

SDG Adherence of Social Performance Indicators Used by Brazilian Mining, and Oil and Gas Extraction Companies

Ivan Santiago da Silva and Márcio Sampaio Pimentel

This study aimed to examine whether the social performance indicators used by mining companies participating in the BM & FBOVESPA Corporate Sustainability Index (índice de sustentabilidade empresarial [ISE]) during 2005–2021 were aligned with United Nations' Sustainable Development Goals (SDGs). Content analysis was conducted after collecting key information from voluntary sustainability reports presented by the companies. The results uncovered 423 social indicators and revealed repeated discontinuity and large time gaps of as many as 6 years in the disclosure of sustainability information. Among the SDGs investigated, the most discussed were (in order): SDGs 4, 3, 5, 1, 10, and 2. Thus, it is recommended that even though SDGs have been implemented since 2015, the desired social impact can be created only when companies in the mining and extraction sectors make a formal commitment to continuously disseminate sustainability reports and work equitably on SDG goals.

Keywords: social indicators, performance, SDGs, sustainability, social disclosure

Introduction

According to Sánchez (2012), the consolidation of Brazil as an emerging economy is not a result of any specific political or economic miracle; the nation consciously modified its commercial and financial strategies to adapt to global economic trends. He adds that with increase in global demand for raw materials (mainly monoculture, oil, and minerals), Brazil's growing economy is becoming increasingly dependent on commodity exports.

Ivan Santiago da Silva is a Master's Student on Research Program in Controllershship, and Márcio Sampaio Pimentel is an Associate Professor in the Department of Administration, Federal Rural University of Pernambuco, S/n Dom Manoel de Medeiros St, Recife, PE, Brazil. Ivan Santiago da Silva can be contacted at ivan.santiago@ufpe.br, and Márcio Sampaio Pimentel can be contacted at marcio.pimentel@ufrpe.br.

Mining is defined as the extraction of geological resources such as rocks, minerals, and metals. These extracted materials, such as iron, granite, coal, oil, and natural gas, have viable economic value and are found in solid, liquid, or gaseous states. Mining provides raw materials to industries to be used in the production of myriad consumer goods, making it one of the most important economic activities in Brazil and the world (Damasceno, 2017).

Brazil has a huge mineral heritage. It is one of the largest producers and exporters of ores in the world and the world's leading producer of niobium and tantalum (Araújo, Olivieri & Fernandes, 2014). Mining industry is integral to the Brazilian economy; it has contributed greatly to Brazilians' wellbeing and quality of life.

According to Sánchez (2012), Brazil's mining and oil extraction activities are expanding. The nation currently plays an important role in international mining industry, especially through organizations such as the mining company Vale and the oil and gas company Petrobras. However, the rapid economic progress that the country has experienced has not been accompanied by equally rapid development of policies to protect the social rights of ordinary citizens. This imbalance could prevent Brazil's sustainable development.

According to Cavenaghi (2019), mineral exploration laws have become more stringent because of the environmental damage caused by mining activity. However, little is known and discussed about the socioeconomic effects of mining. Although mineral products are the backbone of current social prosperity, and mining promotes overall economic and technological growth, it is not carried out with an intention to promote common development of all parties; it does not take into account the issue of wellbeing of and fairness toward the local communities of mining regions (Viana, 2012). Industrial activity has both positive and negative social consequences, and mining is no exception. However, negative consequences could be minimized and positive changes could be achieved by practicing mining in a controlled and conscious manner. In the absence of such restraint, negative consequences are felt by local communities of mining regions. (Cavenaghi, 2019).

Sustainability refers to reducing negative effects of human activities and creating economic and social wellbeing for both current and future generations (Instituto Brasileiro de Mineração [Brazilian Mining Institute; IBRAM], 2013). Therefore, to achieve sustainability, the mining industry should actively discuss topics such as growth in income, health and education, minimization of poverty, distribution of income, employment opportunities, and cost of living (Enríquez, 2007).

The aim of this study is to verify whether the social performance indicator ratings of the mining and extraction companies participating in the *índice de sustentabilidade empresarial* (ISE) or Corporate Sustainability Index of BM & FBOVESPA are aligned with the United Nations' (2021) Sustainable Development Goals (SDGs).

Theoretical Framework

Social Disclosure

Disclosure is an act of exposing, that is, making public the internal aspects of an organization, such as its business information (Murcia & dos Santos, 2009). Some organizations disclose information encouraged by the benefits it can provide (Botosan & Plumiee, 2002; Dye, 2001; Guay & Verrechia, 2017; Sengupta, 1998; Verrechia, 2001).

Evidence shows that larger companies that are more exposed to the international market, and have greater financing needs and greater growth opportunities, are more likely to provide accounting reports that are informative to external investors (Daske, Hail, Leuz, & Verdi, 2013).

It should be noted that disclosure could occur either voluntarily or compulsorily (Santana, Góis, De Luca, & De Vasconcelos, 2015). Mandatory disclosure refers to the disclosure of information required by law under the supervision of regulatory agencies (Lima, 2007), while voluntary disclosure includes information beyond what is required by regulations; managers can decide which additional information to disclose based on their discretion (Forte, Peres, Bessa, & Oliveira, 2015). In this sense, the focus of this work is voluntary dissemination, as it uses annual reports to verify the level of use of social performance indicators.

Information on social performance indicators presented in annual reports fits the scope of voluntary disclosure, as it is used in internal decision-making and helps stakeholders to take informed decisions (Sánchez, Domínguez, & Álvarez, 2011).

There is no standard on how to disclose nonfinancial indicators, and each company uses discretion to provide the information (Kotane & Kuzmina-Merlino, 2011). Publishing of voluntary information becomes a competitive differential for organizations (Sánchez et al., 2011).

By examining relationships between governance and extent of disclosure in Bangladesh's annual business reports, Khan, Muttakin, and Siddiqui (2013) found that corporate governance attributes play a vital role in ensuring organizational legitimacy and social performance. In addition, Belal and Roberts (2010) noted that companies involved in social sustainability encourage governance exposure more than those that are less committed to social performance.

Social Performance Indicators

Evaluating performance refers to judging performance and assessing the fulfillment of predetermined expectations (Pereira, 2001). It includes qualitative attribution of value in relation to merit or importance and quantitative measurement assignment. According to Miranda and Silva (2002), performance evaluation monitors evaluate the achievement of goals; provide wellness systems and control plans; create, implement, and execute strategies; and identify failures and

problems. For these authors, when evaluating a company's performance, it is necessary to define the attributes that are important for measuring performance and focus on characteristics relevant to the objectives of evaluation. In this way, the performance evaluation system that best suits the company's characteristics is chosen and the performance indicators to be included are defined.

Through evaluation of performance, a company can obtain information from the customer's or production's perspective, which would help it outline its objectives and provide visibility to its positioning in the market (Callado, Soares, Callado, & Holanda, 2011). It is noted in literature that companies have greater options in the use of financial performance indicators (Callado, Callado, & Almeida, 2008; Kotane & Kuzmin-Merlino, 2011; Pace, Basso, & Silva, 2003). However, nonfinancial indicators provide a vision for the future and can help to achieve more satisfactory financial indicators (Neely, Richards, Mills, Platts, & Bourne, 1997). Other authors go further and believe that proper management of social issues could improve the economic performance of a company (Lu, Lee, & Cheng, 2012; Sancha, Gimenez, Sierra, & Kazeminia, 2015).

Wood (1991) describes social performance as the configuration of social responsibility rules, social responsibility procedures, policies, plans, and observable results of the company, as they are related to the company's social responsibility. According to Pires and Trez (2018), social responsibility plays an important role in shaping the reputation of a company, as fulfilment of social expectations is a key determinant of reputation.

Mining and Oil Sectors

Mining is a part of the history of Brazil's territorial occupation; in the mid-1960s, mining was selected as one of the key sectors of the country's economy to promote national economic growth (Enríquez, Fernandes, & Alamino, 2011). It is a crucial part of the current economy; it provides large number of jobs and higher remuneration than the Brazilian average. According to the Ministry of Labor and Employment (MTE), in 2018, mining was among the highest tax-paying industries in the nation.

According to the data from the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística [IBGE], 2018), the mineral extraction industry had a substantial share in Brazil's gross domestic product (GDP) and represented 3% of the index mentioned, thus presenting higher economic development when compared with the GDP of the industrial sector and even compared with Brazil's total GDP. According to the data released by the Agência Nacional de Mineração (National Mining Agency; ANM, 2018), the mining sector generated 742,806 jobs in 2018, in addition to increasing by 3.6 times employment opportunities in the mineral processing industry. According to the Ministry of Labor and Employment, the average salary of mining workers during the first half of 2018 was 2,166% higher than the Brazilian average of reais (R\$) 1,580.03 (ANM, 2018). In addition, information published by IBRAM (2013) shows that in most cases, the human development index of cities with mining

activities is higher than that of the states in which these cities are located, indicating that mining has positive effects on the quality of life of Brazilian population.

Negative impacts of mining include excessive economic dependence on mining, increased cost of living, and disordered growth, and in case of mine closure, the impoverishment of the population (Araújo et al., 2014). According to Enríquez et al. (2011), although mining provides employees with higher wages than the local average, it also leads to an increase in per capita income and, in general, some form of local inflation, which leads to increase in commodity, service, and real estate prices.

Sustainable Development Goals

Through its 193-member states, including Brazil, the United Nations has pledged to adopt the 2015–2030 agenda, which is considered to be one of the most ambitious in the history of international diplomacy. Since then, the countries have committed themselves to the formation and implementation of public policies aimed at achieving SDGs (Empresa Brasileira de Pesquisa Agropecuária [*Brazilian Agricultural Research Corporation*; EMBRAPA], 2020; Ministério Público do Paraná [Public Prosecutor's Office of Paraná; MPPR], 2020).

The SDGs are a global action plan aimed at eradicating extreme poverty and hunger by 2030 by providing quality lifelong education to all, protecting the planet, and promoting a peaceful and inclusive society (MPPR, 2020; Nações Unidas Brasil [United Nations Brazil; NUB], 2020).

The agenda includes an international action plan for achieving the 17 SDGs, subdivided into 169 goals, which deal with several key subjects related to human development from five perspectives: people, planet, prosperity, partnership, and peace (EMBRAPA, 2020). The objectives are broad, interdependent, and interconnected, and address the main development challenges faced by people across the world, including the people of Brazil.

Methodology

To meet the objective of this research, that is, to identify which social performance evaluation measures are used by companies in the mining, and oil and gas extraction sectors participating in the ISE of BM & FBOVESPA, content analysis was chosen as the method. According to Bardin (2010), content analysis represents a set of techniques used in communications analysis and aims to collect, through objective and systematic procedures for describing the content of messages, quantitative or non-quantitative indicators, which allow the inference of knowledge related to the conditions of production and reception of these messages. Content analysis, according to Bardin (2010), is divided into the following three steps:

1. Pre-analysis: This is the organizational stage of the research wherein the precise research objective is defined clearly. Materials to be analyzed are

selected, and the hypotheses to be tested are reviewed together with the definitions of the indicators to guide the collection and interpretation of the data.

2. Exploration of the material: In this phase, research data are collected from previously selected materials. It consists of data collection, encoding, decomposition, or enumeration.
3. Treatment of the results obtained and interpretation: This stage involves the transformation of the original collected data into significant and valid data through analysis.

Pre-analysis

Data were collected from the annual reports published by the companies in digital media for the period of 2005–2020. During the collection of the documents disclosed by the companies, annual reports with different names were found: “Management Report,” “Annual Report,” “Sustainability Report,” and “Presentation of Results.”

We looked for shares that make up the theoretical portfolio of the ISE of BM & FBOVESPA (www.bmfbovespa.com.br) website, and the composition valid from January 2006 to December 2021 was used in this research. Companies that completed the questionnaires to be part of the ISE of BM & FBOVESPA in 2005 were included in the portfolio from January to December 2006, when the first listing was published. The data were processed for the selection of companies in the mining, and oil and gas extraction sectors participating in the ISE of BM & FBOVESPA.

The data collected were social indicators disclosed by the companies in their reports. These indicators were identified by their description and measurement units. These descriptions and measurement units indicated the nature of the objects that the social indicators referred to, the relationship of the indicators with business activities, and their adherence to the SDGs. Indicators that have the same properties but show different situations or opinions are part of the collected data. As a form of organization, the following indicators were parameterized based on the social SDGs recommended by the UN: 1. Eradication of poverty, 2. Zero hunger and sustainable agriculture, 3. Health and wellbeing, 4. Quality education, 5. Gender equality, and 10. Reduction in inequalities.

Exploitation of the Material

The research was carried out through content analysis of annual digital reports for the years 2005–2020. The reports were carefully scrutinized to find evidence of dissemination of social indicators. While reading and interpreting the reports, the focus was on terms related to the following social performance indicators: *education, training, safety, health, food, income, work accidents, sustainability, reduction of inequalities, and function by gender*. These terms had been derived from the social SDGs.

No specific software was used for data collection and processing. The data were tabulated in a simple Excel spreadsheet and categorized according to the (SDGs). Only the explicit social indicators in the report were extracted, with the respective units of measure, when available.

Treatment of Results

According to Campos (2004) and Moraes (2003), categories are great statements that encompass a variable number of themes, according to their degree of intimacy or proximity, which can express important meanings and elaborations through their analysis. In this context, the categories were defined by the SDGs of the agenda 2030 platform, and the social indicators associated with the SDGs identified and classified as being closer to each objective of the social dimension were applied to this study.

Results and Discussion

The results allow us to realize that in general, 423 social indicators related to social SDGs (1, 2, 3, 4, 5, and 10) recommended by the UN and extracted from the reports published by the companies over a period of 16 years were obtained, which are presented in Table 1.

In Table 2, the indicators analyzed were arranged by year and per company, in line with the social SDGs. It was observed that from the 423 indicators identified over the period evaluated, in quantitative and percentage terms, SDG 4, which

Table 1 Classification of indexes

SDG	Description	Example	
1	Eradicating poverty	Ending poverty in all its forms, everywhere	Average pay per employee; wage increase
2	Zero hunger and sustainable agriculture	Ending hunger, achieving food security and improving nutrition, and promoting sustainable agriculture	Stimulating family farming
3	Health and wellbeing	Ensuring a healthy life and promoting wellbeing for all at all ages	Accident prevention; attendance of employees with STDs
4	Quality education	Ensure inclusive, equitable, and quality education, and promote lifelong learning opportunities for all	Employees by level of education Training and qualification in underprivileged communities
5	Gender equality	Achieving gender equality and empowering all women and girls	Women at management positions Harassment cases
10	Reducing inequalities	Reduce inequalities within and between countries	PNE employees Wage matching

Note: PNE: People with special needs.

Table 2 Social indicators identified in mining companies listed on the Bovespa between 2006 and 2021

Year	Company	Sustainable Development Goals						Total	Percentage
		1 Eradicating poverty	2 Zero hunger and sustainable agriculture	3 Health and wellbeing	4 Quality education	5 Gender equality	10 Reducing inequalities		
2006	x	0	0	0	0	0	0	0	0.00
2007	Petrobras	5	1	9	5	4	5	29	6.86
	Gerdau	4	1	3	7	1	1	17	4.02
2008	Petrobras	3	1	9	7	6	5	31	7.33
	Gerdau	4	1	3	7	1	1	17	4.02
2009	x	0	0	0	0	0	0	0	0.00
2010	Gerdau	3	1	4	7	0	1	16	3.78
	Usiminas	3	1	5	12	9	6	36	8.51
2011	Gerdau	3	1	3	5	0	1	13	3.07
	Vale	2	1	6	5	8	3	25	5.91
2012	Gerdau	2	1	3	3	0	1	10	2.36
	vale	4	1	6	21	5	2	39	9.22
2013	Gerdau	2	1	3	4	0	1	11	2.60
	Vale	1	0	12	9	6	2	30	7.09
2014	Gerdau	1	1	3	4	0	1	10	2.36
	Vale	7	1	12	10	16	2	48	11.35
2015	Gerdau	0	0	1	1	0	0	2	0.47
	Vale	4	0	6	13	13	3	39	9.22
2016	x	0	0	0	0	0	0	0	0.00
2017	x	0	0	0	0	0	0	0	0.00
2018	x	0	0	0	0	0	0	0	0.00
2019	Vale	2	2	3	8	4	2	21	4.96
2020	x	0	0	0	0	0	0	0	0.00
2021	Petrobras	1	0	9	2	15	2	29	6.86
Total		51	15	100	130	88	39	423	100
Percentage		12.06	3.55	23.64	30.73	20.80	9.22		

deals with quality education, was the most cited indicator in comparison to the others (130 indicators and 30.73% of the total), followed by SDG 3—health and wellbeing (100 indicators and 23.64% of the total); SDG 5—gender equality (88 indicators and 20.80% of the total); SDG 1—poverty eradication (51 indicators and 12.06% of the total); SDG 10—reduction of inequalities (39 indicators and 9.22% of the total); and finally, SDG 2—zero hunger and sustainable agriculture (15 indicators and 3.55% of the total).

It is remarkable that little attention is paid to issues associated with SDG 2—zero hunger and sustainable agriculture—which is represented by only 3.55% of social indicators cited. This finding is worrying because according to the data for the 2017–2018 Family Budget Survey released by IBGE (2020), more than one-third of the nation (36.7% of households—equivalent to 25.3 million households) suffers from food insecurity (FI). In an estimated population of 207.1 million inhabitants, 84.9 million Brazilians (41% of the population) had some degree of food insecurity: 56 million with mild food insecurity, 18.6 million with moderate food insecurity, and 10.3 million with severe food insecurity. Therefore, these results demonstrate that it would be ideal for the SDGs to be complied with in a more uniform and balanced manner, with almost equal attention to all SDGs, given the size of the companies evaluated here and their undoubted capability to operationalize these actions.

In this sense, it is important to highlight that even though mining is one of the most polluting activities and it uses social responsibility mechanisms to justify itself and obtain a “social license,” it is necessary to think not only about profit but also about introducing a culture of responsibility toward society (Prno and Slocombe, 2012). Although its relevance is highlighted, the results showed that there was a strong discontinuity in the dissemination of reports, as in 6 years out of the 16 years evaluated, there were no socio-environmental reports.

In 2006, there was no addition of any mining company in the ISE of BM & FBOVESPA. In 2007, PETROBRAS S.A. and GERDAU S.A. made an appearance on the index, only to get suspended in 2009. With the exception of 2009, GERDAU S.A. had representation from 2007 to 2015 and was noted for presenting only two indicators, showing a drastic drop in social indices; since then, there has been no more support for the ISE of BM & FBOVESPA from the mining industry. Petrobras S.A., which was on the list in 2007 and 2008, only returned to the index in 2021.

VALE S.A. presented the most social indicators: in 2014, it released 48 indicators, representing 11.35% of the total. However, it first appeared on the ISE of BM & FBOVESPA in 2011 and lasted until 2015, when the tragedy occurred with rupture of the dam in the municipality of Mariana (MG), and a little more than 3 years later, in 2019, the second disaster occurred with rupture of the Mina do Feijão dam in Brumadinho (MG). In spite of taking the lead in the number of social indicators, the company became the cause of many deaths.

One interesting observation was that USIMINAS S.A. emerged only in 2010 and did not present any more reports; yet it presented 36 indicators in this year,

enough to represent 8.51% of the total. Overall, the results show that there is no continuity in the presence of companies in the ISE of BM & FBOVESPA or the maintenance of their sustainability portfolio. Companies tend to appear and disappear from the list, often with long periods of absence, such as in the case of PETROBRAS S.A., which spent 11 years off the list, and USIMINAS S.A., which had only one appearance in 2010.

It is important to highlight that the absence of disclosure to the ISE of BM & FBOVESPA does not imply that the company has not carried out actions in line with the SDGs, but rather that it simply did not join ISE of BM & FBOVESPA for a few years. The nonmandatory disclosure compromises the adequate monitoring of companies by stakeholders, mainly due to the nature of the mining activity and the magnitude of its impact. As a contribution to the sector, it is suggested that companies maintain their disclosures annually when adopted.

Conclusion

This study aimed to identify social indicators reflecting adherence to SDGs in the annual reports of mining, and oil and gas exploration companies listed in the ISE of BM & FBOVESPA during 2005–2021. It could be concluded from the collected data that these companies use many social indicators, and these indicators did address social SDGs (1, 2, 3, 4, 5, and 10). It was also noted that the indicators showed greater adherence to SDGs 3 (health and wellbeing) and 4 (quality education) but left much to be desired regarding efforts for zero hunger and sustainable agriculture (SDGs 2). It is pertinent to consider that the SDGs were set by the UN in 2015, but it is necessary to seek to work more equitably on these SDGs.

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