

Knowledge Politics in Environmental Conflicts: A Case from Brazil

La política del conocimiento en los conflictos ambientales: un caso de Brasil

Aline R. B. Pereira^{a, b}, Wolfram Laube^a

ABSTRACT

Following large environmental conflicts and disasters, economic endeavors -particular large-scale investments in mining or hydropower- are nowadays subjected to rigorous environmental law and regulations. The application of rules and regulations takes place in environmental administration and courts and includes environmental impact assessments (EIAs), licensing processes and litigation in court. Within these contexts, decision making is supposed to be based on rational reasoning and purportedly impartial scientific knowledge and information. Thus, citizens' rights in resource conflicts and the effective enforcement of these rights in administrative, judicial, and political contestation become highly dependent on knowledge and information and the ways it is produced, interpreted, and valued in the interaction between people affected and investors, lays and experts, bureaucrats, legal practitioners and citizens. Political contestation becomes a seemingly technical dispute. This paper bases on a qualitative study of the conflicts surrounding the establishment of the large-scale iron-ore mining project Minas-Rio, in Conceição do Mato Dentro, Minas Gerais, Brazil, conducted in 2014-2015. It describes the problematic nature of the production of information and knowledge in a given political-economic context and the contestations surrounding the validity of apparently scientific results as they emerged alongside the environmental licensing process. Environmental studies and their technical evaluations are based on questionable assumptions and often lack accurate baseline data. The deficiency of public resources for independent investigation makes the environmental agencies dependent on services and information provided by mining companies. Apart from this form of collaboration, the prioritization of allegedly scientific "expert" knowledge, career trajectories of agencies' personnel, and pressure by pro-mining politicians lead to the uncritical adoption of data, information and knowledge provided by the company and/or the consultancy firms employed by them. At the same time, information given by the people affected and environmentalists becomes sidelined. Thereby, environmental and citizen rights, as the rights to information concerning the environment and to participation in licensing processes, guaranteed in the Brazilian constitution and environmental legislation, become ineffective.

KEYWORDS: knowledge politics; right to information; environmental impact statements; large scale mining; information management.

RESUMEN

Tras grandes conflictos y desastres ambientales, los proyectos económicos, en particular las inversiones a gran escala en minería o energía hidroeléctrica, están hoy en día sujetos a leyes y reglamentos ambientales rigurosos. La aplicación de las normas y reglamentos tiene lugar en la administración pública y en los tribunales e incluye evaluaciones de impacto ambiental (EIAs), procesos de concesión de licencias y litigios en los tribunales. En este contexto, se supone que la toma de decisiones se basa en un razonamiento racional y en conocimientos e informaciones supuestamente científicas e imparciales. Así, los derechos de los ciudadanos en los conflictos ambientales y la aplicación efectiva de estos derechos en procesos de contestación administrativa, judicial y política dependen en gran medida del conocimiento, de la información y de las formas en que se producen, interpretan y valoran en la interacción entre las personas afectadas y los inversores, los expertos y no expertos, los burócratas, los profesionales del derecho y los ciudadanos. La discusión política se convierte en una disputa aparentemente técnica. El presente texto se basa en un estudio cualitativo de los conflictos en torno al establecimiento del proyecto minero a gran escala Minas-Río, en Conceição do Mato Dentro, Minas Gerais, Brasil, realizado en 2014-2015. Se describe la naturaleza problemática de la producción de información y conocimiento en un contexto político-económico dado y las disputas en torno a la validez de los resultados aparentemente científicos que surgieron en el proceso de concesión de licencias ambientales. Los estudios ambientales y sus evaluaciones técnicas se basan en supuestos cuestionables y a menudo carecen de datos de referencia precisos. La falta de recursos públicos para la investigación independiente hace que las agencias ambientales dependan de los servicios y de la información proporcionada por las compañías mineras. Aparte de esta forma de colaboración, la priorización de conocimientos supuestamente científicos y "expertos", las trayectorias profesionales del personal de las agencias y la presión de políticos que favorecen la minería, conducen a la adopción arbitraria de datos, información y conocimientos proporcionados por las mineras y/o las empresas consultoras empleadas por ellas. Al mismo tiempo, la información proveída por las personas afectadas y los ambientalistas queda al margen. De esta manera, los derechos básicos del ciudadano y del ambiente, así como los derechos a la información sobre el medio ambiente y a la participación en los procesos de concesión de licencias, garantizados en la Constitución y la legislación ambiental brasileñas, se vuelven ineficaces.

PALABRAS CLAVE: política del conocimiento; derecho a la información; declaración de impacto ambiental; minería a gran escala; gestión de información.

^a Center for Development Research, University of Bonn. Bonn, Germany. ORCID Pereira, A.R.B.: 0000-0002-0550-6073; ORCID Laube, W.: 0000-0002-6798-7968

^b Corresponding author: alinerbpereira@daad-alumni.de

Introduction

The global scramble for natural resources, combined with the depletion of older and more consolidated ore deposits, has been pushing mining frontiers to the deep countryside of Brazil¹, affecting communities not yet fully part of global markets and commodity chains. A good example for this dynamic is the open pit mine of the Minas-Rio iron ore mining project, located in Conceição do Mato Dentro, Alvorada de Minas and Dom Joaquim (Minas Gerais). The case is paradigmatic to the recent advancement of extractive industries in the country after 2000, during the boom of commodities, and raised considerable public and scientific attention (Milanez and Santos, 2018; PoEMAS, 2015, p. 80; Zhouri, 2014). Imposing environmental costs and other “externalities” of large-scale economic activities over local communities (Martinez-Alier, 2001, p. 159) often fosters the emergence of resistance movements and conflicts. In conflict scenarios typically related to extractive industries, previous researchers strongly report rights violations (Ferreira, 2015; Pereira et al., 2013; Zhouri, 2014) such as eliminating or considerably limiting communities’ access to land and water, not to mention other social impacts, *inter alia* sudden population influx, rising cost of housing and living, or an increase in criminality (Hilson, 2002).

These researches are certainly relevant to identify patterns of rights’ violations in similar contexts. Nonetheless, academic discussion could benefit of more systematic analysis in order to understand *how* these right violations occur within existing institutions, or in which manners that do not strictly fall under the category of ‘rights violations’ certain actors and groups are deprived from the means to satisfy their needs. On this background, the research underlying this study set out to understand the contestations over the Minas-Rio iron ore mining project as it unfolded in the administrative and legal realms

1 The ore deposits were there before. But as these areas often lacked the necessary infrastructure for its exploitation (transport, energy sources, etc.), they were not considered economically viable until the first decade of 2000, when the Chinese demand for natural resources has triggered a commodities’ boom (according to Milanez, 2017, a commodities’ bubble). As the deposits located closer to more established mining areas and richer in the desired minerals are depleted, the mining frontier moves further to more remote areas.

between 2006 and 2015, within the environmental licensing process². In Brazil the environmental licensing process is still the main instrument governments have implemented to enforce environmental legal frameworks, to monitor and control activities that actually or potentially pollute and degrade the environment and to ensure the rights of affected citizens (Ribeiro, 2015, p. 10). As a result, this administrative process ends up as the single “barrier”, which hampers or (at least) delays the uncontrolled advancement of extractive industries in the country³. Among these typically violated rights, in this paper we focus on the right to information, perceived as one of the most violated rights in environmental licensing processes (Bermann, 2014, p. 98).

The right to information is a pre-requirement to guarantee other rights in conflicts sparked by large scale mining activities. Closely related to the right to participate in public decision-making, good quality information is also essential for good governance and forms the basis of legal claims. As enshrined in Brazilian constitutional and infra-constitutional legislation, the right to trustworthy environmental information is not only a right of all citizens, but also a duty of the State through its Environmental Authorities⁴. Law 6938/1981 establishes in its article 4, item V, that the National Environmental Policy will aim at “[...] the dissemination of environmental data and information and the formation of public awareness of the need to preserve environmental quality and ecological balance”. The same law further determines in its article 9 that the instruments of the National Environmental Policy include “the guarantee of provision of environmental

2 The discussion presented in this paper relates to a broader investigation in Aline R. B. Pereira’s PhD research, an in-depth qualitative study of the Minas-Rio iron ore mining project and the conflict it sparked in the countryside of Minas Gerais, Brazil.

3 In spite of its many faults, some of which described in this paper, the environmental licensing process is still an indispensable requirement with which mining (and other industries) have to cope.

4 Constituição da República Federativa do Brasil (1988), article 5, XIV and XXXIII, article 225 §1º IV and VI. Law 6938, article 9, XI, and article 4, V, (Presidência da República do Brasil, 1981); Law 10650, especially article 2 (Presidência da República do Brasil, 2003).

information, which obliges the Public Power to produce them when they do not exist” (item XI).

The application of rules and regulations takes place in environmental administration and courts and includes environmental impact statements (EISs), licensing processes and litigation in court, which can evolve when the former processes become contentious. Within this context, decision-making is supposed to be based on rational reasoning and purportedly impartial scientific knowledge and information. Thus, citizens’ rights in resource conflicts and the effective enforcement of these rights in administrative, judicial, and political contestation become highly dependent on knowledge and information. Political contestations become seemingly technical disputes. In these cases, the way information is produced, interpreted, and valued in the interaction between people affected and investors, lawyers and experts, bureaucrats, legal practitioners and citizens become crucial not only for the citizen right to information, but also to the citizens’ general ability to realize their full rights in socio-environmental conflicts.

Administrative decision-making is said to be largely based on supposedly impartial data, information, and knowledge generated within the ‘modern’ scientific epistemology. Along the research, though, it became clear that this was not always the case. Thus, deepening the critical scrutiny of these underpinning assumptions and epistemologies, processes of knowledge production, as well as questioning which (forms of) data, information and knowledge were considered valid and credible – and were, thus, acknowledged in decision-making forums – became necessary.

These questions are not straightforward, but they form a major field of contestation. Thus, in order to understand how the right to information is limited in practice, this paper describes and analyzes the processes surrounding knowledge production, valuation and contestation, and the way the outcome of these processes impacts the environmental licensing process and the environmental and citizen rights it is meant to protect.

This paper starts with a short review of the theoretical debate regarding the problematic role of experts and (scientific) knowledge in public

decision-making processes. This will be followed by an overview of data collection methods. The Minas-Rio case will then be introduced, with emphasis in the epistemological, social, and political-economic problematics of the production, valuation and contestation of knowledge. The paper concludes by discussing the empirical findings in theoretical perspective, trying to map out possible strategies that could reduce the emptying of citizen rights in legal and administrative procedures that involve the extractive industry.

Knowledge politics in environmental conflicts

Anthropologists and sociologists have theorized law as a dynamic process involving informal interactions and uncertainties that cannot be fully controlled by legislation (Moore, 1978), or as social practices influenced not only by codified rules, but also by a range of less explored contextual factors and social behavior (Bourdieu, 1987; Edelman et al., 2010).

The case presented here illustrates that disputes to define what information counts and what is the law that prevails are intermingled in fields in which actors with very different resources fight to define the extent of communities’ and environmental rights, as well as companies and government’s duties. These actors include legal professionals, but also many others (councilors, affected families, technical staff in charge of environmental analysis, representatives of the mining company) who appropriate the language of rights according to their interests and capacities. The case provides an interesting arena to study how different processes and events influence the law that concretely prevails.

However, what is directly addressed in this paper is not litigation and the adjudication of mining conflicts. It is not the conflict about which law, rule or regulation actually counts, or how to interpret it, or whether or not it should be implemented or ignored. The focus here lies on the right to information, or yet on a step that precedes it: the definition, production and valuation of knowledge and the politics of knowledge that go along with the legal and administrative procedures. The inherent indeterminacy

of law is exacerbated by the fact that many environmental and societal conflicts, together with political disputes, are framed in technical terms and adjudication actually depends on (the mostly) scientific assessment of the problems at hand. However, this delegation of evaluative and decision-making competencies to the scientists, technicians, and (so-called) experts, does not automatically result in objective decision- and consensus-making.

As Epstein (1996, p. 16) observed with respect to public controversies with regard to the HIV/Aids epidemic: “Increasingly, science is the resource called on to promote consensus, and experts are brought in to ‘settle’ political and social controversies. Yet this ‘scientization of politics’ simultaneously brings about a ‘politicization of science’[...].”

As experts and scientists can determine the outcome of controversies that greatly touch upon the vested interests of conflicting factions, these factions invest considerably in influencing the outcome of the data, information, and knowledge generation process per se. As Leach and co-authors verse it, “we can see this tendency for social and political disputes to become technical disputes, and for conflicts around resources to be expressed in terms of conflicts around knowledge” (Leach et al., 2007, p. 17).

These “conflicts around knowledge”, as we will see below, evolve at different scales and levels. They can lead to attempts to influence different aspects of the knowledge definition (what is valid and relevant), knowledge generation (basic assumptions, which data is gathered, who gathers data), and the valuation of knowledge (which knowledge becomes a valid and credible resource in the decision-making process).

Defining Epistemology, Information to be Relevant, and Forms of Presentation

Public controversies and political conflicts usually rely on modern, technical data, information and knowledge that is held to be relevant and credible. Other sources of information and knowledge, such as local (environmental) knowledge, individual experiences –let alone spiritual interpretations– are frequently declared to be difficult to integrate or even irrelevant and obsolete (Petts, 2006), although the

integration of such kinds of knowledge is important in environmental management contexts (Raymond et al., 2010). In general, the integration of different types of knowledge and expertise is meant to improve communication and participatory decision-making in deliberative and democratic processes, as it enhances “interactive knowledge” (Lindblom and Cohen, 1979) and “communicative rationality” (Habermas, 1984) by integrating all participating actors, expert and lay, and their types of knowledge.

While this is not really put into practice, habitual problems of presentation exist. Even seemingly, objective empirical findings, for instance observations of pollution by affected people in environmental conflicts, are ignored in decision-making fora, if they are not presented in scientific and/or compatible ways. The tendency to sideline non-scientific ways of conceptualizing reality and generating and presenting knowledge has been widely discussed and problematized (e.g.: Long, 1992; Wynne, 1996).

Apart from the type of knowledge, legal requirements and public decisions detailing which actual data and information should be provided –and thus becomes relevant in the decision-making process– is also crucial. As can be seen from the empirical material below, the lack of resources and expertise on the side of environmental agencies, the lack of legal requirements to gather sufficient baseline socioeconomic data, and the lack of a sufficient legal definition of people affected by a project in existing laws can lead to the omission of important data and information from the knowledge generation process⁵. A fact corroborated in other studies on EIAs in Brazil (e.g.: Duarte et al., 2017, p. 276, Fonseca, 2017, p. 92).

Generating Data and Producing Knowledge

Once the type and format of data, information and knowledge to be generated is agreed upon, the collection and production of knowledge starts. Again this process is not necessarily straightforward. Knowledge production largely depends on

⁵ As detailed in Pereira (2019), this lack of legal definition can be partially explained by the procedural character of environmental law in face of the complexity of ecological relations.

the availability of expertise and resources as well as the incentives provided for the production of particular results. While experts are supposed to be knowledgeable, resourceful, honest and impartial brokers in controversies (Limoges 1993, p. 418), this ideal is often far from reality. In the environmental licensing process, large amounts of varied kinds of data need to be collected, compiled, analyzed and interpreted. This usually exceeds the capacities of local affected people, but also of public environmental authorities, who lack the personnel, transport, equipment, laboratory facilities and funding to carry out complex studies. Therefore, EISs are usually outsourced and carried out by hired independent experts or consultants. While the latter are supposed to produce impartial, objective knowledge, their results are often tainted by the stance of the organization employing them. Frequently, working for the same employers or companies leads to dependencies that can inspire loyalties and predispositions resulting in favorable reports (Fischer, 2000, pp. 99-101). This is especially problematic if the contract for the EIS is issued by the company applying for the license, and the environmental agency lacks the means to independently scrutinize the results presented, as in the Minas-Rio case.

Valuation of Knowledge

The question on which data, information and forms of knowledge are decided to be relevant, accurate and credible is closely related to the decisions prior to the knowledge production process, because in the first step certain type of inputs for the decision-making process are already ruled out. However, even with regard to types of data, information and knowledge regarded as relevant, questions of validity and credibility can arise. Research on scientific decision support in environmental decision-making has long pointed to “scientific indeterminacy” (Fischer, 2000, p. 94) as a major point of concern. In many cases, existing scientific findings have been scientifically contested and alternative scientific analysis of the same phenomena provided. So, on the one hand, the accuracy and relevance of techno-scientific results can be questioned from a lay and local knowledge perspective. On the other hand, scientific results and opinions are often critically scrutinized and their

credibility impeached by other scientists. This often results in “politics of counterexpertise” (Fischer 2000, p. 94) that leave the decision-making bodies with a large degree of digression, having to decide which findings and results to prioritize, declare valid and credible. In a situation where political pressure on environmental agencies to issue permits for economically interesting investments is high – as for instance under the extractivist regimes in Minas Gerais, or Brazil per se – critical scientific expertise, often produced on behalf of local communities and/or activists, easily becomes sidelined.

The dynamics and processes described above show how not only legal decisions are highly dependent on contextual factors such as social practices, economic interests and political influences, but also supposedly technical risk-benefit analyses and EISs are prone to subjective and interest-driven interference that can, as will be shown in the empirical part below, result in the emptying of citizen rights.

Methods

This paper bases on an in-depth qualitative research that was conducted by the first author in Brazil between 2014 and 2015. The researcher studied the ways in which environmental, economic, and political citizen rights are upheld or become emptied in the framework of large mining investments in the country’s extractivist economy. Being a trained lawyer, but having worked with social scientists before, a qualitative research methodology paying special attention to legal and social practices surrounding the environmental licensing process of the Minas-Rio project was employed.

Data collection encompassed 28 in-depth, semi-structured interviews with key informants purposefully selected according to their expertise with regard to the case studied. The case was selected considering its paradigmatic character among recent mining projects in Minas Gerais, data availability and the possibility of access to data and informants. The first interviews, mapping out the conflict history and dynamics, were carried out with people that had been engaged in the legal procedures and public contestations surrounding the mining investment since 2007. This included inhabitants of

Conceição do Mato Dentro, members of affected families, environmental and social activists, municipal authorities, state and municipal environmental authorities' representatives, technical staff of the Minas Gerais environmental agency (including legal experts), and public prosecutors involved in the conflict. In a second phase, paying closer attention to the environmental licensing process in particular, persons specialized in elaborating EISs, lawyers specialized in mining and environmental law, and lawyers working for affected communities were interviewed. Depending on the informant's background, the interview's focus was on the history of the case, how the conflict between mining company and community unfolded, and on the Minas-Rio environmental licensing process, or on general aspects of environmental licensing processes of mining activities in the state of Minas Gerais.

Environmental licensing processes in Minas Gerais unfold in two main spaces or subdivisions of the environmental agency: a technical and administrative branch that verifies the studies presented by the mining company (known as Regional Environmental Superintendence, the SUPRAM), and a deliberative council, the Collegiate Regional Unity (URC), that comes together in public sessions in order to discuss and vote for issuing or denying environmental permits. In these public deliberative sessions only the environmental councilors (representatives of public power and civil society) can vote, but different actors can attend and use around two minutes to voice their claims.

Interviews were supplemented with observations of public sessions of URC-Jequitinhonha during 2014 and 2015 in Diamantina (where the environmental authority responsible for the Minas-Rio project is located) and in Conceição do Mato Dentro⁶.

6 A total of 18 public meetings involved sessions organized by affected families without the presence of the mining company, one meeting organized by the affected families with the mining company, mediated by the local prosecutor, meetings organized by municipal authorities with the mining company and with attendance of affected families, meetings organized by municipal authorities because of affected families' pressure (without the presence of the mining company), meetings organized by state environmental authorities with the mining company, environmental councilors and prosecutor

Furthermore, the researcher collected and evaluated the extensive documentation of the environmental licensing process in the SUPRAM-Jequitinhonha archives. This process took six weeks, and also provided opportunities to build rapport, to observe the daily routines and the internal and external interactions of those working for the technical branch of the environmental agency (SUPRAM-Jequitinhonha) implementing the licensing process.

During the research, because of the contested and conflictive nature of the mining investment, it was sometimes difficult to gain access to observation spaces and build rapport with informants from diverging groups. In the discordant context surrounding the Minas-Rio, social relations are worn and mistrust is looming. But in the end, different actors involved in the process (i.e. affected communities, local authorities from Conceição do Mato Dentro and environmentalists, environmental authorities from Diamantina, lawyers and prosecutors) agreed to participate in the research. Especially representatives of local communities and activists expressed their interest in a better understanding of the procedures of the environmental agency and the dynamics of the environmental licensing process, which is less simplistic than usual suspicions of corruption. Having gained access and rapport with the different actors involved in the conflicts and negotiations surrounding the Minas-Rio project enabled the researcher to gather the required information to be able to present the empirical findings below. During research, because of the conflict and the potential risks involved for outspoken respondents, they were promised confidentiality. Therefore, name, age, gender, location and particular office of interviewees, especially from the environmental authorities, will not be mentioned in the following. All interviews were held in Portuguese and transcribed and translated into English by the first author.

(without affected communities members or representatives), and formal sessions organized by the state environmental authorities to deliberate the environmental permit, the URC-Jequitinhonha sessions (with massive attendance of affected families, mining company representatives and workers).

Mining Advancement Conceição do Mato Dentro, Minas Gerais

The Minas-Rio iron ore mining project consists of an open-pit mine and a processing plant in three municipalities of Minas Gerais: Conceição do Mato Dentro, Alvorada de Minas and Dom Joaquim (a total area of around 3880 hectares of land). It also entails a pipeline of 525 km length, which is crossing 32 municipalities in the states of Minas Gerais and Rio de Janeiro to transport iron ore pulp to the shore, and a port in Açú in Rio de Janeiro State, which was built to export the extracted iron ore. The investment initially anticipated was 3 billion US dollars, but the cost had already risen to 8,8 billion dollars by 2013 (Miller and Kiernan, 2013). After licensing, the mine was to produce 26,6 millions of tons of iron ore per year (Prates, 2014, p. 11). The establishment and operation of the mine comes at considerable social and environmental costs. Among these, the significant water demand of the mine and especially the pipeline exerting huge pressure on local water resources has been singled out as one of the main problems by affected families and environmentalists (Becker, 2009, p. 340; Becker and Pereira, 2011; Pereira et al., 2013). Local communities have started to question the expansion of mining in the region from the onset. They tried pushing state authorities and the mining company to give more complete accounts of the possible range of impacts in the region.

Because of its potentially large impact the project would have to undergo, under Brazilian laws, an environmental licensing process with the elaboration of an EIS and divided in three phases, each of which resulting in a different environmental permit (preliminary permit, installation permit and operation permit⁷) and start the application process around 2006. But despite considerable political pressure and investments, iron ore extraction has been only allowed more than eight years later, in 2014 (when the operation permit was issued). However, environmentalist and affected people maintain that

7 The environmental licensing of the Minas-Rio, though, had four phases, the Installation permit stage being divided in installation permit I and installation permit II. The fragmentation has also been heavily criticized by researchers and activists (see Becker and Pereira, 2011).

much of the information on which the licensing is based was wrong and/or incomplete. Furthermore, it is claimed that during the licensing process the company acted non-transparently and deceitfully. Promises of the company to mitigate problems and compensate local communities were not kept as the environmental licensing process advanced⁸. The company, for instance, failed to sufficiently develop the infrastructure and social conditions of Conceição do Mato Dentro before it recruited a huge contingent of workers to start building the mine. Like in other mining areas, the onset of large-scale mining did not only lead to conflicts over land, water and environmental externalities, but a large in-migration of mine workers, business people and fortune seekers, which led to hiking prices for housing and other urban services as well as increases in criminality and prostitution. This corresponds with local inhabitant's perceptions that the city is now less safe than before the mining project (Becker and Pereira, 2011; Zhouri, 2014; Pereira et al., 2013 specifically about Conceição do Mato Dentro; and Zhouri, 2010; Zucarelli, 2006; Bebbington, 2010, 2009; Bebbington et al., 2008, p. 2890; Hilson, 2002, in general).

While the living conditions in Conceição do Mato Dentro worsened, promises such as local economic development and an increase in the employment of locals did not materialize. Company's failure to meet promises and frustrated local expectations led to the deterioration of the relationship between local communities and the mining company throughout the environmental licensing process. Mistrust, hostility and opposition dominated public debates, and also found expression in the ways information and knowledge was defined, produced and privileged within the licensing process.

The public sessions that were part of the environmental licensing process became a place of confrontation, where local inhabitants, local researchers, and environmentalists, fought what they saw as unacceptable rights violations and flaws in the knowledge and information politics. They demanded for additional environmental studies and, with the help of

8 Local dwellers have already started to complain about impacts during the mining infrastructure building stage, around 2009, before extraction begun.

engaged researchers, even produced their own technical reports. In the following, examples of these processes will be provided.

Defining Knowledge and Information Needs in the Minas-Rio Case

In Brazil the information and knowledge that is relevant in environmental licensing processes is largely defined by law. Scientific bio-physical documentation and reasoning has precedence over local forms of knowing and representing knowledge and information. Furthermore, crucial data that would help to determine the impact of the mining requirements and the people potentially affected is not demanded for, at least before the onset of project activities. As an officer from the environmental agency explained:

In the environmental licensing, the State doesn't demand that the company evaluates the socioeconomic impacts, the State doesn't demand and the company also doesn't do it. And people are there, in-between. If you would arrive there and say 'let's see, how many families are there? – There are 150. – How many are in a vulnerability situation? – 50. Well, these vulnerable ones need a differentiated treatment, a differentiated resettlement program.' There isn't such a thing! There is no law to protect these people nowadays. [...] [But], for you to damage the [protected] Atlantic forest you have to make an inventory, and for you to take the people out of the place you don't need one! Have you ever seen something like this? But [...] there is a whole legislation that classifies what is the vegetation in medium stage, what is an advanced vegetation, you have... extractification of the forest, under forest, I don't know what. It is easier to take a family out of the place than to damage a part of the Atlantic rainforest. (Interview with state environmental agency technical staff, Diamantina, 22 May 2015)⁹.

Another respondent also argued that while in other investment areas, such as the energy sector, the company must obtain at least the preliminary

9 The legal requirement of information about the physical; biological and socioeconomic environment (Resolução CONAMA 001/86) is further specified in Normative Deliberations (DN) in Minas Gerais regarding certain ecosystems, but such a norm regarding socioeconomic aspects is absent.

permit¹⁰ before the initial purchase of land by investors, this is not the case in the context of mining. One of his colleagues described the consequences as follows:

Now it is very hard to define [the affected families], it is very hard. Imagine how to define that in an area where there was no previous diagnosis! There wasn't a previous diagnosis there, how to delimitate it now? My understanding is that if you have affected, impacted the economic and social life of a person, she is an affected person. And she must be compensated. [...] Isn't it an impact that the mining company is causing? [...]. (Interview with state environmental agency technical staff, Diamantina, 22 May 2015).

Interviews highlighted the differences between the mining and the energy sector (hydroelectric plants). Whereas companies building dams are forbidden to intervene in anyway on the ground (e.g., buying land) before the environmental permits have been issued, in the mining sector the practice is not forbidden; on the contrary, it is widespread and, in the Minas-Rio case, accounts for many of the conflicts over land that have been unfolding to present days (Diversus, 2014a). As a private EIA-consultant explained:

In the mining sector, the companies even hide that they are arriving in the region in order to buy lands to certain ends. They end up buying [land] and generating impacts long before they have the [environmental] permit. In the energy sector, for instance, this is something that used to be tolerated, and that today it is not. You cannot arrive and buy land before the preliminary permit. It is not tolerated because... in the case of rural workers, sharecroppers, partners, they end up being impacted even before the project starts. [...] So, there are some companies in the State [Minas Gerais] in the mining sector, that do not even inform that they are coming to the region. They arrive, they introduce third parties to buy the land, these third parties buy all the land, those who used to live there have already been impacted, left the land, and this generates... generates huge environmental problems. [...] [In the

10 First environmental permit in the three-stages licensing process that is done for projects that are regarded as potentially more degrading/pollutant.

energy sector] The company only buys [land] after the installation permit. (Interview with former technical staff of the environmental authority, now expert working in EIS elaboration. Belo Horizonte, 18 May 2015 (see also: Santos, 2014).

The impossibility and failure to gather most crucial socioeconomic data is paralleled by confrontations about the type of bio-physical information that needs to be taken into consideration. While conflicts about the quantity and quality of water resources and the pollution of water by the Minas-Rio project are discussed in hydrological terms, local inhabitants find it difficult to insert their own experiences and observations into the environmental licensing process. The failure to take local knowledge onboard has led to bitter conflicts. One example of knowledge conflicts happened during the 85^a Meeting of the URC-Jequitinhonha, on September 18th 2014. Being enraged by the bureaucratic processes and by a language that seemed to conceal water quality problems caused by the mine, local inhabitants presented a large number of dead fish and bottles of turbid water to the councilors. They explained they had collected the water and the dead fish downstream of the tailings dam of the Minas-Rio project some weeks before, when all fish suddenly appeared floating dead. While technical investigations were inconclusive and technicians were not able to determine the actual cause of the fish dying, the locals continued to be convinced that the tailings dam upstream polluted their water. Any scientific investigation was futile since the dead fish and the turbid water were speaking for themselves.

In a nutshell, a legal ill-definition of investment procedures and baseline data need in the mining sector (especially regarding its socioeconomic aspects), as well as conflicting views about which information should be integrated into the decision-making process earmarked the environmental licensing process of the Minas-Rio project from the onset.

Generating (incomplete) Data and Producing (contested) Knowledge in the Minas-Rio Case

The lack of basic information on the side of the state authorities remained a central obstacle to the

decision-making process. Especially because this lack of baseline information was to be ameliorated by information presented by the mining company. As a technical staff member of the environmental authority remembers:

We, the state, we haven't been there [in Conceição do Mato Dentro] before the project, the state hasn't been there. The state doesn't know who the people are. The State didn't have a picture of the situation before. All that is produced, all the information that is produced, is brought to us by the company, this is the system, do you understand? [...] Indeed, I believe this should change, this relation between company, state, I believe this should be maybe reverted. I believe the state has to assume its role more... impartially. [...]" (Interviews with an environmental agency technical staff, Diamantina, 22 May, 2015 and 1 June, 2015)

Since the state did not have a databank with the relevant socioeconomic or environmental data of the investment area, nearly all information on which the environmental authorities could rely on to reach a decision had been provided by the mining company or the consultants the mining company hired. Resources for field visits (cars, fuel, drivers, accommodation costs) were also scarce. Thus, environmental authority's staff had very restricted opportunities to verify in loco the information presented in the EIS in case of doubt. Many times, the transport for field visits, as reported by interviewees and observed by the researcher, had been provided by the mining company.

Indeed, neither public environmental authorities nor local communities have the necessary infrastructure and capacity to collect and process the large amounts of data needed in such impact analysis. But also the experts hired to produce the EIS have delivered insufficient information regarding important aspects of the case. A practice that is common in the Brazilian environmental studies consultancy market. As a consultant explained:

[The environmental agency] lacks of important criteria in the analysis of the studies. This has been generating other problems, [...], leading to the dropping quality of the results. So sometimes [in the environmental consultancy market] you find people who make [an environmental study] very cheap, in an unfeasible

time. [...] [F]or [instance in] an EIS/RIMA [Environmental Impact Statement and Environmental Impact Report] you need to evaluate hydrological cycles, [but] there are some methods of diagnosis that certain companies do not accept to do, and other do". [...] This has been generating many documents of doubtful technical quality... which ends up misleading the entrepreneurs. Which has also been resulting in new problems. (Interview with former technical staff of the environmental authority, now expert working in EIS elaboration. Belo Horizonte, 18 May 2015).

Asked about the response of the environmental agency in such cases the same respondent continued to explain:

The environmental agency today does not even realize it. The environmental agency is extremely overburdened, with a very small workforce and expertise, because it does not pay well, do you understand? Because it doesn't pay well there is a very high turnover. A lot of people with very little experience... they have not been trained, they have not been oriented, they have not been trained, they arrive there and have a lot of paper thrown on them [...]. So the guys do not even notice basic flaws that resonate throughout the process". (Interview with former technical staff of the environmental authority, now expert working in EIS elaboration. Belo Horizonte, 18 May 2015).

As result, the EIS of the Minas-Rio, for instance, has underestimated the number of affected families (declared to be less than 100). Only the families who lived in the area where the open pit and other structures of the project would be installed were considered "affected". After consistent contestation by local communities new studies found out that even within the operational area some families had been overlooked (Diversus, 2011, 2012, 2014b). Inhabitants living in the surroundings of the project, who are certainly affected by the mining project in various ways (e.g. water problems, soil vibration, dust, noise, etc.) have been disregarded (Ferreira, 2015; Prates, 2014; Tôrres, 2014; Vieira, 2015). The failure to account for the indirectly affected people is one of the reasons why the project is still met with a high degree of opposition (Ação Francisca de Ecologia e Solidariedade, 2017; Gesta, 2016;

Gesta 2017; Justiça Global, 2017; Prates, 2017; Rodrigues, 2018).

While the lack of infrastructure of the environmental agencies surely weakens the range of monitoring activities by the state, further difficulties arise from the fact that technical staff at the environmental agency (engineers, geologists, economists, legal staff) criticizing the studies presented by the mining company's consultants are sometimes intimidated by their superiors:

They [our superiors] threatened us [...]. [T]he former technical director at the time used to say 'you know, it is because if they make it [the licensing process] too difficult, you end up transferring these employees to places that are not very nice...'. (Interview with state environmental agency technical staff, Diamantina, 22 May 2015)

In general, and especially as the process dragged on, superiors in the environmental agency and state-level politicians seemed to be more concerned with accelerating the licensing process than producing additional (scientific) evidence. Referring to the need to comply with demands by their superiors, another respondent explained that he had to cede to what seemed to have become the dominant concern in the environmental agency:

Is the institutional position? Even if it goes against my personal position, against what I believe? If this is the case... I will defend the institutional position. [...] I always make it clear. I cannot agree, but if I am here as a civil servant, then I will defend the institutional policy. But the state must give me elements to defend this position". (Interview with state environmental agency technical staff, Diamantina, 22 May 2015 and 1 June 2015).

Weak capacities and lacking political will on the side of the environmental agency, on the one hand, and flawed reports provided by the mining company and its consultants, on the other, made alternative routes of knowledge and information generation necessary. Independent researchers and communities started gathering their own evidence, and the environmental agency –giving in to public criticism– asked for an additional report by a second independent consultancy called Diversus. However,

this additional and alternative information was ousted in the process of selecting information sources that were considered relevant for the decision.

Validating Knowledge and Information in the Minas-Rio Case

In the Minas-Rio case, the definition of relevant information and knowledge as well as the production of data and information was compromised. This was partially due to legal and institutional weaknesses that undermined the knowledge generation process, but also resulted from political pressure to streamline and short cut licensing processes. Politicians saw the need to move the process in favor of the acclaimed investment. Furthermore, the politically dominant view that the licensing process should be fastened greatly affected the decisions on which data, information and knowledge was finally defined to be relevant, credible, and to be taken in consideration in the decision making process.

In the environmental agency, existing reports were, according to interviewees, actually tempered in order to omit information that could be detrimental to the investors. Asked about inconsistencies in the environmental licensing file, a member of the technical staff exclaimed:

“There are so many documents that were taken out of there [the environmental licensing process file]! [...] She [the highest officer at SUPRAM-Jequitinhonha] said that she had removed these documents from the file. That whenever she would find this kind of documents there again, she would remove them again”. (Interview with state environmental agency technical staff, Diamantina, 22 May 2015)

Furthermore, critical questions within the environmental agency were actively suppressed by superiors. As the officers went on to confide:

For example, when I requested more information, or concluded that the studies were insufficient, then the secretary [State Secretary for the Environment] came here to tell me that this was not the case [that more information was not needed], that I should just leave everything as it was.” (Interview with state environmental agency technical staff, Diamantina, 22 May 2015)

Technical staff from the environmental authority has reported what they considered an excess of political pressure over them in order to suppress information that could hinder or delay permit's emission in informal talks at SUPRAM-Jequitinhonha (Diamantina, MG), as well as in recorded interviews:

When I reported things that went against what the company wanted, they [superiors of this environmental expert] changed the technical expertise. This also happened in another mining project now [not only in the Minas-Rio]. I wrote an expertise, and afterwards they took out everything that could somehow be contrary to the interests of the company. I obviously didn't sign this expertise. There is no autonomy. In the environmental authority, whoever worked on the Minas-Rio project had no independence working in this process. The political pressure to just let the project pass was huge. They [superiors of this environmental expert] even told us [the technical staff]: ‘This project will pass. You better put in conditionalities, because it will pass’. And that is what we had in the end. An environmental permit with more than two hundred conditionalities, can it be feasible? If there are more than two hundred measures that the project has to fulfill so that it can be installed, how can something like that be feasible?’ (Interview with state environmental agency technical staff, Minas Gerais, 22 May 2015).

This information was frequently repeated in informal talks during archival research and in interviews. Officers soon learned that they were not supposed to question the information presented by the mining company too much and that they were meant to facilitate the quick licensing of the Minas-Rio project.

The need to speed up the licensing process became also clear when alternative information, partially asked for by the environmental agency itself, was regarded as irrelevant for the final decision-making process, preceding the deliberation on the operation permit. For example, in a public deliberative session at the environmental council (URC-Jequitinhonha), in Diamantina, Minas Gerais, in September 29th 2014, concerns of local inhabitants, who requested issues of water scarcity, vibration damaging houses, and uncertainty about resettlement process to be discussed before the license was to be issued,

were brushed aside. In the same meeting, the environmental consultancy report by Diversus which had been carried out on URC-Jequitinhonha's request and had recently been submitted was completely ignored. The report was held from the environmental councilors responsible for the licensing. Thus this important (alternative) information—though scientifically grounded—was ignored in the decision-making.

The fact that alternative information is often ignored in environmental licensing processes is no novelty in Brazil. An environmental councilor referring to his experience from other licensing processes concluded that it would be more reasonable to decelerate the process, allow time for a better analysis of the studies and for more community participation, so that the environmental councilors could vote in a more reliable manner¹¹. In this context, another environmental councilor has asked the Minas Gerais State Secretary of Environment and Sustainable Development, who was present at the meeting, why the State of Minas Gerais found it so urgent to decide on the permit on that day, instead of pausing the licensing process in order to allow the environmental councilors to have access to the complementary studies about the socioeconomic impacts of the project and, at least, understand better the unresolved matters before deliberating¹². In face of this question, the State Secretary of Environment and Sustainable Development declared:

I have had the opportunity to accompany the development of this process for more than six years, therefore, I do not know to which extent you understand that it is accelerated, and to which extent I understand that the time to decide the issue is long overdue. [...] I believe that the State of Minas Gerais cannot afford the luxury of such an inefficiency in not judging this case, this or any other."¹³

Note that the Secretary of Environment of Minas Gerais did not hesitate to highlight as inefficiency (of the State) that the operation permit had not yet

been decided upon. But he by no means acknowledged that the dubious quality of the EIS initially presented by the mining company—which made several complementary studies necessary—was itself a main reason for the 'delay' of the process—not to mention that it caused community insecurity and enhanced the opposition to the project.

Given the flaws in the definition and demand for information, problems in data and information production, and a rigorous process of elimination of potentially relevant knowledge and data calling the investment in question, it does not surprise that all environmental permits were finally granted.

Discussion: Politics of Knowledge in the Environmental Licensing Process for the Minas-Rio Project

The state of Minas Gerais and Brazil have, in theory, a democratic model of environmental protection, a model in which strong technical evaluation by environmental experts (in the case here presented, at SUPRAM) is enriched by social control and participation (in an environmental council, as the URC-Jequitinhonha). However, both technical assessment and social control depend on available information. As has been discussed above, evidence-based decision-making often leads to politics of knowledge and politization of science. Knowledge politics affect the basic assumptions, demand for information, and epistemological digression as to which form of knowledge to privilege. In the Minas-Rio case, legal requirements for the environmental licensing in the mining sector omitted important baseline information and allowed for investor engagement (e.g. buying land) prior to the knowledge generation and decision-making process. Local knowledge about water pollution, presented in situ in the form of dead fish and dirty water, did not meet the required benchmarks of knowledge deemed relevant. As the licensing process dragged on, the knowledge and data production also became problematic. Lack of resources as well as poor staff capacities severely curtail the ability of the environmental agency to generate a sound knowledge basis for an informed decision-making process. In the case discussed, the information presented in the studies provided by the mining company was

11 Minutes of the 86^a URC-JEQ meeting, lines 714-719.

12 Minutes of the 86^a URC-JEQ meeting, lines 724-725 and 747-750.

13 Minutes of the 86^a URC-JEQ meeting, lines 728-736.

insufficient, lacking important data and information. The analysis and verification of these studies by the environmental agency was also lacking. As this was decried by local and environmental activists, they produced and asked for the production of alternative data, information and knowledge. While the environmental agency agreed in principle and alternative studies were commissioned, pressure within the agency to temper with evidence and to speed up the licensing process mounted. Politicians and leading agency bureaucrats directly interfered in the knowledge production process on behalf of the investors and stopped critical officers from further investigating flawed or insufficient information. Last but not least, while investor information was deemed credible, alternative studies and information—even the alternative study commissioned by the environmental agency itself—was ignored for the final decision making-process. As the political will to facilitate the Minas-Rio project was strong enough and the definition, production and valuation of knowledge was politicized, participatory and well-informed decision-making became impossible.

Therefore, the process and the quality of environmental licensing in the mining sector of Brazil is highly questionable and produces high risks for the local people affected as well as the environment, despite the country's relatively advanced environmental legislation. These problems have become more visible to the broader public after the devastating dam break in Mariana, in 2015 (see, among others, Douglas, 2015; Phillips, 2015; Milanez et al., 2016), and the most recent mining dam break in Brumadinho, on January 25th, 2019 (Bragon, 2019; Camargos, 2019).

Research on the dam break in Mariana has also highlighted problems related to information and knowledge management in environmental licensing processes, as the low quality both of EISs and of their analysis by the environmental agency, confirming the findings of the present study. Analyzing the EIS of the Samarco mining project, the research group PoEMAS points that the risks of mining dam failures and the likely extension of resulting damages have been neglected in the environmental licensing process. While the studies promised increased job and income generation, the tailing dam break

was classified as “unlikely”, in spite of many mining dam failures that happened in Brazil and worldwide on the decade before this EIS was written (PoEMAS, 2015, p. 56).

The dimensions of one of the biggest environmental disasters of Brazilian history has triggered investigations by other state authorities, such as the federal police and the *Ministério Público*, the Government Agency for Law Enforcement and Prosecution¹⁴. Since the catastrophe these authorities (external to and independent from environmental agencies) have been questioning both the environmental licensing process and the mining dams monitoring system.

Concluding remarks

In a scenario of deregulation and weakening environmental barriers to mining advancement, as can be encountered in Brazil—especially under the new president—knowledge politics in environmental licensing process become ever more pronounced. Despite the catastrophic consequences of the Mariana disaster little has changed regarding the well-known flaws in information management. A bill proposed by popular initiative in order to impose stricter rules on the environmental licensing of mining tailings dams was rejected by the Legislative Assembly of Minas Gerais in July 2018. According to a state deputy who voted against the bill, it would make mining unfeasible in the state (Faria and Linhares, 2019).

14 We opted for this translation (instead of Public Prosecution Office, more common in translations from Brazilian Portuguese to English) because the *Ministério Público* has no correspondence in English-speaking common law countries. As a public authority, it is independent from the Executive, from the Judiciary and from the Legislative Powers and it is also known as a fourth power in Brazil. It exists in federal level—*Ministério Público Federal* (MPF)—and in the federal states level—*Ministério Público Estadual* (MPE). In the Brazilian Constitution of 1988, the *Ministério Público* is defined as “a permanent institution that is essential to the jurisdictional function of the State” (Brazilian Constitution, article 127). Apart from criminal prosecution, the functions of the *Ministério Público* encompass the defense of the legal order, of the democratic regime, and of social interests and inalienable individual interests. In the environmental licensing, the member of the *Ministério Público* (State Agency of Law Enforcement and Public Prosecution) acts as the guardian of the law, defendant of the legal order and of social interests.

The acknowledged lack of resources and precarious infrastructure of environmental agencies in Minas Gerais certainly account for many of the above mentioned problems in knowledge and information management within the environmental licensing process. But in the findings above presented also a structural problem of knowledge politics becomes clear: politicians and top bureaucrats wield excessive pressure over SUPRAM technical staff in a space that evades public control. Furthermore, frequent interaction between mining and environmental authority staff at the environmental agency, partially created by the lack of resources and capacities on the side of the public agency, has the potential to even enhance investor friendly knowledge politics. Pressure as well as this sort of collaboration deeply compromise the environmental licensing process. The questionable knowledge management is worsened by companies specialized in EIS elaboration, which do not always have the necessary independence to contradict mining companies' interests. In the case here discussed, environmental agencies trusted with verification, monitoring and control of this information fell short on their tasks.

Furthermore, the exclusion of knowledge and information provided by affected communities and the wider civil society (including organized environmental activists and social movements backed up by acknowledged research groups from local universities) reinforced the severely flawed and investor-friendly knowledge politics in the environmental licensing process.

In face of these pitfalls, it seems that the environmental licensing is solely a bureaucratic, formal requirement before mining projects are allowed, but which does not allow for any thorough knowledgeable questioning of the basic decision at hand. While discussions focus on compensations and mitigation measures to mining's inevitable environmental and social externalities, the projects themselves are taken for granted. In an extractivist economy like that of Brazil, mining and other large-scale industrial or agricultural projects are seen as welcome pre-requirements to development. The alternative of denying the environmental permit, or to favor other territorial uses over mining is in most cases out of question.

However, the case also shows that knowledge contestation and participation in decision making have been crucial for affected communities. They made their struggles more visible and allowed mobilization and alliances with other groups (as environmentalists and local universities). Greatly due to consistent opposition by affected families in the Minas-Rio, the company was obliged to finance further studies about the socioeconomic situation (Diversus, 2011, 2012, 2014a, 2014b), as well as to elaborate resettlement plans and negotiation standards with vulnerable families.

Thus, the case presented in this paper shows many problems and uncertainties that arose during the production and verification of information about social and environmental impacts and risks of mining projects, and this information dimension, as here argued, is important to understand the processes in which rights and interests of certain groups are sidelined. This has important implications for the strategies of affected people and their scientific and civil society allies. The definition, production and public promotion of relevant and critical knowledge may be a necessary condition to question risky and sometimes ruthless investments. However, providing better arguments and contesting dominant definitions and forms of knowledge does not suffice to stop the ongoing emptying of environmental and citizen rights in the case of large-scale investment in extractivist economies. Due to the inherent politics of knowledge in environmental licensing processes, any engagement needs to be political. Crucial decisions based on vested interests, therefore, remain political and seem to necessitate engagement with power –even more so than with knowledge.

Acknowledgements

The authors thank the DAAD for financing the PhD research on which this text was based, and thank the reviewers of this text for their valuable comments and questions.

Conflict of interests. The manuscript was prepared and reviewed with the participation of the authors, who declare that there exists no conflict of interest that puts the validity of the presented results at risk.

References

- Ação Franciscana de Ecologia e Solidariedade, 2017. Mineração em Conceição do Mato Dentro denunciada na assembleia da Anglo American em Londres, 25 abr. 2017. Available at: <http://www.falachico.org/2017/04/mineracao-em-conceicao-do-mato-dentro.html>; consulted: April, 2017.
- Bebbington, A., Bebbington, D., Bury, J., Langan, J., Muñoz, J., Scurrah, M., 2008. Mining and social movements: struggles over livelihood and rural territorial development in the Andes. *World Dev.* 36, 2888-2905. DOI: 10.1016/j.worlddev.2007.11.016
- Bebbington, A., 2009. The new extraction: rewriting the political ecology of the Andes? *NACLA: Rep. Am.* 42, 12-20. DOI: 10.1080/10714839.2009.11722221
- Bebbington, A., 2010. Extractive industries and stunted states : conflict, responsibility and institutional change in the Andes. In: Raman, R. (Ed.), *Corporate social responsibility: discourses, practices and perspectives*. Palgrave MacMillan, London. pp. 97-115.
- Becker, L., 2009. *Tradição e modernidade: o desafio da sustentabilidade do desenvolvimento na estrada Real*. PhD thesis. Instituto Universitário de Pesquisas do Rio de Janeiro (IUPERJ), Rio de Janeiro, Brazil.
- Becker, L., Pereira, D., 2011. O Projeto Minas-Rio e o desafio do desenvolvimento territorial integrado e sustentado: a grande mina em Conceição do Mato Dentro. In: Fernandes, F., Enríquez, M., Alamino, R. (Eds.), *Recursos minerais & sustentabilidade territorial: grandes minas*. Vol. I. CETEM/MCTI, Rio de Janeiro, Brazil. pp. 229-258.
- Bermann, C., 2014. A desconstrução do ambiental e a invisibilização do social nos projetos de usinas hidrelétricas. In: Zhouri, A., Valencio, N. (Eds.), *Formas de matar, de morrer e de resistir: limites da negociação negociada de conflitos ambientais*. UFMG, Belo Horizonte, Brazil. pp. 95-109.
- Bourdieu, P., 1987. The force of law: toward a sociology of the juridical field. *Hastings Law J.* 38, 814-853.
- Bragon, R., 2019. Risco de rompimento foi citado na tensa reunião que aprovou a licença da barragem. *Folha de São Paulo*, 25 Jan. 2019. Available at: <https://www1.folha.uol.com.br/cotidiano/2019/01/risco-de-rompimento-foi-citado-na-tensa-reuniao-que-aprovou-licenca-da-barragem.shtml>; consulted: January, 2019.
- Camargos, D., 2019. Secretário mudou regra, e nova norma rebaixou risco da barragem de Brumadinho. *Repórter Brasil*, 26 Jan. 2019. Available at: <https://noticias.uol.com.br/cotidiano/ultimas-noticias/reporter-brasil/2019/01/26/germano-vieira-norma-licenciamento-ambiental-barragem-brumadinho.htm>; consulted: January, 2019.
- Constituição da República Federativa do Brasil, 1988. Brasília.
- Diversus, 2011. Diagnóstico socioeconômico da área diretamente afetada e da área de influência direta do empreendimento Anglo Ferrous Minas-Rio Mineração S.A. (Ex-MMX Minas-Rio Mineração S.A.) - Lavra a Céu Aberto com Tratamento a úmido de minério de ferro - Conceição do Mato Dentro, Alvorada de Minas e Dom Joaquim/MG - DNPM No: 830.359/2004 -PA/No 00472/2007/004/2009- Classe 06. Belo Horizonte, Brazil.
- Diversus, 2012. Adendo ao Diagnóstico Socioeconômico: área diretamente afetada (ADA) e Área de Influência Direta (AID) da Mina da Anglo Ferrous Minas-Rio Mineração S/A - Conceição do Mato Dentro, Alvorada de Minas e Dom Joaquim/MG. Belo Horizonte, Brazil.
- Diversus, 2014a. Avaliação socioambiental dos processos de negociação fundiária e reestruturação produtiva das famílias atingidas: Empreendimento Anglo Ferrous Minas-Rio S.A. - Municípios de Conceição do Mato Dentro, Alvorada de Minas e Dom Joaquim. Belo Horizonte, Brazil.
- Diversus, 2014b. Estudo de definição sobre comunidades/famílias a serem reassentadas: área diretamente afetada (ADA) e Área de Entorno da cava licenciada e estruturas correlatas - Conceição do Mato Dentro, Alvorada de Minas e Dom Joaquim/MG. Belo Horizonte, Brazil.
- Douglas, B., 2015. Brazil's slow-motion environmental catastrophe unfolds. *Newspaper The Guardian*, November 13 2015. Available at: <http://www.theguardian.com/business/2015/nov/13/brazils-slow-motion-environmental-catastrophe-unfolds>; consulted: December, 2015.
- Duarte, C., Dibo, A., Sánchez, L., 2017. What does the academic research say about impact assessment and environmental licensing in Brazil? *Ambient. Soc.* 20, 261-292. DOI: 10.1590/1809-4422aso-c20150268r1v2012017
- Edelman, L., Leachman, G., Mcadam, D., 2010. On law, organizations, and social movements. *Ann. Rev. Law Social Sci.* 6, 653-685. DOI: 10.1146/annurev-lawsocsci-102209-152842
- Epstein, S., 1996. *Impure science: AIDS, activism, and the politics of knowledge*. University of California Press, Oakland, USA.
- Faria, F., Linhares, C., 2019. Projeto que endurece regras para barragens não avança em Assembleia de MG. *Newspaper Folha de São Paulo*, 27 Jan. 2019. Available at: <https://www1.folha.uol.com.br/cotidiano/2019/01/projeto-que-endurece-regras-para-barragens-nao-avanca-em-assembleia-de-mg.shtml>; consulted: January, 2019.
- Ferreira, S., 2015. "O que a gente quer é justiça": Conflito, mobilização e a luta por justiça dos atingidos pela mineração nas reuniões da Rede de Acompanhamento Socioambiental (REASA), em Conceição do Mato Dentro/MG. Ungraduate thesis. Faculty of Philosophy

- and Human Sciences (FAFICH), Anthropology Department, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil.
- Fischer, F., 2000. Citizens, experts and the environment: the politics of local knowledge. Duke University Press, Durham and London.
- Fonseca, A., Sánchez, L., Ribeiro, J., 2017. Reforming EIA systems: a critical review of proposals in Brazil. *Environ. Impact Assess. Rev.* 62, 90-97. DOI: 10.1016/j.eiar.2016.10.002
- Grupo de Estudos em Temáticas Ambientais (Gesta), 2016. Nota de repúdio à criminalização e intimidação de lideranças comunitárias em Conceição do Mato Dentro/MG. Available at: <http://conflitosambientaismg.lcc.ufmg.br/noticias/nota-de-repudio-a-criminalizacao-e-intimidacao-de-liderancas-comunitarias-em-conceicao-do-mato-dentro-mg/>; consulted: November, 2016.
- Grupo de Estudos em Temáticas Ambientais (Gesta), 2017. Atingidos pela Anglo American em Alvorada de Minas e Conceição do Mato Dentro bloqueiam estradas em protesto. Available at: <http://conflitosambientaismg.lcc.ufmg.br/noticias/atingidos-pela-anglo-american-em-alvorada-de-minas-e-conceicao-do-mato-dentro-bloqueiam-estradas-em-protesto/>; consulted: November: ago. 2017.
- Grupo Política Economia, Mineração, Ambiente e Sociedade (PoEMAS), 2015. Antes fosse mais leve a carga: avaliação dos aspectos econômicos, políticos e sociais do desastre da Samarco/Vale/BHP em Mariana (MG). Mimeo: UFJF, Juiz de Fora, Brazil. Available at: <http://www.ufjf.br/poemas/publicacoes/desastre-do-rio-doce/>; consulted: August, 2016.
- Habermas, J., 1984. The theory of communicative action. Vol. 2. Beacon press, Boston, MA.
- Hilson, G., 2002. An overview of land use conflicts in mining communities. *Land Use Policy* 19, 65-73. DOI: 10.1016/S0264-8377(01)00043-6
- Justiça Global, 2017. Organizações e movimentos realizam missão de proteção a atingidos pelo Projeto Minas-Rio. Available at: <http://www.global.org.br/blog/organizacoes-e-movimentos-realizam-missao-de-protecao-atingidos-pela-mineracao-em-conceicao-do-mato-dentro-mg/>; consulted: July, 2017.
- Leach, M., Scoones, I., 2007. Mobilising Citizens: social movements and the politics of knowledge. IDS Working Paper 276. Institute of Development Studies, Brighton, UK.
- Limoges, C., 1993. Expert knowledge and decision-making in controversy contexts. *Public Underst. Sci.* 2, 417-426. DOI: 10.1088/0963-6625/2/4/009
- Lindblom, C., Cohen, D., 1979. Usable knowledge: Social science and social problem solving Vol. 21. Yale University Press, New Haven, CT.
- Martinez-Alier, J., 2001. Mining conflicts, environmental justice, and valuation. *J. Hazard. Mater.* 86, 153-170. DOI: 10.1016/S0304-3894(01)00252-7
- Milanez, B., Wanderley, L., Mansur, M., Pinto, R., Gonçalves, R., Santos, R., Coelho, T., 2016. Antes fosse mais leve a carga: reflexões sobre o desastre da Samarco/Vale/BHP Billiton. Editorial iGuana, Marabá, Brazil.
- Milanez, B., 2017. *Boom* ou *bolha*? A influência do mercado financeiro sobre o preço do minério de ferro no período 2000-2016. *Versos – Textos para discussão PoEMAS* 1, 1-18.
- Milanez, B., Santos, R., 2018. Extraction minière, stratégie d'entreprise et flexibilisation de la réglementation environnementale au Brésil: le cas du projet Minas-Rio. *Brésil(s)* 13. DOI: 10.4000/bresils.2488
- Miller, J., Kiernan, P., 2013. Miner, billions over budget, slogs ahead in rural Brazil. *Newspaper Wall Street Journal*, Jun 10 2013. Available at: <http://www.wsj.com/articles/SB10001424127887323582904578487090505277214>; consulted: February, 2016.
- Moore, S., 1978. Law as process: an anthropological approach. Routledge & K. Paul, London; Boston.
- Petts, J., Brooks, C., 2006. Expert conceptualisations of the role of lay knowledge in environmental decision making: challenges for deliberative democracy. *Environ. Plan. A*, 38, 1045-1059. DOI: 10.1068/a37373
- Pereira, A.R.B., 2019 (in the press). Taking sides in scientific research? The struggle for the right to participate in public decision-making related to a mining project in Brazil. In: Feichtner, I., Krajewski, M. (Eds.), *Human Rights in the extractive industries: transparency, participation, resistance*. Interdisciplinary Studies in Human Rights Series. Springer, Berlin.
- Pereira, D., Becker, L., Wildhagen, R., 2013. Comunidades atingidas por mineração e violação dos direitos humanos: cenários em Conceição do Mato Dentro. *Rev. Ética Filos. Polít.* (16), 124-150.
- Phillips, D., 2015. Brazil's mining tragedy: was it a preventable disaster? *Newspaper The Guardian*, November 25 2015. Available at: <http://www.theguardian.com/sustainable-business/2015/nov/25/brazils-mining-tragedy-dam-preventable-disaster-samarco-vale-bhp-billiton>; consulted: December, 2015.
- Prates, C., 2014. Mineração em Conceição do Mato Dentro: uma análise da REASA como instância de 'resolução' de conflito. Undergraduate thesis. Faculty of Philosophy and Human Sciences (FAFICH), Department of Socioenvironmental Sciences, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil.
- Prates, C., 2017. Efeitos derrame da mineração, violências cotidianas e resistências em Conceição do Mato Dentro-MG. MSc thesis. Inter-institutional Master Program on Society, Environment and Territory.

- Universidade Federal de Minas Gerais, Montes Claros, Brazil.
- Presidência da República do Brasil, 1981. Lei 6.938, Política Nacional do Meio Ambiente, seus fins e mecanismos de formulação e aplicação. DOU 2.9.1981. Brasília.
- Presidência da República do Brasil, 2003. Lei 10.650, acesso público aos dados e informações existentes nos órgãos e entidades integrantes do Sisnama. DOU 17.4.2003. Brasília.
- Raymond, C., Fazey, I., Reed, M., Stringer, L., Robinson, G., Evely, A., 2010. Integrating local and scientific knowledge for environmental management. *J. Environ. Manage.* 91, 1766-1777. DOI: 10.1016/j.jenvman.2010.03.023
- Ribeiro, J., 2015. Licenciamento Ambiental: herói, vilão, ou vítima? Arraes Editores, Belo Horizonte, Brazil.
- Rodrigues, W., 2018. Como prometido, manifestantes bloqueiam acesso à Anglo em Conceição do Mato Dentro. Newspaper *Jornal DeFato* online, March 12 2018. Available at: <https://www.defatoonline.com.br/como-prometido-manifestantes-bloqueiam-acesso-anglo-em-conceicao-do-mato-dentro/>; consulted: July, 2018.
- Santos, A., 2014. Não se pode proibir comprar e vender terra. In: Zhouri, A., Valencio, N. (Eds.), *Formas de matar, de morrer e de resistir: limites da negociação negociada de conflitos ambientais*. Editora UFMG, Belo Horizonte, Brazil. pp. 143-166.
- Tôrres, M., 2014. Histórias de água e minério: os efeitos do Projeto Minas-Rio em Água Quente, Conceição do Mato Dentro. Undergraduate thesis. Faculty of Philosophy and Human Sciences (FAFICH), Department of Social Sciences, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil.
- Vieira, L., 2015. O Projeto Minas Rio e a mineração em Conceição do Mato Dentro/MG: Uma análise a partir dos discursos, dos conflitos e da resistência. MSc thesis. School of Architecture, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil.
- Wynne, B., 1996. May the sheep safely graze? A reflexive view of the expert-lay knowledge divide. In: Lash, S., Szerszynski, B., Wynne, B. (Eds.), *Risk, environment and modernity: Towards a new ecology*. Sage Publications, London. pp. 44-83. DOI: 10.4135/9781446221983.n3
- Zhouri, A., 2010. 'Adverse Forces' in the Brazilian Amazon: developmentalism versus environmentalism and indigenous rights. *J. Environ. Dev.* 19, 252-273. DOI: 10.1177/1070496510378097
- Zhouri, A., 2014. Mapeando desigualdades ambientais. In: Zhouri, A., Valencio, N. (Eds.), *Formas de matar, de morrer e de resistir: limites da resolução negociada de conflitos ambientais*. Editora UFMG, Belo Horizonte, Brazil. pp. 111-142.
- Zucarelli, M., 2006. O papel do termo de ajustamento de conduta no licenciamento ambiental de hidrelétricas. In: III Encontro do Associação Nacional de Pós-Graduação e Pesquisa em Ambiente e Sociedade (ANPPAS). Available at: <http://principo.org/o-papel-do-termo-de-ajustamento-de-conduta-no-licenciamento-am.html>; consulted: July, 2018.