Journal of Cleaner Production 181 (2018) 88–101

Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

Review

Mapping of the literature on social responsibility in the mining industry: A systematic literature review

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ARTICLE INFO

Article history:
Received 18 July 2017
Received in revised form
20 December 2017
Accepted 20 January 2018
Available online 5 February 2018

Keywords:
Corporate social responsibility
Mining industry
Bibliometric analysis
Systematic literature review
Content analysis

ABSTRACT

The discussion in recent years about the sustainability of the mining industry has emphasized its commitment to social responsibility as an emerging topic. In this context, this article aims to develop a mapping of the literature on social responsibility in the mining industry. In accordance, a systematic literature review approach was adopted and, grounded on a rigorous screening processes, 72 significant papers were selected for analysis from the ISI Web of Knowledge database. The paper provides a bibliometric analysis regarding this specific field and, based on a content analysis approach, highlights a growing interest by the academic community and identifies two key research streams: *i)* Relationships with local communities, and *ii)* CSR reporting. Cluster 1 shows that relationships with stakeholders are important to mining companies in obtaining relevant social performance, and in acquiring local legitimacy from surrounding communities; cluster 2 highlights the importance of the elaboration, dissemination and quality of social reports, particularly concerning credibility. The review also points to shortcomings identified in literature, which correspond to potential significant opportunities for future research, either quantitative, qualitative, action research or mixed in nature.

Contents

1. Introduction

In recent decades, faced with the phenomenon of globalization, a profound change has been seen in the business environment and

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https://doi.org/10.1016/j.jclepro.2018.01.163
0959-6526/

in the traditional way to do business, and society's attitude in general has also undergone significant changes. In this connection, there has been wide discussion of whether firms, particularly multinationals, make their profits while neglecting environmental and social questions (Edwards et al., 2007). There is consensus in the literature that the responsibility and functions of firms/multinationals should be adjusted to this new climate.

Therefore, at the centre of this debate is the concept of sustainable development, which for Bansal (2005) is development that satisfies the needs of the present without jeopardizing future generations' capacity to satisfy their needs too. Here, three basic principles were defined (Bansal, 2005): environmental integrity (related to not harming the natural environment); social equality/fairness (equal access to resources and opportunities) and economic prosperity (the productive capacity of organizations to provide individuals with a reasonable quality of life). Further, these three principles are translated, in practical terms, to another fundamental concept, corporate social responsibility. Among the countless definitions of social responsibility, the definition of Porter and Kramer (2002) was adopted, for whom this is a positive relationship between the environment and business opportunities, as well as the geographical and social context in which that business takes place. The justification for adopting this definition has to do with it being associated with other dimensions, specifically respect for ethical principles, codes of conduct, well-being and quality of life (social questions) and relationships with all stakeholders in implementing and disseminating good practices of social responsibility. However, these practices differ from one country to another, where institutional and cultural issues can be factors influencing how those practices are implemented and spread, and how relationships with stakeholders are managed. The differentiation of these practices is reflected in the literature, where empirical studies focus on just one region.

Arthaud-Day (2005) concluded that multinationals' growing interest in social, and also environmental, questions is associated with their great public exposure, and so the social impact implied by their operations has led them to focus more and more on social responsibility. Here, the mining industry is one sector with major public exposure, due to the social and environmental impacts brought about by exploiting mineral resources. This industry is considered strategic worldwide, and no less importantly, crucial to support many families living in the surrounding communities/regions, playing a significant role in regional and global economic growth.

Mining is important for the economy and employment, and has social and environmental repercussions globally and locally. This activity has specific characteristics related to its transitory nature, due to exhausting mineral resources and reserves and the strong environmental and social impact. The effects of that exploitation are seen as a threat to the natural environment and society in general. Faced with these impacts, mining company directors come under pressure to include measures of social responsibility in their management strategies, and to adopt a high degree of social responsibility in the countries they operate in, particularly in relation to the surrounding communities. In this context, the main challenge for this industry is to demonstrate it contributes to the well-being of the present generation and future generations, without harming the quality of life of any of them (Vintró et al., 2014). We can therefore expect the regular issue of reports on social responsibility and the formation of dynamic relationships with surrounding communities, among other stakeholders.

Nevertheless, although social responsibility is crucial for the extraction industry, little research has been carried out in the mining sector, where most concerns are held by multinationals, and where, despite the importance of this variable, literature on the subject is somewhat scarce (Turker, 2009); indeed, driven by leading authors such as Boiral (e.g. Boiral and Heras-Saizarbitoria, 2017; Boiral, 2016) and Kemp (e.g. Owen and Kemp, 2012; Kemp, 2010) approaching sensitive issues as stakeholders' involvement, reporting, sustainability performance, and company-community relations, among others, research in the field remains rather scattered with studies related to a specific geographical context, which justified the topicality of this article and its subject matter. It is therefore important to compile that literature systematically. In this context, this article aims to identify the most studied themes in the academic community regarding social responsibility in the mining industry, through a bibliometric review.

Following this brief introduction, the literature review, methodology, results and conclusions are presented.

2. Theoretical framework

The concept of CSR has been a much studied subject in recent years (Turker, 2009). Generically, this responsibility was defined as business's commitment to contribute to sustainable economic development, and also as the commitment to collaborators and their families, local communities and society in general, to provide a better quality of life (World Business Council for Sustainable Development Cross, 2004). Social responsibility includes: volunteerism, ethics, legality and economics, which are variables according to the type of business, and so society expects organizations to assume these responsibilities, demanding social commitment to all stakeholders (Carroll, 1979). The response capacity ranges from 'doing nothing' to 'doing much', i.e., depending on the strategy defined and how this is put into practice (Carroll, 1979). This author also indicated that the CSR concept has a brilliant future, as at its core lie citizens' fundamental concerns in terms of the relationship between business and society (Carrol, 1999). Certainly, organizations must continue to create economic value, but through creating social value. It is understood that value creation should be shared, although that sharing is more wide-reaching than CSR (Porter and Kramer, 2011). So the literature contains various definitions around the concept of CSR, but that of Porter and Kramer (2002) stands out as it shows this responsibility is a positive relationship between the environment and business opportunities, taking into consideration the place where activities are carried out.

For Prieto-Carrón et al. (2006) it is important to reconsider CSR, where initiatives in this connection should be heterogeneous, i.e., organizations have to adapt them to the specific characteristics of each country. This conclusion had already been reached by Blowfield and Frynas (2005), as the least developed countries require different solutions in terms of CSR, and so the authors criticize the homogenization of CSR practices.

The position of the above-mentioned authors fits the argument that globalization altered the business environment. Multinationals predominate, and therefore their strategies must take into consideration the social responsibility practices of the host country (Kolk and van Tulder, 2010). These authors also argued that they face difficult and complex decision-making processes, as they include economic, legal, social, environmental and ethical aspects. Mohan (2006) considered that global management of social responsibility depends on the strategies defined by multinationals, on definition of their internal processes, on the influence of regulations/norms/procedures and knowledge of the environment. Here, several studies deal with multinationals' strategy in various contexts, for example, the relationship between this and CSR and its impact (Guerras-Martín et al., 2014).

Finally, multinationals are seen as the driver of economic growth in developing and developed countries (Matten and Crane,

2005) and they have become crucial players in the field of CSR (Surroca et al., 2013).

Study of the relationship between multinationals and social responsibility (CSR) has shown that the transfer of voluntary environmental management practices between countries, with different regulations, generally means financial investment, greater alignment of values and added advantages for host countries. This means these practices strengthen the transparency, reputation and legitimacy of the multinational (Bansal, 2005), and also improve the relationship with stakeholders. No less importantly, for correct implementation of a social responsibility policy, this must be the result of interactive dialogue between all interested parties. This process assumes shared values which go beyond shareholders' interests. It is therefore understood that implementation of social responsibility policies represents a major challenge, as firms tend to adapt their policies to local policies, as a way to gain legitimacy, which leads to greater institutional distancing (Yang and Rivers, 2009). Social responsibility is therefore strategic for multinationals, as a great many of them operate in developing countries (emerging economies), where social factors are increasingly relevant, and where they can have an active role in improving conditions, since regulations in this respect and the respective monitoring are still at an early stage (Reimann et al., 2012).

Summarizing, multinationals are considered able to lead change, in the economic, environmental and social dimension, as they operate in various markets, a situation that allows them to make a simultaneous impact in different parts of the world (Bondy et al., 2012). Nevertheless, they face countless challenges, unlike local companies, usually being exposed to global pressure groups in both home and host countries (Aguilera-Caracuel et al., 2014).

Debates about social responsibility are particularly prominent in the mining industry (Hamann, 2004). These impacts are related to macroeconomic factors, environmental factors and social actions in the communities affected (Hamann, 2004). Faced with these impacts, mining company managers are widely confronted with the social responsibility practices their business should have, and their inclusion in strategic and operational management practices (Hamann, 2004), as this means benefits for the business in the short and medium term.

In this context, the Council of Mining and Metals (ICMM) committed itself to supporting sustainable development, which led to making institutional changes in countries' markets and governments and inter-sector collaboration, in this way increasing the sector's commitment to social responsibility (Hamann, 2004). This commitment is the reflection of the mining industry having a reputation to defend and build in society in general, which implies transparency and clarity regarding the values adopted, and requires it to show clear commitment to the principles of sustainability, which in itself represents a complex challenge (Cragg, 1998). Historically, mining has been seen as unsustainable, but if companies adopt a stance of being committed to ethics, the environment and social justice, besides the economic perspective, they will be in a condition to respond to this harsh criticism, in the same author's view.

This argument was corroborated by Cragg and Greenbaum (2002), who consider that mining directors should be socially responsible with regard to the other stakeholders, besides shareholders' interests (maximization of profit). From another perspective, this type of industry seems to be more focused on environmental rather than social sustainability, despite being likely to have duly formalized codes of ethics and conduct (Reichert et al., 2000).

However, with the growing public exposure of this type of activity, operators have demonstrated a tendency to include the social, as well as the economic and environmental, dimension in their company strategies (social responsibility), showing the possibility of reconciling these three dimensions (Schlett, 2012) and that negative impacts can be cancelled out in the future.

3. Research methodology

Considering the aim of this research, a systematic literature review approach was used which, according to Rowley and Slack (2004), facilitates the identification, assessment and interpretation of studies in a specific field, through examining and systemizing concepts, practices and theories. Indeed, corresponding to the analysis of the relevant literature on a specific field, literature reviews are, however, much more than a simple procedure describing a list of papers or looking for the best contributions. Value-adding reviews should be critical and evaluative reports, analyzing and synthesizing what has been published on a specific field, as well as exploring consistencies and inconsistencies observed in previous research, identifying thus gaps in literature, justifying further research efforts. Representing a first step in theory development, literature reviews aim to provide an in-depth report of research performed in a specific field. (Mentzer and Kahn, 1995). According to Seuring and Müller (2008), literature reviews generally pursue two main aims: *i)* to summarize current research by identifying patterns, themes and issues, and *ii)* to identify the conceptual content of the field, and to contribute to theory development.

Concerning the literature review development process, our study followed the framework proposed by Tranfield et al. (2003), who highlight three core stages for conducting a systematic literature review: *i)* review planning, *ii)* review development (articles selection and data synthesis), and finally, *iii)* results communication and dissemination.

Concerning research methodology, two further issues need to be addressed. First, we summarize how the searching process was conducted to identify relevant papers about social responsibility issues in the mining context. Then, we explain how the data analysis process was conducted.

3.1. Delimitations and the search for literature

Because a search strategy highly contributes to a methodical extraction of papers, it is critical to determine what terms will be used in the searching process, to identify the relevant papers and to determine how these will be specified during the search (Bandara et al., 2011).

In accordance, criteria used in the searching process, performed on March 31th 2017, for selecting relevant publications were the following:

- The articles were obtained from *Science Citation Index Expanded (SCI-Expanded), Social Science citation Index (SSCI)* and *Social Science Citation Index (A&H CI)* compiled by *Thomson/Reuters*, the online database of *ISI*, one of the largest repositories and frequently used in such research projects, which includes countless scientific publications and all bibliographic information about their authors, citations, journals and more. The search was made on the *Web of Science* without any chronological filter and only scientific articles written in English were considered.
- Because our aim in defining the searching key terms was to identify as many papers as possible, the search was carried out using "*mining*" and "*social responsibility*" as keywords on the "topic" field. Based on these parameters, 440 articles were obtained.
- In a second screening step, Web of Science "**categories**" where restricted to "*mineralogy*" *or* "*mining mineral processing*" *or*

"business finance" or "management", and "**research areas**" where limited to "*business economics" or "mineralogy" or "operations research management science" or "mining mineral processing" or "social sciences other topics" or "environmental sciences ecology"*. Applying these filters resulted in a final sample of 72 articles.

3.2. Data analysis and rigor of the research process

Based on the 72 papers retained for analysis, we followed two different sequential steps. First, after the corresponding metadata being imported into Microsoft Excel 2010, we performed a descriptive analysis of literature on social responsibility in the mining industry context, approaching issues such as year wise distribution, distribution by source title, distribution by authors, distribution by research fields, geographical focus, and citations. Next, we undertook an in-depth content analysis to address our main purpose, identifying and analyzing key research streams, reporting the state of the art of research on the field, and highlighting significant opportunities for further research directions. In order to identify the key research streams, we used the VOSViewer version 1.6.4 software for constructing and visualizing bibliometric networks, as suggested by Van Eck and Waltman (2010). For such a purpose, we followed a co-citation analysis approach.

According to Small (1973), co-citation analysis focusses on the frequency with which two papers are cited together, and the strength of co-citations deals with the number of times that two previous documents are cited together by a further document. The co-citation frequency between two authors reflects how a field knowledge structure is perceived by researchers (Gmür, 2003), and co-citation analysis may be used to map the core of literature within a specific field (Small, 1973). Briefly, the main goal of co-citation analysis is to identify the intellectual structure of a scientific knowledge field in terms of the groupings formed by accumulated co-citation trails in the scientific literature (Jeonga et al., 2014).

Considering the main aim of the research, the co-citation analysis was complemented through a content analysis approach. Previous studies have shown that content analysis is an appropriate approach to systematically analyse published research findings (e.g. Seuring and Gold, 2012; Neuendorf, 2002), especially for synthesizing the main research streams covered in literature, and for highlighting fields where additional research efforts are important (Spens and Kovács, 2006).

Content analysis is a research approach to the analysis of documents and texts that seeks to describe and quantify the manifest content of communication in terms of predetermined categories (Bryman, 2012), following a systematic approach, allowing replicable and valid inferences from texts (Krippendorff, 2012; Deacon et al., 1999).

Although content analysis is a systematic approach, it is still subjective, because several choices and interpretations have to be considered throughout the research process. Thus, because, research methodological processes have their limitations, we followed a structured and systematic approach to maximize the objectivity of the research process, according to several recommendations suggested by several researchers (e.g. Seuring and Gold, 2012; Tranfield et al., 2003; Cullinane and Toy, 2000). For example, reliability was addressed by ensuring that all steps of the formal analysis were conducted by two researchers. Moreover, to ensure validity, the development of this research project was followed up by other researchers, through mid-term public presentations, where they had the opportunity to comment and provide insightful suggestions.

4. Results

4.1. Descriptive analysis

According to the selection of articles to include in this study (72), the first article on this topic was found to be published in 1997 by van Dijk and Wilke in *Organizational Behavior And Human Decision Processes*, a journal of the 1st quartile from 1999 to the present day, with an impact factor of 2.805. The most recent one is by Boiral and Henri (2017) published in *Journal Of Business Ethics* of the 1st quartile with an impact factor of 1.837. Fig. 1 shows the evolution of publications from 1998 to March 2017, revealing that the peak of publications on this topic was reached in 2016, with 15 articles published.

Fig. 1 shows that 2016 was the most productive year for research on social responsibility in the mining industry, demonstrating that after the commitment made by ICMM, in 2004 (12 years later), the topic continues to be promising in terms of scientific research.

Concerning publications by country, Table 1 summarizes the 10 most productive geographical areas. In the ranking, Australia (32%) and Canada (25%) stand out. The percentages concerning these two countries are understandable as both are rich in natural resources, and the mining industry has a significant weight in the economy.

On the other hand, although China is the greatest producer of minerals and has a strategic position in the world market, research is still at an early stage (3%), which could suggest a line of future research, since this sector has a high impact in terms of social and environmental, as well as economic, matters. Consequently, China has invested in CSR to improve the international reputation of its mines given the high number of accidents occurring in recent years, and it would be interesting to give continuity to the study of legislation and dissemination of CSR in China by Dong and Xu (2016).

Regarding publications per author, Table 2 presents the 9 authors with most research on the topic. Findings highlight clearly two researchers (with four articles each) from Canada and Australia. Highly awarded researcher, and Canada Research Chair concerning internalization of sustainable development and organizations responsibilities, Olivier Boiral is a full professor and researcher at the Faculty of Business Administration (Université Laval) in Québec City (Canada), whose main research interests deal with environmental management, international management standards, social responsibility, sustainable development, environmental citizenship behaviors, and management of biodiversity.

Deanna Kemp is an international researcher at the University of Queensland (Brisbane St. Lucia – Australia), focused on the social dimensions of mining. She is also director of the People Centers of two research Centers [the Centre for Social Responsibility in Mining, and the Minerals Industry Safety and Health Centre), both belonging to the Sustainable Minerals Institute (SMI) at the University of Queensland.

Table 3 highlights the main research fields. Table 3 reveals that the research area with the greatest percentage of publications is *Business Economics*, whose articles have been quoted 883 times since 1998, highlighting once more the year 2016 with 216 citations. Among the 64 articles, the most cited (120 citations) is "Kapelus, P. (2002). Mining, corporate social responsibility and the "community": The case of Rio Tinto, Richards Bay minerals and the Mbonambi. *Journal of Business Ethics*, 39 (3), 275–296".

As observed in Table 4, the journal publishing most articles on social responsibility in the mining industry context is the *Journal of Business Ethics*; this is quite understandable, considering that CSR has a relevant relationship with ethical principles associated with management in mining activities.

Finally, Table 5 summarizes the 10 most cited articles from the

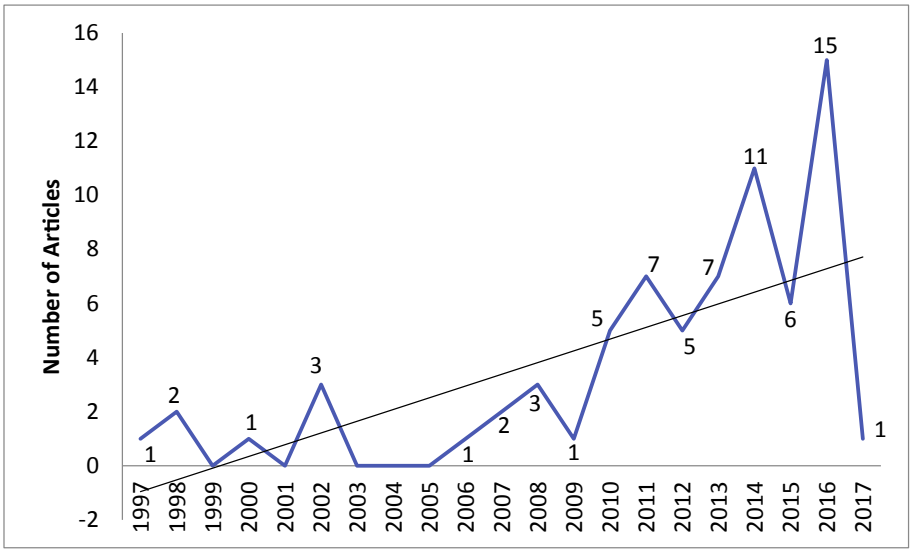

Fig. 1. Evolution of publications on social responsibility in the mining industry.

Table 1
Percentage of publications published by country.

Countries	Percentage of publications
Australia	32
Canada	25
England	14
United States of America	13
South Africa	6
Netherlands	4
New Zealand	4
China	3
Poland	3
Scotland	3

72 analysed. Kapelus (2002) appears as the most significant article, at least in what quotations concerns; indeed, the number of quotations (120) is three times higher than the number of quotations registered by the second article.

4.2. Cluster analysis

As can be observed in Fig. 2, the *Vosviewer*–based analysis highlights the existence of two distinct clusters. Fig. 2 shows the co-citation network of references resulting from the analysis. Two articles are co-cited if a third article cites both these publications; as a result, the strength of the co-citation relation between the two articles depends on the number of articles where both these two articles are co-cited. Based on the analysis of all the articles organized in each group, the two clusters were labelled as *i) relations with local communities*, and *ii) reports of social responsibility*.

These two key issues, highlighted through the *Vosviewer*-based co-citation network analysis, are discussed in detail below in the following pages: first *i*) relations with local communities and then *ii*) reports of social responsibility.

Table 6 shows the articles included in Cluster 1 (8 articles), highlighting the number of citations, the main objective, the nature of the study, as well as the main conclusions of each study.

Regarding the analysis of this cluster and the articles cited by the authors mentioned above, we found that these papers address emerging topics in the current debate on the role of mining industry in surrounding communities and, even in the host countries, this is, in the geographic context in which they operate. Hereafter, we summarize the main contributions reported in literature:

a) Consequences of mining activities at the tripartite level (economic, social and environmental)

Operating in diverse institutional contexts (in developed and developing countries), the mining industry faces significant and different environmental and social challenges, ranging from pollution to problems related to local communities, and has to adapt to various and different institutional structures and standards (Raufflet et al., 2014). According to these authors, the sector responds to such a challenge through the development and implementation of social responsibility practices. This opinion is corroborated by Dougherty and Olsen (2014) who pointed out that, since the beginning of 1990, extractive industries have increasingly valued social responsibility in surrounding communities, and this practice is seen as an effective policy and as a matter of survival (Hamann, 2004), as well as a source of synergies between business profitability and social issues (Dougherty and Olsen, 2014).

Therefore, as a supplier of raw materials for many industries (Vintró et al., 2014), mine exploitation has a critical economic and labor importance, as well as social and environmental repercussions at the global and local scales (García et al., 2010).

b) Critical factors inherent to the sustainability of the mining industry

Nevertheless, Vintró et al. (2014) pointed out that the effects of these industries are considered a threat to the natural environment, with environmental consequences on air, water and land quality. In fact, in the first decade of the 21st century there is a growing debate about mining activity and its sustainability, due to increasing public concerns about the environment degradation (Hilson and Murck, 2000). The main challenge for this specific sector is thus to demonstrate that it contributes to the well-being of the current and future generations, without compromising the quality of life of both (Vintró et al., 2014). However, the mining industry must adapt its current strategies or adopt new ones to cope with such expctations and to deal with the compatibility issue between its productive activity and the inherent environmental impacts (Gomero et al., 2004), as well as with social issues (Wheeler et al., 2002).

Table 2
Authors with most articles published.

Authors	No of articles	Article titles
Boiral, O.	4	Boiral, O., & Heras-Saizarbitoria, I. (**2017**). Managing biodiversity through stakeholder involvement: why, who, and for what Initiatives? *Journal of Business Ethics,140* (3), 403–421. Boiral, O., & Henri, J. F. (**2015**). Is sustainability performance comparable? A study of GRI reports of mining organizations. *Business & Society*, 56 (21), 283–317. Boiral, O. **(2016**). Accounting for the unaccountable: Biodiversity reporting and impression management. *Journal of Business Ethics,135* (4), 751–768. Boiral, O. (**2013**). Sustainability reports as simulacra? A counter-account of A and A + GRI reports. *Accounting, Auditing & Accountability Journal*, *26* (7), 1036–1071.
Kemp, D.	4	Owen, J. R., & Kemp, D. (**2012**). Assets, capitals, and resources: frameworks for corporate community development in mining. *Business & Society*, *51* (3), 382–408. Kemp, D., Owen, J. R., Gotzmann, N., & Bond, C. J. (**2011**). Just relations and company–community conflict in mining. *Journal of Business Ethics*, *101* (1), 93–109. Kemp, D. (**2010**). Community relations in the global mining industry: exploring the internal dimensions of externally orientated work. *Corporate Social Responsibility and Environmental Management,17* (1), 1–14. Kemp, D., Keenan, J., & Gronow, J. (**2010**). Strategic resource or ideal source? Discourse, organizational change and CSR. *Journal of Organizational Change Management*, *23* (5), 578–594.
Giford, B.	2	Gifford, B., Kestler, A., & Anand, S. (**2010**). Building local legitimacy into corporate social responsibility: Gold mining firms in developing nations. *Journal of World business*, *45* (3), 304–311. Gifford, B., & Kestler, A. (**2008**). Toward a theory of local legitimacy by MNEs in developing nations: Newmont mining and health sustainable development in Peru. *Journal of International Management*, *14* (4), 340–352.
Imbun, B.	2	Kepore, K. P., & Imbun, B. Y. (**2011**). Mining and stakeholder engagement discourse in a Papua New Guinea mine. *Corporate Social Responsibility and Environmental Management*, *18* (4), 220–233. Imbun, B. Y. (**2007**). 'Cannot manage without the significant other': Mining, corporate social responsibility and local communities in Papua New Guinea. *Journal of Business Ethics*, *73* (2), 177–192.
Kestler, A.	2	Gifford, B., Kestler, A., & Anand, S. (**2010**). Building local legitimacy into corporate social responsibility: Gold mining firms in developing nations. *Journal of World business*, *45* (3), 304–311. Gifford, B., & Kestler, A. (**2008**). Toward a theory of local legitimacy by MNEs in developing nations: Newmont mining and health sustainable development in Peru. *Journal of International Management,14* (4), 340–352.
Maroun, W.	2	Dube, S., & Maroun, W. (**2017**). Corporate social responsibility reporting by South African mining companies: Evidence of legitimacy theory. *South African Journal of Business Management*, *48* (1), 23–34. Hill, N., & Maroun, W. (**2015**). Assessing the potential impact of the Marikana incident on South African mining companies: An event method study. *South African Journal of Economic and Management Sciences*, *18* (4), 586–607.
Mzembe, A.	2	Mzembe, A. N.(**2016**) Doing Stakeholder Engagement Their own Way: Experience from the Malawian Mining Industry. *Corporate Social Responsibility and Environmental Management*, 23 81): 1–14. Mzembe, A. N., & Meaton, J. (**2014**). Driving corporate social responsibility in the Malawian mining industry: a stakeholder perspective. *Corporate Social Responsibility and Environmental Management*, *21* (4), 189–201.
Newenham-kahindi, A.	2	Selmier II, W. T., Newenham-Kahindi, A., & Oh, C. H. (**2015**). "Understanding the words of relationships": Language as an essential tool to manage CSR in communities of place. *Journal of International Business Studies*, *46* (2), 153–179. Newenham-Kahindi, A., (**2015**). Managing sustainable development through people: Implications for multinational enterprises in developing countries. Personnel Review, 44 (3), 288–407.
Owen, Jr.	2	Owen, J. R., & Kemp, D. (**2012**). Assets, capitals, and resources: frameworks for corporate community development in mining. *Business & Society*, *51* (3), 382–408. Kemp, D., Owen, J. R., Gotzmann, N., & Bond, C. J. (**2011**). Just relations and company–community conflict in mining. *Journal of Business Ethics,101* (1), 93–109.

Table 3
Publications by research field.

Areas	Nº of publications	% of total publications
Business Economics	64	88,9%
Social Sciences Other Topics	23	31,9%
Environmental Sciences Ecology	11	15,3%
Mining Mineral Process	8	11,1%
Metallurgy Metallurgical Engineering	3	4,2%
Psychology	3	4,2%

Next, Table 4 presents the main journals publishing the selected articles on this topic.

Table 4
Publications by journals.

Journals	Nº of publications	% of total publications
Journal of Business Ethics	22	30,6%
Corporate Social Responsibility and Environmental Management	7	9,7%
Accounting Auditing Accountability Journal	4	5,6%
Business Society	3	4,2%
Business Strategy and the Environment	2	2,8%
Cim Bulletin	2	2,8%
Engineering and Mining Journal	2	2,8%

Table 5
Citations by author/article (Top 10).

Authors/articles	No. of citations
Kapelus, P. (2002). Mining, Social Corporate and the Responsibility The Case of "Community": Rio Tinto, Richards Bay Minerals and the Mbonambi. *Journal of Business Ethics*, *39* (3), 275–296.	120
Rankin, M., Windsor, C., & Wahyuni, D. (2011). An investigation of voluntary corporate greenhouse gas emissions reporting in a market governance system: Australian evidence.*Accounting, Auditing & Accountability Journal*, *24* (8), 1037–1070.	44
Szablowski, D. (2002). Mining, displacement and the World Bank: A case analysis of compania minera antamina's operations in Peru. *Journal of Business Ethics*, *39* (3), 247–273.	42
Fonseca, A. (2010) How credible are mining corporations' sustainability reports? A critical analysis of external assurance under the requirements of the international council on mining and metals. *Corporate Social Responsibility and Environmental Management*, *17* (6).	41
Kemp, D. (2010). Community relations in the global mining industry: exploring the internal dimensions of externally orientated work. *Corporate Social Responsibility and Environmental Management*, *17* (1), 1–14.	37
Whitehouse, L. (2006). Corporate social responsibility: Views from the frontline. *Journal of Business Ethics*, *63* (3), 279–296.	37
Boiral, O. (2013). Sustainability reports as simulacra? A counter-account of A and A + GRI reports. *Accounting, Auditing & Accountability Journal*, *26* (7), 1036–1071.	33
Cragg, W., & Greenbaum, A. (2002). Reasoning about responsibilities: Mining company managers on what stakeholders are owed. *Journal of Business Ethics*, *39* (3), 319–335.	31
Gifford, B., Kestler, A., & Anand, S. (2010). Building local legitimacy into corporate social responsibility: Gold mining firms in developing nations. *Journal of World business*, *45* (3), 304–311.	29
Kemp, D., Owen, J. R., Gotzmann, N., & Bond, C. J. (2011). Just relations and company–community conflict in mining. *Journal of Business Ethics,101* (1), 93–109.	25

Fig. 2. Co-citation network of references (*Vosviewer*).

Table 6
Cluster 1 - Relations with local communities.

Authors	Citations	Objective	Type	Conclusions
Ballard and Banks (2003)	2	Review regarding development of the research begun by Godoy (1985), through anthropology.	Theoretical	The effects of mining activity need a contribution from anthropology to solve the various conflicts this generates.
Garvin et al. (2009)	2	To examine the perception of impacts of a gold mine in Ghana in its surrounding community and multinationals' commitment to CSR.	Empirical	Communities hold multinationals responsible for a number of economic, social and environmental changes, but also recognize some benefits brought by the mine. However, they demand greater commitment to CSR.
Hamann and Kapelus (2004)	2	To fill the gap in that aspects concerning social responsibility and mines remain to be solved (accountability and equity).	Empirical	Accountability and equity in mines are important to assess the impact of CSR.
Humphreys (2000)	2	To understand the strategic importance of community relations.		The main aim of mining is to create value for shareholders. However, the importance given to local communities gives a competitive advantage and makes the mine sustainable.
Idemudia and Ite (2006)	2	To analyse violent conflicts between oil companies and local communities.	Empirical	The absence of government intervention is one of the gaps that must be filled regarding CSR, to solve those conflicts.
Jenkins (2004)	2	To examine mining industries' reports, revealing their language and constructs to frame the industry's environmental responsibility, the local community and its role in possible conflicts.	Empirical	Need to better understand the complex nature of the communities where they operate, aiming to adapt suitably their strategies in this matter and thereby improve their relations with these communities and show they are socially and environmentally responsible.
Kapelus (2002)	2	How one of the largest mining companies implemented its social responsibility agenda in its subsidiaries in South Africa.	Empirical	There was some inconsistency in application of the multinational's policy in its subsidiaries, and it is still necessary to take more steps for effective application of social responsibility practices.
Tsang et al. (2009)	2	To understand reporting practices on investment in communities, performance and their impact, as well as whether they agree with the GRI guidelines.	Empirical	It is argued that companies have great difficulty in involving communities in their objectives. Very few reports present outputs and impacts of their investment in communities.

Thus, the relationship between sustainable development and the mining industry is still somewhat controversial because it is all about finite and non-renewable mineral resources and reserves (Vintró et al., 2014), with potential scarcity problems concerning future generations. The mining industry reputation, often questioned, can be thus improved through the adoption of social responsibility management systems (Driussi and Jansz, 2006). As stressed by several researchers, such as Sánchez and Atienza-Sahuquillo (2010), this reputation can be strengthened positively if these industries promote voluntary environmental practices, which go beyond legislation compliance, and thus achieving greater sustainability and competitive advantages. Thus, it is crucial

for these businesses to follow a proactive long-term environmental and social strategy, which should be based on the continuous reduction of environmental conflicts and on the creation of knowledge for future generations (Aragón-Correa and Sharma, 2003).

This means that the industry must continue to demonstrate a positive attitude toward changes that this criticism implies at the tripartite level, in order to ensure that society in general is aware of its contribution to global sustainability (O'Faircheallaigh, 2015). In such a context, It is clear that environmental and social are the most critical dimensions (Yakovleva and Vazquez-Brust, 2012), which have led to several significant investments in these areas (Reichert et al., 2000), where efforts have been developed to balance these dimensions with the economic one, to allow a sustainable economic growth of host countries (Keenan et al., 2016); as a result, companies have been suffering constant external pressures, such as from local activist groups (Mzenge and Meaton, 2013).

Finally, legitimacy is also considered as a critical factor in this industry, especially the external legitimacy (Claasen and Roloff, 2012), associated with an ongoing commitment to CSR vis-à-vis stakeholders who, considering the organizational changes these companies have developed concerning their commitment to CSR (Kemp, Keenan and Gronow, 2010), are already beginning to recognize that the extraction of mineral resources may be consistent with global sustainability principles (Cragg, 1998; Littlewood, 2014; Schlett, 2012).

c) Specificities of surrounding communities and their influence on the mining industry

Relations with the surrounding communities of mining operations are something implying that companies must understand the perspectives of these communities, allowing the creation of an ongoing dialogue, and a mutual understanding between both parties (Kemp, 2010). In this sense, the strategic models adopted by these industries have to take into account local specificities of the host country, to allow the so-called local, social and even environmental legitimacy by addressing the concerns of surrounding local communities (Gifford and Kestler, 2008). Such a local legitimacy can be gained through social investments in these communities, regarding both tangible and intangible resources (Owen and Kemp, 2012), as a way to cope with the sustainability challenge (Gifford et al., 2010). The effectiveness of these investments in local communities can be measured by the economic development of the region where they are located, as well as by the existence of strategic partnerships between mining companies and local organizations (Esteves and Barclay, 2011). It means that mining companies need to consider changing the nature of their relation with local communities (institutional and informal dialogue) (Mayes et al., 2013), and to identify vulnerabilities concerning the negative impacts of mining operations (Owen and Kemp, 2012); nevertheless, it is important to know the phase of the life cycle in which the company is (Mzembe, 2016). Overall, it is still crucial to understand that environmental and social impacts are systemic in the mining life, and thus have to be systematically addressed and included in companies' strategy (Humphreys, 2000).

Moreover, linguistic, cultural and institutional barriers that mining companies face in host countries have implications in their relations with local communities, and it is important to remember that the adoption of a common language is important to confer the desired local, social and environmental legitimacy (Selmier et al., 2015), and allows communities symbolic power by their integration into CSR management (Dougherty and Olsen, 2014; Newenham-Kahindi, 2015), and to recognize that there is an organizational commitment (Dobele, Westberg, Steel and Flowers, 2014). However, it is important that local communities understand that the exploitation of mineral resources may have a positive impact both on the quality of life (Lauwo et al., 2016; Viveros, 2016), and on the economic activity (Buultjens et al., 2010; Rifai-Hasan, 2009).

According to Kemp et al. (2011), relations with stakeholders, in particular with local communities, can be a source of conflict, specifically in terms of resources, risks, impacts, benefits involved, and thus, there is an emerging need for some global standards; the same authors argue that local communities, as well as other stakeholders, have growing expectations concerning the hope that these industries will translate into reality their commitment to social responsibility, which has been corroborated by other authors (e.g. Dougherty and Olsen, 2014; Li et al., 2012); this social commitment is an effective way for these industries to obtain local legitimacy.

d) Management of stakeholders expectations

The management of stakeholders' expectations is the key to relationships between companies and communities (Garvin et al., 2009; Humphreys, 2000; Jenkins, 2004) and any change has to be active rather than passive in relation to its effects on the environment (Hamann and Kapelus, 2004), since value creation is shared simultaneously by shareholders and other stakeholders (Biggemann et al., 2014). However, the materialization of these shareable values depends highly on organizational changes, reached with the collaboration of stakeholders (Gunarathne et al., 2016).

Therefore, mining industries' strategy should support the creation of sustainable long-term value for all stakeholders, allowing companies to obtain significant competitive advantages (Lorenc and Sorokina, 2015). Furthermore, researchers also argue that such value should include human rights (McPhail and Adams, 2016), and labour rights (Jones et al., 2007) as an integral component of social responsibility.

In summary, this first cluster addresses the present and future of sustainability in the mining industry, in a context characterized by the negativism associated with these exploration activities, as well as the importance of relationships with stakeholders, especially surrounding communities.

Cluster 2 - Reports of social responsibility.

Table 7 shows the articles included in Cluster 2 (8 articles), highlighting the number of citations, the main objective, the nature of the study, as well as the main conclusions of each study.

Considering that the value creation in these industries is common to all stakeholders, through the adoption of a sustainable strategy, evidencing the commitment to CSR best practices, the dissemination of information concerning these activities turns crucial (Lorenc and Sorokina, 2015). In this context, several key topics have been emphasized in the extensive literature on social responsibility reports, from which the following stand out:

a) CSR strategy versus social responsibility reports

The dissemination of social reports by large companies, particularly mining companies, has been a distinctive issue for sustainable business strategies, considering stakeholders' growing expectations, the need for a proactive and positive response to negative impacts of exploration activities (socially and environmentally) (Sethi et al., 2016), as well being considered a way for neutralizing these impacts through the way information is communicated (Boiral, 2016).

Moreover, if there is interaction between the various global and local institutional agents, information reporting will tend to be

Table 7
Cluster 2 – Reports of social responsibility.

Authors	Citations	Objective	Type	Conclusions
Cho and Patten (2007)	2	Crossing of environmentally-aware and non-environmentally-aware industry groups and how the information is reported.	Empirical	In general, they argue that issuing reports with environmental information is used as a tool to gain legitimacy.
Clarkson, Li, Richardson, & Vasvari (2008)	2	To assess the extent of discretionary announcements in reports on environmental and social responsibility.	Empirical	There is a positive relationship between the type of announcement of environmental information and its performance.
Dando and Swift (2003)	2	To fill the existing gap between the type of information announced by multinationals and by other organizations in relation to environmental performance.	Theoretical	There is a need for universal standardization of the contents of reports on performance, to ensure the credibility of social, ethical and environmental information in reports issued.
Deegan et al. (2006)	2	To document a study in Europe and the United Kingdom about the three dimensions of social responsibility regarding the reliability of information provided in reports.	Empirical	The results indicate great variability and ambiguity inherent to these reports, in their contents regarding stakeholders' interests.
Moneva, Archel, & Correa (2006)	2	To analyse the sustainable development approach adopted by the GRI and its guidelines, checking its potential impact on companies' reports and the effects on their content.	Theoretical	The existence of standardized guidelines is not enough to be able to rely on companies adopting a stance of social responsibility. The reform carried out in this respect needs monitoring and assessment to be able to conclude on effective actions of social responsibility.
Owen et al. (2000)	2	To provide a critical assessment of current developments in a new form of auditing, social auditing.	Theoretical	Although it is important, duplicity of roles and monopolization of assessment by auditing companies can arise, and control should be exercised by public/government entities.
Owen (2008)	2	Critical review of the literature on social and environmental accounting, with particular reference to the role and contribution of *Accounting, Auditing & Accountability Journal.*	Theoretical	Much research studies the determinants and motivations of management underlying initiatives to report information in these areas. However, there should be some articulation between social movements and companies, and the latter should work directly with all stakeholders.
Peck and Sinding (2003)	2	To examine efforts to issue voluntary reports on environmental matters, besides those considered traditional, by companies, particularly mining ones.	Empirical	Reports are still not completely standardized, nor is there a totally effective policy on communication. Besides, this dissemination is greatly related to government regulations.

voluntary through an isomorphic positioning, in which such voluntarism is understood by stakeholders as a strategy and a real commitment to the tripartite sustainability of the mining industry (Dashwood, 2012).

b) Credibility/legitimacy of social reports and heterogeneity/ambiguity of their content

Fonseca (2010) analysed the credibility of reports of companies member of the International Council on Mining & Metals (ICMM), and concluded that these reports are, in fact, characterized by some control and credibility, although according to several authors (e.g. Deegan et al., 2006), more rigor and control are still needed. Indeed, the veracity, integrity, precision and transparency of the information contained in these reports is still far below what would be wished, due to the scarcity of information and models that could allow a systematic comparability (Sethi et al., 2016).

In this regard, after severe criticisms directed at industrial mining operations from environmental/social groups in the 1990s, ICMM emerged from the Mining, Minerals and Sustainable Development project (multi-stakeholder research initiative) in 2001, representing more than 20 mining and metals companies as well as more than 30 national and regional mining and global commodity associations. To “catalyse change” and strengthen the mining and metals industry contribution to sustainable development (Hodge, 2013), ICMM launched its Sustainable Development Framework (SDF) for establishing standards of conduct for member companies (10 compulsory principles for sustainable mining operations), addressing issues such as ethical business practices, integration of sustainable development considerations within decision-making process, respect of human rights, customs and values, risk management, continuous improvement, health and safety, environmental conservation, communities' social, economic and institutional development, and reporting. Moreover, ICMM' members are also required to report annually their performance in accordance to Global Reporting Initiative guidelines.

Although ICMM's sustainable development framework corresponds to one of the most significant opportunities to demonstrate the effectiveness of an industry-based framework for sustainable development, with far-reaching consequences for the industry's economic and financial health (Sethi and Emelianova, 2006), literature points to a general common position on *i)* the idea that SDF′ operationalization, as initially envisaged, falls short of meeting the minimum level of commitment to allow reaching public acceptance and credibility, and *ii)* the need to take further and more difficult steps toward a more meaningful operationalization/implementation of the framework (e.g. Sethi, 2005). Overall, it seems reasonable to believe ICMM′ authority will continue influencing CSR decisions of mining companies towards sustainable development outcomes (Dashwood, 2012).

c) Standardization in the preparation of reports, as well as in monitoring and evaluation processes

In addition, more rigor in CSR reporting, for example through standardized regulation (understood as a key driver), would probably lead mining companies to adopt more likely good social responsibility practices (Mzenge and Meaton, 2013). Latridis (2013) also highlight the high quality of audit reports from big 4 auditors or cross-listed on foreign stock exchanges, stressing that these reports improve investors' perception, especially in the mining industry.

Nevertheless, although the growing use of very demanding and detailed standards (e.g. the Global Reporting Initiative - GRI) has reinforced the prevailing optimism about the relevance, rigor and relative transparency of sustainability reports, Boiral (2013) argue that these standards should be questioned and evaluated externally. Referring to GRI, de Villiers and Alexander (2014) consider that these reports suffer isomorphic pressures from the institutional environment and the surrounding market environment, meaning that the guidelines of the Global Sustainability Standards Board (GSSB) can be clearer and more effective if they are under a normative isomorphic pressure, but always subject to an external evaluation, because managers can manipulate their social

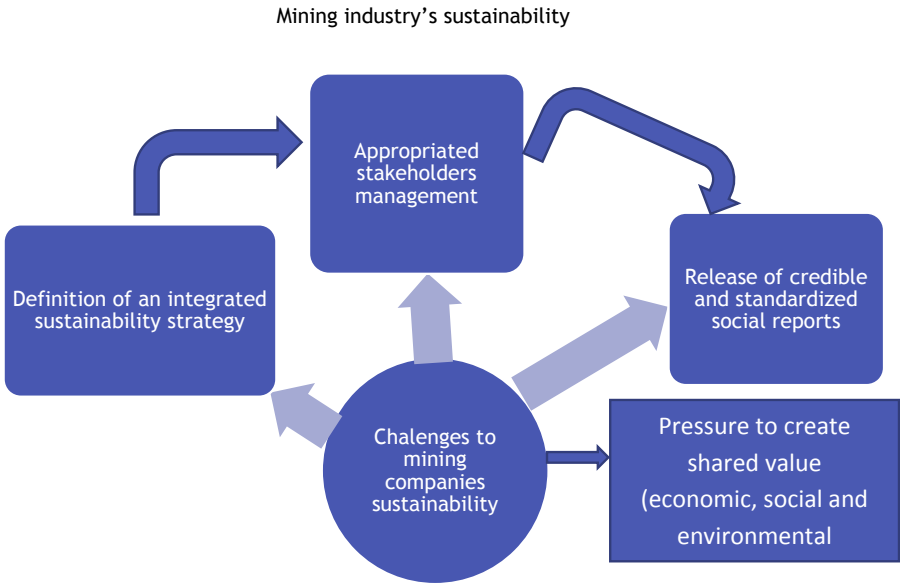

Fig. 3. Mining industry's sustainability.

responsibility information to adapt them to these standards, and it is difficult to make comparative studies about performance in a credible way (Boiral and Henri, 2017). Indeed, Boiral (2013) argue that disclosed sustainability reports are unreliable because they are likely used to disguise the real problems inherent to the activities of this industry, and thus their evaluation and monitoring by independent auditors is crucial to ensure credibility and confidence, in line with the arguments of other researchers such as Grandy and Mills (2004), or Macintoshet al. (2000).

d) Role of the State

Externally, mining industries have to comply with the legislation in force in the country where they operate (Peck and Sinding, 2003) to satisfy interested parties (Vintró et al., 2014). However, to allow a greater analytical precision regarding CSR strategies' implementation and effectiveness of results, a link must be ensured between private and state regulation, avoiding fragmentation between both (Marques, 2016).

Summarizing, this second cluster addresses the legitimacy granted by CSR reports' disclosure to all stakeholders (Cho and Patten, 2007), the standardization and dissemination of these reports (Clarkson et al., 2008; Dando and Swift, 2003; Deegan et al., 2006; Moneva et al., 2006; Peck and Sinding, 2003), and the importance of auditing for higher transparency and credibility (Owen et al., 2000).

Fig. 3 summarizes the main issues discussed in this cluster analysis section, highlighting that mining companies must rethink their vision, mission and business strategy in order to cope with the challenges to their sustainability.

It means that sustainability, materialized by the implementation of a CSR policy, would allow the desired internal and external legitimacy to be obtained and maintained and thus ensuring the so-called social license to operate (continuity of long-term operations), enabling that societies become increasingly sustainable.

4.3. Contributions and agenda for future research

4.3.1. Contributions

One of the contributions of this study is to highlight that the mining industry has to implement social and ethical responsible practices, in addition to environmental ones, in order to positively manage its negative impacts on local communities and to disclose true information about its sustainable performance, as a way to demonstrate that companies pursue a sustainable activity. Obviously, as most of the mines are owned by multinationals, it is up to these to respond to such a challenge by applying an integrated CSR strategy, with the appropriate adaptation to the host country specificities.

Another contribution concerns the elaboration of a descriptive mapping of the literature on this subject, highlighting the two main issues that have raised the interest of the academic community. This systematic literature review allowed a general picture concerning the state-of-the-art in this field, identifying and analyzing the relationships between mining explorations and the surrounding communities, who are a crucial stakeholder for their continuity, as well as, the appropriate disclosure of sustainability reports to the interested parties (social reports) as a way to manage and respond positively to stakeholders' expectations in general.

Finally, this literature review allows to highlight issues that continue to raise the interest of researchers, especially the most controversial, such as *i)* the need to balance the economic/market value of the mining activity desired by investors/shareholders, with other intangible values expected by other stakeholders, to ensure a co-creation value for the global sustainability chain, as well as *ii)* the importance of disseminating reliable and standardized information on social responsibility, to ensure comparability in the mining sector all over the world and to allow a systemic and continuous analysis, to allow that needed improvements are developed and implemented.

4.3.2. Agenda for future research

In addition to some research opportunities already referred throughout this review, in our opinion, several literature gaps have to be enhanced, because we believe that they correspond to important opportunities for future research directions:

- A first gap identified in this review that needs to be addressed with future research deals with the fact that most empirical evidence has been obtained in a limited number of geographical context (e.g. Canada, Australia, Africa), through single case studies, which in itself is generally recognized by several

researchers (e.g. Newenham-Kahindi, 2015), as a critical limitation for theory development, because this panorama does not allow the generalization of the results obtained. Although data collection for multiple case studies in different scenarios may be difficult, considering the particularities of the sector, potential results would represent a crucial contribution for a better understanding concerning the consequences of mining activities (positive and negative), the critical factors in relation to a tripartite sustainability, and how companies position themselves in relation to their surrounding communities in different institutional and cultural contexts.

- A second emerging research issue relates to reports on sustainable performance (economic, social and environmental). Although there is extensive research on these reports, under different perspectives, it has not yet been possible to measure and compare this performance through GRI reports (standardized indicators), and more research on this topic is required, as already highlighted by other researchers (e.g. Boiral and Henri, 2017). Moreover, there is a critical need to investigate whether the information and the extent of the information contained in these reports is credible, objective and transparent, that is, effectively reporting reality, or if they only disseminate an apparent information that transmits a positive image about the mining industry's commitment to social responsibility (reputation); this idea was already advanced by Boiral & Heras-Saizarbitoria study (2017), concluding that monitoring and evaluation of these reports is crucial (audit), and suggesting that future studies should only focus on audited reports. Furthermore, considering the findings of the study conducted in South Africa by Hill and Maroun (2015), future studies should approach how reports disclosure may influence the value of shares from multinationals holding mining explorations (geographically dispersed subsidiaries).
- Although there are already some studies on how boards' characteristics of mining companies can affect the adoption and dissemination of CSR practices (e.g. Kemp et al., 2011; Ntim et al, 2017; Trireksani and Djajadikerta, 2016), the influence of issues such as diversity, independence and women' quota is clearly under studied and needs further research, since such variables may impact decision making concerning social responsibility matters.
- Although approached in two previous articles (Keenan et al., 2016; Kemp et al., 2010), even if very superficially, the influence of gender emerges as an innovative and clearly unexplored issue, that needs to be addressed in future research on CSR in mining contexts, in order to assess the effects that women may have on the development and the implementation of CSR strategies, approaching themes as nature and strength of commitment, or communication processes, among others.

Briefly, the issue of CSR in mining contexts is still a fertile ground for future research, in particular concerning the social and environmental dimensions and the nature and strength of relationships with stakeholders.

5. Conclusions

Literature has been reporting a general view that CSR doesn't have a significant influence on environmental management or poverty reduction, and thus, CSR often appears to be associated with a minor contribution to communities' welfare. Moreover, mining industry is commonly linked to broken promises concerning local employment, environmental impact, economic development, quality of life, and overall welfare of host communities.

Indeed, this industry is important for countries (mostly in developing countries and emerging economies) in terms of their economic growth and, faces the harmful consequences that exploration processes may have on social and environmental issues concerning surrounding communities. Considering this context, mining companies have been continually questioned about their effective contribution to sustainable development, and, as a response, one of the alternatives progressively adopted is the development and implementation of policies grounded in social responsibility vectors, without obviously compromising their economic performance. As examples of such practices, we can highlight the investments made all over the world by this industry to provide local communities with the necessary infrastructure for improving the quality of life and well-being of their residents (social dimension), who are a crucial stakeholder. The adoption of a responsible environmental management that respects the norms of the international entities has also helped to improve the organizational image of these companies.

Nevertheless, the industry faces several different barriers, which can be institutional, cultural, linguistic, among others, and especially related to divergent stakeholders interests, because if on the one hand this activity is extremely important to generate wealth, on the other hand, surrounding communities suffer environmental and social consequences. As a result, the cross-perceptions about sustainability have been raised over time, and thus it is urgent for companies to find a balance between economic, social and environmental dimensions. For example, it is well known that there are several mineral resources in Europe that are not currently exploited, precisely due to institutional and legal barriers, because host countries impose social and environmental requirements, which make potential investments unrecoverable.

Potentially, in order to overcome the implicit negativity associated with the mining exploration, a different business vision may be imperative, due to changes in both internal and external environments, where social responsibility has become a priority for executives of mining companies. However, to ensure a practical feasibility, the business model must be based on the all value chain and not only on the economic dimension, human resources management must be proactive and incentive-based, information technology must be strongly emphasized, and a close collaboration with all stakeholders is needed. Sustainability lies upon safety at work supported by new technologies, an adequate energy and environmental management, and an adequate response to community interests and expectations; it means that mining explorations would be managed at all levels through an integrated information system (e.g. ERP), which would allow an interaction between either tangible or intangible assets used both inside and outside the mine, with a common commitment to present and future generations.

Nevertheless, environmental and social concerns are undoubtedly sensitive issues for mining industries, and stakeholder pressure is of paramount importance. In such a context, considering stakeholders' opposition to foreign direct investment in the mining sector concerning both the extent of environmental impacts and the largescale exports of unprocessed minerals without further contribution to domestic value creation, among other issues, mining companies are expected to provide evidence of their engagement with social and environmental issues to their stakeholders, especially because mining companies are frequently perceived as organizations characterized by a reduced engagement with stakeholders. This study contributes by reporting a systematic and structured in-depth overview of the state-of-art research on CSR issues concerning the mining industry context. Looking ahead, we believe that results presented in this paper involve some theoretical and practical implications that will benefit both academia and mining industry professionals, guiding researchers and

practitioners who are interested in conducting research approaching CSR issues in the mining industry context.

Our paper contributes to the sustainability literature by exploring the current literature on the mining industry. This research provides an additional dimension to the review literature on sustainability, focussing on a specific sensitive industrial context, identifying specific research trends and highlighting gaps in the current literature which open space for further research opportunities that need to be explored. Indeed, through this review, it is evident that during the next decade, the relevance of CSR in mining industries covered in scientific journals will keep increasing substantially, following the gradual evolution witnessed along the last decade, and that the mining industry remains an ambiguous field to investigate.

Concerning the main objective defined for this research, we may conclude that concerning social responsibility in the mining industry, great prominence has been given to relations with stakeholders (specifically with local communities) and reports dissemination on the industry's social performance. In addition to the idea that partnering with local government and civil society is a crucial issue for mining companies, literature also highlight the need for mining companies to assume a proactive behavior towards both social and environmental issues, either in searching for acceptable technological solutions, or in involving key stakeholders in social/environmental decision-making, in order to pursue a better collaboration, generally recognized as crucial for a sustainable integrated catchment planning. Moreover, because suppliers' CSR performance influences significantly clients' operational success, as well their organizational image, effective/efficient coordination efforts are expected between customer and supplier concerning several key issues such as expectations, monitoring procedures, oversight, and reporting, throughout the supply chain.

As easily understood, considering the main outcomes of this study, the research field explored is highly fragmented, lacks replication findings, and thus difficult a consistent cumulative growth of knowledge. For that reason, the issue of CSR in mining contexts represents a fertile ground for future research, in particular concerning the social and environmental dimensions, as well as the nature and strength of relationships with stakeholders.

Overall, findings of this systematic literature review suggest that while some progress has been made concerning sustainability management practices focused on minimising social and environmental incidences of mining activities, [eg standards ICMM] improvements are still needed in current practices, especially in what sustainability assessment and reporting concerns. For example, literature highlights that sustainability assessment and reporting initiatives in the mining industry have been progressing slowly, showing significant needs for improvements in managing sustainability concerns and further auditing measures (especially in developing countries), although few organizations are already found to be following leading sustainability reporting methodologies.

In fact, while leading companies in the mining industry are showing greater awareness of environmental and social challenges, integrating CSR into their mainstream business and looking for opportunities to collaborate within and across sectors on sensitive issues such as climate change, human rights, and poverty alleviation, it keeps remaining on the periphery for most of companies. Literature points to the idea that business processes/systems needed to manage the challenges of environmental, and that social performance has been developed at a slow pace; in addition, literature also highlights a special need for a higher integration of CSR issues into business strategy and operations, seen as critical for successful projects development and execution, and directed at ensuring a balanced trade-off between business competing priorities, as well as environmental and societal expectations.

As a result, climate change risks and opportunities, integrated reporting, regulatory concerns and the use of social media as a corporate communication tool in the mining industry are important issues that require the attention of researchers, and need to be addressed or expanded, among other critical issues. For example, literature point to the idea that regulatory emphasis towards growing demands for benefits sharing of resources extraction is now growing in the mining industry, and thus, besides commercial responses, companies' strategies, defined to cope with such pressures, will influence social license outcomes. Climate change risks and opportunities, including disturbance to operations, challenges to environmental management, challenges to employees' safety and health, supply chain management in general, and distribution routes in particular, among other issues of paramount importance; furthermore, as industries highly dependent on water resources (often point of contention between communities and industries), mining companies are facing increasing pressures towards a more sustainable water management, especially given critical phenomena such as climate changes or population growth, and thus such companies are expected to invest in innovative solutions in this area in the next future.

In addition, it is worth noting that there is a significant need for further international comparative studies which would help to better understand the global trends of such relevant issues for current and future generations.

Finally, it is important to highlight here that the current literature is essentially grounded on findings from studies focused on companies as unit of analysis; this review highlights that research should move beyond the corporate focus, exploring other stakeholders that play a key role in sustainability in the mining industry, and exploring how mining companies manage and engage their stakeholders. Such research focus would lead to a shift from a corporate perspective towards stakeholders' perspective, allowing a better understanding of their concerns.

Concerning this issue, since social and environmental issues involve complex modes of integration among stakeholders across different sectorial contexts and hierarchical levels, combining stakeholder analysis, with a rigorous social network approach would add value, generating complementary and fruitful results when investigating the role of mining companies and collaborative processes in multi-stakeholder networks. Indeed, based on the ideas that *i)* organizations operate within an external network of relationships, *ii)* networks provide advantages for some agents, and *iii)* networks evolve and are vulnerable to strategic actions (Rowley, 2017), a social network analysis would be a promising approach to study such collaborative and multi-level governance settings, because of its capacity to grasp structural patterns of stakeholders involved, allowing thus to address research questions that can't be explored properly through stakeholder analysis.

Although this review brings significant insights regarding the literature body on CSR issues in the mining industry, we still have to point out that because the search process in our review was restricted to the *Web of Knowledge* database, this could be considered a limitation. Nevertheless, including only the most influential, relevant, and credible articles, which have passed through rigorous evaluation processes, this is one of the most recognized scientific database in the academic community, and typically used in literature reviews. Moreover, comparing to the SCOPUS database, we observed that journals publishing in the field approached in this review are, in general, common to both scientific databases. As a result, in spite of such "limitation", we believe that we were successful in capturing the main key insights characterizing the scientific literature on CSR issues in the mining industry.

Acknowledgements

The authors are pleased to acknowledge financial support from Fundação para a Ciência e a Tecnologia (grant UID/ECO/04007/2013) and FEDER/COMPETE (POCI-01-0145-FEDER-007659).

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