

Sustainable Development Goals: the impact of large representatives in the Brazilian construction industry

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Abstract: The large corporations cause the most significant damages, but they can contribute to achieve the Sustainable Development Goals (SDG) and its global priorities. The purpose of this research was the map the main impacts related to SDG, analysing the business sector of Brazilian civil construction, including some of the main Brazilian companies of the following segments: construction companies, factories and cement plants, analysing their sustainability reports according to the Global Reporting Initiative (GRI) model. Only four out of the seventeen SDG were found not to be directly affected by the material aspects of the Brazilian construction industry. Therefore, suggestions were made for the mitigation of the impacts caused, including mostly governmental actions for regulation and enforcement, as well as entrepreneurial action concerning the management model. Based on the Attention-Based View theory, contributions have been suggested applicable to the companies' management model seeking to achieve the SDG.

Keywords: Sustainable Development Goals (SDG); Sustainable Development; Corporate Social Responsibility; Global Reporting Initiative (GRI); Materiality Matrix.

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Introduction

There are contradictions and lack of metrics concerning sustainability. However, it is necessary to seek them, since the speed of environmental changes is unquestionable (ADAMS, 2006). The need to create a sustainable society and economy has never been more broadly recognized, even though the challenges in the path towards them are still high (PAELKE, 2005; WANG, 2014). The United Nations (UN) has made efforts to promote the importance of achieving sustainable development.

With the creation of the Sustainable Development Goals (SDG) in September 2015, which consists of one Declaration, 17 SDG and 169 goals which must be reached by 2030, the companies are explicitly summoned to solve the challenges of sustainable development (UNDP, 2015). However, a dilemma that arises is the fact that large companies do not want to lose power and profitability. A solution for the impasse of creating changes that do not arise suspicion in business owners must be to present the premises for sustainability in terms of opportunities and not threats. (ADAMS, 2006).

Therefore, new tools have been prepared and new ways to view sustainable development have been presented to the organizations. Among them, the SDG Compass Guide can be mentioned, created to help companies align their strategies with the SDG, measure and manage their contribution. The guide explains how the SDG affect the business, offering tools to place sustainability in the centre of business strategy. Large corporations are those that cause most damages, but at the same time they can contribute to achieve the SDG and their global priorities (SDG COMPASS, 2015).

The definitions of the SDG and their goals, as well as the connection between the subgoals, are not trivial steps for the construction industry (IEA; UN ENVIRONMENT PROGRAMME, 2018; OPOKU, 2019). The most relevant goals concerning the construction industry must be identified in advance. The definition and introduction of theme fields covering each goal is a first attempt to make the model more understandable and tangible. There are multiple interactions among the SDG for construction, so it is important for the construction industry and its actors to take into consideration the systemic thinking and systemic approaches to contribute to each goal. The interdependencies within the 2030 Agenda (ALLEN et al., 2018) must be explored in a systemic manner for the implementation of the SDG, especially regarding the construction industry and the built environment (WIESER et al., 2019).

The companies of the construction industry have a major impact in economy, society and the environment. The industry plays an important economic role, but is also responsible for a significant consumption of natural resources and for an expressive environmental impact (PASCHOALIN FILHO; DIAS; CORTES, 2014; JOHN; SILVA; AGOPYAN, 2001).

It is important to stress that the word “industry” here is being considered in a broad sense, encompassing both construction itself (as described by CNAE - National Classification of Economic Activities) and the activities related thereto, such as the production of construction materials. According to CNAE (2022), the construction activity consists of the construction of buildings in general, infrastructure works and specialized services that

are part of the construction process. The CNAE categorization for construction does not encompass the production of construction materials or more complex elements intended for building and infrastructure works, but makes reference thereto and, for this reason, for the importance and representativeness of these production activities, the companies that develop them and had sustainability reports were included in the text. It should be further noted that the term “segment” was used in the text to mean the division of the construction industry and its related activities into sub activities. In Brazil, according to a study by FGV and ABRAMAT (2016), the construction chain amounted to 8.32% of the GDP in 2015, having collected BRL 15 billion in taxes. In social terms, the industry’s contribution is noteworthy for the generation of jobs, as demonstrated by the 4.2 million workers who were working in the production chain in 2017 (CBIC, 2017). At the same time, its products consume approximately 40%-75% of the raw material produced in the planet, apart from a third of its natural resources. The consumption of cement is greater than that of food and is only behind that of water, which makes construction the planet’s most pollutant industry (GLOBAL CEMENT, 2018).

In spite of the impact caused by construction, there are few studies covering the sustainability of the industry’s companies. However, several companies in the industry issue their sustainability reports and make them public. Even though corporations see their relationship with the environment as a threat to profitability and the established business practices, large companies were led to implement sustainable development policies, pressured by the political context, by social movements, by Governments and by changes in the competitive atmosphere arising from globalization (HOFFMAN, 2000; ARRUDA et al., 2013).

Corporate responsibility and sustainability emerge from common concerns, even if they originate from different sources. However, the “labelling” of companies concerned with sustainable practices requires greater reflexivity. Corporations must align their organizational behaviours with normative approaches for businesses and societies, considering systemic and interconnected approaches. This may entail a natural outcome in which each organization seeks unrestricted economic growth, thus disturbing natural and social systems. The adoption of normative prescriptions and systemic perspectives may help managers and organizations seek alternative ways to view and understand their relationship with society, for an easier delivery of new solutions to growing problems and challenges (BANSAL; SONG, 2017).

To break from management challenges and achieve a more flexible and adaptable response to the demands of the business macroenvironment, companies must manage strategies and products to meet the intertemporal demands (BANSAL; DESJARDINE, 2014; MUNCK, 2015). In the context of sustainability, it is relevant to say that results aren’t always obtained in short term. The search for sustainability involves a large-scale organizational transformation process based on an emerging process developed and applied by a series of organizational procedures. This includes social value factors and safe predictions about the environmental conditions in future scenarios (MUNCK; TOMIOTTO, 2019). In short, sustainable actions encompass changes, including new horizons for the

understanding and grasping of meanings, both on an individual and organizational level (MUNCK, 2015).

The change process includes the management of data and indicators for the purpose of building a sustainability-oriented structure for the organization. The sustainability report works as an evaluation and communication element, being a contribution tool for sustainable management of companies (LOZANO; HUISINGH, 2011). The quality of data and indicators depends on the data collection process, demanding more detailed and well-characterized data, resulting in reports with wider-encompassing and more in-depth indicators in sustainability topics. The attainment of sustainability also depends on the development and publication of multi-theme reports (also focusing on sustainable development), which drive the sustainability-oriented changes for the organizations (LOZANO et al., 2016).

A sustainability report is a non-financial report published by a company or organization about the economic, environmental and social impacts caused by its activities (GRI, 2016). It can be defined as the practice of measuring and disclosing the company's sustainability performance, ensuring the responsibility to the interested parties and supporting the company in the management of change toward a more sustainable operation (BEBBINGTON, 2001; GRI, 2015).

GRI's Guidelines for a Sustainability Report is made up of principles for the definition of the report's contents and methods to ensure the quality of the reported information. These guidelines emphasize the importance of concentrating on the "material" aspects of sustainability (MARIMON et al., 2012) which reflect the significant economic, environmental and social impacts of the organization (GRI, 2015).

The purpose of the materiality assessment in sustainability reports is to identify, select and prioritize aspects and indicators which better reflect the company's economic, environmental and social impacts. Since not all sustainability issues have the same relevance for each company, the sustainability performance report requires organizations to disclose information related to sustainability with a suitable level of detail, according to their materiality (CALABRESE et al., 2016). Krembs and Cort (2015) state that "materiality" is a principle referring to the identification of major issue and opportunities for the company and the stakeholders, and may influence strategic decisions.

The manner by which materiality is identified and operated changes from one company to the other, but the "materiality matrix" is perhaps the most commonly used approach to determine issues related to materiality (JONES; COMFORT; HILLIER, 2015). For each company, the matrix correlates the material issues in two axes, namely, the importance of the topics for the stakeholders and the importance of the topics for the organization itself (JONES; COMFORT; HILLIER, 2015), on a scale ranging from high to extremely high relevance. For the Attention-Based View, the organization's ability to keep its attention focused on development, implementation and preparation of good in a specific strategic agenda for the creation of value is very important (OCASIO; JOSEPH, 2018). Therefore, this text proposes that strategic decisions be prepared based on material issues raised in companies' sustainability reports. These must keep the atten-

tion focused on placing the sustainable development goals at the centre of the strategy and the business model.

Considering the presented context, the study had as main purpose the identification of how Brazilian construction has positive or negative impact on the Sustainable Development Goals (SDG), considering the segments of construction companies, factories and cement plants.

With this, the study has as its main topic the following research question: What are the most material Sustainable Development Goals (SDG) positively or negatively impacted by the Brazilian construction industry?

Method

Regarding the method, this study was qualitative, regarding the purposes, it was descriptive, and regarding the means, the research was conducted in bibliography and in the field, with primary (interviews with specialists) and secondary (the companies' sustainability reports) data having been collected in different steps of the research. For the analysis of the collected data, content analysis is used (BARDIN, 2011).

Population – identification of the studied companies

For the study, the most representative companies in the construction sector were considered, also encompassing those related to the sector, such as those producing materials used in construction. The main criterion for the inclusion of companies was the availability of their sustainability reports. Initially, it was necessary to identify the largest companies related to construction in Brazil and, subsequently, find which among them had sustainability reports based on the GRI guidelines and finally which reports included the company's materiality matrix in its contents. Only the organizations that passed through this filter, featuring the required parameters for the study to be conducted, were considered.

In order to identify the largest construction companies in the country, four construction rankings in Brazil were used: Valor Econômico magazine (2016) - "As 1000 maiores empresas do país em 2014"; Exame magazine (2016) - "As melhores empresas do Brasil em 2014"; O Empreiteiro magazine - Ranking da Engenharia Brasileira - 500 Grandes da Construção - Ano LII - August of 2014 - nº 533; Inteligência Empresarial da Construção (ITC) (2016) - "As 100 Maiores Construtoras do Brasil em 2014". A single ranking was not considered, as none of them is official, as companies are required to pay to take part in each of them. The data for the year 2014 were used for analysis and comparison among them, as this was the latest year appearing in all the studied rankings when this study was conducted in May 2016.

For the definition of which companies would be analysed for the study, the top 25 organizations in each ranking were selected, as in all rankings the top 25 companies amount to more than 60% of the amounts analysed by them.

Then the verification was made by means of GRI's official sustainability report

website (<http://database.globalreporting.org/search/>) and the companies' official websites, checking which ones contain sustainability reports; which GRI version they report; in which year the latest report was prepared; whether they feature a materiality matrix and if it contains any mention to SDG. In October 2017, when the data were collected, only 12 (Table 1) disclosed their sustainability reports according to the GRI, presenting their materiality matrix. Table 1 indicates whether or not ("YES" or "NO") the report mentions the SDG. Even in reports where the SDG, the relationship of the report with them appears incipiently, as will be discussed later.

Table 1 – Companies that took part in the study

Company	Report type	Report year	Mention to SDG
Construtora Odebrecht	GRI-G4	2016	NO
Votorantim Cimentos	GRI-G4	2016	YES
Construtora Andrade Gutierrez	GRI-G4	2015	NO
MRV Engenharia	GRI-G4	2016	YES
Duratex	GRI-G4	2016	YES
Even	GRI-G4	2016	NO
Somague Engenharia	GRI-G4	2015	NO
Tigre	GRI-G3	2016	NO
Mendes Junior	GRI-G3	2012	NO
Amanco	GRI-G3	2012	NO
Holcim	GRI-G4	2013	NO
Tecnisa	GRI-G4	2016	NO

Source: Prepared by the authors.

The latest reports available in October 2017 were considered when the data were collected. Only companies with reports published on-line were included in the study. It should be noted that the research lasted nearly two years and the collection of reports on the companies' websites was a first step followed by others, such as the creation of the materiality matrices and validation by specialists.

Only 12 (20.7%) of the 58 largest construction companies in Brazil have disclosed their sustainability reports according to the GRI model, including their materiality matrix. With this data, it is possible to say that the main construction companies in Brazil are reluctant to embrace the materiality concept. According to Jones, Comfort and Hillier (2015), this could suggest that the companies' main commitment to sustainability are designed according to existing business models, focused on continuous growth and consumption, and that the current policies can be viewed as a little more than genuflections to sustainability (JONES; COMFORT; HILLIER, 2015). The results found confirm the findings of Siew (2015b), who faced a similar problem in Australia.

Research steps

The study was divided in two steps: in the first step, secondary data were used (sustainability reports of the construction companies); in the second steps, primary data were used (semi-structured interviews with construction specialists).

First step: creation of the unified materiality matrices

The first step of the research took place with the use of secondary data which, according to Cooper and Schindler (2011), are studies made by third parties, with their own purposes. In the case of this study, secondary data are the sustainability reports of the 12 previously named Brazilian construction companies.

The companies' sustainability reports revealed that, even if they all belong to construction, the industry segments are quite different between themselves. Therefore, to make the study more accurate, it was necessary to divide the companies according to the industry segment where they operate as follows:

- Construction companies: Construtora Odebrecht; Construtora Andrade Gutierrez; MRV Engenharia; Even; Somague Engenharia; Mendes Junior; Tecnisa.
- Cement plants: Votorantim Cimentos; Holcim.
- Factories: Duratex; Tigre; Amanco.

The organizations' materiality matrices were sought in the contents of the reports. The intention in collecting the individual materiality matrices was to identify which were the most material aspects for each company. The company matrices, divided in segments, went through a content analysis process using the method described by Bardin (2011), from which, through categorization, it was possible to list the most material aspects for each segment.

Each material aspect, grouped in categories, was compared against all the 17 SDG to verify which of them was impacted by the material aspect, either positively or negatively. After the data tabulation, it was possible to create a unified matrix for each segment (construction companies, cement plants and factories).

Guthrie et al. (2004) and Hahn and Kühnen (2013) claim that content analysis is a research method frequently used to capture and organize data in a research focused on the analysis of corporate disclosure, as it allows the analysis and comparison of report trends and patterns (STEMLER, 2001; GUTHRIE et al., 2004). Within this scope, this method is also widely used in research related to sustainability, for instance: ZEGHAL; AHMED, 1990; MYERS, 2005; AFZAL; LIM, 2013; AFZAL; LIM; PRASAD, 2017.

Second step: validation by specialists

The second step of the research was conducted based on primary data, i.e., semi-structured interviews with construction specialists for the validation of the matrices created in the first step and discussion about positive and negative impacts created by the selected companies. The specialists were also inquired about how to deal with the impacts and the practices related to sustainability.

The validations in recent research fields which are still in development is of great importance, and in the view of Creswell (2007), it is necessary to establish a commitment with validation strategies for the purpose of confirming and crossing data from various sources. As for reliability, Creswell (2007) says it shows the consistency of a research, based not on accidental results but on the confidence of the process of data collection, treatment, analysis and interpretation.

Table 2 below shows a list of specialists interviewed. According to Cooper and Schindler (2011), privacy and confidentiality are very important in research involving interviews; access to names, phone numbers, addresses and other forms of identification must be restricted. Therefore, the names of the interviewees have been omitted, with only the institution where the specialist works, the position he or she holds, years of experience in the construction and the size of the company where he works being informed.

Table 2 – Specialists interviewed

Identification	Institution	Position held	Years of experience	Company size
Specialist 1	Estácio Ribeirão Preto/ Vante Engenharia	coordinator of the civil engineering course and professor doctor	18	1,001-5,000 employees
Specialist 2	University of São Paulo – São Carlos Engineering School	professor doctor	17	more than 10,001 employees
Specialist 3	University of São Paulo – Institute of Architecture and Urbanism	professor doctor	15	more than 10,001 employees
Specialist 4	University of São Paulo – Zootechnics and Food Engineering School	associate professor	25	more than 10,001 employees
Specialist 5	Polytechnic School of the University of São Paulo	associate professor	30	more than 10,001 employees
Specialist 6	Federal University of São Carlos	adjunct professor	13	2,101 employees

Specialist 7	University of São Paulo - Institute of Architecture and Urbanism	professor	15	more than 10,001 employees
Specialist 8	University of São Paulo - São Carlos Engineering School	contracted professor	23	more than 10,001 employees

Source: Adapted from Abuzeinab, Arif and Qadri (2017).

Specialists 1 and 8 were interviewed in person and all the others were interviewed on-line, through Skype. All the interviews were recorded and notes were taken (with the interviewees' authorization) for easier documentation and were subsequently transcribed for an easier analysis.

The interviews began with a brief presentation of the study, in order to provide the specialists with context. Then the unified materiality matrices of the construction companies, cement plants and factories were presented to them. This was when the specialists were requested to comment on the matrices, whether they agreed or disagreed with the aspects the company claimed to cause positive or negative impact and the effect thereof on the SDG. Thus, every aspect of the matrix would be validated or invalidated according to the specialist.

The second part of the interview was more controlled. The specialists were asked to answer five questions for the purpose of guiding the conversation and understanding the view of each of them about sustainability in construction companies and the impacts caused by them. The questions asked were as follows:

1. Have construction companies tried to be more sustainable.
2. What leads companies to seek sustainability?
3. What are the greatest social, environmental and economic impacts, both positive and negative, caused by construction?
4. What are the greatest problems not usually disclosed in construction?
5. How can the construction problems be reduced or eliminated?

Results and discussion

First step: creation of the unified materiality matrices

Unified materiality matrices

From the relationship between the most material aspects for each construction and SDG arose the unified materiality matrices proposed by the study.

The decision of considering the impact positive or negative was made based on the data obtained and statements made by the companies in their sustainability reports.

When an SDG is affected both positively and negatively by a material aspect, this means that the companies are already doing something positive regarding the aspect, but possibilities still exist of mitigating the negative impact. When an SDG is positively affected by an aspect, it means that the companies have shown concern with it and acted upon it, even though there is always a possibility to improve. When an SDG is negatively affected by an aspect, it means that either companies are not taking any action upon it or they assume that the actions taken are not sufficient, or they show problems regarding the aspect, with represents an opportunity for improvement.

Some organizations have incorporated the SDG reference in their latest sustainability reports, which shows progress, as the organizational reporting practices are considering what has currently been discussed about sustainability on a global scale. However, by reading the reports, one notices that this relationship with SDG appears incipiently and superficially, only as a mention or as icons in the materiality matrix, without affecting the companies' material aspects or their organizational strategy.

Comparison between the unified materiality matrices

By comparing the unified materiality matrices created for each segment (cement plants, factories and construction companies), one notices that some aspects such as “safety”, “local community”, “energy”, “water”, “commitment to customers”, “health”, “training and development”, “ethics”, “diversity”, “economic performance” and “products and services” are considered material for all of them. On the other hand, aspects such as “residue”, “compliance” and “organizational relationships” were considered material only for the factory and construction company segments; the aspects “atmospheric emissions” and “supplier management” were considered material only for the factory and cement plant segments; and the aspect “labor practices” was considered material only for construction companies and cement plants. Some aspects were considered material for only one segment, namely, “fight against corruption”, “human rights” and “sustainability” for the factories; “socioenvironmental commitment” for construction companies; and “biodiversity”, “effluents” and “research and development” for cement plants.

All told, 14 of the 17 SDG and 43 of the 169 goals are impacted by the sum of the three studied segments for the Brazilian construction industry. It was then considered that only SDG 1 (Eradication of poverty), 2 (Zero hunger and sustainable agriculture) and 14 (Life in water) are not directly impacted by the industry, according to the information obtained from the company reports, as summarized on the table below.

Table 3 - Main SDG impacted by the Brazilian construction industry

SDG positively impacted by the industry	SDG negatively impacted by the industry
<ul style="list-style-type: none"> • SDG 3 – Health and Well-being • SDG 4 – Quality Education • SDG 8 – Decent Work and Economic Growth • SDG 9 – Industry, Innovation and Infrastructure 	<ul style="list-style-type: none"> • SDG 5 - Gender Equality • SDG 6 – Potable Water and Sanitation • SDG 7 – Clean and Accessible Energy • SDG 10 – Inequality reduction • SDG 11 – Sustainable Cities and Communities • SDG 12 – Responsible Consumption and Production • SDG 13 – Action against global climate change • SDG 15 – Earth Life • SDG 16 – Peace, Justice and Effective Institutions

Source: Prepared by the authors.

Second step: validation by specialists

Most specialists had no knowledge of SDG, but even so the interviews, with the part of validation of the matrices developed, followed by the semi-structured questions, were quite rich. Some specialists brought new questions about the addressed topics, while others contributed views that are reflected in the field's literature.

Table 4 below presents a summary of impacts, both positive and negative, as raised by the specialists in social, environmental and economic scopes. The table shows that the number of negative impacts, especially in environment, is greater than the number of positive impacts.

Table 4 – Impacts of construction raised by the industry's specialists

	Positive impacts	Negative impacts
In society	<ul style="list-style-type: none"> - Supply the demand for housing and infrastructure - Generation of jobs and income 	<ul style="list-style-type: none"> - Corruption and lack of ethics - Informal work - Low wages - Poor income distribution in the industry - Inappropriate urban planning
In the environment	<ul style="list-style-type: none"> - If there is treatment in construction residue - There is an attempt by factories to reduce atmospheric emissions 	<ul style="list-style-type: none"> - Waste - Lack of solid waste management - Water, soil and air pollution - Atmospheric emissions - Use of natural resources - Great energy consumption

<p>In the economy</p>	<p>- Construction has a durable, high added-value product - The industry encourages economic growth and keeps the economy moving</p>	<p>*****</p>
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Source: Prepared by the authors.

Validation of the materiality matrices

In this part of the study, a comparison is made between the unified materiality matrices (prepared according to the companies’ sustainability reports), data about construction impact as obtained in literature and validation by the specialists.

This comparison revealed which are really the most material aspects for the industry, considering its division in the segments of factories, construction companies and cement plants. Furthermore, it was possible to determine which SDG are positively or negatively affected by each of the material aspects.

The comparison between unified matrices, literature and interview is important because Jones, Comfort and Hillier (2016) notices that many of the questions identified by companies as having high priority are in fact centred on business continuity (such as marketing, purchases, fiscal policy and customer satisfaction) and not on environmental and social issues (such as the use of water, waste management, local community and biodiversity).

Jones, Comfort and Hillier (2016) argue that only identifying material aspects does not ensure a change to more sustainable consumption patterns and does not challenge the dominant business ideology of continuing economic growth. In this regard, Moneva, Archel and Correa (2006), in a critical manner, state that GRI is involved in “camouflaging business unsustainability”.

This study is intended to solve this problem by means of interviews with specialists to validate the unified matrices developed. It is believed that, in the post-validation unified matrices, it was possible to reduce, at least in part, the discrepancy between what companies claim they do and what they really do, bringing to the surface the camouflage that companies use in their report by presenting sustainable actions that actually do not exist in that form or which are not actually sustainable.

Main SDG impacted by the Brazilian construction industry

The post-validation unified materiality matrices show that, all told, 13 of the 17 SDG are impacted by the sum of the three segments of the Brazilian construction industry studied. This means 1 fewer SDG impacted than when considering the unified materiality matrices based only on the companies’ sustainability reports. Through the analysis of the post-validation matrices, one concludes that SDG 1 (Eradication of poverty), 2 (Zero hunger and sustainable agriculture), 14 (Life in water) and 17 (Partnerships and

implementation) are not as directly impacted by Brazilian construction as the other SDG.

Answering the research question, which was: “What are the most material Sustainable Development Goals (SDG) impacted positively or negatively by the Brazilian construction industry?”, Table 5 below summarizes the main SDG impacted, predominantly in a positive or negative manner by the construction industry as a whole, i.e., adding up the cement plant, factory and construction company segments.

Table 5 - Main SDG impacted by the Brazilian construction industry

SDG positively impacted by the industry	SDG negatively impacted by the industry
<ul style="list-style-type: none"> • SDG 3 – Health and Well-being • SDG 4 – Quality Education • SDG 8 – Decent Work and Economic Growth • SDG 9 – Industry, Innovation and Infrastructure 	<ul style="list-style-type: none"> • SDG 5 - Gender Equality • SDG 6 – Potable Water and Sanitation • SDG 7 – Clean and Accessible Energy • SDG 10 – Inequality reduction • SDG 11 – Sustainable Cities and Communities • SDG 12 – Responsible Consumption and Production • SDG 13 – Action against global climate change • SDG 15 – Earth Life • SDG 16 – Peace, Justice and Effective Institutions

Source: Prepared by the authors.

Suggestions to reduce negative impacts

Apart from the analysis of the materiality matrices, another point that must be considered are the suggestions, obtained from the review of literature and interviews with specialist, in order to mitigate the impacts that appear in a recurring manner. They are: the government may promote political actions for regulation and control (enforcement); the government may provide financial incentives or subsidies; the government may levy taxes on certain activities or irregularities; engagement between academia members specializing in construction and construction company managers with the government; adoption of new technologies and tools; innovation of products; search for new materials; revision of the management model (think of the strategies that will be adopted); government role in the promotion of the use of more sustainable products; implement environmental and labour guidelines or regulations focused on sustainability; investment in education and culture (to reduce corruption and improve ethics); reduction in resource consumption; improve income distribution; conduct researches to improve knowledge about the construction production chain; concern with the assessment of the products life cycle, from production to disposal. Furthermore, the mitigation of impacts can be pushed by the idea of cost reduction for the company, of the search to improve the organization image and/

or by the demands of the market.

Chang et al. (2016) have investigated the driving forces and barriers for sustainability in construction and among a large number of identified factors; the main one was the government policy. As for the role of public managers, Lu and Tam (2013) state that governments in several countries have implemented public policies such as laws, regulations and guidelines to rule construction activities for the purpose of reducing impacts to the environment and public health.

Apart from the regulations, politics plays an important role in the provision of financial incentives (SHI et al. 2013). The government can provide greater incentive to companies that work better in environmental terms and impose financial penalties to those not in compliance with the requirements (ABUZEINAB; ARIF; QADRI, 2017).

Government policies created to encourage or force actors to adopt behaviours and technologies compliant with integrated and suitable waste management, for instance, would be implemented by means of command-and-control instruments (environmental regulations, rules and quality standards) or economic instruments (fees, tariffs and taxes; subsidies and tax incentives) (SEROA DA MOTTA, 2006; VERGARA; TCHOBANOGIUS, 2012; KLEIN; GONÇALVES-DIAS, 2017).

As for the revision of the management model, Siew (2015b) states that the very survival of companies is dependent upon their capacity of adaption and transition to a business models addressing sustainability. Therefore, must be able to identify the main risks and opportunities in terms of sustainability.

For the Attention-Based View (ABV), a company's strategy is the standard of organizational attention, the distinct focus of time and the cognitive effort of the firm in a particular set of issues, such as problems, opportunities and threats, activities and organizational initiatives (OCASIO, 2011; OCASIO; JOSEPH, 2005). The search for sustainability may entail an opportunity for the organizations, as the companies seek to set themselves apart and obtain a competitive advantage in environmental and social strategies (TROAST et al., 2002).

In this regard, the SDG Compass Guide may help companies align their business strategies with SDG and help measure and manage their Contribution (SDG COMPASS, 2015). The SDG Compass Guide contains tools and knowledge to place sustainability in the centre of business strategy through the understanding of SDG, definition of priorities, definition of goals, integration and communication (SDG COMPASS, 2015).

Integrating sustainability to the heart of business and governance in incorporating sustainable development goals in all the company is essential to achieve the established intents. With a common strategic agenda and attention coherence, it is likely that different functional areas and business units will channel resources to shared opportunities or problems, so that the corresponding solutions will align with the corporation's interests and purposes (OCASIO; JOSEPH, 2018). This way, the companies may develop a management strategy focused on impacts on SDG and the future.

Conclusions

As for the practical contributions brought by the study, it could be said that the building of unified materiality matrices for the segments of the Brazilian construction industry, verifying the SDG impacted by material aspects, serves as a direction, support and capacity building for actions by the industry in the search for sustainability. The matrices show the main points with which the industry must be concerned in order to be a bit more sustainable, helping companies improve their management with a view to achieving global sustainable development objectives and goals.

As for management, the study contributes to the Attention-Based View by showing how it is dynamic and may be inserted within a more current context in terms of global sustainability, since a manner is presented by which the Attention-Based View contributes to achieving SDG.

Furthermore, the materiality matrices created may help companies in the industry, of all sizes, including those that would not be able to develop their own materiality matrix, to explain questions that could generate value in the long run; identify and capitalize on business opportunities; coordinate sustainability and business strategies; build and improve the organization's corporate brand and reputation; and anticipate and manage change.

In the academic scope, the study contributes with a clear presentation of the discrepancy between the statements by companies, which include so-called sustainable actions in their reports, and those of specialists and scholars in the industry, who state that what is shown in the reports is not entirely true or not in fact something sustainable. This contrasting of statements helps identify the deficiencies of the Brazilian construction industry and bring to light aspects that the companies usually hide or omit. Furthermore, it is the first time that unified materiality matrices are created for the industry segments, presenting visually the main impacts of construction. The study contributed with the collection of information that is usually scattered, thus consolidating and disclosing data about Brazilian construction.

The study was also relevant for it analysed sustainability in the scope of organization and management of construction company, and not of projects and buildings, as is more common, and for showing potential innovations in business strategies related to sustainability that companies could adopt, such as the adoption of new technologies and tools; innovation of products; search for new materials and investment in research. The study is also innovative and new because it was devoted to understanding and analysing impacts caused by the Brazilian construction on Sustainable Development Goals which, having been disclosed in 2015, still represents a recent field for research.

The limitations of this research arise both from one of the methods used, which was focused on secondary data, and the small number of specialists interviewed and the fact that none of them works in construction or is part of the studied companies. Furthermore, the interviews were conducted near the year when the SDG were launched. Presently, both the SDG and the revision of the GRI have greater dissemination and scope. In GRI, gaps are being identified and the latest version, effective in 2023, already includes the SDG. The effect of these limitations in the results obtained may be considered as a sug-

gestion for future studies, in order to provide improvements to this research. An analysis is suggested both of the change in the relationship of companies with the SDG over the years and the effect of the GRI update process.

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Objetivos de Desenvolvimento Sustentável: o impacto de grandes representantes da construção brasileira

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Resumo: As grandes corporações causam os danos mais significativos, mas podem contribuir para alcançar os Objetivos de Desenvolvimento Sustentável (ODS) e suas prioridades globais. O objetivo desta pesquisa foi mapear os potenciais impactos relacionados aos ODS, analisando o setor empresarial da construção civil brasileiro, incluindo algumas das principais empresas brasileiras dos seguintes segmentos: construtoras, fábricas e cimenteiras, analisando seus relatórios de sustentabilidade de acordo com o modelo da Global Reporting Initiative (GRI). Foi identificado que apenas quatro entre os dezessete ODS não são diretamente afetados pelos aspectos materiais do setor de construção brasileiro. Por isso, foram feitas sugestões para a mitigação dos impactos causados, incluindo principalmente medidas governamentais de regulação e fiscalização, bem como medidas empresariais relativas ao modelo de gestão. Com base na teoria da Visão Baseada na Atenção, foram sugeridas contribuições aplicáveis ao modelo de gestão das empresas visando o alcance dos ODS.

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Palavras-chave: Objetivos de Desenvolvimento Sustentável (ODS); Desenvolvimento Sustentável; Responsabilidade Social Corporativa; Global Reporting Initiative (GRI); Matriz de Materialidade.

Objetivos de Desarrollo Sostenible: el impacto de los principales representantes de la construcción brasileña

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Resumen: Las grandes corporaciones causan los daños más importantes, pero pueden contribuir al logro de los Objetivos de Desarrollo Sostenible (ODS) y sus prioridades globales. El objetivo de esta investigación fue mapear los impactos potenciales relacionados con los ODS, analizando el sector empresarial de la construcción brasileño, incluyendo algunas de las principales empresas brasileñas de los siguientes segmentos: empresas constructoras, fábricas y cementeras, analizando su Global Reporting Initiative (GRI). Identificamos que solo cuatro de los diecisiete ODS no se ven afectados directamente por los aspectos materiales del sector de construcción brasileño. Por lo tanto, hicimos sugerencias para la mitigación de los impactos causados, incluyendo especialmente medidas gubernamentales en materia de regulación e fiscalización, así como medidas empresariales relativas al modelo de gestión. Con base en la teoría de la Visión Basada en la Atención, sugerimos contribuciones aplicables al modelo de gestión de las empresas orientadas a la consecución de los ODS.

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