



## Social perception at the onset of a mining development in Eastern Amazonia, Brazil



Valente J. Matlaba\*, José Aroudo Mota, Maria Cristina Maneschky, Jorge Filipe dos Santos

Instituto Tecnológico Vale, Rua Boaventura da Silva, 955. Nazaré, 66055-090 Belém, Pará, Brasil

### ARTICLE INFO

#### Keywords:

Perception  
Mining  
Amazonia  
Canaã dos Carajás  
Sustainability

### ABSTRACT

The mineral industry generally operates in remote territories where lifestyles are often unrelated to the logic of the global market and the infrastructure and institutions are fragile. These conditions increase the complexity of the impact of mining. Thus, the sustainability of the industry must consider the social perceptions of local communities. This article focuses on social perceptions at the start of operations of the S11D iron mine — currently the largest in operation in the world — located in the municipality of Canaã dos Carajás, southeast Pará state, Eastern Amazonia. The methodology of the study involves the use of questionnaires, administered in 2015 to a stratified sample of 253 households of the central district of the municipality. The analysis identifies the role that differences in gender, origin, time of arrival in the city, and a person's occupation have on perceptions. The results show high acceptance — with 83% of the respondents perceiving the mining positively — indicating concession of a social license to operate, mainly due to opportunities for work and income and the increase in both activity in the city and the collection of taxes and fees. Negative aspects were poor public management, environmental degradation, and a fear of fleeting prosperity. Perceptions were most favorable among those who had recently arrived in the city — people who are still hoping to socially integrate — and those who arrived a long time ago and are already embedded in the local context. The population consists of migrants who settled in the territory at the same time as the industry. Therefore, unlike other contexts dealt with in the literature, there is no conflict between the community and the project. The challenge for the mining company and the public authorities in converting the mineral assets into sustainable local development, especially through more efficient management of the city, remains.

### 1. Introduction

Currently, large mining companies seek to establish — in the territories where they operate — a series of initiatives that express new meanings of sustainable development in the sector. The industry is aligned with the concept that this development involves three pillars — economic, environmental, and social, which have been entrenched since the Brundtland Report in the late 1980s (Brundtland, 1987). However, the environment in which mining operates — which includes the mines and their ecosystems as well as markets, governments, regulatory frameworks, and local civil societies — is marked by uncertainty and complexity, which reinforces the arguments for corporate management that is capable of adapting to changes and responding in a timely manner to emerging challenges. Thus, it is important to examine the effectiveness of pro-sustainability actions through instruments that contribute to fine-tuning the alignment between the companies and the contexts in which they operate. One way of doing this is through research into how the populations neighboring such projects —

populations that are affected directly or indirectly — experience and interpret the impacts and formulate expectations about their territory.

This article analyzes the perceptions of residents of the effects of mining in a territory that hosts large mines in the eastern portion of the Brazilian Amazon. It focuses on the city of Canaã dos Carajás in the state of Pará (Fig. 1). The municipality of Canaã dos Carajás is home to the Sossego copper mine, which has been operating since 2004 and, since 2010, has been experimenting with the dynamics surrounding implementation and start-up (in December 2016) of the S11D project (Vale, 2017). This latter project is the largest iron ore mine in the world today and is part of the Carajás Mineral Province, whose deposits have the highest iron content on the planet (Santos, 2002, p. 135–36). The project utilizes innovative technological solutions, which have increased efficiency and reduced impacts on the environment and communities. For example, conveyor belt technology enables plant and waste tailings to remain outside the protected area of the Carajás National Forest, where the ore is located. Additionally, processing at natural moisture levels dramatically reduces water consumption and

\* Corresponding author.

E-mail address: [valente.matlaba@yahoo.com.br](mailto:valente.matlaba@yahoo.com.br) (V.J. Matlaba).

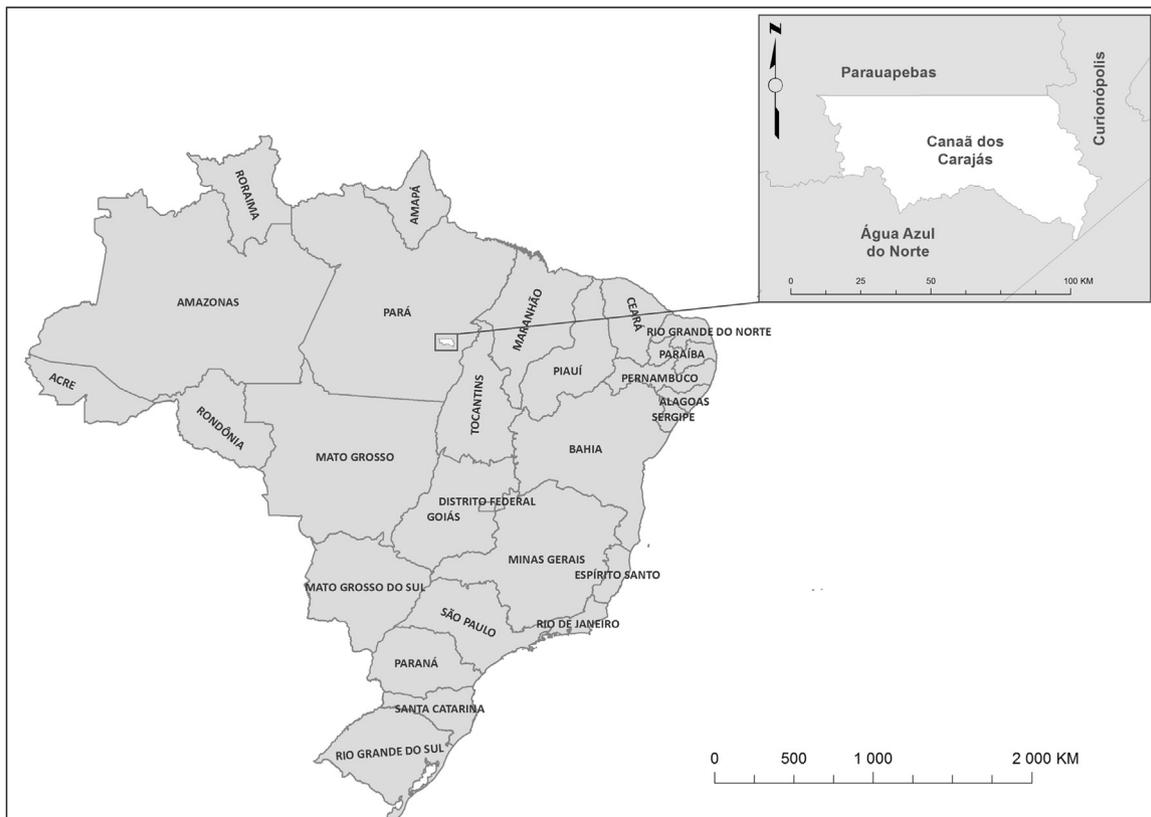


Fig. 1. Location of Canaã dos Carajás municipality. Source: IBGE (2011).

dispenses with tailings dams. The S11D project could provide an additional 90 million tons of ore per year, bringing the production capacity of the state of Pará to 230 million tons (Vale, 2017). This increase has been used to justify the partial duplication of the Carajás Railroad (Estrada de Ferro Carajás - EFC), which is almost 900 km long and links Carajás to the port of Itaqui in the neighboring state of Maranhão, and the construction of a new 101 km railroad branch linking the new mine to the EFC (Vale, 2017). This dynamic makes it important to study the perceptions of the stakeholders related to this activity.

Social perception is a record of the world as mediated by "cultural filters" (Tuan, 1980, as cited in Rodrigues et al. (2012, p. 100)) and is, therefore, active because certain phenomena are recorded, while others are blocked. It is a process that goes beyond the impressions that subjects receive from the outside world through their sensory organs. The observer occupies various social positions, which influence their view of the surrounding world. From this perspective, studies of the social perceptions of mining are believed to shed light on the effects of the industry, based on experience and knowledge of the local populations. Thus, knowledge about these impacts improves in quality and contributes to well-justified mitigation actions and programs.

The region in question experienced its most intense occupation beginning in the 1970s, when a series of major highways and infrastructure projects — including hydroelectric projects — opened the upper dry lands of the Amazon forest to the national and international economy. New economic activities developed in the region — for example, large-scale cattle raising and industrial and artisanal mining, which, in turn, were preceded and accompanied by logging fronts (Hébette, 2004; Palheta da Silva, 2013). Since then, intense migratory movements — both induced and spontaneous — have occurred in the region. Significant changes in use and occupation of the land have led to high rates of deforestation. These events occurred without corresponding territorial planning and institutional order, turning the region into an economic "frontier", marked by a conflicted coexistence

between modern and traditional ways of life. The Amazon became known for the frequency of conflict — related to land rights — involving small-scale farmers, indigenous and other traditional peoples, and large landowners.

Since then, settlements located at strategic points have quickly become municipal centers, as, for example, was the case with Canaã de Carajás and Parauapebas — two cities in the region affected by the mines of Carajás. If, in the early 1980s, Canaã dos Carajás was only a locus of agrarian reform settlements, by 2014, it was already a medium-sized city with approximately 54,000 inhabitants (Diagonal and Vale, 2014). The sample of this study — 253 households in the city of Canaã dos Carajás — reflects these transformations, given that 98% of those interviewed, in September 2015, were not born in the municipality. Municipal incomes came to depend mainly on mining, which resulted in an increase in the industry's share of GDP (in terms of current gross value added) from 7% in 1999 to 84% in 2013.

This rapid evolution is responsible for the lack of effectiveness of civil society organizations in the municipality and the difficulties public authorities face in organizing urban space and providing public services. Within this social framework, the mineral sector is preparing to make a great economic leap, as the goal of the S11D project is to bring 90 million tons of iron to the market every year. And unlike other mines in the region, its technological set-up requires very little — but highly specialized — labor (2600 direct and 7000 indirect jobs), compared with the 15,000 jobs that were offered at the peak of the mine's implementation between 2010 and 2015 (Vale, 2017).

The positive impact of mining on municipal revenue is already significant. National legislation (DNPM, 2010) has established that 65%, 23%, and 12% of royalties from mining (Financial Contribution from Mineral Exploration — CFEM) are destined for the mine's municipality, the State, and the Union, respectively. Moreover, mining positively impacts other sources of revenue. For example, from 2004 to 2015, although the CFEM's share of municipal revenue declined from almost 11–7%, the share of the Tax on Services of any Nature (ISSQN)

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات