

EIA IN BRAZIL: IS IT RATIONAL?

By

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ABSTRACT

According to a traditional view, Environmental Impact Assessment (EIA) should aim at providing more rigorous and comprehensive environmental knowledge in order to enable a more rational decision to be reached. However, this rational model has come under criticism as studies suggest that decision-making processes are far more complex than previously envisaged. As a consequence, attention has been directed to other possible ways in which EIA could work beyond the mere passive provision of information to decision makers. This dissertation used the models proposed by Bartlett and Kurian (1999) to examine how EIA worked in Brazil. Analysis was broken down into four aspects: project design, environmental license, conditions and mitigation measures, and contribution to sustainable development. Examination of two case studies showed a strong presence of the information processing model albeit with variable degrees of importance. The symbolic politics model was also evident, with an action that reduced considerably the influence of the information processing model. The pluralist politics model contributed to the definition of conditions and mitigation measures but inputs from public participation were not directly fed into EIA but were first filtered by the information processing model. The institutionalist and organisational politics models were only observed in the aspect related to the contribution of EIA to sustainable development. There was no indication of the political economy model in the two case studies. These results suggested that enhancing the rationality of EIA in Brazil should not be the only priority. Efforts should also be directed at learning through EIA, which requires more attention to participatory practices.

Keywords: EIA – rationality – causal models – decision making

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ABBREVIATIONS AND ACRONYMS

CMM - Conditions and Mitigation Measures;
CO - City Officials;
CONAMA - National Council of the Environment;
CSD - Contribution to Sustainable Development;
DILIC - Licensing Board;
DT - Developer's Team;
EA - Environment Agency;
EIA – Environmental Impact Assessment;
EIS - Environmental Impact Statement;
EL - Environmental License;
ES – Environmental Studies;
FUNAI - National Indian Foundation;
IBAMA - Brazilian Institute for the Environment and Renewable Natural Resources;
IPHAN - National Historic and Artistic Heritage Institute;
LA – Local Authorities;
LI - Installation License;
LO - Operation License;
LP - Preliminary License;
MMA – Ministry of the Environment;
MP - Prosecution Office;
MPF – Federal Prosecution Office;
NEP - National Environmental Policy;
NEPA - National Environmental Policy Act;
PD - Project Design;
RIMA - Environmental Impact Report;
SC - Statutory Consultees;
SC – Statutory Consultees;
SEA - Strategic Environmental Assessment;
SISNAMA - National System of the Environment;
SVS - Health Surveillance Secretariat;
TCU – Brazilian Court of Audit;
TOR – Terms of Reference.

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1. INTRODUCTION

1.1 Background

Since its genesis in 1969, Environmental Impact Assessment (EIA) has been associated with expectations of greater environmental protection in developments. Initially, EIA was supposed to achieve this goal by generating rigorous and objective information and analyses that would help decision makers reach the best possible decision.

However, these expectations have not been quite met. Environmental decision making seems to be influenced also by things other than rigorous and objective information and analyses. At the same time, research has found that EIA may have more than the mere provision of information to offer for greater environmental protection.

In this sense, critical studies have shown the limits and possibilities of EIA. On one hand, influence on consent and project design decisions appears to be only moderate. Also, EIA is not seen as significantly effective at ensuring impacts are minimized or avoided, if irreversible, and at facilitating sustainable development.

On the other hand, attention has been directed to other ways EIA can contribute to better environmental decision making. In particular, public participation and learning as a result of EIA have received attention as mechanisms that can achieve more robust and transparent decision making and help attain more sustainable patterns of development.

1.2 Main aims of this study

There is a need to better understand how EIA actually works. For this purpose, the objective of this dissertation is to critically assess how EIA functions in Brazil. This objective leads to the following aims:

- identify the different causal factors at play in the EIA process and their relative influence on decisions regarding the design and environmental licensing of projects, including conditions and mitigation measures;
- identify the contribution of EIA to sustainable development.

1.3 Outline

The remainder of this dissertation is broken down into six chapters. Chapter 2 starts with a literature review of the rational approach to EIA and its criticism. The chapter ends by presenting the six causal models proposed by Bartlett and Kurian (1999), which are used in this dissertation as a theoretical framework to analyze the functioning of EIA in Brazil. Chapter 3 presents a description of the EIA system in Brazil. Chapter 4 details the methodology employed to achieve the overall objective and specific aims of this study. In Chapter 5, results are presented and then discussed in Chapter 6. Finally, Chapter 7 concludes by summarising these results and outlining recommendations for future research.

2. THE RATIONAL APPROACH TO EIA

Environmental Impact Assessment (EIA) can be defined as a systematic process that examines the environmental consequences of a proposed development. Besides contributing to consent and design decisions, EIA is also expected to promote sustainable development. EIA can be traced back to the enactment of the National Environmental Policy Act (NEPA) in the USA in 1969. Since then, it has spread to other parts of the world, with a current estimate of 140 countries having EIA systems albeit varying greatly in terms of procedures and practices (Glasson et al., 2012).

An environmental assessment can also be applied prior to project level, in a process usually known as Strategic Environmental Assessment (SEA). In this regard, the environmental consequences of proposed policies, plans and programmes are systematically evaluated in order to ensure their full integration with economic, social and political concerns (Partidário, 1999). SEA is expected to lead to early consideration of alternatives and consistency in lower level planning, especially as low as project level. The emphasis in this dissertation, however, is on EIA as a tool for decision making regarding proposed developments.

In general, EIA involves the following steps (Glasson et al., 2012):

- Project screening (is an EIA needed?);
- Scoping (which impacts and issues should be considered?);
- Description of the project/development action and alternatives;
- Description of the environmental baseline;
- Identification of key impacts;
- Prediction of impacts;
- Evaluation and assessment of significance of impacts;
- Identification of mitigating measures;
- Public consultation and participation;
- Presentation of findings in the Environmental Impact Statement (EIS), including a non-technical summary;
- Review of the EIS;
- Decision-making;
- Post-decision monitoring;

- Audit of predictions and mitigation measures.

The philosophy and principles of EIA have roots in a rationalist approach to decision making that was prevalent in the 1960s (Jay et al., 2007). According to Weston (2000, page 189),

“EIA brings together some of the pressing demands of the 1960s and 1970s, a proactive environmental approach to development planning and a rational approach to decision making. Indeed much of its popularity and legitimacy as a tool for aiding decision making is in its proactive approach to environmental protection and its claim to being objective and rational—i.e. ‘good’.”

The decision process was seen as a sequence of logical steps, starting with the establishment of objectives for a given situation, followed by the identification or design of alternatives, assessment of their impacts, and selection of the option that best met the set objectives (Kornov and Thissen, 2000, Weston, 2000). Decision making should use objective, i.e. value-free, information, collected following the norms and rules of scientific methods (Cashmore, 2004).

Cashmore (2004, page 409) mentions that the policy makers who formulated NEPA were said to be strongly influenced by scientific concepts, particularly ecology, with NEPA being perceived as a “way of recruiting science to inform and correct policy-making”. Therefore, EIA should aim at providing more rigorous and comprehensive environmental knowledge in order to enable a more rational decision to be reached (Cashmore and Kørnøy, 2012).

Associated with this view, EIA was mainly expected to influence consent and design decisions related to development proposals. The scientific data collected by EIA should be processed by apolitical stakeholders, alongside other information, to make rational design and approval decisions (Nilsson and Dalkmann, 2001). Interestingly, no assumption was necessarily made that the resultant decisions would be more environmentally sensitive or socially just compared to a situation where no EIA was undertaken. This can be attributed to early emphasis being placed on procedural rationality, following judicial interpretations of NEPA as essentially procedural legislation, i.e., requiring a set course of action rather than mandating a specific level of environmental protection (Cashmore et al., 2004).

Given this perspective, research on EIA effectiveness has tended to focus on practical and procedural aspects, rather than substantive purposes and outcomes. Emphasis is placed on

“rigorous undertaking of the key stages in the EIA process; an emphasis on quantification of data, and in particular impact predictions; and, presentation of the EIA findings in a logical, coherent and comprehensible manner” (Cashmore et al., 2004, page 298). Perhaps the most prominent example is the widespread use of review packages to assess the quality of environmental impact statements under the usually implicit assumption that better procedures will lead to better outcomes (Lee et al., 1999, Sandham and Pretorius, 2008, Peterson, 2010, Pöder and Lukki, 2011).

However, the rational model has come under criticism as studies suggest that decision-making processes are far more complex than previously envisaged¹. At the individual level, there are significant factors bounding the rationality of decision-makers, such as natural limited mental capacity and restricted volumes of information. Habits, values, tradition, context and rules can also constrain the way decisions are made by individuals (Kornov and Thissen, 2000). In this regard, neuroscience research has shown that decision making is a complex process, in which the brain structures associated with reason and feelings are inextricably intertwined and emotions play a crucial part in the way decisions are made (Lehrer, 2010, Gladwell, 2007).

In turn, collective decisions must take account of the distribution of interests and power among participants. In this regard, dominant interests are seen as capable of steering decisions regardless of technical assessments or then using those assessments to rationalize decisions that have been reached on other grounds (Owens et al., 2004, Richardson, 2005).

Weston (2004) considers that the main criticism regarding the science of EIA and the rationalist model associated with it is that environmental assessments are intrinsically value based. There is no objective yardstick to judge if a particular decision made following EIA is correct or just since that depends on the perspectives of decision-makers. Even the decisions about whether or not an EIA should be conducted for a particular project (screening) and the range of effects to be studied (scoping) involve value judgments and opinions about the significance of likely impacts from the different interests recruited during the process (Weston, 2000). There is also indication that assessment techniques utilized in EIA and apparently value-free, such as risk analysis, are inevitably tempered by subjectivity (Stirling, 1998).

¹ Kornov and Thissen (2000, page 192) go as far as to say that “virtually all empirical research shows that decision-making processes in practice often do not follow such a rational procedure, even in cases where significant efforts are made to improve rationality”.

At the same time, evidence shows that EIA has limited influence on development decisions. After analyzing forty cases in the UK, Wood and Jones (1997) concluded that EIA seemed to have a gradual rather than a revolutionary effect on decision-making, with its main benefits being enhanced provision of information about the environmental impacts of the development and help in defining conditions included in the authorization.

In an international study about the effectiveness of EIA, Sadler (1996) found that EIA was considered to contribute significantly to more informed decision making and to the prevention of environmental damages. However, EIA was seen as less effective at ensuring impacts were minimized or avoided, if irreversible, and at facilitating sustainable development.

Cashmore et al. (2004) reviewed empirical studies about the substantive outcomes of EIA and found that it was seen as having a moderate, rather than substantial, influence on consent and project design decisions. Using the rational paradigm, Benson (2003) argues that EIA is an ineffective tool to steer decisions towards sustainable development due to the lack of environmental standards or targets to be imposed upon decision-makers.

These challenges to the rational approach have made evident the inadequacy of some of the theoretical assumptions behind EIA. In this sense, Lawrence (1997, page 80) perceives the theoretical condition of EIA as being

“largely an uneven mix of planning theory (largely represented by the rational planning model); traditional scientific theory (as a general model for impact prediction); discipline-specific social, economic, and biological theories (to characterize environmental conditions); evaluation theories and procedures (to screen and compare alternatives); public policy and organizational theory (to facilitate implementation and public and agency consultation); and a loose amalgam of methods, concepts, and frameworks derived from a range of sources including EIA practice.”

As a consequence of the theoretical shortcomings of the rational approach, attention has been directed to other possible ways in which EIA could work beyond the mere passive provision of information to decision-makers. In an often-cited article, Bartlett and Kurian (1999) consider that the thinking and writing about EIA have been guided by implicit assumptions and models rather than explicit and systematic attempts to establish theoretical foundations. After reviewing the research literature, the authors proposed six models, not necessarily

mutually exclusive, to understand how EIA operates. These models embody the different ways in which EIA is seen to work in the literature rather than how it should work but are nevertheless useful to draw richer theoretical perspectives (Cashmore and Kjørnø, 2012).

The information processing model is the most common view of how EIA is supposed to work. It assumes that EIA is essentially a technique for generating, organizing and, communicating information. This information is then used to reach decisions in an apolitical way. Emphasis is placed upon procedures that ensure that rigorous and, most often, quantitative information is available to decision-makers in order to reach better decisions. There is a clear connection between this model and the rational approach discussed earlier. For Bartlett and Kurian (1999), this model presents the obvious deficiency of ignoring the political nature of the decision-making process and therefore offers little explanatory power as to how EIA actually works or ought to work. As the authors put it,

“[I]n modern polyarchic political systems dominated by large markets, administered institutions and formal rules, more and better information may occasionally, by itself, produce better decisions, but unaided by other causal variables, the effect is likely to be marginal and serendipitous” (Bartlett and Kurian, 1999, page 418).

In the symbolic politics model, EIA is seen in two somewhat different ways. According to a more positive perspective, EIA operates by creating meaning and evoking emotional responses and the reaffirmation of moral commitments to environmental concerns. According to this view, EIA crafts language and arguments “which structure meaning for us and, consequently, our interpretation of the world that results in changing current reality” (Bartlett and Kurian, 1999, page 419). These worldviews embody the prominence of environmental values over ordinary interests and preferences.

However, the symbolic politics model also implies that EIA can be merely a technique for legitimizing the exercise of power by the powerful. EIA is then reduced to a formality, a token gesture to pacify opposing interests. In this sense, EIA is used to justify decisions already made on political or economical grounds.

In turn, the political economy model suggests that EIA practices can be undertaken voluntarily or semi-voluntarily by businesses, leading to the internalization of externalities in order to anticipate and prevent environmental harm. This may follow, for example, from the

perception of growing consumer interest over environmentally-friendly products or the use of clean technologies and techniques. EIA is then expected to provide information that will enable practices such as ecolabelling, ecoauditing and environmental management to improve the protection of the environment. The following quote clarifies the rationale for this model:

“At the heart of sound environmental management is the assessment of effects, real or potential, on the environment as a consequence of business activities and the planning and implementation of measures to avoid or mitigate that damage. Environmental assessments can assist companies in their quest for continuous improvement by identifying ways of maximizing profits through reducing waste and liabilities, raising productivity and demonstrating a company’s sense of duty towards its customers and neighbors” (Sadler, 1996, page 33).

The organisational politics model holds that EIA operates by changing the internal politics of organisations involved with it. These changes affect internal structures and processes and can modify values, organisational culture, and even the kinds of individuals recruited. Bartlett and Kurian (1999, page 421) provide an interesting illustration:

“NEPA required an interdisciplinary effort to study and evaluate environmental impacts and, thus, previously homogenously staffed agencies (in terms of training and profession) were forced to recruit experts and professionals who became environmental advocates in agency decision making.”

In line with this view, there has been considerable interest in the mechanisms by which organizations change their internal structures to better respond to EIA. For example, Sánchez and Morrison-Saunders (2011) argue that knowledge management inside environment agencies is crucial to enhance environmental management activities that go beyond the scope of normal EIA practice. There is also a need to understand how organizations might improve their public participation practice in order to reinforce change both outside and inside their boundaries (Chess and Johnson, 2006, Gazzola et al., 2011).

The next model was termed pluralist politics. It assumes that EIA is relevant because it opens up the decision-making process to the polity, allowing participation and, to various degrees, influence from the public and other organized interests. These interests may comprise non-governmental organizations, state and local governments and other administrative agencies. The model emphasizes the need for public participation and its limits to contributing to

meaningful EIA. In this sense, there have been significant efforts aiming to study and promote participatory practices in environmental decision making as a way to overcome shortcomings related to decision framing, resource allocation and power distribution (Burgess and Chilvers, 2006, Chilvers, 2009, Stirling, 2008).

Finally, the institutionalist model claims that EIA can bring about changes in formal and informal rules that govern environmental decisions as a result of altered values, beliefs and norms in the larger society. Thus, “the success and effectiveness of the impact assessment process is evaluated by the degree to which values are transformed, ways of doing things are changed, and orientations and perspectives on what ought to be done are modified to incorporate environmental values” (Bartlett and Kurian, 1999, page 425).

Learning is an important aspect of the institutionalist model. It is expected to come about particularly as a result of the engagement of the public and organized interests in the EIA process emphasized by the pluralist politics model, although learning and knowledge can also be fostered by means of the efforts highlighted in the information processing model.

The literature about EIA reveals different types of learning associated with its practices. As noted by Armitage et al. (2008, page 89), there are “multiple and sometimes contradictory definitions of learning, even within a particular theoretical framework”. In many instances drawing upon educational theories, these typologies highlight the potential of EIA to promote changes in information and knowledge levels as well as in attitudes, perceptions and norms of individuals and groups.

Diduck and Mitchell (2003) provide an interesting illustration of the ways learning in EIA can promote sustainability:

“Individual decision makers in specific cases can learn how to avoid or mitigate adverse effects and enhance the benefits of their decisions. Post-hoc and cumulative effects assessments afford opportunities for government departments, communities, and other forms of social organization to learn from past development decisions. Public involvement creates opportunities for practitioners and decision makers to identify social values, and learn from local or traditional knowledge. Involvement also furnishes opportunities for members of the public to acquire scientific and technical knowledge, learn about their community and the interests of fellow citizens, and engage in collective political action” (Diduck and Mitchell, 2003, page 340).

The different models can be seen as causal channels by which EIA is supposed to operate. In this regard, Cashmore and Kjørnø (2012) argue that they each have explanatory potential, including, in limited circumstances, the information processing model. Therefore, “causation is generally seen to involve multiple, possibly complimentary pathways to effecting sustainable development” (Cashmore and Kjørnø, 2012, page 11).

The relative influence of the factors described in each model appears to depend on the particular context in which EIA is performed. For example, Cashmore et al. (2008) analyzed three cases involving EIA procedures in the UK and found no indication of an instrumental role for passive information provision in design and consent decisions. Instead, there was an interplay of non-rational variables such as power, agency, experiences and expectations underlying the decision-making process. In turn, Osorio (2010) concluded that the rational model had some explanatory power concerning how decision making occurred in hazardous waste management in Mexico but not as strong as political considerations.

Interestingly, these two cases also illustrate how EIA can relate to the decision-making process. In the UK, as well as in a number of other countries, EIA is, or should be, a ‘material consideration’ in the decision made by the local planning authority on whether or not to give planning permission for a development proposal (Wood and Jones, 1997). It does not bind, legally or otherwise, the administrative decision makers to what the Environmental Impact Statement (EIS) informs.

The process depicted by Osorio (2010) for hazardous waste management in Mexico is somewhat different. EIA is the procedure through which the Ministry of the Environment grants an environmental permit and establishes the conditions to be complied with by the development. The EIS is submitted together with a permit application to the Ministry of the Environment who then evaluates it and decides whether to approve, deny, or conditionally approve the project.

The contrast between these two examples is suggestive of how context may matter. Since EIA in the Mexican case is integral to the decision-making process, which, in addition, is carried out by an institution with specific capacity for environmental matters, it is reasonable to expect a more prominent role for the information processing model when compared to the UK. Therefore, passive provision of information may have more influence on consent and project design decisions than usually found in the research literature about EIA.

Since Brazil has an EIA system similar to the Mexican case, it is interesting to see if the information processing model is also more relevant in explaining how decisions are made. The next chapters examine this aspect, beginning with a description of the EIA process in Brazil.

3. EIA IN BRAZIL

In Brazil, EIA was established in 1981 with the enactment of the National Environmental Policy (NEP) through Law 6.938/81. This legislation also created a new institutional framework to promote the preservation, enhancement, and recuperation of environmental quality, which reflected the scale and complexity of the country (Glasson and Salvador, 2000). The National System of the Environment (SISNAMA – Sistema Nacional do Meio Ambiente) articulates governmental institutions at the federal, state and local levels. The National Council of the Environment (CONAMA - Conselho Nacional do Meio Ambiente) is the consultative and deliberative body of SISNAMA and gathers representatives of the three levels of government, businesses, unions, and non-governmental organizations. Among other attributions, it formulates directives and regulations for environmental issues (Sánchez, 2008b).

CONAMA's Resolutions 01/86 and 237/97 define the basic characteristics of the EIA process in Brazil. EIA is associated with the licensing of activities that can significantly impact the environment². Projects requiring EIA to get an environmental license are indicated in an illustrative list. The environment agency determines the need for EIA in other cases (TCU, 2007). It is worth mentioning that there is no legal requirement for SEA in Brazil although some initiatives have been voluntarily attempted over the years (Sánchez, 2008a, Egler, 1998).

There are three different licenses to be obtained before a proposed project can start operating. The process begins with the developer applying for a preliminary license (LP – Licença Prévia) in the preliminary stage of project planning and design, when different locations and technological alternatives can be considered. The developer's team carries out the necessary environmental studies, which are defined beforehand³ and later reviewed by the environment agency. These take the form of an Environmental Impact Study (EIA – Estudo de Impacto Ambiental)⁴ and its Environmental Impact Report (RIMA – Relatório de Impacto Ambiental) (IBAMA, 2002, MMA, 2009).

It should be noted that the RIMA does not correspond to the Environmental Impact Statement

² There is a separate building permission that is issued by the local authority.

³ Usually by means of a document called terms of reference.

⁴ In order to avoid confusion with other terms, the Environmental Impact Study is referred to as environmental studies.

(EIS) as elaborated in other countries, such as England. It is more similar to the non-technical summary of the EIS since its main purpose is to provide information about the EIA process to the people attending public hearings (Sánchez, 2008b).

Public hearings are organised if deemed necessary by the environment agency or requested by the Prosecution Office (MP - Ministério Público) or by more than fifty citizens (IBAMA, 2002, MMA, 2009).

Statutory consultees have to be heard as part of the review of the Environmental Impact Study done by the environment agency. At the federal level, statutory consultees are the National Indian Foundation (FUNAI – Fundação Nacional do Índio), the National Historic and Artistic Heritage Institute (IPHAN - Instituto do Patrimônio Histórico e Artístico Nacional), the Palmares Foundation (Fundação Palmares), which aims to preserve African-Brazilian culture, and the Health Surveillance Secretariat (SVS - Secretaria de Vigilância Sanitária) (IBAMA, 2002, MMA, 2009).

The agency then decides if an LP is to be given as well as the conditions and mitigation measures that should go with it. Conditions are the commitments made by the developer to obtain and maintain the environmental licenses, therefore ensuring the environmental sustainability of the development (TCU, 2009). Mitigation measures are the actions proposed to reduce the magnitude or the importance of negative impacts (Sánchez, 2008a).

With the LP, the developer should elaborate the engineering design for the project following the conditions and measures defined in the LP in order to apply for an installation license (LI – Licença de Instalação). If the LI is given, the developer can start the implementation of the project. When the project is completed and ready to start, the developer requests an operation license (LO - Licença de Operação), which is issued after the environment agency checks if the conditions established in the LP and LI were met (TCU, 2007).

The institutional responsibility for the licensing process depends on the characteristics of the project. The Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA - Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis) is the federal environment agency. It is responsible for the licensing of projects with significant environmental impacts at national or regional level. In turn, state agencies should license developments with a more restricted spatial influence (MMA, 2009). However, Sánchez (2008b) mentions that IBAMA has in practice extended its mandate in environmental

licensing to the detriment of state agencies. This seems to be related, at least partially, to the perception that some state environment agencies have difficulties to perform licensing procedures in their remit properly, which triggers efforts from the Prosecution Office (MP – Ministério Público) to judicially force IBAMA to take over the process in some more controversial cases (TCU, 2011).

Sánchez (2008b) considers that the association of EIA with environmental licensing gives decisive influence to environment agencies. It is up to them to define the necessary environmental studies and to establish the procedures and decision-making criteria to grant a license, provided legal parameters are followed. In this sense, decisions can be made directly by the environment agency, as happens with IBAMA and some state agencies, or by a council that gathers representatives from government and society (Sánchez, 2008b).

This context seems to imply the possibility of a more pronounced role for the rational model in explaining environmental decision making in Brazil. This perception is further reinforced by the adherence to technocratic values by environment agencies, at least in the case of IBAMA (Araújo and Calmon, 2010). In this sense, a recent report from IBAMA states that EIA should provide environmental information to support decision making (IBAMA, 2011). It is worth mentioning that the federal environment agency has extensive technical expertise, with staff including biologists, geologists, chemists, geographers, economists, and sociologists (TCU, 2009).

In accordance with this perspective, a literature review about EIA in Brazil apparently upholds the relevance of the information processing model. The emphasis is on procedural aspects and the diagnosis is generally a perception of an implementation deficit hindering the attainment of more sustainable outcomes in EIA. As a result, recommendations are made along the lines of more training, better coordination of efforts, more use of structured and rigorous analysis and dissemination of guides and best practice (Fowler and de Aguiar, 1993, Glasson and Salvador, 2000, MPF, 2004, Nicolaidis, 2005, Kirchhoff, 2006, Lazzarotto, 2009). Even when political pressures are reported to play a significant role in decision making, this is seen as an unwanted intrusion in an otherwise technical procedure (Filho, 2006, TCU, 2009).

Bond et al. (2010) present an interesting exception to this panorama by highlighting the importance of learning through EIA as a means to better reach sustainable development goals in Brazil. In turn, Sánchez and Gallardo (2005) argue for the importance of establishing

environmental management systems in order to properly implement mitigation measures during the EIA process, which can be said to be associated with the organisational politics model mentioned in the previous section.

However, the review did not find any studies to have critically investigated how EIA works in practice in Brazil. Therefore, it seems opportune to examine whether the information processing model really prevails in explaining how environmental decisions are made or, as discussed in much of the literature about EIA effectiveness, other factors hold greater sway.

This aspect has both theoretical and practical repercussions. Besides contributing to theory building related to the way EIA influences environmental decision making and sustainable development, a study of the relative influence of EIA causal channels in Brazil can help enhance the effectiveness of the process by redirecting efforts towards factors that are perceived to better address its goals. As Cashmore et al. (2008, page 1246) put it: “Can the historical predilection for decontextualized ‘best practice’ be maintained when outcomes are so pervasively influenced by dynamic contextual contingencies?”.

The next section presents the objectives and methodology of this dissertation.

4. METHODOLOGY

4.1 Objective and aims

The objective of this dissertation is to critically assess how EIA works in Brazil. This objective leads to the following aims:

- identify the different causal factors at play in the EIA process and their relative influence on decisions regarding the design and environmental licensing of projects, including conditions and mitigation measures;
- identify the contribution of EIA to sustainable development.

4.2 Data and methods

To attain these objective and aims, this dissertation employed the six theoretical models proposed by Bartlett and Kurian (1999), as previously discussed. The purpose was then to identify how relevant these models were in explaining decisions regarding project design, granting of the preliminary license, including conditions and mitigation measures, and the contribution of EIA to sustainable development.

The investigation into how EIA works in Brazil required complex and detailed data from different sources. This wealth of information was thought to be best handled by means of a case study research design in which a detailed and intensive analysis of specific cases could be conducted. Case studies are not meant to represent a certain class of objects. Instead, they provide the opportunity to have a close look at particular situations and generate insights that can help theory building (Bryman, 2008).

In this sense, the units of analysis are licensing processes, which are associated with EIA in Brazil. These processes are cases that bring together different stakeholders around a development project, configuring specific situations that help understand how EIA works.

It was deemed convenient to study licensing processes carried out by IBAMA. The choice of the federal environment agency over its state counterparts was justified on the grounds that it is considered to be better resourced and structured, which should minimize the occurrence of problems such as insufficient documentation and inexperienced staff.

To perform an EIA, IBAMA puts together teams with five to twenty analysts, depending on case complexity. Teams should minimally gather scientific skills related to fauna, flora,

hydrology, geology, and socioeconomic factors. The analysts involved define the terms of reference for the environmental studies⁵. After the environmental studies are submitted by the developer's team, they are checked by IBAMA to verify compliance with the terms of reference. In case of acceptance, the studies are then reviewed by IBAMA and sent to the statutory consultees for a formal opinion on the viability of the project and the conditions and mitigation measures that should go with the license. If requested, public hearings are held in the cities affected by the development. Local authorities from those cities may also provide information and state their needs to be able to cope with the consequences of the project (IBAMA, 2011).

IBAMA then decides if a preliminary license is to be given. The Licensing Board (DILIC – Diretoria de Licenciamento) gives a conclusive technical opinion about the environmental viability of the development, which is then considered by the President of IBAMA in his decision to grant the license (IBAMA, 2008).

This process takes a minimum of six months, but complex cases may take years to reach the decision point about granting or not a preliminary license (IBAMA, 2011). A simplified diagram can be seen in Figure 1.

⁵ Statutory consultees and the developer's team are invited to participate and contribute with the elaboration of the terms of reference.

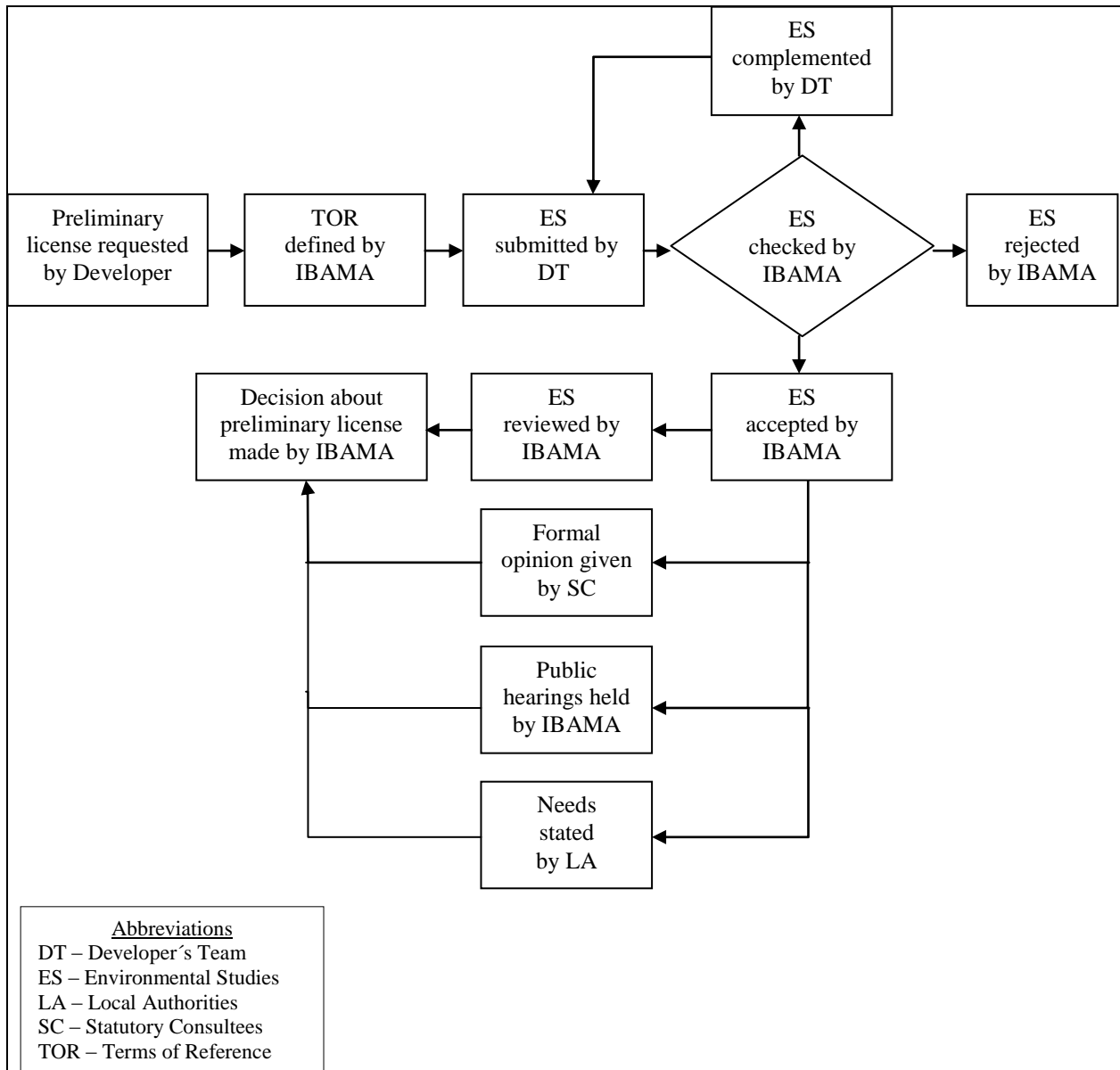


Figure 1 - Diagram of the process to grant a preliminary environmental license in IBAMA

Adapted from IBAMA (2011, page 24)

In order to achieve a richer perspective of how EIA works in Brazil, whilst still within the time limits of this dissertation, it was deemed appropriate to select two case studies. This was meant to provide a suitable context to reach the objective and aims of this dissertation by comparing two exemplifying situations (Bryman, 2008). The first case would present favourable conditions for the prevalence of the information processing model in explaining how EIA works. In turn, the second case would add a ‘shock’ to that situation to check for changes in the relative importance of the different causal factors.

Preliminary interviews with IBAMA staff indicated that a high level of political and social pressure in a licensing process was a characteristic that could strongly disturb the way EIA

should work. Other possible aspects in that regard, such as the high cost of a development or its complexity, were considered to be likely associated with intense political and social pressure. Therefore, this factor was chosen to be the main difference between the two cases.

The selection of the two licensing processes considered some criteria. Both EIAs should have good environmental studies. This condition was seen as necessary to avoid the perception of limited influence of the rational model due to an implementation deficit.

However, it should be mentioned that there are no formal rules or standards to identify good studies. As discussed in the previous section, there is no similar document to the Environmental Impact Statement in the licensing process in Brazil. As a consequence, it was not possible to use tools such as the review package devised by Lee et al. (1999) to assess the quality of environmental studies in EIAs.

Therefore, the two cases were chosen among those the IBAMA staff regarded as having good technical quality. This was judged based on their own experience, usually emphasizing the participation of the developer's team in the definition of the terms of reference and their efforts to fully comply with the aspects requested for the environmental studies.

According to preliminary interviews, the best studies are usually from proposals to build hydroelectric dams. At the same time, it was thought to be appropriate that the two cases were of the same project sector to increase the comparability of the developments under study.

It was also considered convenient to select cases that were relatively recent. This included EIAs whose preliminary licenses were given in the past four years in order to maximize the probability of accessing the relevant stakeholders whilst the process was still fresh in their minds.

As a result of applying the previous criteria, two proposals for hydroelectric dams were selected. The more neutral development was termed 'Case 1' whereas the more politically and socially 'charged' project was termed 'Case 2'. It is worth mentioning that IBAMA utilizes 23 categories to classify the main types of development, with hydroelectric dams comprising 5.2% of the 1,675 processes under different stages of analysis in 2010 (IBAMA, 2011).

Data collection was based on semi-structured interviews and documentary analysis. Semi-structured interviews were considered appropriated since they allow a more flexible interaction to explore respondents' views and perceptions about a topic (Bryman, 2008).

Therefore, interview guides were designed to elicit information related to the objective and aims of this dissertation and further questions were asked to expand or clarify significant replies from interviewees.

Respondents included IBAMA staff, the developer's teams, statutory consultees, and officials from the cities affected by the hydroelectric dams. This range of stakeholders was considered necessary and sufficient to provide a rich perspective of the functioning of EIA in the case studies. In total, 17 interviews were conducted, according to the following table.

Table 1– Interviewees according to type and case

Type / Case	Case 1	Case 2
IBAMA Staff	4	3
Developer's Teams	1	2
Statutory Consultees	3	2
City Officials	1	1

Two interview guides were elaborated. The first one covered questions about the relative influence of the different causal factors at play in the EIA process on the design of projects, granting of the environmental license, including conditions and mitigation measures, and attaining sustainable development. It was used to interview IBAMA staff and the developer's teams, given that these respondents participated in the licensing process from the beginning. The second guide excluded the question about the influence on the design of projects and was used to interview statutory consultees and officials from the cities affected by the projects, since they were active later in the process (Table 2).

Table 2– Interview guides used

Interview Guide 1	Interview Guide 2
<ol style="list-style-type: none"> 1) EIA altered in any way the initial design of the development? What was most influential for this to happen? 2) What was most influential for the preliminary license to be granted for this development? 3) What was most influential in the definition of the conditions and mitigation measures for the preliminary license in this development? 4) Do you consider that EIA was effective in promoting sustainable development in this case? Why (not)? 	<ol style="list-style-type: none"> 1) What was most influential for the preliminary license to be granted for this development? 2) What was most influential in the definition of the conditions and mitigation measures for the preliminary license in this development? 3) Do you consider that EIA was effective in promoting sustainable development in this case? Why (not)?

The interview guide 1 was pilot-tested with an IBAMA analyst that was not involved with the two selected cases. This provided the opportunity to adjust the wording and number of questions in order to make interviews more focused and dynamic.

Upon initial contact, usually by telephone, potential interviewees were given an explanation of the general purpose of the research and the reason why they were selected to participate. After that, an e-mail was sent containing more details about the research and a copy of the terms of consent. This document described the way the interview was to be conducted, including the possibility of audio recording it if the interviewee so authorized, and how the information would be used. Before interviews started, respondents had the opportunity to ask questions about the research and then were asked to sign a hard copy of the term of consent.

Whenever possible, interviews were face-to-face in order to build rapport and increase the amount of information provided. All face-to-face interviews⁶ were authorized to be audio-recorded, which allowed their transcription and facilitated content analysis. Telephone interviews, as was the case with city officials, used note taking. This kind of interview may have affected respondents' willingness to expand on their answers or be more open to admit that causal factors deviating from the 'expected' information processing model were at play. It also prevented the opportunity to observe interviewees' body language and thus reveal nuances in their replies.

⁶ Face-to-face interviews represented 77% of all interviews

In both situations, measures were taken to ensure the anonymity of interviewees in order to increase their confidence, which were previously described in the terms of consent. Other than the information already mentioned before, no details were disclosed about the two developments selected. Respondents were identified by codes and, with the exception of IBAMA staff, no connections were made with their institutions.

However, one aspect is worth pointing out. The researcher is an auditor at the Brazilian Court of Audit (TCU – Tribunal de Contas da União) and currently works in its environmental sector. As such, he is in the position to audit IBAMA and, eventually, the federal statutory consultees. This condition may have influenced respondents, especially those from IBAMA, to give what they thought were ‘safe’ answers rather than answering what they actually thought. It is fair to assume that ‘safe’ in this case tends to favour the information processing model, given its still prominent and valued conception as a ‘rigorous’ and ‘objective’ approach.

In order to minimize this bias, efforts were made to clarify that this dissertation was of strictly academic interest and had no relation with the researcher’s role as a TCU auditor. This statement was included in the terms of consent submitted to the interviewees. Nonetheless, it is probable that some level of bias still remained favouring the information processing model in the interviews.

Information from interviews was then analysed using coding (Bryman, 2008) that followed the six models proposed by Bartlett and Kurian (1999). This approach was successfully employed in other researches that investigated the functioning of EIA, such as in Cashmore et al. (2008) and Osorio (2010). Transcripts from face-to-face interviews and notes from telephone interviews were examined to see what categories representing the different causal factors were present and their relative influence on decisions about the design and environmental licensing of projects and on the contribution of EIA to sustainable development.

The relative importance of the models was assessed using the number of occurrences in different interviews in the same licensing process as well as the emphasis applied by respondents when referring to these occurrences. This assessment was not ‘objective’, in the sense that it was based on the researcher’s judgment which is, of course, prone to subjective bias. Nonetheless, triangulation with documentary analysis was employed whenever possible

to attenuate this bias.

Documentary analysis covered the case files, including the terms of reference, memos, public hearing minutes, analytical reports, and opinions. No attempt was made to examine or analyze the environmental studies in both cases due to their complexity and extension. Documentary analysis was used to give background information about the licensing processes and as a means to triangulate with information gathered in the interviews. This was done employing qualitative content analysis (Bryman, 2008) to see if causal factors mentioned in interviews also appeared in the case files related to a particular licensing process.

Results are presented in the next section.

5. RESULTS

Results were organized by case study. In each licensing process, results were then broken down into four aspects: project design, environmental license, conditions and mitigation measures, and contribution to sustainable development. Reference to a specific interview was made by using a code representing its case (Case#1 or Case#2), type (EA for Environment Agency, DT for Developer's Team, SC for Statutory Consultees, and CO for City Officials) and number.

5.1 Case 1

Project design

The occurrence of changes in project design as an effect of the EIA process was controversial. Some respondents considered that there were minor modifications (Case#1_EA#1; Case#1_EA#2) whilst others did not identify any changes resulting from licensing procedures (Case#1_EA#4; Case#1_DT#1). Since documentary analysis of case files could not produce any evidence to corroborate claims of change, even minor ones, EIA was considered as not having influenced project design.

Environmental license

Most interviewees stated that the preliminary license was granted because the analysis of the environmental studies by IBAMA showed the viability of the development (Case#1_EA#1; Case#1_EA#2; Case#1_EA#3; Case#1_EA#4; Case#1_DT#1; Case#1_SC#2; Case#1_CO#1). In this regard, the report containing the technical opinion of the team of analysts presented an extensive review of the environmental studies. The examination focused on methodologies and data used as well as consistency of results. Some aspects of the environmental studies were criticised, especially because of underestimation of impacts derived from synergies. Nevertheless, the opinion was in favour of granting the license, with limitations found in the studies serving as basis to propose some conditions as well as recommendations to be followed by the developer throughout the licensing process. The preliminary license validated the technical opinion of the team of analysts in its entirety.

The consideration of concerns of local indigenous populations in the environmental studies was also seen as a significant factor in clearing the way for granting the preliminary license (Case#1_SC#1). However, the analysis of these concerns was criticised. There was the perception that political pressure pushed for the approval of the license according to the

schedule set by the federal government to auction the concession of the hydroelectric dam⁷, therefore preventing a proper evaluation of how local indigenous populations would be affected.

“Working with the precautionary principle, how can you authorize something that does not offer you enough information? We cannot so we issued an opinion saying no and then came pressure from the government. What is the position then? Oh, since it has to be auctioned, it must have the preliminary license, all that, everything that should have been done prior to the preliminary license becomes a condition” (Case#1_SC#3).

In this regard, the corresponding technical report stated that the environmental studies had to supply more information about impacts on indigenous populations before a conclusion could be reached. Nevertheless, the formal opinion from that Statutory Consultee expressed its accordance with the development, provided information gaps listed in the technical report became conditions of the preliminary license.

Interviews and documentary analysis showed a strong influence of the information processing model on the granting of the preliminary license. However, there was also indication that such influence was seemingly tempered by a tokenistic approach in which technical analysis was constrained by decisions already made on political grounds, a situation that can be linked to the symbolic politics model in its negative strain.

Conditions and mitigation measures

The environmental studies were identified as the main source for the definition of conditions and mitigation measures by almost all interviewees (Case#1_EA#1; Case#1_EA#2; Case#1_EA#3; Case#1_EA#4; Case#1_DT#1; Case#1_SC#1; Case#1_SC#2; Case#1_SC#3). Some respondents stated that the review carried out by the team of analysts generated additional measures to complement those already in the environmental studies (Case#1_EA#1; Case#1_EA#2; Case#1_EA#3; Case#1_EA#4; Case#1_DT#1). Documentary analysis showed that the list of conditions and mitigation measures in the preliminary license came essentially from proposals in the environmental studies and in the review done by IBAMA.

⁷ The preliminary license is a prerequisite for the auction of a public concession that may cause significant environmental damage, such as dams or roads.

Public hearings and demands voiced by the cities affected by the development were also a significant contribution to the definition of conditions and mitigation measures (Case#1_SC#1; Case#1_SC#2) but only after being validated by technical analysis and then incorporated in the licensing process (Case#1_EA#1; Case#1_EA#2; Case#1_EA#3; Case#1_EA#4; Case#1_SC#3).

However, there was a sense that public participation was impaired by limited knowledge of what was happening and of the harmful consequences of the development (Case#1_CO#1). Participants expressed discomfort about the lack of opportunity to have their say about the development during one of the three public hearings held in the region.

At the same time, two public hearings held in the region revealed intense opposition to the development from representatives of indigenous peoples, especially because of uncertainties about the impacts on their livelihoods, primarily based on fishing, and the benefits that would accrue to them.

“They asked: is the dam put in that place a risk to us? Then, what is the answer? Look, nobody wants that and we will do everything to prevent that but there is no guarantee there will not be any risks. The next question: will the fish diminish? Because we live off fish here. The answers are not clear either. Then the third question: will there be energy for us? No, the answer was no. Then, what was their position? So, we will run the risk of having our village flooded, of not having fish to eat and sell and we will not even have the energy” (Case#1_SC#1).

As mentioned in the previous section, some uncertainties supposed to be dealt with prior to consent became conditions of the preliminary license, something apparently caused by the reported political pressure to speed up the licensing process (Case#1_SC#3).

Conditions and mitigation measures were essentially defined by the working of the information processing model. Even the contribution of public participation, associated with the pluralist politics model, was filtered through technical analysis to fit into the preliminary license. However, some conditions resulted from the mixture of two models, information processing and symbolic politics, leading to the postponing of studies and analyses that were expected to inform the consent decision.

Contribution to sustainable development

A significant contribution from EIA was the design and implementation of initiatives to tackle

preexisting social needs in the affected area, which would be aggravated by the thousands of people expected to be drawn in by the development (Case#1_EA#3; Case#1_EA#4; Case#1_SC#1; Case#1_SC#3). There was a requirement in the preliminary license for the developer to invest in schools, health care services, workforce training, water supply, sewage systems, housing developments and public security, among other things. Even the demarcation of indigenous lands was pushed forward because of the sudden interest in the region (Case#1_SC#1). Documentary analysis indicated that this contribution was shaped by local demands gathered during the licensing process, especially through data collection for the environmental studies, public hearings and letters from the affected cities.

EIA also was perceived as enabling direct communication between the developer and local authorities, thus helping find solutions to problems related to the development and building a relationship based on a minimal level of mutual trust. This situation should provide a favourable setting to devise and implement actions more in tune with a sustainable perspective (Case#1_CO#1).

Following this, there was a view that sustainable development would be attained because of the proper use of the best analytical techniques and a comprehensive analysis of the costs and benefits arising from the development (Case#1_EA#1; Case#1_DT#1). Therefore, the extent and nature of negative and positive impacts were evaluated so that the definition of mitigation measures would render the project sustainable.

Nonetheless, the contribution of EIA was allegedly constrained by the development model. This model was seen as privileging big economic interests (Case#1_SC#3) and excluding the perspectives and values of indigenous peoples (Case#1_SC#1).

Conclusion

Addressing local demands can be seen as an effect of the pluralist politics model in which the interests of the local population were given voice through different types of participation. There was an indication that this opening-up also led to closer dialogue between the developer and local authorities which, in turn, could possibly promote changes in attitudes and values through learning, an important aspect of the institutionalist model. At the same time, the information processing model was included as a contributing factor to sustainable development through technical analysis of the environmental studies. However, the joint effect of these models could be somewhat neutered by the influence of the symbolic politics model in its negative strain, represented by a set of decisions already made and embodied in

the development model.

5.2 Case 2

Project design

There were significant changes in project design during EIA (Case#2_EA#1; Case#2_EA#2; Case#2_EA#3; Case#2_DT#1; Case#2_DT#2). The most cited one was the modification of the hydrograph⁸ defined in the engineering feasibility studies, seen as a way to better preserve biodiversity and resulting from discussions between the developer and IBAMA analysts. This and other alterations were listed in one of the reports from the team of analysts.

These changes were attributed to the analysis of the environmental studies and seemingly showed the influence of the information processing model.

Environmental license

There was a strong perception that the decision to grant the preliminary license was not transparent (Case#2_EA#1; Case#2_EA#2; Case#2_EA#3; Case#2_SC#2). The environmental studies were considered an insufficient basis upon which to form a technical opinion about the environmental viability of the development, a situation that was registered accordingly in the reports written by the team of IBAMA analysts prior to consent. Nevertheless, a decision was made in favour of the project by the senior management of the environment agency on grounds that were opaque to the analysts.

“At that time [before consent], a technical opinion listed a series of problems, of knowledge gaps, especially about the infrastructure in the region, the region was not ready to receive a development of that size and then it left our sphere and the decision went to a totally different sphere where we have neither control nor much contact to know what did or did not influence the consent” (Case#2_EA#3).

It is worth mentioning that interviewees from the environment agency showed signs of tension when answering questions about this aspect, suggesting a significant level of discomfort with the way the decision about the preliminary license was made. At the same time, there were indications that the main influence pushing for consent was political pressure (Case#2_SC#2; Case#2_DT#1).

“In my opinion, you have the influence of the national energy plan, it was considered a fundamental development for the national energy plan, this gave rise

⁸ A hydrograph is a graph showing the rate of flow (discharge) versus time past a specific point in a river, or other channel or conduit carrying flow (Wikipedia, access on 23/10/12).

to a coalition of public and private initiatives with strong political-institutional support in defence of the project” (Case#2_DT#1).

“What was most frustrating for me all these years was that the decision had been made. So they should have spared the technical organs from being so stressed out” (Case#2_SC#2).

Unlike the previous case, the information processing model was seemingly overridden by the symbolic politics model. The decision to grant the preliminary license was not directly based on technical analysis of the environmental studies but on reported external influence that determined that a specific result had to be reached.

Conditions and mitigation measures

Similarly to the previous case, the environmental studies complemented by the review carried out by the team of analysts were identified as the most important source for the definition of conditions and mitigation measures (Case#2_EA#1; Case#2_EA#2; Case#2_EA#3; Case#2_SC#1; Case#2_SC#2; Case#2_DT#1; Case#2_DT#2). Contributions from stakeholders were also cited as a significant factor (Case#2_EA#2; Case#2_SC#2; Case#2_CO#1).

“The environmental studies proposed the great majority of measures and they are improved with everybody participating: communities in public hearings, inspections from the environment agency. In short, all those things contribute to the final result” (Case#2_EA#2).

However, the apparent external influence mentioned in the previous aspect reflected on the way conditions and mitigation measures were defined. Although the reports from the team of analysts did not endorse the consent to the development, the reservations and considerations in them were used to shape the preliminary license (Case#2_EA#3; Case#2_SC#2). Documentary analysis revealed that knowledge gaps considered in reports as precluding an opinion on the environmental viability of the development became conditions in the license.

Public participation was also said to have been constrained by the time frame imposed on EIA (Case#2_SC#2; Case#2_CO#1). In this sense, the minutes of one of the three public hearings held in the region revealed a strong sense of uncertainty among participants about the environmental impacts of the development.

There was also the view that some conditions that would have prepared the affected cities for

the expected massive influx of people, especially those related to social infrastructure, should have been anticipated (Case#2_CO#1). This feeling was present in two of the three public hearings, including one showing strong support for the development.

Another effect of pressure on EIA was that conditions and mitigation measures were defined in a more conservative way in order to cope with knowledge gaps in the environmental studies (Case#2_EA#1; Case#2_SC#2).

“With all the restrictions, we were much more conservative than if we had time, maturation, we could have been a bit more tranquil, let’s say, with some conditions. Now, we did have a conservative stance because the situation presented for the evaluation was not ideal” (Case#2_SC#2).

Somewhat similarly to the first case, conditions and mitigation measures came from a combination of the information processing model with a pinch of the pluralist politics model. Nevertheless, the symbolic politics model was much more influential here, turning a wider set of studies and analyses expected to base consent into conditions as well as forcing these conditions to be more conservative and potentially also leading to higher costs.

Contribution to sustainable development

Again, design and implementation of initiatives to cope with social needs in the region were mentioned as an important contribution of EIA (Case#2_EA#1; Case#2_EA#2). The preliminary license listed a number of measures designed to strengthen local infrastructure so that the affected cities would have conditions to meet not only preexisting demands but also the projected extra load arising from the project. There was also a requirement for the design of a plan which should articulate the actions of the different levels of government and the developer in order to aim for sustainable development.

At the same time, changes in project design (Case#2_DT#1) and the continuous analytical scrutiny of the development, even after consent (Case#2_DT#1; Case#2_EA#3), were considered fundamental to guarantee a proper balance between environmental preservation and economic benefits. Given this, the developer had to reorganize its environmental department to be able to fulfil its duties to implement conditions and mitigation measures and to monitor impacts. More people were hired and internal committees were set up in order to better coordinate efforts with the senior management and even shareholders (Case#2_DT#1).

However, there was a sense that EIA did more harm than good to sustainable development

(Case#2_SC#2; Case#2_CO#1). On one hand, the project brought disruptive pressure to cities and indigenous peoples in the area, aggravating some problems to the point of collapse.

“So you see the absolute disruption of some indigenous communities, absolute. If you had been there five years ago, then went again today, you would despair at the sight” (Case#2_SC#2).

On the other hand, initiatives that were meant to counter these problems were not implemented as expected (Case#2_CO#1; Case#2_DT#2). In particular, measures that depended on public authorities seemed to be lagging behind actions which were the responsibility of the developer.

“Then we have the responsibility to build a sewage collection network and a sewage treatment plant in these two small cities. The only thing is that nobody has toilets. So what am I going to connect the network to?” (Case#2_DT#2)

It is worth pointing out that there was a perception that some initiatives were improperly imposed on the developer as they represented public obligations in nature (Case#2_DT#2).

Conclusion

As in the first case, attention to local needs can be attributed to the influence of the pluralist politics model. Changes in project design and analytical efforts to ensure sustainability, in turn, are an expression of the information processing model. It was also possible to identify the organisational politics model at play in the action taken by the developer to adjust its internal structure in response to participation in the licensing process. Nevertheless, EIA seemingly brought a negative contribution to sustainable development as it became a formality to some extent, thus bringing in elements of the symbolic politics model.

A summary of the relative influence of causal models in both cases according to each aspect is shown in Table 3:

Table 3– Relative influence of causal models according to case and aspect

Case	Case 1				Case 2			
Model / Aspect	PD	EL	CMM	CSD	PD	EL	CMM	CSD
Information processing	0	+++	+++	+++	+++	+	+++	++
Symbolic politics ⁽¹⁾	0	+	+	+	0	+++	++	++
Political economy	0	0	0	0	0	0	0	0
Organisational politics	0	0	0	0	0	0	0	++
Pluralist politics	0	0	++	++	0	0	++	++
Institutionalist	0	0	0	+	0	0	0	0

PD Project Design
 EL Environmental License
 CMM Conditions and Mitigation Measures
 CSD Contribution to Sustainable Development
 (1) Symbolic politics as tokenism or formality

0 Not observed
 + Weak influence
 ++ Moderate influence
 +++ Strong influence

6. DISCUSSION

The different causal factors at play in the EIA process and their relative influence varied according to aspect and case (Table 3). The information processing model was perceived in all aspects of Case 1 except for project design. The influence of this causal factor in other aspects of Case 1 was always strong whereas in Case 2 it varied between weak and strong. This degree of influence seems to be related to the ‘technocratic’ arrangement of EIA in Brazil in which the environment agency has the central role of issuing licenses (Sánchez, 2008b).

The environmental studies and their review carried out by IBAMA were considered the main influence on decisions regarding consent and definition of conditions and mitigation measures in Case 1. This influence was still seen as relevant in defining conditions and mitigation measures in Case 2 but much less so in relation to consent.

Changes in project design and definition of mitigation measures were identified as a direct contribution of the information processing model to sustainable development. There was a sense that sustainability would be promoted by careful consideration of negative and positive impacts so that economic benefits and environmental preservation would be balanced.

In addition to the information processing model, other causal factors were noted. In particular, the ‘negative’ strain of the symbolic politics model was observed in all aspects of both cases except for project design. Its manifestation was associated with perceptions of external pressure constraining decisions in a particular direction and identified by references to ‘pressure from the government’, ‘development model’ or ‘national energy plan’.

Interestingly, this causal factor apparently neutered the influence of the information processing model to some extent, especially in Case 2. In this regard, the second case presented a higher magnitude of the symbolic politics model, as could have been expected because of the more politically and socially ‘charged’ nature of the development. Decision about consent in this licensing process was made in spite of technical analysis asserting the impossibility of a decision at that time.

One visible effect of the combination of the information processing and symbolic politics models was the postponing of studies and analysis that were supposed to happen prior to consent, which then became conditions of the preliminary license in both cases. This effect

was also reported in a study conducted by the Prosecution Office which reviewed 80 EIA processes in Brazil (MPF, 2004). It was considered a common occurrence but a harmful one on account of two reasons:

“First, because it hurts the good scientific practice that should be associated with the elaboration of the environmental studies, compromising the main objective of these studies; second, because it does not allow stakeholders involved and also the public authority to know and debate the projected environmental alterations, prerequisite for decision-making based on the environmental studies” (MPF, 2004, page 18).

Another apparent consequence of the interaction between these two models was the definition of more conservative conditions and mitigation measures in Case 2. This may have been a significant driver for the occurrence of the organisational politics model in the same case since the developer probably had to adjust its internal organization in order to deal with the extra burden of more ‘robust’ measures.

In terms of contributions to sustainable development, it seemed that the symbolic politics model worked towards the enhancement of economic benefits to the detriment of other components. Especially in Case 2, external pressure was seen as hindering public participation and timely technical analysis, two elements essential for the proper evaluation of the socio-environmental aspects in EIA.

In turn, the pluralist politics model contributed to the definition of conditions and mitigation measures in both cases. The main mechanisms for this contribution were public hearings and letters from affected cities. Public participation was especially concerned with the design and implementation of initiatives to cope with preexisting and projected social needs in the affected areas.

However, inputs from public participation were not directly fed into the licensing process but were first filtered by the information processing model. This is similar to what Arnstein (1969) termed ‘consultation’ in her often-cited article about the different levels of citizen participation. In this case, participants can hear and be heard but lack the power to ensure that their views will be heeded by those with power to decide. Therefore, participation is devoid of direct influence and becomes a form of tokenism.

There was some evidence of this in Case 2. Even though public participation was able to contribute to the definition of initiatives to tackle social needs in the region, once consent was granted, efforts to implement these initiatives seemed less intense than efforts to build the development. As mentioned above, this tended to reinforce the economic component of the project to the detriment of a proper addressing of its social impacts.

In Case 1, the institutionalist model was only perceived in the aspect related to the contribution of EIA to sustainable development. There was an indication that interaction based on mutual trust between the developer and local authorities could lead to changes in attitudes and values through learning.

According to Armitage et al. (2008), this social learning is a result of the process of iterative reflection that occurs when sharing experiences, ideas and environments with others. In this sense, it seems reasonable to suppose that a more constrained presence of the pluralist politics model in Case 2 (when compared to Case 1) could be one of the reasons for not observing any social learning in that licensing process.

The organisational politics model had a moderate presence in Case 2, also in the aspect related to the contribution of EIA to sustainable development. There was a significant reorganization of the developer's environmental department as a response to increased duties to implement conditions and mitigation measures and monitor impacts. As mentioned above, one of the reasons for this reorganization may have been the extra load derived from more 'robust' measures resulting from the combination of the information processing and symbolic politics models. It is interesting to question whether these changes will be only temporary or later incorporated into the organizational structure of the developer. However, this aspect goes beyond the scope of this dissertation.

Finally, there was no indication of the presence of the political economy model in the two licensing processes. This was to be expected since this study focused on EIA as a tool to grant public permission for a development rather than an instrument for private businesses to internalize externalities in order to anticipate and prevent environmental harm.

7. CONCLUSION

Notwithstanding the prominence of the rational approach in the history of EIA, research literature has found little evidence that the passive provision of information to decision-makers plays a significant role in explaining how EIA actually works. Therefore, other causal models have been considered, like those proposed by Bartlett and Kurian (1999).

However, a literature review of EIA in Brazil seemed to uphold the relevance of the rational approach. At the same time, the institutional context of EIA in Brazil is rather different from most cases studied in the research literature in the sense that an environment agency, with a specific capacity for environmental matters, is responsible for decision-making in the EIA process. For this reason, it was considered opportune to critically assess how EIA worked in Brazil.

Unlike other studies, this dissertation found a strong presence of the information processing model in the two case studies albeit with variable degrees of importance. In a more ‘neutral’ situation, as in Case 1, the influence of the environmental studies and their review carried out by the environment agency was fundamental in explaining how the decision to grant an environmental license was made. This influence was also very important in the definition of conditions and mitigation measures and the contribution to sustainable development. This does not mean that other causal factors were not at play. Nonetheless, Case 1 followed closely a rational approach to EIA as described by the information processing model.

This rationality, however, did not seem to be immune to external pressure. Case 2 presented a more politically and socially ‘charged’ process in which the symbolic politics model considerably reduced the influence of the rational approach. Even though decisions in EIA were made by an environment agency, the fact that this technical institution was also a governmental institution apparently made it more susceptible to pressure from within the government.

In a situation like this, the current emphasis on capacity building found in the literature about EIA in Brazil may not be the best solution to augment the robustness and transparency of the decision-making process. More training and use of rigorous technical procedures are not likely to make the information processing model prevail when decisions have already been made on other grounds. The rational approach can only go so far.

Perhaps a better strategy to achieve this goal is not only to concentrate on learning about EIA but also trying to learn *through* EIA. Drawing a parallel with the study of Jha-Thakur et al. (2009), the former ('learning about') involves learning about definitions and techniques employed in EIA practices and has an instrumental and pragmatic character (know how). The latter ('learning through') implies transformation in norms and values through the practice of EIA that help deliver sustainability and better protection of the environment (know that or know why). These new norms and values may eventually contribute to shape such things as the 'development model' or 'national energy plan', which were held responsible for decisions made in the two case studies to a considerable extent.

Learning through EIA would involve more attention to participatory practices in Brazil. Public participation in EIA does not go beyond providing information to the public and generating information for decision makers. Participants have very limited resources to be able to actively engage in debates about consent and the definition of conditions and mitigation measures.

It should be mentioned that the importance of public participation in environmental decision making has been emphasized by international initiatives such as the Aarhus Convention. The signature of this convention by the European Community in 1998 represented a significant impulse to recognize and strengthen the importance of public participation in increasing the accountability and transparency of the decision-making process regarding environmental issues (Hartley and Wood, 2005).

In this sense, meaningful participation would require active efforts to build competence and fairness in the dialogue between different stakeholders (Webler, 1995). According to Webler (1995, page 62), fairness refers to "the distribution among participants of opportunities to act meaningfully". It includes equality in: being represented in the participatory process; agreeing rules of engagement; contributing to discussions; and influencing outcomes. Competence involves the "construction of the best possible understandings and agreement given what is reasonably knowable to the participants" at the time of the decision (Webler, 1995, page 65). It depends on access to knowledge and its interpretations and the use of the best available procedures for knowledge selection and resolving disputes about knowledge and its interpretations.

Competent and fair participation can lead to more robust and transparent decisions in EIA

since they are based on an open debate and attempt to reach the best possible solution (Webler, 1995). It also offers favorable conditions for social learning. Social learning can be defined as a process “by which changes in the social condition occur, particularly changes in popular awareness and changes in how individuals see their private interests linked with the shared interests of their fellow citizens” (Webler et al., 1995, page 445).

Therefore, maybe it is time the research agenda for EIA in Brazil shifted its focus. Instead of discussing how rational EIA in Brazil is and the extent of an alleged implementation deficit, studies should examine to what extent EIA practices are participatory and learning-oriented. This could benefit not only particular EIA processes, even ‘rational’ ones, but also environmental decision making as a whole.

8. REFERENCES

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