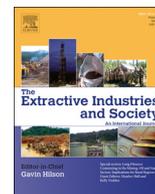




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Anticipating futures through enactments of expertise: A case study of an environmental controversy in a coal mining region of Colombia

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ABSTRACT

In a water-scarce, coal-producing region of Colombia, frictions are intensifying over the environmental impact of the diversion of a creek. Through ethnographic observation, this article examines the different positions on what this article refers to as the *Bruno Creek Controversy* and the enactments of scientific expertise deployed to influence decision making. On the one hand, there are officials from the mining company, who believe the risks associated with the creek diversion are negligible and manageable, potentially offset by interventions implemented under Corporate Social Responsibility (CSR) programs. On the other hand, a group of activists, equipped with local knowledge and partnered with experts, claims the project would cause unacceptable damage, furthermore arguing that the creek is a part of a sensible broader ecosystem. At the same time, environmental authorities reveal how their enactment of expertise is bounded to political relations. This article argues that expertise is a performative, ideological, and interactional phenomenon that is authorized by existing power relationships. Controversies such as *Bruno Creek*, therefore, are highly productive sites for shaping environmental governance, whether through the increasing influence of local communities in decision-making, activist scientists' ability to inform policy, or through a shifting of temporal and geographical scales to better understand the implications of resource extraction.

1. Introduction

In late-2016, in a water-scarce region of northern Colombia, the annual meeting between the CEO of one of the world's largest open-pit coal mines and its local employees took place. Voicing what was a collective concern, one member of the audience inquired about how the company's recent decision to expand operations would impact local water availability and the environment. The CEO, in an attempt to appease employees about concerns that were already a subject of heated controversy, assured the audience that "projects involving water, when done by international standards, are viable".¹ The CEO also acknowledged that they faced criticism and stated that the company did not have a problem with this "as long as the discussion is based on the technical issues".

In his statement, the CEO sought to discredit local knowledge as valid enough grounds to stop the project, maintaining that altering a watercourse, which the expansion would cause, was acceptable and could be managed; activists opposing the project were challenged to debate these issues with company's experts. For their part, anti-project

activists portrayed the watercourse as a microcosm of nature and used it as an example to showcase the impacts of large-scale mining – how it is potentially destructive – while simultaneously establishing dialogues between scientific experts and Indigenous people. For us, the scene captures some of the complexities of a debate in which different expertise and other forms of knowledge production are deployed to portray the future of an entire region. This is a process that is common among environmental controversies linked to neoliberal mining expansion in Latin America and elsewhere (Bebbington, 2012).

In this article, we examine different enactments of expert scientific knowledge and explore how they are used when imagining, anticipating, and resisting possible futures of resource extraction. We present an account of a specific controversy surrounding the Cerrejón Mine, located in the water-scarce region of La Guajira in northern Colombia. We analyze the enactments of expertise of three internally-heterogeneous groups: activist groups, the mining company, and local and national environmental agencies. We further analyze the interplay between enactments of scientific and local experiential knowledge and how they clashed or complemented each other in making water scarcity

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a contending issue.

In order to better acquaint readers with the controversy, some contextual details are required. La Guajira is the driest region in Colombia. Its geographical topography ranges from the hilly tropical dry forest (in the south), featuring rural as well as urban settlements, to desertic mountain chains and plains (in the north) that are mainly inhabited by the Wayuu people. According to official figures, La Guajira has performed poorly on most social indicators, including unsatisfied basic needs (UBN), inequality, poverty, and access to public services (DANE, 2015). These circumstances pose ongoing challenges for the mining industry, which, despite its deployment of cutting-edge technologies and its alleged compliance with international standards and development programs for over 30 years, has not had the expected positive effects on the well-being of the region; in fact, it has reinforced structural problems of marginalization and the inequality of this region's poorest inhabitants.

Founded in the early 1980s, the Cerrejón Mine initially operated as an association project between the Colombian State and Exxon. In 2005, it came under the joint ownership of three international mining-giants—Anglo American, Glencore, and BHP—and changed its name to Carbones del Cerrejón Limited. Today, the mine covers 13,539 hectares on a concession of 69,000 hectares, with infrastructure including seven operating pits, camps, offices, a coal processing plant, a 150 km railway, and a port on the Caribbean coast. Accordingly, this mining project's area of influence is vast, impacting five municipalities with a total of 304,958 inhabitants and directly affecting 313 Peasant and Indigenous communities.

While the mine's environmental and social impacts have historically been extensive, in 2012 the company undertook growth plans that sought to increase the mine's production from 34 to 40 million tons. One of these plans called for the partial diversion of a creek to extend a mining pit, a typical step in an open-pit operation that in La Guajira has irreversibly affected watercourses in the past. Nevertheless, the Cerrejón Mine expansion has gone hand in hand with the mining development plans and mineral export targets implemented by the governments over the past two decades.

Carbones del Cerrejón Limited (henceforth, “the company”) refers to the above project as *Engineering Works at La Puente Pit*. This name in many ways symbolizes the project's technical and managerial approach, drawing focus to the mining pit as the locus of attention, with no mentioning of the creek it impacts. Contrastingly, activist organizations and communities in the vicinity of the mine have called the project the *Bruno Creek Diversion* [La Desviación del Arroyo Bruno], a denomination that highlights the name of the watercourse and the associated intervention as a critical issue of contention. This last name is popular among the governmental and media actors, a title that signals that water is at the center of what this article henceforth refers to as the *Bruno Creek Controversy*.

With the focus here being on frictions around natural resource extraction, we seek to understand the dynamic assemblage of practices, knowledge, and discourses that surround these controversies. We situate our work in the anthropology of mining (Ballard and Banks, 2003; Jacka, 2018), and we draw on the political ecology of mining and its acknowledgement of the power relations and distribution-based conflicts that surround corporate mining (Alimonda, 2011; Bebbington, 2012; Bridge, 2004; Gonzalez, 2018; Prieto et al., 2019). We also take inspiration from Science and Technology Studies (STS), especially the works of Latour (2004) and Callon et al. (2009), when thinking about how scientific facts become enacted within a wide range of relational fields.

Our main finding is that controversies over mining projects arise when companies respond to community concerns through risk-management practices. In contrast, representatives from potentially-affected local communities identify the projects as the main threat to their future. In these situations, a dispute over different framings of extractive industries futures inevitably arises due to different

enactments of expertise.

We take inspiration from the literature on the anthropology of expertise, specifically Carr's (2010) notion of expertise as a performative, ideological and inherently interactional phenomenon “implicated in semistable hierarchies of value that authorize particular ways of seeing and speaking as [an] expert” (p. 18). However, to understand controversies as disputed framings of risk, uncertainty, and the future, we advance Carr's notion by pointing to the positions and structural power relationships that shape the encounters between communities, experts, the State and private actors in environmental decision-making. This way of conceptualizing expertise in mining-related environmental controversies reveals how expertise can articulate risks, uncertainties, and concerns about the future in a variety of ways within existing power relations. Our approach allows for an understanding of change—and the potential for change—within societies that actively embrace extractive industries as a developmental approach, as has been the case in Latin America during recent decades (see the special issue *Extractive Imperative in Latin America*, edited by Arsel et al., 2016a).

This article draws on the findings of a two-year research project (2014–2016) that examined the role of expert knowledge in the construction and endurance of extractive regimes in Colombia. During this project, we gained insights into various elements of the *Bruno Creek Controversy* and decided to study it through the observation of real-time interactions, focusing on the assemblage of sites, forums, and organizations. We engaged in participant observation during events organized by State, corporate and activist groups. We also conducted in-depth semi-structured interviews in La Guajira with activist leaders, Wayuu representatives, company officials, and representatives of national and regional environmental authorities. We also reviewed and critically analyzed documents and press releases relating to this controversy.

In the next section of the paper, we present a review of the literature and key concepts related to our analysis of the relationship between mining-related environmental controversies and expert knowledge within the fields of anthropology, geography, and science and technology studies. Next, we present an in-depth account of this controversy, the enactments of scientific expertise of its three sets of actors, and the imagined futures implicated in these enactments.

2. Extractive industries and expert knowledge: risk and uncertainties in mining controversies

Around the world and in Latin America in particular, mineral extraction has become a locus of social conflict, territorial fragmentation, and intricate relational divisions linked to gender, class, and race (Alimonda, 2011; Avci and Fernández-Salvador, 2016; Göbel and Ulloa, 2014; Helwege, 2015). Anthropologists have detailed a wide array of relations between communities and corporations in the context of extractive industries. These relations range from community opposition to resource extraction, preventing what they perceive as a threat to livelihoods (Ballard and Banks, 2003; Jacka, 2018; Kirsch, 2014), to mobilizations aimed at benefiting locally from mining revenues or having greater local-level participation during project development (Babidge, 2013; Bebbington et al., 2008; Welker, 2014).

While corporations and community relations are a broad topic, we are primarily interested in the academic literature that questions how the future and its risks are defined and what kind of relationships and knowledge prevail in these power-ridden processes. A key topic in the literature is how mining is intrinsically related to a multiplicity of temporalities and diverging and conflicting perceptions of the future (D'Angelo and Pijpers, 2018; Ferry and Limbert, 2008). Early studies about the *risk society* (Beck, 1992) have been expanded by scholars who have examined the enactment of risk as new coherent forms of knowledge and practice (Collier, 2008). Today, there is a growing literature on the enactments of risk during controversies related to the extractive industries, showing how scientific projections of risk are constantly being contested (Hébert, 2016; Hovardas, 2019;

Metze, 2018).

Scholars have paid particular attention to the anticipatory actions towards a future problematized as threatened, indeterminate, or uncertain (Anderson, 2010), the affective horizons associated with uncertain futures (Weszkalnys, 2016), and the changing identities following the non-linearity of resource extraction (Kneas, 2018). Academics have also conceptualized the range of sites and entities that create new regimes of prognostic environmental politics (Ferry, 2016) and have described the proliferation of new practices of modeling, planning, and interpolating the future (Mathews and Barnes, 2016). Studies such as Hébert (2016) have shown how questions about the future—far from becoming sites of unequivocal and hegemonic answers often “overflow” the experts’ techniques concerning environmental impact. Following this line of thinking, of particular interest for our project are studies about the role of science in these prognoses, especially how expert methods such as modeling, risk assessments, and scenarios are applied and have political effects (Barnes, 2016; Kneas, 2016; Lundin and Öberg, 2014). Furthermore, we also explore how enactments of expertise are incorporated into objects and processes, gaining independence from the expert.

The literature and our past research have shown that scientific knowledge is often privileged in the management of risk to facilitate the implementation of development projects, thereby excluding incommensurable local values (Carmona and Jaramillo, 2015; Carmona and Puerta Silva, 2020). Many debates have also focused on alternative uses of science, such as the post-normal science debate (Funtowicz and Ravetz, 1993; Wesselink and Hoppe, 2011). Of particular interest is the interplay between scientific and local experiential knowledge in scientific or environmental controversies depicting the environment as a contested site full of frictions between kinds of knowledge (Callon et al., 2009; Davis, 2005; Latour, 2004; Li, 2015; Negev and Teschner, 2013; Tsing, 2005).

At the same time, mining companies have their own strategies for dealing with local opposition and acquiring legitimacy for their projects. One example is lobbying for legislation or public strategies implemented under the banner of *Corporate Social Responsibility* or “CSR” (Kirsch, 2014; Rajak, 2011; Welker, 2014). Mining companies usually anticipate adverse futures portrayed by activist groups claiming that the territory will be left “exactly or better than it was before,” an optimistic scenario associated with the motto of *responsible mining* [Minería Responsable]. This term evokes the deployment of technical expertise at all stages of a mining operation and the idea that mining contributes to sustainable development through taxes and royalties (Broad, 2014; Kirsch, 2010). These strategies create a particularly positive vision of the future as subject to actions such as accurate investment of revenues and technical-environmental management. They also require expertise provided by a growing industry of consultants and NGOs (Ballard and Banks, 2003; Luning, 2012).

The ethnographic material on the *Bruno Creek Controversy* linked scientific expert knowledge to imagining, discussing, and making decisions about the future involved in this mine’s expansion. Following Latour’s insights on scientific concerns, we define environmental controversy as contexts in which experts are incapable of reaching a consensus and wherein *matters of fact* become *matters of concern* (2004, p. 63). Furthermore, the *Bruno Creek Controversy* reflects a broader *political situation* (Barry, 2013), in which events that connect scales, localities, and voices emerge with expectations of economic growth, Indigenous participation, climate change or global economic models. Expanding on these analyses, we argue that this mine expansion project enables controversial instances traversed by power relations that go beyond scientific communities. In line with Callon et al. (2009), we argue that spaces of controversies are *hybrid forums*: public spaces in which technical-scientific knowledge and other non-technical sources of knowledge come together in decision making, enriching democracy.

However, Callon et al. (2009) envisaged a radical division between experts and laypeople that do not fit with our observations in the field

within experts-activist alliances. Consequently, we advance Callon et al. (2009) as we accept the possibility of connections between different ways of knowing and relating to entities, such as mountains or rivers within hybrid forums in mining controversies (De la Cadena, 2010; Li, 2013), and the new prognostic politics related to resource extraction (Ferry, 2016). Accordingly, we did not consider that the sole intention of hybrid forums was “to discuss the technical options involving the collective” (Callon et al., 2009, p. 18). Instead, we understand them as spaces of contention and resistance, in which laypeople, along with the explanations provided by the experts they have partnered with, could identify their own explanations of why the creek should not be diverted, as well as to open the possibility to imagine futures without extractive projects.

One final conceptual remark concerns the themes of power relations and emerging prognostic politics. Often, environmental decision-making entails top-down relationships. Yet studies of social movements around extractivism have revealed how controversies are increasingly resolved in favor of a *priori* weak actors after social mobilization, judicial instances and through alliances between communities and technical experts (De la Cadena, 2010; Faruque, 2018; Kuecker, 2007). This situation indicates that environmental governance is an open-ended project that involves power struggles and changing priorities in politically conflictual local and global arenas.

3. Water: the “matter of concern”

Water scarcity is one of La Guajira’s most pressing issues and one of the primary triggers of conflict between the company and local inhabitants. This is no surprise if one considers that the region’s clean water distribution and sewage systems are deficient or nonexistent in urban settlements, and the drinking water of most Wayuu communities during dry seasons arrives in tank cars. The issue has not escaped the assessment by public experts: La Guajira is described in the Colombian Integral Plan of Climate Change as “highly vulnerable to the availability of water and the hydro-meteorological events linked to climate change and climate variability.” Furthermore, the document emphasizes that “it is considered necessary to take immediate action” (CAEM, 2015, p. 31). The Plan of Action Against Desertification by the Ministry of the Environment also describes La Guajira as one of the two regions in Colombia at major risk for desertification, with over 87% of its territory being dry. Indeed, the annual rainfall in La Guajira is the lowest in the country, ranging between 150 and 200 mm (Ministerio de Ambiente, 2005, p. 41). Along with government expert reports, recent extended periods of drought (2014–2015) aggravated poverty and child malnutrition which became a national issue widely depicted in the media.

In recent years, assessments, plans, and forums discussing how the risks of the region’s geographical conditions have proliferated. Concepts such as *drought*, *water scarcity*, *climate change*, and *food security* have become a part of everyday conversations in the region. Although water issues have been of concern in La Guajira from the onset of colonialism (see Ardila, 1990; De la Pedraja, 1981; Gutiérrez de Pineda, 1955), now, more than ever, *water* has become the central term of political debate in the region, mostly elicited by the coal mine recent expansion plans. In the context of water scarcity, the idea to divert a creek to exploit coal located under the riverbed appears to be overly contradictory, prompting affects and concerns about the territory’s uncertain extractive future (cf. Weszkalnys, 2016).

At the same time, the company has deployed its discourse of *responsible mining*, and despite its substantial water consumption, proclaims its efficient use of the liquid and highlights *investments* such as the reforestation of watersheds, the building and maintenance of water wells, and the provision of clean water to rural communities during periods of extreme drought. The company actively advertises these corporate investments during its mining expansion plans, including the *Bruno Creek Controversy*. Local consent is necessary to prevent

blockades of the mine's operation, and in the case of ethnic groups, an *a priori* consultation process, in which the community agrees to the project, needs to be carried out.² As a result, the company's idea of manageable risks enjoys widespread legitimacy with actors such as local, regional, and national government authorities, mine employees, and urban communities. Nevertheless, it is a discourse that subordinates local knowledge and the experience of negative impacts to technical management.

Thus, while official agents and the company have explained recent water shortages as the result of climate change combined with a generalized lack of infrastructure, activists call attention to how the seven open operating pits of the coal mine actively produced scarcity. In other words, water scarcity has become a *matter of concern* (Latour, 2004), something that is not taken for granted and is becoming a subject of research, debate, and controversy in all sectors. In this case, Bruno Creek, which is a tributary stream of the main river in the region, has been constituted as an object of knowledge constructed in multiple ways (Latour, 2005). Scientific expert knowledge has become the common ground for bringing forth arguments for decision-making. This is where understanding and describing enactments of scientific expertise becomes pertinent to imagine the future and its intertwined power relations.

4. The controversy

In the *Bruno Creek Controversy*, a struggle ensued over whether scientific and non-scientific knowledge was of value. In our ethnography, we identified the repertoire of practices of expertise through which actors in this controversy deployed their expertise and competed to make it prevail. It is noteworthy that in the process of enacting expertise, an institutionalized knowledge domain—for example a discipline, a university, an academic conference—authorizes certain experts, enabling these performers to make claims about what is true, valid, or valuable within this domain (Carr, 2010, p. 18). When the issue being discussed involves decision-making about environmental-economic relationships, the authorization of experts can also come from differential power positions of the institutions they represent. Keeping this in mind, we focus our description of events on the contested positions of the three sets of institutional actors.

4.1. The early stages of the controversy and internal tensions among environmental authorities

In 1998, the Bruno Creek Diversion was conceived as being a logical development of the company's Life-of-Mine Plan, and around 2005 the concerned national authorities pre-approved the project. This meant that the land surrounding the creek was then declared a mining zone, and it is today owned by the company, who has been acquiring local land titles since the early 1980s.

In June 2013, the company decided to pursue this project and submitted to the National Authority of Environmental Licenses—henceforth, the National Authority—the detailed engineering studies of the "La Puente Pit Surface drainage management works - partial modification of Arroyo Bruno riverbed," known colloquially as the Bruno Creek Diversion. The National Authority approved most of the works but required the company to submit for approval to the Regional Environmental Authority—henceforth the Regional Authority—three minor permits concerning water concessions, tree

harvesting, and streambed occupation. In early 2014, the Regional Authority rejected these permits.

In July 2014, we first interviewed three technicians from the Regional Authority. We were received in a recently renovated building in the city of Riohacha, the capital of the department of La Guajira. Ironically, the modernized office did not have running water. In a display of their knowledge of national laws, these technicians showed us a PowerPoint presentation that explained the hydrological basin's jurisprudence. They focused primarily on the River Basin Regulation and Management Plans, henceforth POMCAs after its Spanish acronym [Planes de Ordenamiento y Manejo de Cuencas]. POMCAs are the main management instruments of the regional environmental authorities, who are entrusted with the POMCA's formulation and implementation.

The technicians stressed two issues of utmost importance. First, the POMCAs have legal precedence over municipal regulatory plans. Second, the POMCAs declare that riparian buffer zones are conservation areas, with no exceptions. Concerning this point, one of the technicians commented, outraged: "the company wants to divert Bruno Creek, but the POMCA clearly says that it cannot!"

When this meeting took place, the Bruno Creek Diversion was not yet a public issue. During the interview, the technicians recounted fragments of the nascent controversy, expressing their indignation at the company's plans. They explained that the creek was part of a biological corridor between the Serranía del Perijá and the Sierra Nevada de Santa Marta mountain ranges. They stated that this well-preserved biological corridor was one of few remaining in the damaged ecosystem of La Guajira. Through their enactment of legal and ecological expertise, the technicians turned the Bruno Creek Diversion into a matter of risky intervention in a vulnerable ecosystem, which endangered life at large in the region.

The Regional Authority technicians referred to the POMCA as their "only weapon" for protecting riparian buffer zones. It was their legal base for denying the permissions. In 2013, after a technical visit to the project, the Regional Authority decided to grant the tree harvesting permit but to prohibit the cutting of any protected tree species within the buffer zone. Thus, the permission was rendered useless for the company. As the Regional Authority officials explained to us, the strategy had been to say, "yes, but no." Amused, they asked, "How can you expand a pit without cutting trees?"

The technicians at the Regional Authority did not regard this as a victory, although they considered that the technical and legal arguments were sound. According to the technicians, the company had argued that the POMCA had no authority to stop the project. They stated that the Regional Authority was driven by political interests and that it would eventually align with the national government and the company. They foresaw an inevitable defeat of their personal positions to the project. For us, it became apparent that within these controversies, expertise needs to be continuously contextualized in complex political and jurisdictional zones and networks.

The next day, we attended a public forum on land management to which the technicians invited us. During one of the technicians' presentation, the ongoing debate between the Regional Authority and the company became evident. The presenter introduced the POMCA, saying that it was the outcome of a participatory process undertaken with a variety of stakeholders in the river basin. He implied that the process entailed—and was legitimized by—the inclusion of local knowledge. Moreover, he pointed out that by guaranteeing a healthy environment, the POMCA intended to respond to the general needs of the population. When the time for questions came, a company's representative from the audience argued upset that preservation should not impede economic development and that the zone already had green light for the project. These statements were followed by a heated debate over the potential conflict between the POMCA and mining expansion (cf. Avci and Fernández-Salvador, 2016).

During a loud exchange of arguments, company representatives did not refute the POMCA's aims but argued for its technical ability to avoid

² Colombia is a signatory to ILO Convention 169, which stipulates that Indigenous communities are entitled to be consulted on interventions in their territories or on any administrative decisions that could affect them. During consultations, Indigenous groups should participate, according to their own customs and traditions, in the identification of impacts and give their consent to projects.

or compensate for the damage. The company therefore publicly discredited the POMCA as a non-binding instrument, invoking the precedent of its mineral exploitation contract with the Colombian State—dated in the 1980s—over the POMCA—dated in 2011. Up to that point, the disagreement between the company and the Regional Authority seemed irreconcilable.

In early 2016, the company—with the full support of the National Authority—resumed the process for the approval of permissions from the Regional Authority. This time, as predicted by the three technicians, the minor permits were granted.

It is noteworthy that the three technicians in the Regional Authority confirmed that some of the resistance to extractivism lies within State institutions and is noncontentious, as [Bebbington \(2012\)](#) has pointed out. Nonetheless, this short episode of controversy shows that a long and private negotiation between the company, the Regional and the National Authority was necessary to let the project emerge and be represented as a technically manageable intervention. In other words, the authorization of expertise appeared more as a matter of jurisdictional power than a matter of performance among scientific communities. The result was that the Regional Authority, in the end, appeared as a homogenous institutional actor who granted the permits after enacting expertise, through practices such as technical field visits and reviewing laws.

Thus far, we can draw certain conclusions. At the onset of this controversy, the POMCA was the object that contained the expert knowledge guiding the Regional Authority's decisions. It enabled the technicians to articulate and defend their positions within a legal framework. The POMCA's mandatory protection of riparian buffer zones attempted to govern the future, by endorsing a precautionary temporal logic in its expert language (cf. [Anderson, 2010](#)). Risks associated with the Bruno Creek Diversion were represented as being surrounded by a high degree of uncertainty that made it preferable not to intervene the riverbed.

Nonetheless, we can also conclude that the Regional Authority's enactment of scientific expertise was constrained by national programs to develop large-scale mining, a mining contract dated in the 1980s, and an environmental management plan. These instruments legitimized the company as a portrayer of risk-management expertise and therefore led the Regional Authority eventually to authorize the project.

As [Guzmán Solano \(2016\)](#) has shown, this situation is an example of how the law can be rendered flexible around mining projects, attending to the government's interest in extractive development and undermining political participation and rights. Then, anti-mining positions become mobilized through increasingly visible practices, in which the enactment of expertise becomes a key feature of the political struggle. As we show next, activist mobilization can come to be backed by—or even performed by—scientists and technicians, who gain influence during environmental controversies.

4.2. Exposure of the controversy to the public: enactments of local activists

We now turn our attention to the deployment of expertise from an activists' coalition named *The Committee for the Dignity of La Guajira* [Comité Cívico por la Dignidad de La Guajira].³ In January 2015, we received an email announcing a call to participate in a public forum in

³The Civic Committee got together in 2011 and became well-known for leading the opposition campaign to an unprecedented, large-scale mine-expansion project concerning the Cerrejón Mine. The project included a diversion of the main river in the region to extract 500 million tons of coal located under its riverbed. After a long campaign, the company halted that project, arguing that low coal prices had made the initiative unprofitable and pursued other expansion options (including the Bruno Creek project). This episode empowered the civic committee and some of its member organizations, enabling them to consolidate and expand their network of national and international experts and NGOs.

Riohacha named *In defense of the Bruno Creek, health and the environment* [Gran foro en defensa del Arroyo Bruno, la salud y el medio ambiente]. The controversy was already beyond the private domain of institutions and had become a public matter. One year later, the activists' coalition organized a second forum to analyze the impacts of the Bruno Creek project and carried out several smaller forum-debates in various towns in La Guajira and Bogotá, Colombia's capital⁴ (see [Fig. 1](#)).

At these forums, the activist scientific experts—academics or NGO experts—got together with Indigenous leaders and locals, State representatives, students, worker-union leaders, and others. The forums partly had the aim of better understanding the project's technicalities, but also of bringing the communities' relation with the territory into the political arena. Scientific expertise functioned as a common ground, enabling discussion among these actors about the creek, the water, and the territory. Furthermore, expertise served as the means to frame the controversy in alternative spatial-temporal scales other than the ones the company and the environmental authorities posed.

During forums, the Bruno Creek was simultaneously depicted as a water source, a vital artery of the water system, a structural element within a delicate ecosystem, an unpredictable agent, and a space of affects and memories. As [Li \(2015\)](#) points out, this multiplicity enables *natural* entities such as mountains, rivers or aquifers, to acquire political relevance during mining-related controversies in Indigenous territories. Nonetheless, based on her case study in Peru, Li concluded that technical arguments about *natural* entities prevailed in the disputes over mining projects. The same can be said concerning Bruno Creek, but our intention is not to address this point.

We want to show how within the hybrid forums convened during the *Bruno Creek controversy*, the enactment of scientific expertise constructed identities of the Bruno Creek as something other than an object of compensation and management. We stress how scientific discourse accounted for the agency of the creek, viewed as an unpredictable, dynamic, and interconnected object within a complex system requiring respect and care. Under such assumptions, activists refashion the company's risk management practices as the risk itself, an example of technical overflow ([Hébert, 2016](#)). We found that scientific expertise does not just prevail over other ways of knowing but is also transformed by them.

In March 2015, at our first meeting with the coordinator of the Civic Committee, he was busy organizing the first public forum to discuss the Bruno Creek Diversion. He was happy to receive us since we were potential academic allies for his cause. During the interview, the coordinator spoke enthusiastically about the prominent experts who had confirmed their attendance at the forum the next morning. The coordinator also highlighted that a senator, the mayor of Riohacha, the director of the Regional Authority and the press would attend. All of this, the coordinator said, infused the forum and their cause with legitimacy.

Though most of the attendees were laypeople, the next day at the forum, an academic space was performed. Low budget pens, writing pads, pamphlets and posters were distributed among the participants; two of the forums were held at universities, with college students acting as volunteers; networking and fundraising helped to pay for logistical arrangements. Also, the organizers provided coffee and lunch to all attendees and paid the travel costs of Indigenous and Peasant representatives. This strategy not only increased forum attendance but also enhanced its diversity.

At the forum, we observed two main types of intervening groups.

⁴Other activities included organizing fact-finding missions and field visits to the creek, use of social media (Twitter, Facebook and a petition in Change.org), posting YouTube videos, organizing marches, and very importantly, international networking. We focus on the public forums at which the project was discussed, since they represent the activist main enactments of activist expertise.



Fig. 1. Activist flyers promoting forums to discuss Bruno Creek.

The first group was comprised of what we call *activist experts*. Their presentations focused on the fields of geology, hydrology, hydraulic engineering, and biology, and they related this information to the Bruno Creek Project, inferring the possible effects of its diversion. Among this group were also the representatives of various NGOs, who presented their research on the Bruno Creek Project and other water conflicts in La Guajira (Censat and Sintracarbón, 2015; CINEP, 2016; Indepaz, 2013).

At this forum, one organization stood out, *The Wayuu women's force* [Fuerza de Mujeres Wayuu], who presented their recent research titled "Land, territory and coal" (FMW et al., 2015). Their presenter explained the aim of their study: "to apply qualitative social research methods and techniques to show Wayuu conceptions of coal, land, and territory in a way that could be understood widely". The research also aimed to complement studies done by "the anthropologists, the philosophers, [and] the intellectuals who have dominated the literature" (Romero Epiayú, 2015). The presenter described these academics as partners of Indigenous researchers, showing an effort to make Wayuu ancestral knowledge dialog with social science expert knowledge.

A second group in the forum included representatives of communities affected by coal mining. In their talks, presenters established their positions concerning the Bruno Creek Diversion and revealed that they felt identified with the technical arguments presented at the forum. Those with first-hand knowledge of Bruno Creek drew on their individual and collective experiences, evoking memories of other creeks that had disappeared and fearing the same outcome for Bruno Creek.

In this way, debates about the future intermingled with past experiences and entities other than human. Local community leaders listed plants and animal species that had disappeared from the area and spoke about changes in the rainfall patterns. They described their perception of the unacceptability of the risks entailed by the project, presented their own expertise drawing on experience, most importantly doing so alongside scientific experts. Both groups reflected together and framed the company's risk management practices as reprehensible, since even considering them would imply consent to the creek's diversion.

During the forum, the leading expert who spoke was an Italian hydraulic engineer. He was introduced as being a specialist in the management of river channels and a director of a foundation for stream restoration. His presentation dealt with global experiences of river

modification, and he made it clear that he was not going to talk just about Bruno Creek, but about all rivers in the world. According to the engineer, this information would help stakeholders understand the risks involved in river interventions. His main message was that "rivers are the architects of the landscape; they shape the territory" (Nardini, 2015). He described how rivers are unpredictable and changing entities who interact with their surroundings, shift their course naturally over time and convey an unpredictable force, whose volume of water that can cause significant destruction.

The Italian engineer's ideas were widely discussed at the forum, and the next day local newspapers cited his presentation. A very similar conception of Bruno Creek dominated the other experts' talks in the forum and appeared later in a document authored by the Universidad de La Guajira et al. (2015).⁵

At every stage of the activists' enactment of expertise, the what-would-happen question for the future was palpable. This entailed discussions about the temporal scale of the creek intervention. For example, in the Italian engineer's presentation, one of the key points was that the life span of rivers is considerably longer than those of humans. Consequently, interventions such as the Bruno Creek Project could not be reduced to the managerial scale of human time. The Universidad de La Guajira report reinforced this argument stating that: "The mine will not last forever. [...] Against the economic benefits, we must discount the cost of the future management of the new riverbed. This work requires permanent maintenance that will be the responsibility of the Colombians" (Universidad de La Guajira et al., 2015, p. 11). In this account, activists argued that the worst problems would not arise in the near future, but over the long term.

As we observed, these technical explanations about rivers behavior resonated and easily articulated with the local people's experience of creeks as unpredictable entities with an agency of their own. The sense that the risks and uncertainties at stake were high was enough to discredit the company's enactment of expertise and its idea of risks as technically manageable. As a Wayuu leader later stated later during another forum, "[the company] may have the money to hire the best engineers in the world, but not even the best [engineers] can create a river" (Robles, 2016).

⁵ Prepared by a professor of environmental engineering and the Italian engineer.

Reinforcing our point that enactments of expertise competed with each other, we observed how some activists during the forum showed and controverted the company's data. For example, a brochure distributed at the forum stated that the company resorted to lies, saying that the Bruno Creek is not a permanent body of water when the historical data of IDEAM [the National Institute of Hydrology, Meteorology and Environmental Studies] for the period 1992 to 2012 states that this creek had a flow during every month of each of these years. Other activists demanded the disclosure of the full Environmental Impact Assessment and publicly critiqued the company's refusal to participate in the forum.⁶

We conclude that these hybrid forums involved the consideration of the geographical and temporal scales upon which the creek was to be understood. Activists positioned the creek as an example of a global debate about water streams, expanding the scale of the politics in this dispute. They refuted that the company, contrary to the activists, presented the creek in the smallest possible scale, as we will see later.

The activist discourse was contentious and demonstrated how a social reaction can be traversed by “resource affects” (Weszkalyns, 2016). Feelings of uncertainty and despair emerged from many activists, through the emergence of specific mining materialities such as the expansion of a mining pit that swallows a watercourse. A coal mining pit, in this case, can separate or dispossess people from other resources such as water or land, the very basis of any alternative development (Richardson and Weszkalyns, 2014). Activists envisioned as the only option stopping the project through demonstrations, social mobilization, and legal instances, to prevent the perceived undesired outcomes of the mine expansion project. This political process of opposition linked vital nonhuman entities and past experiences into present practices to imagine a post-extractive future (Halvaksz, 2008).

The story of Bruno Creek is still unfolding. After the company began to develop this project in 2016, the coalition of activists' organizations sustained an energetic campaign to stop the project. A turn of events happened when some Wayuu communities near the project site sued the company for the potential violation of their fundamental rights to water, identity, integrity, ethnic diversity, food security, and prior consultation.

In December 2016, the Council of the State ordered the company to stop the project and conduct a consultation with several communities. In 2017, the Constitutional Court revised the sentence and ratified the previous rulings until further studies were conducted (Corte Constitucional, 2017). Since then, the project has been halted, a fact that has contributed to the company's production descending from 34 to less than 29 million tons expected in 2020 (Portafolio, 2018).

4.3. A corporate response-ability: the company's enactment

As mentioned before, in 2013, the company presented to the National Authority detailed plans and technical studies relating to the expansion of La Puente pit. Two prestigious engineering consulting firms from Colombia and Australia prepared these studies.

The first feature of the company's enactment of expertise that we observed was the company's reliance on these external firms. In early press releases and public speeches regarding the expansion project, the company widely publicized the names and aims of both consulting firms. From there on, the company's construction of the creek as an object of knowledge emerged through the concepts of specialized international consultants. The company's enactment of expertise was also

⁶ Within the company, a debate ensued over whether it should assist the forum. The decision not to attend prevailed because of the radical opposition to the project that was expected to predominate. However, in a strategic move, when the environmental authorities had approved all the permits, the company organized a much smaller informational event, where there was space to raise questions but not to discuss the advance of the project.

materialized in objects in this case, documents such as environmental impact assessments and environmental management plans, both mandatory and legitimized by the State.

The company conveyed the project as a bearer of considerable technical expertise, which would ensure the management of adverse impacts, adhering to a language of exclusively technical criteria as valid to decide over the project. As part of its expertise, the company claimed the capacity to reproduce natural conditions, as exemplified in the statements made by a senior representative:

We will ensure [maintenance of] the gradient, the water force, and we will replicate the wildlife, the vegetation, and the food chain. We will put [back] the same riverbed [that was in] the old riverbed with its rocks and mosses. We further propose a compensation project in the upper basin. If we reforest [that area], there will be a better water supply. [Silva, 2015]

The company framed risks associated with the project as a specific type of acceptable risks. It made no statements concerning the disappearance of the creek, one of the dangers that activists feared. Instead, it assured they would simply move the water flow to a new riverbed that would be as good as the old one: a technical procedure. The company, therefore, worked to disqualify activist concerns as being laden with affects, hiding individual interests, and without sufficient technical substance.

A second feature of the company's enactment of expertise involved the discourse and practice of CSR (Barry, 2013; Rajak, 2011). On this topic, the company engaged scientific expertise and CSR in an intimate relationship, claiming that both guaranteed successful risk-management practices. To give some context, since it had become the property of three publicly traded multinational mining-giants, the company portrayed itself as actively participating in global agreements, international standards, voluntary codes of conduct, and reporting standards (i.e., the company must adhere to the Sustainable Development Goals, the IFC Performance Standards, and the ICMM principles, among others). Since the company fully deployed the CSR discourse in the first decade of the 2000s, it attributed many social and environmental problems to the previous operation. This helped the company to dissociate itself from the disappearance of water streams, representing the Bruno Creek Project as something that cannot be evaluated through previous experiences with mining.

The company's CSR framing also encompassed a myriad of subsidiary actors that took part in the company's enactment of expertise and helped it meet its portrayed social and environmental goals. Some of these subsidiary actors included foundations, NGOs, consultants, contractors, international agencies, and academic institutions. As examples, the company signed an agreement with the NGO Conservation International to manage the post-project compensatory reforestation agreements for the Bruno Creek Project. It has also partnered with the UN's World Food Program, USAID, and numerous other public, private and non-profit organizations. These partnerships worked as a symbol of both the company's hiring of reputed experts and participation of CSR networks.

As part of their CSR programs, the company have made significant investments—though regarded as insufficient due to the problem of water availability in the dry season—in small reservoirs, water dwells, windmills, and in water-management training programs. One can infer that with these water infrastructure investments the company have claimed and enacted certain *water expertise* that although different from the engineering of the Bruno Creek project, became instrumental for the Bruno Creek Diversion to continue. In other words, CSR investments have contributed to the company's capacity to influence governmental actors and therefore, for its expansion projects to go through.

Furthermore, water expertise linked to the company's CSR programs was embedded in an argument about the temporality of water scarcity. By suggesting the possibility of “sustainable development” in mining (Kirsch, 2010), the company envisaged a future in which coal mining was both possible and environmentally friendly. According to the

Characteristics of the Bruno Creek

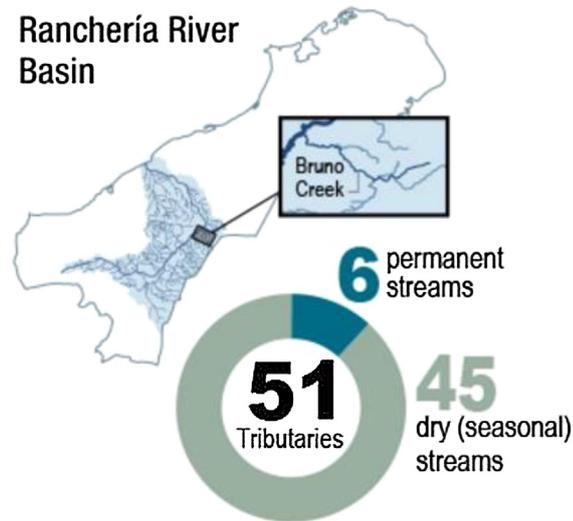


Fig. 2. An image extracted from the English version of the company's website, indicating the relative position of Bruno Creek on the regional map (Cerrejón, 2016a).

company, water issues in La Guajira were related more to a pre-existing infrastructural deficit and political mismanagement, technically fixable problems rather than endemic problems of the extractive industries.

A third feature of the company's enactment of expertise was the use of discourse in keeping the project's risks within a scalar politics that framed them as acceptable, punctual and short term. After the first forum, the company published a graphics-rich page on its website explaining the engineering works at La Puente pit. There, the creek was depicted as a seasonal body of water and was presented through figures as a small part of the wider ecosystem (see Fig. 2). Also, the keyword *diversion* was absent. Instead, the company preferred to use verbs such as *moving* [trasladar] and *preserving* [preservar] when explaining what they would do to the creek.

Furthermore, the webpage content emphasized how the project's termination jeopardized more than 600 jobs and 3.7 billion Colombian pesos in royalties and taxes up to 2033. As read in the webpage: "If these engineering works are not carried out, production could fall by at least 3 million tons a year, which will negatively impact the company's figures in employment, fiscal contributions, and investments in La Guajira and the rest of the country" (Cerrejón, 2016b). The risks depicted here are not environmental. They presented calculations of the effects of inaction, a sort of gentle warning to people and politicians. The risks presented were economic and political, related to a future without mining. Here we identify a fourth feature of the company's enactment of expertise: it relied on eliciting affective responses that moved and mobilized people in favor of the project. This last point is quite interesting since the company actively criticized the activists' affective, emotional responses to the project.

In other words, by depicting an adverse future related to the absence of the project, the company responded to or anticipated the concerns of communities. Instead of a long-term future without water or biodiversity, the company presented a future, within the short-term, without employment and royalties. This representation of an undesirable future reveals how affects, elicited by scientific expertise, not only has the potential to change existing perspectives as in the activist enactment, but it can also reproduce hegemonic views (Hemmings, 2005). Following Anderson, when taking an affective charge, these calculated

figures render complex future geographies actionable (2010, p. 784). Accordingly, in its most recent statements, the company has been optimistic about resuming the Bruno Creek project, while strengthening its CSR discourse. Once again, expertise is more related to the jurisdictional and economic power of influence over environmental decision-making.

5. Conclusion

In the *Bruno Creek Controversy*, social actors deployed their expert knowledge about the creek to influence the decisions of the National government. As this article shows, each enactment of expertise entailed an interpretation of the future and the risks entailed by the project in positive or negative terms, along with a series of anticipatory actions for facing the perceived risks (Anderson 2010). Rather than implying a singular idea of the extractive future, the enactments of expert knowledge in the controversy created a space in which multiple futures could be brought into the present.

During this controversy, the company's approach to the future implied a calculative, managerial, and remedial logic towards manageable and acceptable risks. This view contrasted with the precautionary logic of those who opposed the project and who envisioned a future potentially catastrophic for water resources, with unacceptable risks that are beyond technical control due to the region's geographical conditions. In the case of the Regional Authority, both logics were enacted at some point and competed, but the managerial approach later prevailed, aligned with the national government's interests.

A key conclusion of the *Bruno Creek Controversy* is that during environmental decision making, expertise is not only about performance and authorization within knowledge communities and institutional domains, but that authorization also comes from existing power relations that traverse the juncture of the local, corporate, and governmental domains. While it is crucial not to frame the actors in the controversy as static dominated-dominant dyads, at the same time, it is necessary to recognize that in current times, the efficacy of the enactments of expertise is highly determined by governments favoring extractive industries as a development model in Latin America (Arsel et al., 2016b; Svampa, 2015).

The *Bruno Creek Controversy* also shows how the distribution of power in a controversy can shift and is never static. In a world where water depletion and climate change are now matters of concern, the activist enactments of expertise may ultimately prevail and set precedents for environmental decision making. While the controversy is still unfolding, the Bruno Creek Diversion remains an open discussion. Therefore, the different positions in favor or opposed to the project and the visions of the future that they each portray, need to be conceptualized as flexible, dynamic, conjunctural and closely linked to negotiations.

Whether through the increasing influence of local communities in decision making, the ability of activist scientists to inform corporate policy, or by changing the temporal and geographical scales to understand resource extraction, the enactments of scientific expertise within environmental controversies over mining shape environmental politics of contemporary environmental governance. Therefore, the decision-making process of how humans interact with their environments at a global scale is led by contending enactments of expertise, that in the end not only imagine but also define the future of the material world that we all inhabit.

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