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Contestation, participation, and mobilization in environmental assessment follow-up: the Itabira experience

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This article analyzes the public participation and follow-up stages of the environmental assessment process to secure an operating license for an iron-ore mine in Itabira, Minas Gerais, Brazil. Vale, a major Brazilian mining company, eventually received authorization to begin operations in 2000, but only after making significant concessions to public demands on a variety of environmental and social conditions. In the years following the approval, Vale met several conditions regarding environmental cleanup, parks and infrastructure, water protection, and commitment to the local community. However, over time some of these activities were interrupted or aborted, while a number of conditions were never met. This article suggests that these weaknesses in follow-up were a consequence of the demobilization and retreat of the state and a parallel demobilization of civil society after 2000. The case demonstrates that state and public attentiveness can be episodic and suggests that high-profile agreements do not assure sustainable outcomes. Institutionalized participatory monitoring and management units appear necessary for continued environmental management that pursues long-term sustainability.

KEYWORDS: environmental management, follow-up studies, political change, public awareness, mining, interest groups

Introduction

Environmental assessment (EA) was introduced in the United States during the 1960s in response to environmental concerns and a desire for both rational and publicly involved environmental decision making (Weston, 2004). Advocates initially hoped that the combination of technocratic and populist elements in EA would reduce political conflict over environmental issues, allowing environmentalism to become a dimension of public administration rather than a continuous area of political contention (Caldwell, 1998). With the emergence of a sustainability discourse in the 1980s, EA came to be identified as an important tool for achieving environmental, economic, and social sustainability. However, EA’s technocratic and populist orientations have continued to generate tensions (Wood, 2003; Weston, 2004; Morrison-Saunders & Fischer, 2006).

Technocrats decry the politicization of EA processes and criticize the public for subscribing to a not-in-my-backyard (NIMBY) mentality, while others express dissatisfaction with the limitations placed on public participation (see, e.g., Petts, 1999). At the same time, the social pillar of sustainability with its focus on equity, social justice, and democracy appears less theoretically developed and integrated into decision making than the environmental and economic pillars (Littig & Griessler, 2005; Gibson, 2006).

Populists push for increased democratization of EA through more inclusive and deliberative processes (Deitz, 1987; Bartlett, 2005; Doelle & Sinclair, 2006; Isaksson et al. 2009), but, as Sinclair & Doelle (2003) suggest, assumptions about the potential for participation may be unrealistic. EA unfolds within socially unequal systems and tends to reflect that inequality. In general, projects that are subject to EA are promoted by groups for whom developmental or profit-earning goals are paramount and are opposed by groups concerned with potential negative environmental and social impacts. Powerful actors who value economic development over environmental preservation dominate the decision-making process (Yap, 1990; Beattie, 1995; White, 1996; Gismondi, 1997; Diduck et al. 2007; Bäckstrand et al. 2010). Under socially unequal conditions, EA is open to political manipulation (Dietz & Stern, 2008) and participation in EA may often be little more than “theater” (Hokkanen, 2001). However, sometimes EA processes do lead to abandonment of project proposals (Devlin & Yap, 2008) and proponents do change their plans in response to public concerns (Rutherford & Campbell, 2004). Why do these unusual events occur? Do they represent a strengthening of the social pillar of sustainability?
To pursue these questions, we adopt a contentious politics approach. Analysts of political contention suggest that weaker social actors can gain leverage in decision making only under conditions that create unusual political opportunities (McAdam et al. 2001). These openings may be generated by new legislation, changes in the characteristics of the political regime, elections, initiatives of international actors, or other events that shift the political terrain (Meyer & Minkoff, 2004). Political opportunities can bring new groups to power, increase institutional provisions for participation, encourage new alliances that did not previously seem possible, and make available external resources to groups that lack internal ones (Tarrow, 1994; McAdam, 1996; Tilly, 1999; Meyer, 2004; Boudet & Ortolano, 2010).

The conditions that create political opportunities are historically contingent. Mobilizations can be contained or collapsed, and advances can be reversed (Piven & Cloward, 1979; Tarrow, 1994). While studies of contentious politics tend to focus on macro-level processes, such as large-scale social movements, revolutions, or waves of labor militancy, the approach can also be applied to micro-level processes. For instance, Taylor (2007) argues that the emergence of “new governance” has created opportunities for previously disadvantaged groups to influence decision making. We approach public participation in EA as contentious, historically contextualized processes (Sharp & Connelly, 2002; Connelly & Richardson, 2004), and seek to uncover their micro-scale dynamics to explain how public participation influences EA decisions and outcomes in specific cases (Flyvbjerg, 2002; 2004).

This article offers a case study of what we initially identified as a successful, and thus atypical, public participation process in Brazil. We selected the case because a very powerful Brazilian mining company, Vale, agreed to a long list of environmental and social conditions to obtain an operating license. The agreement was the result of an EA that stimulated public mobilization and a two-year negotiation between the company, state agencies, and community representatives. The resulting environmental management plan incorporated many public concerns. We were interested in understanding how this agreement was reached. How important was public participation? Was the Itabira agreement an advance in social sustainability or an unusual and ephemeral political opportunity?

We were interested in determining whether the agreement was implemented successfully. The literature on EA follow-up suggests that after an environmental management plan has been approved, the implementation period should incorporate monitoring, evaluation, management, and communication, and that public participation can contribute to these processes (Baker, 2004; Morrison-Saunders & Arts, 2004; Marshall et al. 2005). However, numerous difficulties are also recognized in bringing effective EA follow-up into practice (Nadeem & Hameed, 2010). We wanted to know if the Itabira agreement had been successfully implemented. If so, what factors would have contributed to the result and what role might public participation have played.

The next section outlines the events leading up to Vale’s environmental licensing in 2000. The third section describes the key public meeting in 1998 that occurred at the height of the public mobilization. This is followed by a description of Vale’s compliance with licensing between 2000 and 2008. We then survey the factors explaining the levels of compliance achieved and conclude with some lessons for EA planners and environmentalists.

We carried out a process of initial document collection and review during the summer of 2008 in the archives of the environmental authority for the state of Minas Gerais, Fundação Estadual de Meio Ambiente (FEAM) and in the Prefeitura de Itabira (PMI). We examined the EA documentation, minutes of meetings, memoranda of understanding, and letters among the main stakeholders (Vale, FEAM, and the PMI). The following year, we conducted 22 semi-structured interviews in the state capital Belo Horizonte, in Itabira, and in Rio de Janeiro where Vale has its headquarters. Interviewees included three representatives from the state environmental authority (FEAM); three local government representatives from Itabira (PMI), three representatives from the headquarters of Vale in Rio de Janeiro, two representatives from Vale operations in Itabira, and eleven representatives from Itabira’s civil society including the Municipal Environmental Defense Council (CODEMA). The interviews were audiorecorded and transcribed.

The Itabira Process

Itabira is one of 853 municipalities in the Brazilian state of Minas Gerais, located approximately 100 kilometers (km) northeast of the state capital, Belo Horizonte. The total area of the Municipality of Itabira is approximately 1,257 square km and is part of the Doce River watershed (IBGE, 2009). Itabira is situated in the geological area known as the “Iron Quadrangle,” characterized by large quantities of iron-ore deposits (Souza e Silva, 2004; IBGE, 2009), for which the Companhia Vale do Rio Doce (Vale) was formed in Itabira in 1942 to extract, commercialize, and distribute. Vale remained a national state-owned company from 1942 until 1996. The munici-
Sustainability's capital (also named Itabira) has a population of just over 100,000 people (Souza e Silva, 2004).

Public concerns about the environment have a long history in Itabira, where the first "National Meeting on Mining Cities" took place in 1984, bringing together several municipalities of Minas Gerais to discuss environmental issues. The meeting called for civil society, government, and mining companies to seek environmental solutions through a partnership approach. The Municipal Environmental Defense Council (CODEMA) was created in 1985 following that meeting, and strengthened the environmental capacity of Itabira's civil society, including churches, teachers, and neighborhood associations (Souza e Silva, 2004; Guimarães de Souza, 2007). In the early 1990s, there were several community protests over environmental issues such as air quality. One slogan disseminated on tee-shirts and hats in the early 1990s announced "That's not fair Vale; I want to Breathe!" (Guimarães de Souza, 2007).

In 1994, the state government of Minas Gerais instructed Vale to obtain an environmental license, as mandated for all mines to operate under the Normative Deliberation State Environmental Law Council (COPAM) which came into effect in 1990. In 1995, Vale filed for a Corrective Environmental License (Licença de Operação Corretiva or LOC) as required under the law. Also in 1995, Brazil's President Fernando Henrique Cardoso announced that Vale would be privatized, a decision that turned the request for an environmental license into a political opportunity for environmental advocates.

Staff of the local government reported that the EA submitted to obtain the LOC contained inaccuracies and this led to demand for a public meeting, an unusual event at the time. A representative of the state agency FEAM explained that the initial pressure for a public meeting came from FEAM and PMI, but the community soon took up the demand stimulated by the privatization concerns (for a list of acronyms of the main organizations involved in this case study, see Box 1). In the build-up to the public meeting, PMI played an important role by allocating financial support and personnel to prepare the community to voice its concerns.

The Public Meeting

The public meeting took place on February 12, 1998 and ran from 7:30 pm until 1:00 am. Over 800 people attended and, according to a spokesperson from Vale, they were very angry but polite and informed. Civil society representatives came from barrio associations, as well as business, professional, and church groups.

Sixty-two participants spoke during the meeting: seven Vale representatives; 22 civil society representatives; 21 individuals unaffiliated with a specific group or agency; four COPAM members, seven locally elected officials, Itabira's Mayor Jackson, and one Vale rebuttal representative who was later put in charge of negotiations with the community (COPAM, 1998). At the meeting, 96 charges were set forth, tities that caused or could potentially cause environmental harm. This was followed by the passage of CONAMA Resolution nº 09/87 one year later, which legislated public participation in the form of public meetings. CONAMA is the Conselho Nacional de Meio Ambiente, a Federal branch of environmental protection (Fowler & Dias de Aguiar, 1993).

Some of the major civil society participants were: CODEMA; ASSEAG (Apiculture Nucleus; Engineers, Geologists, Agriculturalists, and Architects Association); 52nd subsection of the Brazilian Lawyers Association; Medical Association of Itabira; Representative of the Association of Mining Municipalities of Minas Gerais (AMIG); Itabira Rotary Club; ACITA (Commercia, Industrial, Services and Agricultural Association of Itabira); Vila Paciencia Community Association; Bela Vista Neighborhood Association, Sao Cristovao Neighborhood Association, Alto Pereira Neighborhood Association, Campestre Neighborhood Association; and Diocese Itabira (COPAM, 1998).

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1 Brazilian municipalities can be large regions having capital cities.
2 Brazilian environmental legislation established in January 1986 through CONAMA Resolution nº 01/86 addressed the need for environmental assessment and environmental licensing for activities.
eleven suggestions advanced, seventeen demands presented, and eight requests for clarification made (COPAM, 1998). The main environmental issues raised included concerns about environmental management, air quality, ground and surface water management, management of tailings, waste rock, hazardous materials, land reclamation (of decommissioned open-pit sites such as Cauê Mine), and flora and fauna. Concern was also expressed for patrimony, the intrinsic value of the scenery and biota, as well as about mine encroachment on the city and resettlement issues, noise pollution due to 24-hour mining operations, industrial trucks, blasting, public health and safety, and economic development in light of the mine closure anticipated in 2025 (COPAM, 1996a; 1996b). The Vale spokesperson recalled that she had to agree with the issues raised and informed the community that Vale would be open to negotiation.

After the public meeting, negotiations began involving FEAM, Vale, SMA/PMI, and CODEMA to establish conditions that would be part of the environmental license. FEAM created technical subcommittees centered on the main concerns, such as water resources, air pollution, and soils. CODEMA and SMA/PMI met with FEAM and Vale representatives on a continuous basis. CODEMA served as the bridge with the community, keeping community members informed about the negotiations and communicating concerns to FEAM. Vale spokespersons and SMA/PMI and CODEMA representatives all indicated that the continuous meetings with FEAM personnel were crucial to come to a consensus.

After two years of meetings, it was announced that Vale, FEAM, SMA/PMI, and CODEMA had agreed upon 52 conditions to the environmental license (LOC). The LOC was finally granted to Vale on June 21, 2000. The conditions created a wide range of commitments to the community and the municipality arising from the concerns expressed in the public meeting. They included environmental cleanup, creation of parks and infrastructure, community environmental education and protection of Itabira’s water supply (see Appendix for the complete LOC). Vale, with the help of CODEMA, held several neighborhood meetings to share the results of the negotiations with the community. A majority of community respondents felt that the 52 conditions were a reflection of their concerns shaped by their participation at the public meeting and with the help of CODEMA representatives during the 1998 to 2000 negotiations.

The Follow-up: What was Actually Achieved?

In the years following the licensing approval in 2000, several conditions were met. For example, Vale supported an environmental education program for the community, fenced off urban railroad tracks for public safety, and built neighborhood plazas and sports fields. The company introduced internal waste-management systems and solid-waste and oil containment at train terminals. Some public works and site-remediation projects were also completed. Vale engaged in activities that improved air quality, enhanced environmental waste-management systems, and upgraded land-reclamation sites. In addition, the Parque do Intelecto (Intellectual Park), an urban environmental education and wheelchair-accessible recreational area, was completed.

However, in time some of these activities were interrupted or aborted. For example, Vale ceased to sponsor activities for community environmental education. In addition, the Programa de Mobilização Social de Itabira (PEMSO—Social Mobilization Program) lasted three years, but was not replaced with another social investment program. The neighborhood plazas and sports fields were destroyed and not replaced and the substitution of exotics with endemic species in land reclamation remains incomplete. Moreover, several conditions relating to the Itabira landfill were never met, including protection of water sources and water quality and compensation for biodiversity losses and deforestation. The Itabiruçu Environmental Education Park was converted into a sterile dumping site, interrupting community-training activities. The general public no longer received promised daily bulletins on air quality. Finally, Vale considered all conditions that required a “study,” “conceptual project,” or “plan” to have been completed upon submission of the associated document even if there has been little or no action to fulfill the plan.

Why Have the Results been Mixed?

It is true, but trivial, to suggest that the reason not all 52 conditions were met was because Vale did not follow through on its commitments, that state agencies did not effectively enforce the agreed requirements, or that civil society did not mobilize to pressure for complete compliance. All have fallen short, but how might we explain this breakdown?

From Vale’s perspective, minimizing the costs of compliance was almost certainly a motivation. Slowing down the delivery process, seeking to redefine some commitments, and simply ignoring others would represent a “bottom line” approach. At the same time, the company sought and obtained ISO
14000 certification in 2000. To remain certified, a company must develop an internal environmental-management plan and show evidence of regular improvement in environmental practices (Qadir & Gorman, 2008). So Vale had reasons to meet some, but not necessarily all, conditions. But why did local government and state agencies not sustain their focus when they had been so instrumental in the original negotiation of conditions, and why did public attention falter?

First, the key event affecting the local government was the municipal election in 2000. The environmentally oriented mayor was defeated and several community members suggested that under the new mayor, João Izael Querino Coelho, the local government actively elevated the interests of Vale over those of the community. Most significantly, the PMI administration under the new mayor reduced the size of CODEMA in 2001 and discontinued the positions of two civil society representatives. In 2003, a decree was passed by the municipality that entitled the Secretary of the Environment of the PMI/SMA to be automatically elected as president of CODEMA (Guimarães de Souza, 2007). One interviewee referred to this as the “dismantling of CODEMA.”

The state of Minas Gerais reduced its attention to Itabira once the LOC was granted, FEAM’s attention shifted to other issues, the special technical committees focused on air, water, and soil were dissolved, and staff was reallocated to work on other environmental license applications. FEAM also was administratively decentralized and the regional office responsible for Itabira (SUPRAM leste) was moved from Belo Horizonte to the city of Governador Valadares, which was even further away. Under these new circumstances, it became more difficult for FEAM staff to follow-up on the LOC process in Itabira. Hence, the efficacy of the local and state governmental actors was significantly reduced after the LOC was granted.

From the community’s perspective, the mobilization from 1996 to 1998 was, as one retired Vale employee stated, “a unique coincidence.” The company’s privatization caused concern and anxiety at the community level; one respondent explained that it allowed “an already ticked off community to express itself.” People were worried about layoffs, as Vale started to offer “early retirement” and began outsourcing several services. Vale’s image within the community began to decline. As one resident observed, “Their image was worn out...we started to feel job insecurity, salaries started to fall, and they removed the health plan.” In 1979, at the height of direct employment, Vale had provided work for over 5,000 people. Between 1990 and 2002, there was a 55% reduction (Souza e Silva, 2004). All the community respondents suggested that privatization was expected to lead to job loss. Protests took place, with posters reading: “My father [worked for Vale] for 30 years but what about me?” (Souza e Silva, 2004). There was also fear that the company might eventually shut down its operations completely in light of the anticipated exhaustion of mineral deposits by 2025.

People felt they had “nothing else to lose” and all of the internalized complaints finally surfaced and were expressed at the 1998 public meeting. While the immediate mobilization leading up to the meeting was around the environmental issues raised by the licensing application, the broader impetus came from concerns about the economic implications of privatization. However, after 2000, concern about layoffs declined. Mineral exhaustion was reassessed and Vale announced that it would expand mining operations and would also start to extract iron from lower grade ores and from mine tailings. So the level of public concern and worry about future employment abated.

The second reason for the faltering of public attention occurred after the LOC was granted, when civil society groups stopped engaging with Vale as a collective group. The ex-president of the council of neighborhood associations noted, “[A]fter the LOC was granted the interassociation started to meet less and less frequently; the member associations began to focus on neighborhood issues. We lost our cohesive-ness.” In part, this was because Vale introduced new communication channels for contact with individual neighborhoods, such as Vale Community (Vale Comunidade), which ran from 2003 to 2006 and was followed in 2007 by the Reference Group (Grupo de Referencia) program. Vale negotiators would go to the neighborhoods once a month or the community leaders of the neighborhood association would go to Vale offices to discuss issues. Several respondents explained that community concerns are no longer discussed in terms of the LOC. For example, when house walls were cracking in the neighborhood of Vila Paciencia due to ongoing blasts, the affected community members contacted Vale to repair the cracks but did not address other community obligations under the LOC. That Vale had conditions placed on its license to operate had largely been forgotten.

Third, weaknesses in compliance with the 52 conditions were due to the fact that the community

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4 ISO 14000 is a privately managed international program that certifies that a company has in place and is maintaining an environmental management program. The certification is reviewed annually. Many firms in a value chain may require ISO 14000 certification from their suppliers. Thus, ISO 14000 is often a requirement to enter markets in North America and Europe.
put its faith in the hands of the local government and expected it to ensure compliance. As the local government lost its willingness and capacity to enforce the LOC, no one else emerged to remobilize the community around environmental issues.

Finally, noncompliance was partial and only became apparent incrementally. After 2000, Vale and the community underwent a honeymoon period marked by corporate social responsibility, during which public works such as sports fields and plazas, as well as the Praia Canal, were completed. A free concert to inaugurate the canal, in addition to several highly visible Vale-sponsored events such as school competitions, proved popular within the community. However, as time passed, programs contracted and public works, such as the plazas and sports fields, were not maintained. The relationship of such programs to the LOC faded from public memory. The change in government and the decline in cohesive community pressure gave Vale scope to decide which conditions to meet and to what degree. In addition, for some conditions the exact nature of compliance was unclear. For instance, a respondent indicated that Condition 12, which refers to Itabira’s water supply, continues to be “negotiated” due to the lack of clarity over who is responsible for finding alternate water sources. Hence, in effect, no agreement has been reached on this condition at all.

Overarching all of these factors is the city’s continuing dependence on mining operations for jobs and local economic development. According to Souza e Silva (2004) and several respondents, the municipality is attempting to diversify its economy through partnerships initiated by the Commercial, Industrial, and Agribusiness Association of Itabira (ACITA), but the economy cannot easily disassociate itself from Vale’s presence. Indeed, Vale indirectly supports such services as hotels, banks, taxis, shops, and restaurants. Furthermore, Vale remains central to the psyche of Itabiran society. Several respondents explained that without Vale, Itabira would be a poor and isolated municipality. In 2004, Vale’s LOC for Itabira was renewed behind closed doors in negotiations between SUPRAM leste and Vale without local participation. Several community respondents indicated that they had not even known that Vale’s LOC had been renewed prior to the interviews in 2009.

Viewing the entire period between 1995 and 2008, three distinct phases can be identified. Conditions worked in favor of public mobilization during the late 1990s. The profile of the environment arising from the United Nations Conference on Environment and Development in Rio in 1992, the election of a progressive mayor, and most importantly, the announcement in 1995 of the planned privatization of Vale increased the level of popular access to the political system. The local and state governments were concerned about the future of Vale, which had been nationally owned. This action resulted in an alliance between the local and state governments and the community to put pressure on Vale’s new management. This alliance was maintained during the second phase of the negotiation period up to 2000. During this period, the public was demobilized as community representatives engaged in the negotiation process. The third phase began with the 2000 agreement on the LOC and the 52 conditions. The municipal election in 2000 shifted the relations between Vale and the municipal government, as the progressive mayor was not re-elected. Vale took a conciliatory position, began to implement some of the agreement’s conditions, and made clear that the mine would continue to operate. The new mayor moved toward the company and the strength of the alliance with the community began to fade. Key leaders in FEAM left the organization. Barrio associations turned their attention back to neighborhood concerns.

What the future holds for issues of environmental sustainability in Itabira is far from clear. With the global economic crisis and over 1,000 layoffs from Vale in 2009, the community’s economic foundation is once again in doubt. Perhaps this will spur a new wave of public mobilization and renewed concerns about Vale’s effect on Itabira’s environment. However, the confluence of conditions leading to environmental mobilization in the 1990s may not appear again.

Conclusion

What lessons does the Itabira case offer to environmental planners, environmentalists, and sustainability theorists? The case suggests that local communities may be mobilized when jobs and livelihoods appear threatened, and during such a mobilization, environmental issues may also gain leverage. Hence, threats to economic and social sustainability can facilitate environmental sustainability. Yet, such a foundation for environmental mobilization is weak because it hinges on economic rather than environmental concerns. It can be easily reversed. The case also demonstrates the potential for corporations to use community outreach to outflank regulatory oversight. Through corporate social responsibility programs, such as neighborhood meetings, companies can reach around governments to engage directly with communities and deflect attention away from past environmental agreements by introducing new programs.

Thus, environmentalists must be cautious about apparent victories. Having public concerns recognized and embedded in an environmental manage-
ment plan is necessary but not sufficient for environmental sustainability. The management plan must be implemented. It is important to recognize that planning and implementation are two distinct phases within a longer process. During negotiations over a management plan, some public concerns may be bargained away to obtain others, so that the sustainability potential is already compromised. There is then a second protracted and informal “negotiation” over implementation, with even more sustainability conditions left unmet due to foot dragging, interpretation of conditions, and substantial disagreement over what is considered compliance. What was won during the initial negotiations may be lost during implementation.

Sustainability requires ongoing oversight to guarantee compliance. If a local, state, or national governmental authority takes this responsibility seriously, then compliance can be achieved based on state-company interactions in the standard regulatory mode. However, if government authorities waive in their oversight for any reason, such as limited funding for monitoring staff or an election resulting in a shift, oversight may falter. Still, public mobilization is also not a reliable alternative on its own, but is episodic. A third possibility is legal enforcement through lawsuits, but for this to be effective, management plans must be legally binding and community organizations must have the resources to undertake risky and expensive litigation. Each of these avenues for enforcement might work in some cases and fail in others.

An alternative is for compliance to be enforced by an institutionalized mechanism that encourages sustainability by requiring state agencies and civil society to work together. Many institutional arrangements can facilitate such engagement (Stewart, 2007). The institution most likely to succeed will be a participatory monitoring and management unit responsible for overseeing the implementation of the management plan. Such units would include public representatives with a direct link back to civil society organizations. This offers the greatest likelihood that new civil society mobilizations can be initiated when compliance begins to waiver for any reason. Such units would encourage continuous negotiation between the stakeholders while the threat of remobilization would be sufficient to lubricate the negotiation process (O’Faircheallaigh, 2010). Such follow-up monitoring and management units would create a bridge from participatory environmental planning to participatory environmental management.

For sustainability theorists, the Itabira case demonstrates the efficacy of the political opportunity approach. Integration of environmental, economic, and social goals inevitably gives rise to conflict. For theorists seeking to explain sustainability outcomes, the political opportunity approach encourages the analyst to identify transformational moments, which may open and close as a contentious environmental episode unfolds. Sustainability outcomes are contingent and unpredictable but can be explained historically with attention to political processes. This approach may not add to the normative debate over the meaning of environmental, economic, and social sustainability. However, it does remind us that what happens in the real world is far more influenced by immediate interests than by visions of what a sustainable future could become. The focus on politics invites particular attention to the social conditions under which sustainability is pursued and the uneven distribution of power among the contending interests. For theorists of social sustainability, the Itabira case suggests that the social pillar of sustainability is often missing in practice as well as in theory.

Although EA tends to focus on technical and scientific aspects reflecting its original roots as a rational planning tool, the inclusion of public participation has been a step toward the democratization of environmental planning. Institutionalization continuous participation in the follow-up period would further expand social sustainability through persistent community oversight. Nevertheless, the creation of such multi-stakeholder units will have to be required as a condition of project approval. Monitoring units must be created while project approval is in doubt and project proponents are vulnerable to the possibility that their application will be turned down. Once a project is approved, the political moment passes. Without participatory monitoring, the potential of EA to support environmental sustainability will be compromised. EA processes will continue to deliver outcomes that fall short of the conditions anticipated in environmental management plans in spite of the high levels of contention, participation, and mobilization that may have stimulated their creation.

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### Appendix: The 52 Conditions of the LOC (Corrective Operation License) (COPAM, 1996a)

1. Prepare a conclusive report on Itabira’s landfill and a feasibility study for solid-waste management. Due: six months after issuance of the LOC.
2. Implement oil- and grease-management systems throughout the Vale Mining Complex in Itabira. Due: six months.
3. Provide a solid waste treatment plant (ETE) for the Vale Mining Complex in Itabira. Due: six months.
4. Develop an executive project for solid-waste containment of oils and greases at the train terminals that leave Mina Cauê (Mine) and Conceição Mine. Due: six months.
5. Operate the solid waste treatment plant and the oil and grease systems to contain effluents as dictated by COPAM. Conduct monthly monitoring of the oil and grease systems and submit a report every four months. Due: monthly.
6. Develop an executive project for rehabilitation of Corrego Conceição (Conceição Stream) if it is deemed technically unviable. Provide other compensatory measures with reference to the Guidance Plan of Water Resources of Itabira. Due: three months.
7. Stabilize, rehabilitate, and fill in the sterile pile of the Cauê Mine. Due: 31 December 2001.
8. Develop an executive project for rehabilitation of the Piçarrão Mine. Due: three months.
9. Develop a contingency plan for emergency situations and a mitigation plan for catastrophic events, such as toxic waste spills, breakage of dams, and compromise of dykes. Due: preliminary dangers report due December 2000 and all contingency plans due by July 2001.
10. Prepare an annual photographic report of the Vale Mining Complex of Itabira. Due: first report due by 1 December 2000.
11. Formalize a licensing system to control Itabira’s falling water table. Due: studies are due in three months and the formalization of the licensing system is due in twelve months.
12. Implement all short-term proposals to remediate Itabira’s water-sourcing problems after presentation of all options.
   a. Optimize and enlarge the Tres Fontes water source and study the viability of extracting water from Areao. Due: six months.
   b. Improve the water-treatment plant of Pará and monitor the water that comes from the Companhia Vale do Rio Doce (CVRD). Due: 24 months.
   c. Improve the surface-water system that relies on gravity from Pai Joao. Due: six months.
   d. Improve water filtering and chemical-treatment equipment. Due: 24 months.
   e. Use technical cooperation of CVRD and PMI partnership to find new and viable water sources. Due: 28 February 2001.
   f. Launch a massive campaign to increase awareness about water consumption and to decrease water wastage in Itabira. Due: 24 months. The medium-term and long-term actions on water in Itabira must be presented to FEAM by 28 February 2001 and an accord signed with PMI by 30 July 2000.
13. Maintain the Rio Peixe water level at a minimum of 100 liters per second in May to October during the whole period of validity of the LOC. Due: from 31 May 2000 onwards.
14. Install a water-flow system for Rio Peixe with approval of FEAM. Due: 6 months.
15. Develop a budget for water containment according to legislation. Due: 6 months.
16. Develop an inventory of point source air emissions in Vale operational areas as well as non-point sources (automobiles). Due: 1 month.
17. Prepare a report on meteorological data for the Municipality of Itabira using the suspended particle study. Due: 1 month.
18. Prepare a qualitative report on the chemical composition of suspended particles in Itabira air. Due: 1 month.
19. Undertake a study of suspended particles in the air through adequate mathematical modeling techniques and identify their sources. Due: 3 months.
20. Purchase and install equipment and software creating an Itabira air quality-monitoring network in several locations in accordance with the suspended particles study. Due: 12 months.
21. Install two data-collection stations (computer connected to the data acquisition-monitoring units). The data must go to the air quality-monitoring department of FEAM and to the same type of unit at PMI. Due: 12 months.
22. Maintain and operate all equipment for air-quality monitoring. Due: once the stations are installed.
Appendix: (cont.)

| Number | Task Description                                                                                      | Due        |
|--------|-------------------------------------------------------------------------------------------------------|------------|
| 23.    | Propose a management plan to monitor air-quality networks that entail cooperation with PMI and FEAM to identify other sources of air pollution. Due: twelve months. |            |
| 24.    | Prepare evaluation reports every six months based on air-quality-management actions. Due: 8 months.   |            |
| 25.    | Sample air quality every six days from November to April and every three days from May to October and send the results to FEAM and CODEMA/PMI by weekly fax. Due: upon approval of the LOC. |            |
| 26.    | Develop and present to FEAM and PMI a maintenance program for the operation of the automatic air-monitoring stations. Due: 3 months after installation of the automatic monitoring stations. |            |
| 27.    | Present a radio-station plan to FEAM. Due: 6 months after installing the automatic air-quality monitoring stations. |            |
| 28.    | Develop a contingency plan with PMI and FEAM for air-quality crises in Itabira. Due: six months after beginning operation of the automatic monitoring stations. |            |
| 29.    | Develop retrospective and prospective epidemiological reports for the Municipality of Itabira to evaluate the impacts of air pollution on the local population. Due: six months. |            |
| 30.    | Conduct a complimentary study of the floras and faunas of Itabira that include an inventory and monitoring report of fauna. Highlight the most sensitive ecological areas of the Municipality (i.e., fauna refuge, nesting sites, rare species, threatened species, and endemic species). Due: immediately after submission of the Itabira Municipal Guidance Plan on Green Areas. |            |
| 31.    | Prepare an analytical report of aquatic fauna focused on seasonal species. Due: three months—to be submitted to FEAM for monitoring of the species. |            |
| 32.    | Present a report on the biotypes of plants in the Municipality and in proximity to the mines. Due: twelve months. |            |
| 33.    | Develop a management plan for Pinus and Eucalyptus use and revegetation of the sterile piles with endemic, noninvasive species. Due: twelve months. |            |
| 34.    | Develop a Green Areas Plan for Itabira with a chronology for physical and financial development and execution of the actions set forth in the Plan. Due: twelve months. |            |
| 35.    | Develop a chronology for the establishment of the Itabira Green Belt after consensus has reached with PMI and CODEMA in the areas of mines, railroad tracks and the city with respect to the final submission of the Conservation Units Final Report. Due: March 2002. |            |
| 36.    | Develop a chronology for the construction of sports fields and parks. Due: seven sports fields and parks in 2000 and 2001 and the rest of the sports fields and parks due in 2002. The neighborhoods to receive a sports field or park are: Bela Vista, Vila Amelia, Agua Santa, Fenix, Praia, Bela Camp, Vila Paciencia, Juca Batista, Nova Vista, Gabiroba, and Madre Maria de Jesus. Due: one month after the conceptual project is cleared by PMI. |            |
| 37.    | Present a radio-station plan to FEAM. Due: six months after installing the automatic air-quality monitoring stations. |            |
| 38.    | Develop a Green Areas Plan for Itabira with a chronology for physical and financial development and execution of the actions set forth in the Plan. Due: twelve months. |            |
| 39.    | Develop a chronology and follow through with the actions to rebuild Fazenda do Pontal. Due: 1 month. |            |
| 40.    | Fencing off of all residential areas near train tracks. Due: one month. |            |
| 41.    | Build pedestrian overpasses on all urban and residential train tracks in the neighborhoods of Vila Amelia, Bairro Praia, Bairro Sao Cristovao, and Laboriau. Due: 6 months. |            |
| 42.    | Reduce the number of train maneuvers at stops within the city in Vila Amelia, Bairro Sao Cristovao so as to limit interruptions of local traffic. Due: Permanently after concession of the LOC. |            |
| 43.    | Inform CODEMA in advance when chemical products will be used to clean mining operations along the train tracks. Due: Permanently. |            |
| 44.    | Conduct a feasibility study for the relocation of the train terminal for passengers going to Espiritu Santo. Due: two months. |            |
| 45.    | Conduct an impact study of the expropriation of homes in the neighborhoods of Vila Sao Jose, Santana, Bela Vista and Camarinha. This study should include a program of mitigation and/or compensatory measures and identify affected families in an executive summary as discussed by the Dwelling Association of Itabira. Due: eight months. |            |
| 46.    | Develop a Green Areas Plan for Itabira with a chronology for the establishment of the Itabira Green Belt after consensus has reached with PMI and CODEMA in the areas of mines, railroad tracks and the city with respect to the final submission of the Conservation Units Final Report. Due: March 2002. |            |
| 47.    | Develop an analytical report of aquatic fauna focused on seasonal species. Due: three months—to be submitted to FEAM for monitoring of the species. |            |
| 48.    | Present a radio-station plan to FEAM. Due: six months after installing the automatic air-quality monitoring stations. |            |
| 49.    | Develop a Green Areas Plan for Itabira with a chronology for physical and financial development and execution of the actions set forth in the Plan. Due: twelve months. |            |
| 50.    | Develop a chronology and follow through with the actions to rebuild Fazenda do Pontal. Due: 1 month. |            |
| 51.    | Fencing off of all residential areas near train tracks. Due: one month. |            |
| 52.    | Build pedestrian overpasses on all urban and residential train tracks in the neighborhoods of Vila Amelia, Bairro Praia, Bairro Sao Cristovao, and Laboriau. Due: 6 months. |            |
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