* had a headline the following morning: “Flood of mud buries and kills in Mariana” and on November 7th, it already pointed to the company’s accountability, showing on its front page that “Study warned in 2013 of risk of rupture” (Amorim, 2019). The repercussion of the accident in the media and the consequences for the communities and the environment led the authorities to determine the responsibilities. The investigations led to the indictment of professionals involved in the disaster and directly implicated the company, compromising its reputation, as Samarco was the owner, and responsible for the management and operation of the Fundão dam.



#### 4.2. IMPACT OF THE DAM FAILURE: IBAMA'S REPORT VERSUS THE NARRATIVE OF THE COMPANY'S ACCOUNTS

Given that Samarco's environmental disaster was classified by IBAMA as a "very large disaster", an attempt was made to compare the form of SR reporting with IBAMA's preliminary technical report, which aimed to support the proposition of a public civil action for the accountability of Samarco. The report found the "direct destruction of ecosystems, damage to fauna, flora and socioeconomic", in addition to the loss of balance in the *Rio Doce* hydrographic basin. The impacts were divided into five types covering areas of permanent preservation, fauna, ichthyofauna, water quality, in addition to socioeconomic impacts, Table 3 (IBAMA, 2015, p. 2).

The comparison of the IBAMA report with the content published in RS shows the divergence of reports. The SR briefly reports that all impacts were identified, while the IBAMA report mentions the devastation of riparian forests, burial, suppression, and uprooting of trees. On the one hand, IBAMA reports the interruption of fishing for an indefinite period (IBAMA, 2015), but the company's SR cites an "abundance of fish" (GRI, 2016, p. 77).

In the item related to water, the IBAMA report shows a profound and perverse impact. However, SR minimizes the destructive impacts with the narrative that the tailings plume only temporarily affected the water uptake of the Doce River. The report mentions that populations of small animals were probably decimated, making it impossible to estimate the return of fauna. About this, SR only reports that a large amount of information about the health of animals has been accumulated.

The socio-economic impacts in the report mention the destruction of buildings, bridges, roads and equipment; damage to medical care, public health and emergency medical services; compromise of the rainwater and sewage system. However, such impacts are omitted in SR, in which, on the contrary, there are highlights for actions performed by the company, with the supply of medicines, medical equipment, health agents, and actions to clean public spaces. The company expands the reports of civil works, such as the rescue of architectural assets, but omits that the tailings mud invaded churches in cities of recognized historical value (IBAMA, 2015; GRI, 2016).

#### 4.3. THE IMPACT OF ENVIRONMENTAL DISASTER ON IMAGE DISCLOSURE

Although the company has dedicated special coverage to the accident with a focus on repair and containment work, the survey found a marginal increase in the number of pages in SR, which went from an average of 95 pages in the period prior to the accident, to an average of 99 pages after the crash. On the other hand, an inverse trend was verified in the number of photographs published in SR, going from 40 photographs before the dam burst to 37 after the breakup. This reduction implied a drop in the disclosure of photographs, which went from an average of 14.58 pages in the period prior to the accident, to an average of 11.21 pages in SR 2015/16, Figure 2.

It should be noted that the SR published by the company after the disaster in November 2015 comprises two years, 2015 and 2016, and unlike the others, it reports an atypical situation of the company, which had its operations halted by determination of government authorities, which made the longitudinal analysis of the reports difficult.

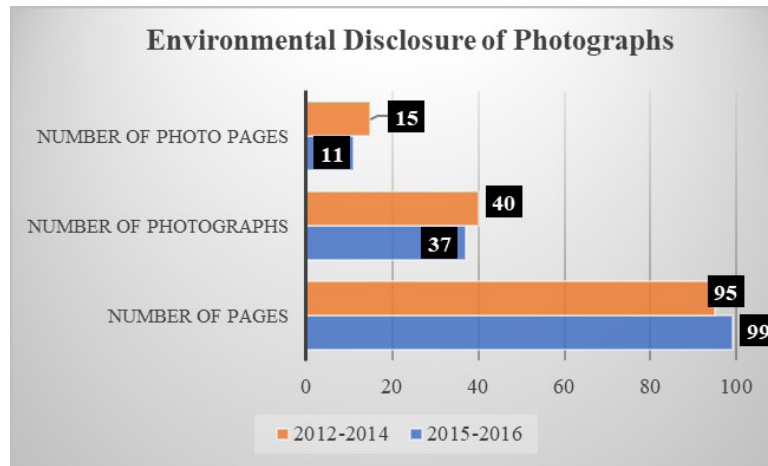
**Table 3**  
*Impacts of dam failure*

| Tipos               | IBAMA report - Negative Disclosure  | SR - Positive Reparative Disclosure  |
|---------------------|---|--|
| Preservation areas  | <ul style="list-style-type: none"> <li>- Devastation of riparian forests, suppression and uprooting of trees</li> <li>- Sediment input</li> <li>- Burial of smaller animals</li> </ul>  | <ul style="list-style-type: none"> <li>Revegetation of 835 hectares in protected areas impacted by tailings</li> <li>Planting riparian forest with regularization of the banks of the main rivers</li> </ul>   |
| Ichthyofauna        | <ul style="list-style-type: none"> <li>- Water contamination with tailings mud</li> <li>- Sedimentation of the riverbed</li> <li>- Burial of lakes and springs adjacent to rivers</li> <li>- Destruction of aquatic vegetation and estuaries</li> <li>- Destruction of fish breeding mangroves</li> <li>- Species mortality</li> </ul>  | <ul style="list-style-type: none"> <li>- Abundance of fish in areas that have been and have not been affected by the passing of tailings</li> <li>- Rescue of 1,700 fish and shellfish</li> <li>- Removal, transport and disposal of dead fish during the passage of the plume</li> <li>- 11.1 million m<sup>3</sup> of tailings carried is diluted along the Doce river</li> </ul>  |
| Water quality       | <ul style="list-style-type: none"> <li>- Interruption of water supply</li> <li>- Changing quality standards for fresh, salt and brackish water</li> <li>- Change in the quality of watercourses</li> <li>- Mortality of aquatic organisms</li> </ul>  | <ul style="list-style-type: none"> <li>- Tailings affected water uptake from the Doce River, compromising the supply</li> <li>- Construction of water mains and wells, supply of 100 drinking fountains</li> <li>- Installation of 120 water monitoring points</li> <li>- Over flights to monitor the plume and bathing of beaches</li> </ul>  |
| Fauna               | <ul style="list-style-type: none"> <li>- Deep and perverse impact</li> <li>- No estimated time for fauna to return to the site</li> <li>- Small animal populations decimated</li> <li>- Animals without access to water for drinking</li> </ul>   | <p>A large amount of information on the health of potentially affected animals, and on mortality has been accumulated</p> <p>Rescue, management and rehabilitation of wild birds, amphibians, reptiles and mammals, total of 225 rescues, with protection of 87,018 offspring</p> <p>Assistance to 5,639 animals, distribution of supplies. Return of dogs and cats</p>  |
| Socio environmental | <ul style="list-style-type: none"> <li>- Devastation of localities, displacement of populations</li> <li>- Destruction of buildings, bridges, roads, equipment</li> <li>- Damage to medical assistance, emergencies and public health services</li> <li>- Compromise of rainwater system, sewage, urban cleaning</li> <li>- Interruption in electricity generation and distribution, telecommunications and transport, education and tourism services.</li> </ul> | <ul style="list-style-type: none"> <li>Reconstruction of public spaces, squares, bridges and schools</li> <li>Supply of medicines and medical equipment</li> <li>Provided endemic health agents, cleaning of public spaces.</li> <li>Dredging of 400 meters of the reservoir and cleaning of 600 thousand m<sup>3</sup> of tailings from the hydroelectric plant reservoir</li> <li>818 students completed the school year.</li> <li>Rescue of 2,000 architectural goods.</li> </ul> |

*Source:* Authors

#### 4.4. THE IMPACT OF ENVIRONMENTAL DISASTER ON TEXTUAL DISCLOSURE

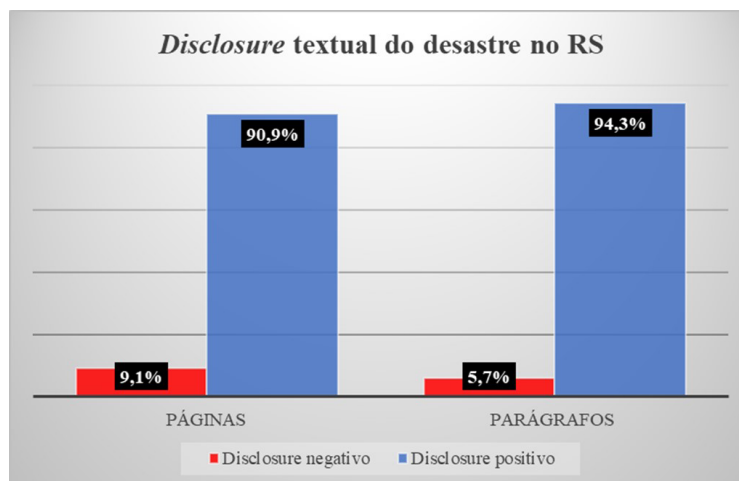
The analysis of textual disclosure identified changes in the content of SR published before the disaster in relation to the content published after the disaster. In the latter, the environment continued to be highlighted, however, issues related to society started to receive greater attention as a result of the image repair strategy, primarily aimed at the external public.



**Figure 2.** Environmental Disclosure of Photographs  
**Caption:** Environmental Disclosure of Photographs: dimensions of photographs in relation to the page.  
**Source:** Authors

The content of the 2015/16 SR was predominantly related to environmental disaster. This theme was distributed throughout the sections of SR with explanations of a justifying nature, works of remediation and compensation, but, above all, actions to assist communities affected by the disaster.

In the sections with content related to the environmental disaster, which corresponded to 44 pages of the SR, we found that 40 pages (90.9%) had repair actions, damage containment, and assistance to communities. On the other hand, only four pages (9.1%) contained negative information about the disaster. In the section About the Burst of the Fundão Dam, the counting of paragraphs showed similar numbers, with six paragraphs of negative disclosure (5.7%), and 99 paragraphs (94.3%), reporting repair and assistance actions performed by the company, Figure 3.



**Figure 3.** Textual Disclosure of the Environmental Disaster in SR 2015/16  
**Caption:** number of pages and paragraphs in relation to the total number of pages in SR.  
**Source:** Authors

Research numbers point to the expansion of positive disclosure, reinforced by the low environmental disclosure of negative information related to the disaster. In its SR, the company expands the disclosure of the positive actions it takes, while omitting the consequences of the dam failure. This increase in disclosure is a response by the company, which seeks to counteract the expansion of information of a negative nature widely publicized about it by the media after the tragedy occurred.

## 5. DISCUSSION

The research found that the way in which the impacts of environmental accidents are evidenced in the SR aims to meet the legitimization strategies of corporations, with omission and expansion of environmental disclosure dictated by the circumstances (Leung et al., 2015). They occur as a reaction to institutional pressures received from relevant social groups (Gray et al., 1995), as society, media, and regulatory environment (Cho et al., 2015).

Due to the trail of destruction, the environmental disaster at Samarco had a strong impact on society, with wide media coverage. The analysis of the news broadcast diverged from the content published by the company in the SR, predominantly of a positive nature. Most of the news indicated that the mining company's performance was harmful and out of harmony with the environment, which was predominantly negative (Brown & Deegan, 1998; Cormier & Magnan, 2015).

The exposure to such news of an unfavorable nature (Cormier & Magnan, 2015), influenced opinion-forming groups (Christensen et al., 2013). Such a negative media agenda has a greater effect on public opinion on a topic with a positive focus (Deegan et al., 2002). The news release revealed the extent of the damage caused, influencing public opinion (Etter et al., 2018), and leading the authorities to restrict the company's operations (Deegan, 2002). Thus, the regulatory environment through public agencies forced the company to account for the disaster (Barbu et al., 2014), and to carry out repair actions, taking responsibility for the environmental liability created (Cho et al., 2015).

In its reaction to negative media news, the mining company expanded positive disclosure (Vourvachis et al., 2016), occupying 90.9% of the pages of the accident report with repair and assistance actions performed (Hahn & Lulfs, 2014), many aimed at containing damage and waste. Negative disclosure (Arora & Lodhia, 2016) was only minimally highlighted occupying only 9.1% of the pages of the report.

On the other hand, the analysis of the report by IBAMA and SR by Samarco brought to light the discrepancies between the two. IBAMA's technical report describes the collapse of the Fundão dam as having a profound and perverse impact, caused by a major disaster. Samarco's SR, on the other hand, has a manipulative nature, as it conceals information about damages (Ben-Amar & Belgacem, 2018).

Thus, in its report, the company neutralizes negative disclosure by describing the effects of environmental tragedy with soft disclosure (Clarkson et al., 2008; Clarkson et al., 2011), which simply omits the number of dead animals and the list of destroyed public goods, while providing a detailed account of the repair works. However, while the mining company omits adverse information (Leung et al., 2015), it expands information of a positive nature (Hahn & Lulfs, 2014), confirming the handling of reports.

## 6. CONCLUSION

The objective of this study was to analyze how the SRs are strategically manipulated after the occurrence of environmental accidents, aiming at repairing the image of companies. The analysis of the consulted material revealed that the omission of negative information and the expansion of positive environmental disclosure are used in a manipulative way as a tool that aims to neutralize the environmental damage arising from the nature of the operations, at the same time that it legitimizes harmful practices to the environment.

Institutional pressures from society, the media, and the regulatory environment are reinforced when environmental accidents occur, because they cause enormous damage to the communities living around the ore extraction mines. The bursting of a dam can cause the death of human beings, fauna, and flora, with irreparable damage to people's health family and social lives, while damaging essential public services, with repercussions in the media, as well as damage to the image and reputation of the companies.

The research found that the increasing spread of unfavorable news in the media as a result of the accident generated legitimizing responses from the company, with the expansion of environmental disclosure and the massive publication of positive information, as well as in the omission of the negative disclosure. While expanding favorable disclosure, companies under media scrutiny resort to soft disclosure to report on damage caused by accidents, described superficially and succinctly, when not totally omitted.

Conceived apart from the objective reality of the facts, these strategies have limited reach, as they came to be disproved after three years of its publication with the occurrence of another environmental disaster in January 2019, in a ruptured tailings dam in the municipality of Brumadinho (MG), of the same parent company, and with incomparably greater consequences. Thus, the impacts caused by the collapse of dams such as Mariana and Brumadinho, bring to light the limitations of SRs in expressing facts independently and seriously, also having repercussions on the independent organizations that regulate such reports.

It should be noted, however, that the impacts of environmental accidents have contributed to more restrictive changes in the regulatory environment, with the ban on upstream dams, the adoption of safer tailings storage techniques, in addition to the introduction and regulation of stricter laws that result in stricter punishments for those responsible.

Despite these changes, the severe environmental impacts and damage they bring to society lead mining companies to resort to legitimization strategies aimed at repairing their corporate image through the instrumentalization of SRs, which are used as vehicles to advertise positive environmental disclosure, expanded to the point that they allow them to deny damage and their guilt.

As a suggestion for future research to broaden the scope of this study, we recommend carrying out a comparative study between mining companies that have incurred similar environmental accidents. In addition to researching the reports contained in the SR, we also recommend carrying out a study of an interpretive nature of images. Content analysis of narratives and images to check if there was a change in the reports after the occurrence of accidents, they can make significant contributions not only to theory, but also to the practices adopted by companies that produce and publish sustainability reports.

## REFERENCES

- Abed, S., Al-Najjar, B., & Roberts, C. (2016). Measuring annual report narratives disclosure: Empirical evidence from forward-looking information in the UK prior the financial crisis. *Managerial Auditing Journal*, 31(4/5), 338-361. <https://doi.org/10.1108/MAJ-09-2014-1101>
- Ahmadi, A., & Bouri, A. (2017). The relationship between financial attributes, environmental performance and environmental disclosure: Empirical investigation on French firms listed on CAC 40. *Management of Environmental Quality an International Journal*, 28(4), 490-506. <https://doi.org/10.1108/MEQ-07-2015-0132>
- Albertini, E. (2014). A descriptive analysis of environmental disclosure: A Longitudinal study of French companies. *Journal of Business Ethics*, 121(2), 233-254. <https://doi.org/10.1007/s10551-013-1698-y>
- Al-Shaer, H., Salama, A., & Toms, S. (2017). Audit committees and financial reporting quality. *Journal of Applied Accounting Research*, 18(1), 2-21. <https://doi.org/10.1108/JAAR-10-2014-0114>
- Amorim, F. C. B. (2019). *Estratégias de disclosure ambiental para legitimação do setor de mineração: uma análise dos relatos da Samarco* [Tese de doutorado]. Faculdade de Administração, Centro Universitário da FEI, São Paulo, Brasil.
- Agência Nacional de Águas e Saneamento - ANA (2020, July 06). Relatório de segurança de barragens 2019 aponta para crescimento de barragens em condições críticas e aumento das ações de fiscalização. <https://www.gov.br/ana/pt-br/assuntos/noticias-e-eventos/noticias/relatorio-de-seguranca-de-barragens-2019-aponta-para-crescimento-de-barragens-em-condicoes-criticas-e-aumento-das-acoes-de-fiscalizacao#:~:text=Conforme%20o%20RSB%202019%2C%20no,aconteceu%20um%20aumento%20de%20129>
- Arora, M. P., & Lodhia, S. (2016). The BP Gulf of Mexico oil spill: Exploring the link between social and environmental disclosures and reputation risk management. *Journal of Cleaner Production*, 140, 1287-1297. <https://doi.org/10.1016/j.jclepro.2016.10.027>
- Barbu, E. M., Dumontier, P., Feleaga, N., & Feleaga, L. (2014). Mandatory environmental disclosures by companies complying with IASs/IFRSs: The Cases of France, Germany, and UK. *The International Journal of Accounting*, 49(2), 231-247. <https://doi.org/10.1016/j.intacc.2014.04.003>
- Bardin, L. (2009). *Análise de conteúdo*. Lisboa: Edições 70.
- Beck, A. C., Campbell, D., & Shriver, P. (2010). Content analysis in environmental reporting research: Enrichment and rehearsal of the method in a British-German context. *The British Accounting Review*, 42(3), 207-222. <https://doi.org/10.1016/j.bar.2010.05.002>
- Ben-Amar, W., & Belgacem, I. (2018). Do socially responsible firms provide more readable disclosures in annual reports? *Corporate Social Responsibility and Environmental Management*, 25(5), 1009-1018. <https://doi.org/10.1002/csr.1517>
- Braam, G. J. M., Weerd, L., Hauck, M., & Huijbregts, M. (2016). Determinants of corporate environmental reporting: The Importance of environmental performance and assurance. *Journal of Cleaner Production*, 129, 724-734. <https://doi.org/10.1016/j.jclepro.2016.03.039>
- Brown, N., & Deegan, C. (1998). The public disclosure of environmental performance information: A dual test of media agenda setting theory and legitimacy theory. *Accounting and Business research*, 29(1), 21-41. <https://doi.org/10.1080/00014788.1998.9729564>

- Carmo, F. F., Kamino, L. H. Y., Tobias, R., Jr., Campos, I. C., Carmo, F. F., Silvino, G., Castro, K. J. S. X., Mauro, M. L., Rodrigues, N. U. A., Miranda, M. P. S., & Pinto, C. E. F. (2017). Fundação tailings dam failure: the environment tragedy of the largest technological disaster of Brazilian mining in global context. *Perspectives in Ecology and Conservation*, 15(3), 145-151. <https://doi.org/10.1016/j.pecon.2017.06.002>
- Cho, C. H., Michelon, G., Patten, D. M., & Roberts, R. W. (2015). CSR disclosure: The more things change...? *Accounting Auditing and Accountability Journal*, 28(1), 14-35. <https://doi.org/10.1108/AAAJ-12-2013-1549>
- Cho, C. H., & Patten, D. M. (2007). The role of environmental disclosure as tools of legitimacy: A Research note. *Accounting Organizations and Society*, 32(7-8), 639-647. <https://doi.org/10.1016/j.aos.2006.09.009>
- Christensen, L. T., Morsing, M., & Thyssen, O. (2013). CSR as aspirational talk. *Organization*, 20(3), 372-393. <https://doi.org/10.1177%2F1350508413478310>
- Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting Organizations and Society*, 33(4-5), 303-327. <https://doi.org/10.1016/j.aos.2007.05.003>
- Clarkson, P. M., Overell, M. B., & Chapple, L. (2011). Environmental reporting and its relation to corporate environmental performance. *Journal of Accounting, Finance and Business Studies*, 47(1), 27-60. <https://doi.org/10.1111/j.1467-6281.2011.00330.x>
- Cormier, D., & Magnan, M. (2015). The economic relevance of environmental disclosure and its impact on corporate legitimacy: An empirical investigation. *Business Strategy and the Environment*, 24(6), 431-450. <https://doi.org/10.1002/bse.1829>
- Cormier, D., Magnan, M., & Velthoven, V. B. (2005). Environmental disclosure quality in large German companies: Economic incentives, public pressures or institutional conditions? *European Accounting Review*, 14(1), 3-39. <https://doi.org/10.1080/0963818042000339617>
- Deegan, C. (2002). The legitimizing effect of social and environmental disclosures – a theoretical foundation. *Accounting Auditing and Accountability Journal*, 15(3), 282-311. <https://doi.org/10.1108/09513570210435852>
- Deegan, C., & Rankin, M. (1996). Do Australian companies report environmental news objectively? An analysis of environmental disclosures prosecuted successfully by the environmental protection authority. *Accounting Auditing and Accountability Journal*, 9(2), 50-67. <https://doi.org/10.1108/09513579610116358>
- Deegan, C., Rankin, M., & Tobin, J. (2002). An examination of the corporate social and environmental disclosures of BHP from 1983-1997 a test of legitimacy theory. *Accounting Auditing and Accountability Journal*, 15(3), 312-343. <https://doi.org/10.1108/09513570210435861>
- Delgado-Márquez, B. L., Pedauga, L. E., & Córdón-Pozo, E. (2015). Industries regulation and firm environmental disclosure: A stakeholders' perspective on the importance of legitimation and international activities. *Organization & Environment*, 30(2), 103-121. <https://doi.org/10.1177%2F1086026615622028>
- Demajorovic, J., Lopes, J. C., & Santiago, A. L. F. (2019). The Samarco dam disaster: A grave challenge to social license to operate. *Resources Policy*, 61, 273-282. <https://doi.org/10.1016/j.resourpol.2019.01.017>

- Dienes, D., Sassen, R., & Fischer, J. (2016). What are the drivers of sustainability reporting? A systematic review. *Sustainability Accounting Management and Policy Journal*, 7(2), 154-189. <https://doi.org/10.1108/SAMPJ-08-2014-0050>
- Estadão. (2017, July 23). *Samarco Mineração descarta retomada das operações em 2017*. <https://exame.com/negocios/samarco-mineracao-descarta-retomada-das-operacoes-em-2017/>
- Etter, M., Colleoni, E., Illia, L., Meggiorini, K., & D'Eugenio, A. (2018). Measuring organizational legitimacy in social media: Assessing citizens' judgments with sentiment analysis. *Business & Society*, 57(1), 60-97. <https://doi.org/10.1177%2F0007650316683926>
- Fleming, P., Roberts, J., & Garsten, C. (2013). In search of corporate social responsibility: Introduction to special issue. *Organization*, 20(3), 337-348. <https://doi.org/10.1177%2F1350508413479581>
- Flyverbom, M., & Reinecke, J. (2017). The spectacle and organization studies. *Organization Studies*, 38(11), 1625-1643. <https://doi.org/10.1177%2F0170840616685366>
- Fooks, G. J., Gilmore, A. B., Collin, J., Holden, C., & Lee, K. (2013). The limit of corporate social responsibility: Techniques of neutralization, stakeholder management and political CSR. *Journal of Business Ethics*, 112(2), 283-299. <https://doi.org/10.1007/s10551-012-1250-5>
- Global Report Initiative - GRI. (2016, August 14). *Register Your Report*. <https://database.globalreporting.org/>
- Gray, R., Kouhy, R., & Lavers, S. (1995). Corporate social and environmental reporting a review of the literature and a longitudinal study of UK disclosure. *Accounting Auditing and Accountability Journal*, 8(2), 47-77. <https://doi.org/10.1108/09513579510146996>
- Guthrie, J., & Parker, L. D. (1989). Corporate social reporting: A Rebuttal of legitimacy theory. *Accounting and Business Research*, 19(76), 343-352. <https://doi.org/10.1080/00014788.1989.9728863>
- Hahn, R., & Lulfs, R. (2014). Legitimizing negative aspects in GRI-oriented sustainability Reporting: A Qualitative analysis of corporate disclosure strategies. *Journal of Business Ethics*, 123(3), 401-420. <https://doi.org/10.1007/s10551-013-1801-4>
- Hassan, A., & Guo, X. (2017). The relationships between reporting format, environmental disclosure and environmental performance. *Journal of Applied Accounting Research*, 18(4), 425-444. <https://doi.org/10.1108/JAAR-06-2015-0056>
- Hooks, J., & Staden, C. J. van. (2011). Evaluating environmental disclosures: The Relationship between quality and extent measures. *The British Accounting Review*, 43(3), 200-213. <https://doi.org/10.1016/j.bar.2011.06.005>
- Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis - IBAMA. (2015). *Laudo técnico preliminar: impactos ambientais decorrentes do desastre envolvendo o rompimento da barragem de Fundão, em Mariana, Minas Gerais*. Brasília, DF.
- Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis - IBAMA. (2017, March 16). *Plumas de Sedimentos na Foz do Rio Doce – Consolidação dos Mapas Gerados de 03/12/2015 a 03/02/2017*. <http://ibama.gov.br/recuperacao-ambiental/rompimento-da-barragem-de-fundao-desastre-da-samarco/documentos-relacionados-ao-desastre-da-samarco-em-mariana-mg>.
- Khelif, H., Guidara, A., & Souissi, M. (2015). Corporate social and environmental disclosure and corporate performance: Evidence from South Africa and Morocco. *Journal of Accounting in Emerging Economics*, 5(1), 51-69. <https://doi.org/10.1108/JAEE-06-2012-0024>



- Leung, S., Parker, L., & Courtis, J. (2015). Impression management through minimal narrative disclosure in annual reports. *The British Accounting Review*, 47(3), 275-289. <https://doi.org/10.1016/j.bar.2015.04.002>
- Longoni, A., & Cagliano, R. (2018). Inclusive environmental disclosure practices and firm performance: The Role of green supply chain management. *International Journal of Operations and Production Management*, 38(9), 1815-1835. <https://doi.org/10.1108/IJOPM-12-2016-0728>
- Lucchesi, C. (2021, April 29). *Samarco avalia propor troca de dívida de US\$ 8,8 bi por oferta de ações*. Exame. <https://exame.com/negocios/samarco-avalia-propor-troca-de-divida-de-us-88-bi-por-oferta-de-acoas>
- Neves, A. C. de O., Nunes, F. P., Carvalho, F. A. de, & Fernandes, G. W. (2016). Neglect of ecosystems services by mining, and the worst environmental disaster in Brazil. *Natureza & Conservação Brazilian Journal of Nature Conservation*, 14(1), 24-27. <https://doi.org/10.1016/j.ncon.2016.03.002>
- O'Donovan, G. (1999). Managing legitimacy through increased corporate reporting: An exploratory study. *Interdisciplinary Environmental Review*, 1(1), 63-99. doi: <https://doi.org/10.1504/IER.1999.053837>
- O'Donovan, G. (2002). Environmental disclosure in the annual report: Extending the applicability and predictive of legitimacy theory. *Accounting Auditing & Accountability Journal*, 15(3), 344-371. <https://doi.org/10.1108/09513570210435870>
- Patten, D. M. (1992). Intra-industry environmental disclosures in response to the Alaskan oil spill: A Note on legitimacy theory. *Accounting, Organizations and Society*, 17(5), 471-475. [https://doi.org/10.1016/0361-3682\(92\)90042-Q](https://doi.org/10.1016/0361-3682(92)90042-Q)
- Roberts, J. (2003). The manufacture of corporate social responsibility: Constructing corporate sensibility. *Organization*, 10(2), 249-265. <https://doi.org/10.1177%2F1350508403010002004>
- Saes, B. M., & Muradian, R. (2021). What misguides environmental risk perceptions in corporations? Explaining the failure of Vale to prevent the two largest mining disasters in Brazil. *Resources Policy*, 72, 102022. <https://doi.org/10.1016/j.resourpol.2021.102022>
- Sanchez, L. E., Alger, K., Alonso, L., Barbosa, F. A. R., Brito, M. C. W., Laureano, F.V., May, P., Roeser, H., & Kakabadse, Y. (2018). Impacts of the Fundão Dam Failure. A pathway to sustainable and resilient mitigation. *Rio Doce Panel Thematic Report 1*. Gland, Switzerland: IUCN.
- Santos, R. S. P. D., & Milanez, B. (2017). The construction of the disaster and the “privatization” of mining regulation: reflections on the tragedy of the Rio Doce Basin, Brazil. *Vibrant: Virtual Brazilian Anthropology*, 14(2). <https://doi.org/10.1590/1809-43412017v14n2p127>
- Stubbs, W., & Higgins, C. (2014). Integrated reporting and internal mechanism of change. *Accounting Auditing & Accountability Journal*, 27(7), 1068-1089. <https://doi.org/10.1108/AAAJ-03-2013-1279>
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571-610. <https://doi.org/10.2307/258788>
- Vale. (2019, January 26). *Clarifications regarding dam I of the correço do feijão mine*. <http://www.vale.com/brasil/EN/aboutvale/news/Pages/Clarifications-regarding-Dam-I-of-the-Correço-do-Feijao-Mine.aspx>
- Verbeeten, F. H. M., Gamerschlag, R., & Moller, K. (2016). Are CSR disclosures relevant for investors? Empirical evidence from Germany. *Management Decision*, 54(6), 1359-1382. <https://doi.org/10.1108/MD-08-2015-0345>

- Vigneau, L., Humphreys, M., & Moon, J. (2015). How do firms comply with international sustainability standards? Process and consequences of adopting the global reporting initiative. *Journal of Business and Ethics*, *131*(2), 469-486. <https://doi.org/10.1007/s10551-014-2278-5>
- Villiers, C. de, & Alexander, D. (2014). The institutionalization of corporate social responsibility reporting. *The British Accounting Review*, *46*(2), 198-212. <https://doi.org/10.1016/j.bar.2014.03.001>
- Villiers, C. de, & Staden, C. J. van. (2006). Can less environmental disclosure have a legitimising effect? Evidence from Africa. *Accounting, Organization and Society*, *31*(8), 763-781. <https://doi.org/10.1016/j.aos.2006.03.001>
- Vourvachis, P., Woodward, T., Woodward, D. G., & Patten, D. M. (2016). CSR disclosure in response to major airline accidents: A legitimacy-based exploration. *Sustainability Accounting Management and Policy Journal*, *7*(1), 26-43. <https://doi.org/10.1108/SAMPJ-12-2014-0080>
- Webb, K. A., Cahan, S. F., & Sun, J. (2008). The effect of globalization and legal environment on voluntary disclosure. *The International Journal of Accounting*, *43*(3), 219-245. <https://doi.org/10.1016/j.intacc.2008.06.001>
- World Information Service on Energy - WISE. (2019, November 16). *Chronology of major tailings dam failures*. *Wise Uranium Project*. <http://www.wise-uranium.org/mdaf.html>
- Wong, R., & Millington, A. (2014). Corporate social disclosure: A User perspective on assurance. *Accounting, Auditing & Accountability Journal*, *27*(5), 863-887. <https://doi.org/10.1108/AAAJ-06-2013-1389>

#### CONFLICT OF INTEREST

The authors inform that there is no conflict of interest in the publication of this article.

#### AUTHOR CONTRIBUTIONS

Author 1: Bibliographic research; Data survey; Redaction; Results; Conclusion. Author 2: Methodology; Redaction; Revision; Formal analysis; Validation; Conclusion.