

Original Article

Engagement strategies in the context of the Itabira mine closure: impacts and stakeholder participation

Estratégias de engajamento no contexto do fechamento da mina de Itabira: impactos e participação dos stakeholders

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ABSTRACT

Purpose: This article aims to propose and apply a set of analytical categories for evaluating engagement in mine closure processes.

Design/methodology/approach: The qualitative research adopts a case study strategy considering the singularity of the phenomenon studied. The mine project analyzed is the country's first large-scale closure, scheduled for 2041, with the potential to influence future processes. Data collection involved observation, documentary analysis, and interviews. Sixteen interviews were conducted with representatives from the public power, community, organizations, and the company. The research strategy chosen was content analysis using the analytical categories raised in the literature review and triangulation of data collection sources.

Findings: The results highlight the importance of the mining company's active role in constructing the city's post-mining future, collaborating to reconvert socio-economic dynamics, and fostering a trusting relationship with the community. However, the company remains distant from the debate. Interviews revealed a paternalistic relationship between the mining company that guides engagement in a predominantly unilateral flow, with communication directed to meet its interests.

Originality/value: This research fills a gap in the existing literature by focusing on engagement in a vulnerable context. It contributes to the theoretical advancement of the main characteristics of engagement in mine closure processes and for dialogue practices with communities to favor sustainable territory development in the post-mining period.

Keywords: Mining; Sustainable development; Stakeholder engagement; Mine closure

RESUMO

Objetivo: Este artigo tem como objetivo propor e aplicar um conjunto de categorias analíticas para avaliar o engajamento nos processos de fechamento de minas.

Desenho/metodologia/abordagem: A pesquisa de natureza qualitativa adota como estratégia a realização de um estudo de caso considerando singularidade do fenômeno estudado. Trata-se do primeiro fechamento do país em larga escala, previsto para 2041, com potencial de influenciar futuros processos. A coleta de dados envolveu observação, análise documental e entrevistas. Realizou-se 16 entrevistas com representantes do poder público, comunidade, organizações e empresa. A estratégia de pesquisa foi análise de conteúdo utilizando-se as categorias analíticas levantadas na revisão da literatura e a triangulação das fontes de coleta de dados.

Resultados: Os resultados ressaltam a importância de a mineradora desempenhar papel ativo na construção do futuro pós-mineração da cidade, colaborando nos esforços de reconversão socioeconômica e fomentando uma relação de confiança com a comunidade. Entretanto, a empresa segue distante do debate. As entrevistas revelaram uma relação de paternalismo da mineradora que orienta o engajamento em um fluxo predominantemente unilateral, com comunicação direcionada para atender seus próprios interesses.

Originalidade/valor: Preenche-se uma lacuna na literatura existente ao focar no engajamento num contexto de vulnerabilidade. Contribui-se para o avanço teórico das principais características do engajamento em processos de fechamento de minas e para práticas de diálogo com comunidades de forma a favorecer o desenvolvimento sustentável do território no período pós-mineração.

Palavras-chave: Mineração; Desenvolvimento sustentável; Engajamento de stakeholders; Fechamento de minas

1 INTRODUCTION

Considering the challenge of sustainable development, the mining industry is compelled to harmonize economic gains with environmental and social costs and benefits. Countries and regions with a strong mining tradition, such as Canada and Australia, have experienced economic and social growth thanks to the extractive sector. In this context, royalties, job creation, and social investments emerge as critical contributions from companies (Vivoda et al., 2019). However, it is crucial to note that mining activities often result in adverse socio-environmental impacts. Harm to local public health and the environment and issues of violence and displacement of traditional economic activities emerge as central concerns (Mancini & Sala, 2018; Vivoda et al., 2019; Yang et al., 2019). These concerns tend to intensify in the context of mine closures when economic benefits significantly diminish. Technological progress,

although essential for economic expansion, does not necessarily guarantee societal satisfaction and may amplify social risks and impacts (Dunbar et al., 2020; Fraser & Xavier, 2021). Thus, the need for a new business model that addresses technical, environmental, and social risks, especially in the context of mine closure, becomes evident (Galo et al., 2022).

To overcome these challenges, collaboration between industry, government, and civil society, whether organized or not, requires a deep understanding of the viewpoints of key stakeholders (Babi et al., 2016). Stakeholder theory acknowledges that value creation occurs when the interests of different stakeholders are considered and addressed. This, in turn, necessitates effective stakeholder engagement for realistic assessment and sustainable decision-making (Perdeli Demirkan et al., 2022). Community participation is crucial and is explicitly linked to obtaining a “Social License to Operate,” a pillar of Corporate Social Responsibility in the mining sector (Mayes et al., 2013). Effective engagement with local communities also presents itself as a promising source of long-term profit, given the range of opportunities that unfold when community engagement is achieved (Deveci et al., 2022). Therefore, promoting community engagement and establishing participatory governance of the territory in collaboration with the community and local government emerge as crucial aspects for socio-economic success during the closure of mining operations (Xavier, 2013). In this regard, partnerships between miners and communities are the backbone for achieving sustainable development that promotes community survival after mine closure (Zvarivadza, 2018).

However, the effective participation process faces a series of challenges, especially in contexts of vulnerability. For example, the concepts of social justice are public acceptability, equity, democracy, representativeness, transparency, and influence, among others. This concept concerns the perceptions of those engaged in the engagement exercise and the public and whether they believe the exercise was conducted honestly with the serious intention of collecting opinions from an

appropriate sample of the affected population and acting upon those viewpoints (Rowe & Frewer, 2005). Engagement mechanisms and how they are structured are not intrinsically “fair” or “unfair” – they become so by the intent of those who sponsor, organize, or participate in them and, therefore, by how they are enacted (Rowe & Frewer, 2005). Thus, among the various challenges to overcoming the individualistic perspective to achieve the social perspective of engagement, it stands out that the purpose of companies often prioritizes risk and reputation management over the effective building of relationships (Hurst et al., 2020).

More studies need to be conducted relating mine closure processes to social dimensions and community engagement, as recent Brazilian legislation prioritizes environmental aspects. The 2021 resolution from the National Mining Agency requires mining companies to present plans for restructuring territories and environmental liabilities generated during operations. However, it still focuses on environmental aspects, neglecting social ones (Resolução ANM No68, de 30 de Abril de 2021, 2021). The resolution emphasizes decommissioning activities, demobilization of temporary structures, and permanent structures’ chemical and physical stability, with monitoring during the post-mining period. However, it is limited in addressing the complex challenges of transforming mining legacies into sustainable development. Additionally, power asymmetry issues in mining territories hinder communities’ effective influence on decision-making processes (Demajorovic et al., 2019; Pimenta et al., 2021). Research in Minas Gerais state points to the emergence of “Mineral-Dependence” or “Mining-Dependence,” indicating the economic and multidimensional reliance of municipalities on extractive activities (Coelho, 2012, 2017, 2018; Dias & Oliveira, 2018a, 2018b; Fontoura et al., 2019; Milanez et al., 2019; Zhouri & Laschefski, 2010). This dependence perpetuates power and domination relationships in mining territories, marginalizing other forms of existence and resistance to mining.

The municipality of Itabira (Minas Gerais state) is an emblematic example of this reality. The country’s first large-scale mineral exploration project was implemented

in 1942, with operations scheduled to end in 2041 (Vale S.A., 2022). Mining in Itabira has caused significant environmental impacts and economic challenges. Large mining operations, such as those by Vale, have created local environmental and social issues, making economic diversification complex and increasing dependency on the mining sector (Guimarães & Milanez, 2017). Additionally, mining affects local public health, with studies showing that exposure to particulate matter generated by mining is associated with increased emergency visits for respiratory and cardiovascular diseases (Braga et al., 2007). Despite efforts to regulate the industry and promote sustainability, mining remains a dominant sector, causing ongoing disturbances that affect the community's resilience (Wasylycia-Leis et al., 2014). The eventual closure of mines poses additional economic and social challenges for the region.

Considering the impacts generated by the company and its economic prominence in the region over the past 82 years, it is essential to understand how the company has been implementing community engagement and participation strategies in its plan to close operations in Itabira. In order to contribute to filling this gap in the literature in the country, this article aims to propose and apply a set of analytical categories for evaluating engagement in mine closure processes. To this end, theoretical and practical aspects of engagement and participation processes are addressed, focusing on the context of mine closures and their impact on mining operations in Itabira, MG.

2 THEORETICAL FOUNDATION

Stakeholder engagement in the context of mine closures is widely acknowledged as a crucial indicator of the quality of relationships between mining companies and local communities. Various studies have emphasized the connection between stakeholder participation and the assurance of fair procedures, an idea supported by Bowles et al. (2019) and Zhao et al. (2020). Moffat and Zhang (2014) underscored the importance of procedural justice as a determining factor in building trust and acceptance of projects, an aspect directly tied to the foundations of the Social License to Operate (SLO). Cesare

and Maxwell (2003) highlighted the essential contribution of communities, governments, and other stakeholders in developing robust mining policies, especially concerning mine closures. This view is also endorsed by Odell et al. (2011), who emphasized communities' vital role in drafting mine closure plans and activities.

A common thread among the authors reviewed is that mining companies face increasing scrutiny and demands for transparency from communities, consumers, civil society, and authorities. This compels companies to demonstrate their commitment to sustainable development and the well-being of societies and the environment. This context puts pressure on more meaningful participation in decisions related to the future use of mined territories. Thus, a convergence of thought emerges among the various sources consulted, emphasizing the fundamental importance of local community participation in all phases of a mine's lifecycle, including closure (Bowles et al., 2019; Cesare & Maxwell, 2003; Odell et al., 2011; Vivoda et al., 2019).

There is also consensus among scholars that an effective and inclusive consultation process should encompass the entire lifecycle of the mine, extending beyond the closure phase (Bowles et al., 2019; Cesare & Maxwell, 2003; Everingham et al., 2018; Odell et al., 2011). Odell et al. (2011) emphasizes that mine closure plans should incorporate local communities' concerns regarding the population's well-being, including socio-economic and environmental aspects. This approach demands the development of specific indicators that reflect local conditions and reinforce the importance of participatory monitoring.

Identifying stakeholders is critical in the mine closure process (Cesare & Maxwell, 2003). Everingham et al. (2018) suggest that diverse representatives from local communities who may be affected by the closure and decisions about future land use should be included in deliberations. The empirical knowledge held by community representatives is also pointed out as a valuable resource, providing unique perspectives and insights for land management.

2.1 Characteristics of Engagement

A significant challenge in post-mining planning is identifying areas of consensus among engaged stakeholders concerning critical issues and concerns (Akbar et al., 2020). However, the context of engagement differs from the mandatory dialogue in the licensing processes for approval by the regulatory entity, where licensing criteria may or may not align with stakeholders' desires. Thus, discussing the duty of regulatory authorities to license a mining venture, whether it is its operation or its closure, is beyond the scope of this research. Pursuing SLO and the resulting engagement is a voluntary practice that may influence the regulatory process (Holley & Mitcham, 2016). Therefore, this research does not consider the regulatory process as a cause for engagement but rather as a business strategy to achieve SLO.

Rowe and Frewer (2005) argue that the engagement possibility space can be classified according to the direction of information flow, identifying three possibilities. They characterize "Communication" as the activities where the information originates from the entrepreneur and is directed to the public. Conversely, "Consultation" follows the reverse flow, i.e., information flows from the public to the entrepreneur. In both cases, the information flow is unilateral, where no formal dialogue occurs between the entrepreneur and individual members of the stakeholder group. Lastly, "Participation" is defined as a dialogue, or better yet, a *bidirectional flow* of information between the entrepreneur and the public. Henceforth, these combined concepts are termed engagement, and the methods aimed at enabling this are engagement mechanisms (generically) or engagement initiatives (precisely). Examples of mechanisms for dialogue include consensus-building meetings, municipal meetings, and voting activities, among others (Rowe & Frewer, 2005). This work considers the entrepreneur the primary economic agent leading or driving the engagement initiative.

The literature suggests three factors that are particularly significant for social acceptance: trust in mining, fairness of processes surrounding mining, and the strong

relationship between the company and the community (Mercer-Mapstone et al., 2018). Some research (Mercer-Mapstone et al., 2017, 2018) points out that trust between a company and its stakeholders lies at the center of the social licensing process and drives social acceptance. The main findings indicate that positive dialogue experiences by community members lead to stronger relationships with mining personnel, increased perceptions of procedural fairness, and, indirectly, trust and social acceptance of the mining industry (Mercer-Mapstone et al., 2018). High-quality engagement between communities and companies significantly increases trust and social acceptance (Moffat & Zhang, 2014). The process of seeking social acceptance differs from creating public and community acceptance for a project where the boundaries and objectives have been fully defined before engagement (Raman & Mohr, 2014). Often, engagement may engage advocacy-based communication, defined as persuasion-based communication aimed at stimulating acceptance of a viewpoint or favorable representation of an individual, organization, or idea (Edgett, 2002). However, from a pro-social perspective, engagement should be an interaction characterized by mutuality/reciprocity, mutual action, and effect, or the building of an ongoing relationship (Hurst et al., 2020; Johnston, 2018).

Social acceptance, therefore, requires a conceptualization of engagement at the societal level, where value is constructed through collective actions and outcomes (Johnston, 2018). Engagement from a pro-social perspective would see the entrepreneur engaging with a wide variety of stakeholders, willing to give up power, or at least try to overcome power dynamics, including those among stakeholders, and work to achieve mutual benefits with their stakeholders, or at least build ongoing relationships with them (Hurst et al., 2020). The tendency of communities to demand a more significant share of benefits and more engagement in decision-making has been stimulated by the growth of the sustainable development paradigm and governance changes that increasingly shifted authority from the government to non-state actors (Prno & Scott Slocombe, 2012). These changes have expanded the range of governmental actors, with civil society and market actors regularly sharing governmental duties with the state. Thus,

governance processes include negotiation, accommodation, concertation, cooperation, and alliance-building, instead of traditional processes of coercion, command, and control, where interaction emerges as a central component of the governance perspective, defined as a relationship of mutual influence between two or more actors or entities. Which governance models work best and in what combination, and how the model's effectiveness varies in different social, political, and economic contexts are specific areas that still require further investigation (Prno & Scott Slocombe, 2012).

Meaningful community engagement is an ongoing process throughout the mine's life cycle to ensure that local communities' concerns are heard and addressed. True collaboration, rather than just consultation, is critical to the successful mine closure recovery (Bjelkevik & Bohlin, 2021). Bjelkevik and Bohlin (2021) believe that stakeholders, communities, and regulatory agents need to be engaged from the initial planning process up to the point of responsibility transfer in post-closure. However, they ponder that this process is complex, despite being theoretically simple, mainly due to the lack of trust among parties, the history of unilateral communication flow (informative), and the need for clarity of responsibility among parties.

The broad scope of mechanisms for stakeholder engagement in closure planning does not imply consensus on effective means to implement them (Everingham et al., 2018). The most suitable mechanism should consider information management, legitimacy, social dynamics, and costs (Rauschmayer & Risse, 2005) or scope, representativeness, opportunity, comfort, convenience, and influence (Eiter & Vik, 2015). Nonetheless, improved trust in the outcomes of engagement in the closure process can be achieved if a collaborative process involving an expanded stakeholder group is conducted, aiming for a greater understanding of the factors that may influence this group's decisions (Everingham et al., 2018). Given the above, it is helpful to narrate some application models of mechanisms and their implications, which will be demonstrated in the next section. Table 1 below summarizes the various engagement categories and identifies the differences between the subcategories.

Table 1– Categories and subcategories of engagement in the mining context

(Continued)

Category	Subcategory	Description
Information Flow (Mercer-Mapstone et al., 2017; Rowe & Frewer, 2005)	Unilateral	Communication – Originates from the mining company and is directed towards the public. Consultation – Flows from the public to the mining company.
	Bidirectional	Participation – Interactive dialogue between the mining company and stakeholders. Transactional – Aims to build relationships with various stakeholders
Engagement Context (Cesare & Maxwell, 2003; Holley & Mitcham, 2016)	Mandatory Dialogue	Does not characterize as effective engagement. It engages fulfilling normative and legal obligations.
	Counterpart Dialogue	Given the negative externalities, the entrepreneur aims to demonstrate their contribution to the development of societies and the physical, social, and economic environment.
	Voluntary Dialogue	Does not consider the regulatory process as a driver for engagement but rather aims for achieving and maintaining SLO or SLC.
Engagement Scope (Hurst et al., 2020; Raman & Mohr, 2014)	Community Sectors Only	Attempts to create public or community acceptance where the objectives were defined prior to engagement with specific elements of the community.
	Variety of Stakeholders	Articulates various perspectives among local communities, other interested parties, and includes those seen as marginalized and vulnerable. It engages individuals who represent the diversity of local communities, potentially affected by closure and decisions regarding future land use.
Type of Engagement (Edgett, 2002; Hurst et al., 2020; Johnston, 2018)	Information-Based	Emphasis on persuasion through advocacy with selective participation of stakeholders to stimulate the acceptance of a viewpoint, or favorable representation of the organization.
	Dialogue-Based	Collective action, shared knowledge, or reflective or experimental interaction with a wide range of stakeholders in pursuit of mutual benefits or ongoing relationship building.

Table 1– Categories and subcategories of engagement in the mining context

(Conclusion)

Category	Subcategory	Description
Critical Elements of Social Acceptance (Cesare & Maxwell, 2003; Everingham et al., 2018; Mercer-Mapstone et al., 2018; Prno & Scott Slocombe, 2012)	Procedural Justice	The opportunity to have a 'voice' in decision-making processes is a central factor that people consider in the development of social justice perceptions.
	Trust	Trust serves as a driver for social acceptance. The construct can be captured using three factors: integrity, benevolence, and credibility.
	Strong Company-Community Relationship	Frequent face-to-face communication is central to building interpersonal relationships. The dialogue experiences of community members are positively linked to their perceptions of their relationships with company personnel, where the core is a mutually beneficial relationship, promise-keeping, and a sense of some control in interactions.
	Governance	Adoption of governance processes with the participation of private, public, and civil society entities that include negotiation, accommodation, conciliation, cooperation, and alliance formation, providing greater stakeholder representation in decision-making.

Source: Authors' own elaboration

3 METHODOLOGY

Considering engagement in mine closure as a phenomenon still poorly understood in the literature (Creswell, 2020), a qualitative approach was adopted to explore the social impact of mine closures, a phenomenon still poorly understood (Creswell, 2010). The research strategy was a single case study, as elaborated by Eisenhardt (1989), focusing on the closure of the Itabira mine, the first large-scale mine in Brazil, inaugurated in 1942 with the creation of "Companhia Vale do Rio Doce" (CVRD), currently known as Vale. The mine is scheduled to cease operations in 2041. Due to its location in an important mining region in the country and its economic impact, the closure of the Itabira mine will serve as a reference for other territories.

To identify the analytical categories that guided the field interviews, we use a systematic approach to identify relevant studies on stakeholder engagement in mine closure processes. A Boolean search was conducted on Web of Science with specific

keywords related to mine closure and correlated with the keyword Social. A total of 217 articles were identified. Subsequently, a new Boolean search was conducted relating the first search with the keyword engagement, and 27 articles were identified: Engagement AND (Mine Closure OR Post Mining Transition OR Closure Relinquishment OR Mining Downscaling OR Mining Decommissioning). Criteria of relevance and quality guided the selection of references, and the data were analyzed to establish the relationship with the specific context of the Itabira mine closure.

Data collection techniques engaged observation, document analysis, and interviews with key stakeholders, including public authorities and civil society organizations. The documents analyzed included Itabira's socioeconomic data from sources such as IBGE, Social Development Atlas, National Mining Association, and Firjan Municipal Development Index. Additional information was obtained through participation in the forums of the Economic Reconversion Project in Mining Territories, led by SEBRAE-MG.

In total, 16 interviews were conducted in August 2022, and the stakeholder groups that made up the sample are presented in Table 2.

Table 2 – Interviewees (n=16) divided by stakeholder segment

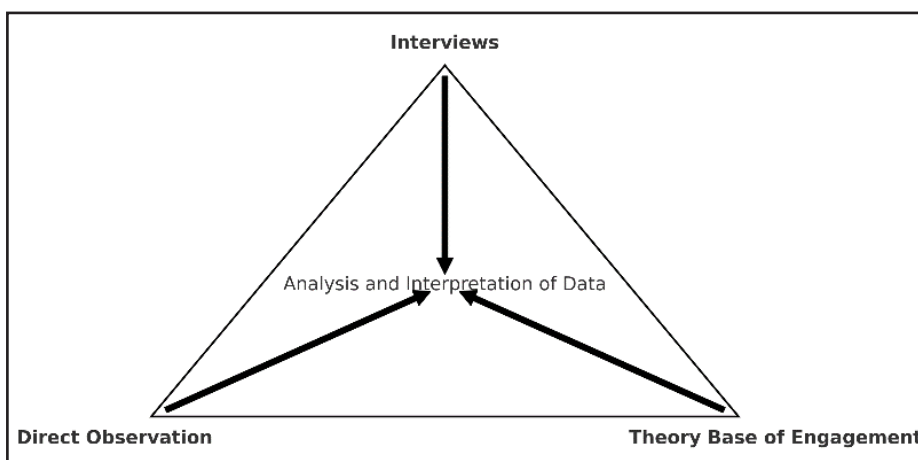
Area	Quantity	Interviewees
Public Authorities (PP)	6	PPE001
		PPE002
		PPE003
		PPL001
		PPL002
		PPL003
Community (SC)	4	SC001
		SC002
		SCEn001
		SCM001
Representatives of Social Organizations (SC)	5	SCE001
		SCE002
		SCE003
		SCS001
		SCO001
Company Representative (RE)	1	RE001

Source: Authors' own elaboration

The interviews, with an average duration of 60 minutes, were conducted by the principal researcher and a research assistant. The interviews used a script in which the elaborated questions allowed for a deeper discussion of the categories and subcategories proposed in Table 1. Thus, the questions focused on the community's perception of the flow of information between the company and the community, engagement strategies, and social acceptance of the mining project. The questions were formulated based on an exploratory qualitative foundation, allowing the interviewees to express their perceptions freely. The exploratory approach enabled interviewees to openly discuss their experiences and opinions, facilitating the collection of rich and detailed data on their perceptions and involvement with the community and the mining company. This methodology effectively captures the complexity of social interactions and the perceived impacts of mining on local communities (Zembe & Barnes, 2023).

The saturation technique proved suitable for determining the number of interviews conducted. The interviews were transcribed and divided into fragments by their five main categories, according to Table 1, using an Excel spreadsheet to facilitate the analysis. The data systematized in the interviews were triangulated with the documents and analyzed through a content analysis strategy, as shown in Figure 1.

Figure 1 – Data Triangulation



Source: Authors' own elaboration

Data triangulation involved comparing interview information, document analysis, and direct observation. Content analysis was performed following the steps proposed by Bardin (2010), which include pre-analysis, material exploration, and result processing. The categories were grouped using NVivo software, allowing for a more in-depth qualitative data analysis.

4 RESULTS

This section presents the results of a field study conducted in Itabira in August 2022, aiming to understand the local stakeholders' perceptions and experiences regarding Vale's engagement in the context of mine closures. Through interviews with local government representatives, civil society members, and the press, data were collected and subsequently analyzed based on previously identified analytical categories and subcategories in the literature review. The categories of information flow, engagement context, scope of engagement, type of engagement, and critical elements of social acceptance were used to categorize and analyze the interviewees' statements.

4.1 Information Flow

The interviews showed that Vale's communication regarding mine closures is predominantly unilateral, originating from the company and directed at the public and neighborhood associations. Interviewees highlighted that Vale sends representatives to participate in neighborhood association meetings, explaining initiatives and seeking community feedback. Vale's constant presence at these meetings was mentioned as a positive factor, allowing the company to gather direct information from residents and address their concerns. However, company participation often occurs through contracted consultancies rather than directly by Vale's community relations staff. Transcribed statements below illustrate this:

“They (consultancy hired by Vale) are going there a lot, they have meetings – I even thought they were from Vale, but they research a lot, they always go there (to the neighborhood associations) and ask, “how is it there, what is causing problems?” (...) Vale’s personnel are always in contact, attending our meetings (of the neighborhood associations), and provide explanations” (SCO001).

“Various things have changed, there was the (newspaper) Vale News, which later became (newspaper) Mapa da Mina, and ended up being (the newspaper) Vale News” (SCM001).

“Since last October, even before that, we have been working with a consultancy that Vale is funding for us, which is Arcadis, to structure exactly this plan, an investment plan. But a real plan, a plan where Itabira can become a showcase for a city that has reinvented itself, that has managed to reinvent itself. To survive well after the mining cycle” (PPE002).

4.2 Engagement Context

Interviewees discussed obligatory dialogue, suggesting that Vale is driven by regulatory and legal obligations to engage the community. Some expressed skepticism about the company’s intentions, raising questions about whether Vale is genuinely concerned about the city or merely fulfilling legal requirements. There were also mentions of studies commissioned by Vale, which, despite being inconclusive, were not continued. Furthermore, they criticized the lack of an effective plan for the mine closure process as required by law.

“I don’t know if it’s because Vale really cares about the city and Itabira, or if the public prosecutor’s office requires them to come (SC001)... what the city hall demands from Vale, they do comply” (SCEn001).

“If I drive around Itabira today, you see a lot of soccer fields, many courts, a lot of gyms, which were requested in this manner through conditions. I believe - I’m sure - that there was no study done, no public hearing; the community was not actually heard to say, ‘is this what you want for the city?’” (PPE001).

“They (Vale) took us (council members) to an auditorium first and started there in the auditorium showing Vale’s video, talking about Vale’s grandiosity, they kept talking (...) Then I said: let me ask you something: I have noticed in Itabira that – I have not seen a mine closure plan, for any of these mines. Legislation dictates that these plans must be updated every five years. Where are those for Itabira? Where are the updates? Because the law is clear. Then he started trying to divert the subject, and so on. (...) Then I realized that things started to get very uncomfortable because it wasn’t just that, I was bombarding with other things, then they decided (saying), ‘no, let’s go for a walk, let’s get out’” (PPL003).

The lack of an effective plan for mine closure is counterbalanced by specific projects that contributed to the construction of a positive vision of the company and its importance in providing complementary services. Respondents mentioned infrastructure construction, such as sports courts, hospitals, and educational centers, as tangible company benefits. Even so, the interviewees understand this protagonism of the company as unfavorable, as the company succeeded in developing a paternalistic relationship between the mining project and the community over time. In addition, for some respondents, these projects cannot be considered an effective dialogue with the population but a way for Vale to serve its interests and reduce community conflicts.

“Vale had this habit, this foundation, of building houses as well, not just walled luxury ones, but for housing. So much so that Itabira still has several neighborhoods with houses built by Vale. For example, Campestre, Vila Armênia, Bela Vista has a sports gym there. A product of Vale... So, I think that all major projects in Itabira have significant participation from Vale” (SC001).

“Until I was 14, there was an option which was SENAI, a vocational course, maintained by Vale, it was an opportunity for every person from Itabira to wear the ‘marronzinho’, the ‘Joãozinho de Barro’, which was the old uniform” (SCE002).

“We always lived based on what Vale brought to the community. So, before, Vale, even before being privatized, we had vacation colonies, toys, scholarships” (SCEn001).

Respondents indicated that Vale often initiates dialogue with the community voluntarily. Although this initiative was pointed out as a positive aspect, comments also suggested that the dialogue is only sometimes as open as it appears. Some participants believe that Vale could improve the quality and effectiveness of their interactions with the community, promoting a more genuine and constructive dialogue.

“It’s usually them (Vale) who seek out (neighborhood associations)... We (neighborhood associations) don’t even get a chance to call them because they are always there” (SCO001).

“I think the way Vale communicates with communities affected by mining needs a lot of improvement. They have the capacity for it; they have excellent professionals. I’m not saying they don’t relate well, they are excellent professionals” (PPL002).

4.3 Engagement Scope

Opinions on Vale’s engagement with the community varied, with some respondents noting a positive shift in the company’s approach over the years. However, criticisms were raised regarding Vale’s history of lack of engagement and the perception that the company only recently began to engage with the community. Interviewees emphasized that Vale needs to be more engaged in shaping Itabira’s post-mining future.

“For a long time, Vale remained closed off and did not engage with the community; this has radically changed in recent years, but they’ve been here for 80 years, so there’s that negative point which was their lack of participation in previous times” (SCE001).

“All the demands the community made, all the points the community raised, there were seven representatives from Vale and their answers were: ‘that’s not up to us’, ‘we have to consult before speaking’, ‘we need to check that’. Those were the answers” (PPL003).

Various voices were heard in the interviews, highlighting the importance of representing a range of perspectives in discussions about mine closure. Respondents

emphasized the need to include traditional stakeholders and marginalized and vulnerable groups. The community expressed the expectation that Vale would play an active role in ensuring the dialogue connects all segments of society.

“We’re fighting to bring this discussion about mine decommissioning, which for us (society), we understand that it should already be discussed in Itabira, the law says it’s five years before the end, but that end has already come – Cauê has exhausted its resources” (SCM001).

“And it had to be participative; it had to engage the Itabira society” (SCM001).

4.4 Type of Engagement

Respondents acknowledged that Vale often seeks to persuade the community through information and arguments. They highlighted that the company usually presents videos and materials emphasizing Vale’s positive contribution to the city. However, there was also a perception that Vale might tailor communication to promote its image rather than foster open and balanced dialogue.

“Vale’s interaction with the community is just for show, right. They only focus on what interests them” (SCM001).

“Vale is a giant, and it’s a giant that contributed to making Itabira the way it is now, also a giant, but dormant, you know? A massive unexplored potential because the way they allow entity managers, the population - it’s persuasive, it’s like they’re giving, but they’re taking away” (PPL001).

“And it’s that old thing, isn’t it, the old blackmail (in the public hearing with the community): either you let us raise the dam or mine. And then, if I (Vale) stop mining, you (community) stop getting resources. And then it snowballs, right?” (PPL003).

Although there were mentions of dialogue attempts, some voices expressed that the dialogue proposed by Vale could be more effective. Respondents demanded that the company be more engaged in the city’s socioeconomic reconversion efforts and share their knowledge and expertise.

“What I say, the challenge is this, Vale should be close to this project (of socioeconomic reconversion coordinated by SEBRAE) and genuinely be a part of it, not just with money, but not just by paying the consultant, but with its history, with its expertise, with its vision, with its participation. Vale needs to be a part of this, not just with money” (PPE002).

4.5 Critical Elements of Social Acceptance

The respondents recognized the importance of participative governance and the inclusion of various stakeholders in decision-making. Vale was identified as a central actor in this process, with the expectation that the company should not only fund initiatives but actively act and participate in this process along with public authorities and other institutions. The need for a trusting relationship between the company and the community was emphasized, highlighting the importance of Vale’s integrity, benevolence, and credibility. However, most interviewees saw the company’s effective participation as mistrust. Many respondents mentioned the company’s distance from the economic reconversion project conducted in the municipality by Sebrae. The level of participation from the representatives in the Economic Reconversion Forum could be much higher.

“I understand that the initiatives where we can perceive longevity and that will bring benefits to the municipality, Vale needs to provide support, give incentives, not necessarily financial energy, but consultancy, bring a way to help public authorities and civil society to see the possibilities, even helping in some type of negotiation” (SCE001).

“But I say for this process in which Itabira prepares for turning the page, economically, diversifying (post-closure), Vale is fundamental because of its capability and potential. Vale has to help us in this process, along with, of course, public authorities, entities, institutions, as Sebrae has been doing through the Productive Reconversion project. But Vale necessarily has to be an actor. One of the main actors in this process” (PPL002).

“No, they don’t. Although Vale, whenever they are summoned, are invited (for meetings), for example, by this forum (of economic reconversion) to participate in the meetings, to listen to suggestions, they stand there as a listener, you know? Like, ‘I will listen,’”(PPL001).

5 DISCUSSION OF RESULTS

The evolution of the literature on the process of mine closures increasingly highlights the importance of participative governance of the territory in collaboration with the community and local government to ensure a transition committed to territorial development (Xavier, 2013). However, the results of this research reveal several challenges for the engagement process to contribute to this direction effectively. The collective memory of the city of Itabira carries substantial remnants of the period when Vale was a state-owned company, perceived by many as a golden age of mining. The ingrained paternalism in the relationships between the company and the community allows a communication process directed by the company to meet its interests. From the respondents' statements, it's evident that the mining company directs its engagement in a predominantly unilateral flow of information, as proposed by Rowe and Frewer (2005), where the developer carries out the prevalent communication, and consultations do not effectively meet community demands. This is evidenced by various meetings conducted by Vale or companies contracted to gather community expectations, but these meetings needed to translate into a detailed plan for shutting down operations.

Moreover, from the respondents' perception, a perspective of obligatory dialogue stands out in the context of engagement. According to the respondents, many of the meetings promoted by Vale are driven by the Public Ministry rather than by a genuine corporate engagement policy. It's important to note that this strategy, according to Holley and Mitcham (2016), cannot be understood as effective engagement as it is merely compliance with a legal requirement. Also noteworthy is the dialogue of counterbalance, as highlighted by Cesare and Maxwell (2003), where the company makes various investments in community assets for the territory's social development. This is evident in the respondents' statements when they emphasize the various infrastructure works and social projects carried out by Vale, which are not structural projects aimed at economic reconfiguration for a post-mining scenario.

Analyzing the scope of engagement, it is observed from the respondents' statements that it is limited to specific communities when it does occur. According to Hurst et al. (2020), such a perspective seeks to establish public or social consensus for goals that have already been set before interaction and only with specific components of the community rather than building a consensus with the participation of society as a whole, involving a broader array of stakeholders. As for the type of engagement, there is a predominant use of information-based engagement favoring advocacy, as defined by Edgett (2002). This occurs through a selective choice of stakeholders and themes in the company's dialogue and communication processes to stimulate the acceptance of a viewpoint. This is evident in the respondents' statements regarding Vale's persuasive power when engaging in dialogue with community associations or public authorities. In this sense, the discourse highlights topics that interest the company exclusively, like dam heightening.

Furthermore, according to one of the respondents, this practice may be complemented by threats or blackmail from the company regarding the hastening of the closure process if the community does not ratify their demands. Lastly, Vale's nascent participation in building shared territorial governance for post-mining is highlighted—a program coordinated by Sebrae-MG called Productive Reconversion. According to Prno and Scott Slocombe (2012), shared governance promotes greater stakeholder representation in decision-making through negotiations, accommodations, consensus, cooperation, and alliance-building. However, what was observed from the respondents is that Vale does not take on a leading role in this forum created by society and coordinated by Sebrae-MG, adopting a listening stance when it participates in some meetings.

6 FINAL CONSIDERATIONS

The research results highlight a complex interaction between Vale and the community of Itabira in the context of mine closures. Stakeholders' perceptions of

engagement varied, reflecting Vale's efforts and the community's expectations. The proposed categories and subcategories of engagement strategies revealed an interaction process that could have better met the interests and expectations of the community. They highlighted the most fragile elements of this process as the unilateral nature of the information flow, the predominance of mandatory dialogue over voluntary, and the prioritization of communication with specific groups identified by the company. As a result, engagement processes, when focusing on the company's short-term interests, operate to the detriment of the participatory construction of the closure process. Through interviews, it was possible to identify a pattern of unilateral communication, a sense of exclusion from the community, and a significant lack of trust in the company's intentions. Although there are sporadic engagement efforts, they are often perceived as insufficient and driven by the company's interests.

Furthermore, the results underscore the importance of Vale playing an active role in building the post-mining future of the city, significantly collaborating in socioeconomic reconversion efforts, and fostering a trusting relationship with the community. However, the company remains distant from the planning debate for the post-mining period. The fragility of local governance also contributes to the company's failure to follow the legislation in terms of publicly presenting and updating a practical plan for mine closure every five years. In such a context, to promote a fairer and more equitable transition, Vale must reassess its communication and engagement strategies, adopting a more inclusive and bidirectional approach. Strengthening the relationship with the community, ensuring procedural justice, and establishing participatory governance are essential steps for building genuine and lasting social acceptance. These changes would meet regulatory expectations and contribute to a positive legacy after the mine closures, strengthening the socioeconomic resilience of Itabira.

It is crucial to emphasize that this research is a starting point for multiple future studies. For a more in-depth understanding of the phenomenon of community engagement in mine closure contexts, it would be helpful to investigate other

localities and compare them with the case of Itabira. Also, given the predominance of a unilateral flow of information and engagement mainly based on legal norms, exploring how more inclusive and participatory dialogue methods could be applied to improve the relationship between mining companies and communities would be relevant. Longitudinal studies that track changes in community perceptions and expectations concerning the cessation of mining activities are essential for advancing the understanding of theoretical issues and managerial implications related to engagement in mine closure contexts and would be highly informative. It is also crucial to examine the efficacy of mine closure policies and efforts for the socioeconomic reconversion of the affected territories. Additionally, “shared territorial governance” deserves special attention and could be the central theme of future research to elucidate viable pathways for more sustainable and inclusive post-mining development. Finally, it is recommended that research be advanced to understand the causal relationships of the mining company’s engagement tools or to explore the relationship between Social License to Close and community engagement.

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2. Development of hypotheses or research questions (empirical studies)	√	√	
3. Development of theoretical propositions (theoretical work)	√	√	
4. Theoretical foundation / Literature review	√		
5. Definition of methodological procedures		√	
6. Data collection	√	√	√
7. Statistical analysis	√		
8. Analysis and interpretation of data	√		
9. Critical revision of the manuscript		√	
10. Manuscript writing	√	√	√
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