

## Streamlined EIA of Ethanol Projects in Brazil

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### Abstract

Brazil is the world's leading producer of sugarcane-based ethanol, an energy source that, although having a relatively low CO<sub>2</sub> footprint, can impact the environment in many negative ways. Since the 1980s, Brazilian legislation requires sugarcane distillery projects to undergo a comprehensive environmental impact assessment (EIA) process, which includes a set of demanding and often costly social-environmental analyses. Pressures, however, are mounting for faster and simpler IAs. The Minas Gerais State Environmental Agency created a streamlined EIA process that waives "comprehensive" studies, in favor of simplified analyses (known as RCA/PCAs). Dozens of ethanol projects are now exempt from a wide range of socio-environmental evaluations. The objective of this study was to analyze the criteria for, and potential consequences of, streamlined EIAs of ethanol projects in the Triângulo Mineiro and Alto Paranaíba areas of Minas Gerais State, one of Brazil's most critical ethanol expansion areas. This study was based on face-to-face interviews with state officials and extensive grey literature reviews in connection with forty-one (41) ethanol projects submitted to the state agency between 2003 and 2010. Results showed that the comprehensive study waiver of at least nine (9) ethanol projects were neither based on scientific/technical criteria nor on legal grounds. A significant degree of discretionary power was used by the environmental agency in the screening and scoping phases. The analysis also revealed numerous technical deficiencies in the simplified EIA studies, such as lack of alternative technological/locational considerations and disregard for cumulative effects. The article concludes by highlighting practical and research implications.

**Keywords:** Environmental Impact Assessment (EIA), Streamlined EIA, Environmental Policy, Ethanol Production, Brazil.

### Introduction

Brazil's growing production of sugarcane-based ethanol is driving up demand for natural resources and causing numerous social and environmental impacts (Goldemberg, Coelho, & Guardabassi, 2008). Among the most important governmental tools being used to address this problem are environmental impact assessments (EIA) and environmental licensing (EL). EIA and EL have been increasingly regulated in federal and state jurisdictions since 1981, when the Brazilian Environmental Policy Act (Law 6938 from 1981) defined them as two of the key national environmental instruments.

In Brazil, like in many other countries, EIA and EL are often used in combination (Glasson, 2000). Projects with potentially high environmental impacts are required to obtain a number of environmental licenses prior to operation. Yet such licenses can only be granted if the EIA of projects concludes for their social and environmental feasibility. In theory, EIAs may conclude that a project is unfeasible. Such a conclusion, however, is rare. As elsewhere (Morgan, 2012; Sadler, 1996), almost every EIA in Brazil concludes for the approval of projects, conditioned to the implementation of social and environmental programs. In spite of such limitations, EIAs play an important role in mitigating the impacts of projects.

Projects of sugarcane-based ethanol plants (i.e. sugarcane distilleries), depending on their production capacity and location, may be subject to EIAs. The screening criteria that the government uses to decide whether a project is required or not to undergo EIAs are fixed in many environmental regulations. At the federal level, the main regulation is the CONAMA Resolution 01/86. This resolution lists the types of projects that are required to prepare costly and often time-consuming studies known in Brazil as EIA/RIMAS. The minimum scope of EIA/RIMAs is technically demanding; it encompasses numerous evaluations, covering biophysical and socio-economic aspects, as well as technological and locational alternatives.

Each Brazilian state has complementary regulation on EIA screening. In Minas Gerais State, the COPAM Resolution 74/04 lists hundreds of types of projects that are required to undergo EIAs prior to operation. This resolution has a nuanced screening system that classifies the size and polluting potential of projects into six (6) classes. While there are exceptions, the general rule of this resolution, as Figure 1 illustrates, is that projects listed in classes 1 and 2 are exempted from EIAs; projects in classes 3 and 4 are required to undergo simplified EIAs; and projects in classes 5 and 6 are required to undergo comprehensive EIAs.

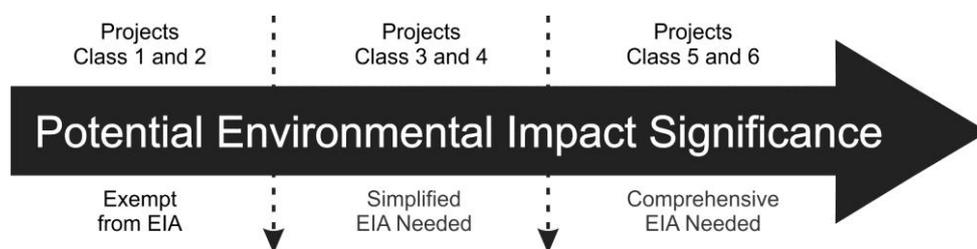


Figure 1 – EIA screening in Minas Gerais State

The pollution potential on air, water and soil of every sugarcane distillery plant in Minas Gerais state is considered high. Nonetheless, the EIA screening class of these plants will depend on their size, which is measured by “sugarcane processing capacity”: the larger the plant’s capacity the more comprehensive the required EIA studies. Table 1 below correlates the screening classes with the installed capacity.

Table 1 – EIA Screening Classes and Threshold Values for Sugarcane Distillery Projects

| Size   | Installed sugarcane processing capacity (X) in daily tonnage | Class (1 to 6) | EIA type      |
|--------|--|----------------|---------------|
| Small  | $X \leq 3000$  | 3              | Simplified    |
| Medium | $3000 < X \leq 7000$   | 5              | Comprehensive |
| Large  | $X > 7000$   | 6              | Comprehensive |

Source: Adapted from COPAM Resolution 74/2004

The threshold impact significance values over which projects are required to undergo EIAs have long been a matter of controversy in Brazil. These values (which may reflect criteria such as project size, type of activity, production capacity and location) are expected to be technically sound, so that only those projects with potentially high environmental impacts are subjected to impact assessments. Flaws in this system may have negative consequences: overestimated threshold values may lead to unnecessary analyzes, project delays, and increased investments;

underestimated values may lead to the approval of projects without due consideration of their socio-environmental harms. The ideal “calibration” of threshold values is particularly relevant to Brazilian environmental agencies responsible for the analysis of EIA studies. In light of the relatively low budget of these institutions, they have limited capacity to analyze EIA studies, particularly comprehensive ones.

In the past decade, Brazilian environmental agencies created many streamlined screening processes, in order to limit the amount of comprehensive studies submitted for analysis. For example, the Minas Gerais State Environmental Agency has created a streamlined EIA process that waives "comprehensive" studies, in favor of “simplified” ones, known as RCA/PCAs, for sugarcane distillery projects. Nonetheless, such streamlined process has been implemented in an obscure way. The criteria adopted by the agency to determine potential impact significance among other screening factors were not made public.

### **Objective and Methodology**

This research investigated the criteria for, and potential consequences of, exempting comprehensive EIA studies for ethanol projects in the Triângulo Mineiro and Alto Paranaíba areas of Minas Gerais State, one of Brazil's most critical ethanol expansion areas (see Figure 2). The research was based on face-to-face interviews with state officials as well as on extensive grey literature reviews in connection with all sugarcane distillery projects proposed for implementation in the area between 2003 and 2010. The authors had access to the environmental agency’s physical archives, where a wide range of official documents and internal records was available for review.



Figure 2 –Analyzed Area (Triângulo Mineiro and Alto Paranaíba)

### **Results and Discussions**

This study identified forty-one (41) sugarcane distillery projects screened in for impact assessment in between 2003 and 2010 in the Triângulo Mineiro and Alto Paranaíba areas. Among these, nine (9) projects (see Table 2) were exempted from comprehensive EIAs, in spite of the legislation requiring so.

Table 2 - Sugarcane ethanol projects that were exempted from comprehensive EIAs

| Project  | Main Activities   | Sugarcane Processing Capacity (daily tonnage) | EIA Screening Class | Legally mandated EIA study | Required EIA study by Environmental Agency | Environmental License |
|--|---|---|---------------------|----------------------------|--|-----------------------|
| Cabrera Central Energética Açúcar e Álcool       | Sugarcane Production, Refinery and Distillery with thermal power station. | 12000   | 6                   | Comprehensive              | Simplified                                 | Granted               |
| Usina Araguari                                   | Sugarcane Distillery with thermal power station.                          | 12000   | 6                   | Comprehensive              | Simplified                                 | Granted               |
| Fle Empreendimentos                              | Sugarcane Distillery with thermal power station.                          | 8000  | 6                   | Comprehensive              | Simplified                                 | Granted               |
| União de Minas Agroindustrial Açúcar e Álcool    | Sugarcane Production, Refinery and Distillery with thermal power station. | 12500   | 6                   | Comprehensive              | Simplified                                 | Granted               |
| Agroerg das Minas Gerais                         | Sugarcane Distillery with thermal power station.                          | 12000   | 6                   | Comprehensive              | Simplified                                 | Granted               |
| Cia Energética de Açúcar e Álcool Vale do Tijuco | Sugarcane Production, Refinery and Distillery with thermal power station. | 12000   | 6                   | Comprehensive              | Simplified                                 | Granted               |
| Unidade Águas Claras da Usina Caeté              | Sugarcane Distillery with thermal power station.                          | 16800   | 6                   | Comprehensive              | Simplified                                 | Granted               |
| Cia Energética Vale do São Simão                 | Sugarcane Production and Distillery with thermal power station.           | 10800   | 6                   | Comprehensive              | Simplified                                 | Granted               |
| Usina Tupaciguara Açúcar e Álcool                | Sugarcane Production, Refinery and Distillery.                            | 6700  | 5                   | Comprehensive              | Simplified                                 | Granted               |

The criteria for exempting comprehensive studies were laid out in the agency's internal document "Relatório Técnico DIRIM 08/07" published in April, 2007. According to one of the interviewees, this internal document was created in reaction to a number of requests from the State Public Prosecution, which had accused the environmental agency of being excessively discretionary in the exemption of comprehensive studies. The "Relatório Técnico DIRIM 08/07" established a case-by-case system of EIA screening underpinned by two key evaluation criteria: surface water availability and natural vulnerability. The reasons for focusing the screening process on these two evaluations were unclear. While the screening criteria may be technically sound, they are not in compliance with the CONAMA Resolutions 1/86 and 237/97, and COPAM Resolution 74/04. These legal pieces require sugarcane distilleries with sugarcane processing capacity greater than 3000 daily tones to undergo comprehensive EIAs. Moreover, those resolutions do not give discretionary power to the environmental agencies to create additional screening criteria, without proper legislation.

This study also analyzed the documentation of each of the 9 projects in order to understand whether they had been exempted from comprehensive EIAs based on sound analysis of water availability and natural vulnerability. With respect to the natural vulnerability, this study identified a general lack of environmental baseline information that limited the ability of the state officials to analyze vulnerability. Not surprisingly, decisions regarding vulnerability were arguably made mostly on the grounds of state officials' personal perception, rather than on scientific or technical data. As for the analysis of superficial water availability, this study identified 3 projects that did not even estimate their water consumption rates. It also identified

discrepancies between the water availability parameters adopted during the screening process with the parameters available in the agencies internal documents.

Table 3 – Discrepancies between water parameters used during the screening process

| Project                                       | Water Availability Adopted by the Agency in the Screening Process (m <sup>3</sup> /h) | Water Availability Mentioned in the Agency's Internal Reports (m <sup>3</sup> /h) |
|---|---|---|
| Usina Araguari                                | 600   | 859   |
| Fle Empreendimentos                           | 11091   | 1338  |
| União de Minas Agroindustrial Açúcar e Álcool | 400   | Water unavailable   |
| Agroerg das Minas Gerais                      | 28-100  | Water unavailable   |

Additional technical shortcomings were identified in the 9 simplified studies. Among the most relevant ones are: lack of alternative technological/locational considerations, lack of public meetings, and disregard for cumulative effects. Such evaluations are included in the minimal EIA scope required by CONAMA Resolution 01/86. The findings from this study are sufficiently strong to argue that the environmental licenses granted to the nine projects are questionable from a legal standpoint. The State Public Prosecution or any other interested party will find much evidence that could be legally used against the environmental agency, thus jeopardizing the streamlined EIA system and the licenses granted to the sugarcane distilleries.

### Final Remarks

Many technical and legal problems in connection with the streamlined EIA of ethanol projects were found. Such findings corroborate previous studies that highlighted the challenge of EIA screening and scoping (Christensen & Kornov, 2011; Mandelik, Dayan, & Feitelson, 2005; Pinho, McCallum, & Cruz, 2010; Snell & Cowell, 2006; Weston, 2011; Wood & Becker, 2005). The ideal approaches to screening in or out projects, and defining the required scope of evaluations, depend on challenging and often conflicting legal, technical and political requirements.

This research revealed that the licenses granted to the ethanol projects are legally questionable since the required EIA studies were not in compliance with Brazilian resolutions. One cannot argue, however, that the simplified EIA studies led the environmental agency to poorer decisions in connection with the analyzed projects. More comprehensive studies do not necessarily translate into better decisions, especially in contexts like Brazil, where environmental agencies lack the capacity to analyze comprehensive EIA studies.

Future studies should consider investigating the degree to which larger EIA scopes, including numerous socioenvironmental evaluations, translate into better decisions. Future studies should also continue to investigate the legal and technical means to enhance the screening and scoping stages of EIAs.

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