

## IMPACT OF THE GEOGRAPHICAL INDICATION ON THE SUSTAINABILITY AND QUALITY OF THE PRODUCTION OF ABAÍRA CACHAÇA

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### ABSTRACT

This article explores the impact of the Geographical Indication (GI) on the sustainability and quality of Abaíra cachaça production, analyzing how the GI contributes to sustainable production practices and improvements in the quality of agricultural production. The main objective is to evaluate the ways in which GI regulations improve the quality of products, meeting the growing demands for more sustainable practices and differentiated products, of guaranteed origin and produced within sanitary standards. Through a methodology that combines bibliographic research and documentary analysis, the study details the GI regulations in the micro-region of Abaíra, focusing on the implementation of strict hygiene practices and good manufacturing practices in the various stages of the production process. The results demonstrate that the adoption of GI leads to significant improvements in cachaça quality, promoting responsible agricultural practices and improving environmental sustainability. The article suggests the need for more research on the long-term effects of GIs on sustainability, development and consumer perceptions, to further strengthen the production chain of agricultural products.

**Keywords:** Agroindustry. Sugar cane. Environment.

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## INTRODUCTION

Currently, the agribusiness is challenged to adopt sustainable practices that simultaneously minimize negative impacts on the environment and deliver certified quality products. This need stems from the urgency to respond to the growing demand for consumer goods in a way that preserves natural resources and reduces the production of waste, which has harmful effects on the planet. Given the urgency to promote a more efficient and responsible use of natural resources, in view of their limitation, the agro-industrial sector is impelled to invest in technologies and methodologies that optimize these resources.

This involves not only the adoption of more efficient production processes, but also the promotion of greater awareness of sustainability, in addition to the development of environmental management strategies aimed at combining economic efficiency with ecological responsibility. In this context, Geographical Indications (GIs) emerge as strategic tools for the valorization of agro-industrial products, promoting not only environmental sustainability, but also social inclusion and local development (Belletti, Marescotti, & Sanz-Cañada, 2017). The cachaça from Abaíra, which was recognized and received the title of Geographical Indication (GI), serves as an example to investigate these dynamics.

The implementation of stricter hygiene protocols throughout all stages of the production process, as evidenced by Santos et al. (2023) in the Abaíra microregion, together with the preservation of traditional techniques, especially the use of yeast and fermentation (Bortoletto, Silvello and Alcarde, 2018) unequivocally exemplify how adherence to GI regulations contributes to improving product quality and ensuring food safety for consumers.

The GI is a registration instrument that attributes recognition and appreciation to specific products or services, distinguishing them from their counterparts in the market based on their unique qualities. These qualities are intrinsically related to the peculiarities of natural resources and the human factors characteristic of the region of origin (Ministry of Agriculture, Livestock and Supply, 2024).

In this sense, Cachaça Abaíra is an example, being an artisanal alembic drink, it is produced in the entire micro-region of Abaíra, which is located in Chapada Diamantina, in the interior of Bahia and integrates three more neighboring municipalities, Mucugê, Piatã and Jussiape. Recognition as a GI promoted the cultural identity of this distillate and encouraged the adoption of agricultural and production practices that respect the

environment, labor and health legislation, ensuring the superior quality of the product (Santos and Nery, 2023). In addition, it contributes to the local economy, increasing the visibility of the drink in the market and promoting tourist activities in the region (Santos, 2022).

However, the implementation of GIs also presents challenges, including the need for compliance with stringent regulations and the potential for exclusion of smallholders who are unable to meet these standards (Santos, 2022). Therefore, it is crucial to investigate how GIs affect production practices and what strategies can be adopted to maximize their benefits while minimizing the associated challenges. In this sense, the present study aims to evaluate the impact of the Geographical Indication on the sustainability and production practices of the cachaça agroindustry in the micro-region of Abaíra.

## **METHODOLOGY**

To meet the proposed objective, the methodology adopted in this work involved two main steps, described below:

### **LITERATURE RESEARCH**

**Type and Approach:** Initially, an exploratory bibliographic research was carried out, in order to theoretically support the investigation. This stage involved consulting various sources of information, scientific articles and websites.

**Subjects and Locus:** Not applicable, since this phase focused on the collection of secondary data.

**Instruments and Procedures:** The selection of theoretical material was guided by the articulation of investigative thematic markers, such as Geographical Indication, Sustainability, Environment, Nature, Beverage Production, Artisanal Cachaças and Agroindustry.

**Techniques Used:** The main technique was the literature review, allowing the construction of a solid theoretical framework that would support the subsequent phases of the research.

## DOCUMENTARY SURVEY

Type and Approach: This was followed by a documentary survey, with the objective of analyzing the Regulation for the Use of Indication of Origin (IP), prepared by the Association of Brandy Producers of the Microregion of Abaíra (APAMA).

Subjects and Locus: The focus of this stage was on the normative and regulatory documents produced by APAMA members, specifically the IP Use Regulation.

Instruments and Procedures: The documentary analysis focused on the evaluation of the standards established for the production of quality cachaça, observing the recommended sanitary and environmental practices.

Techniques Used: Content analysis was used to examine the stages of the production of the beverage, from the harvest of sugarcane to the storage of the final product, based on the guidelines of article 28 of the IP Use Regulation.

Context and Environment: The research is inserted in the context of the production of artisanal cachaça in the Microregion of Abaíra, highlighting the importance of sustainable practices and compliance with environmental and quality regulations.

## RESULTS AND DISCUSSION

GI represent an important instrument for product differentiation in the global market, offering a unique opportunity for traditional and sustainable practices to be recognized and valued. The detailed analysis of the results, obtained through the applied methodology, demonstrates the substantial contribution of GI in several aspects. On the one hand, it promotes practices that protect the environment. On the other hand, it helps to create jobs and increase the income of local communities, at the same time it contributes to the greater visibility of the product's attributes, in this example, so that Abaíra's cachaça is recognized worldwide.

The GI Use Regulation is part of the documentation required by the National Institute of Industrial Property (INPI), currently called the Technical Specifications Booklet, which became part of the Statute of the Association of Sugarcane Brandy Producers of the Microregion of Abaíra (APAMA). Established in 2011, the regulation aims to implement regulations that guide the Indication of Origin (type of GI of Abaíra), with the explicit purpose of promoting the production of cachaça under ecologically responsible practices and within sanitary standards (APAMA, 2011).

In addition, the regulation emphasizes the need to preserve water resources, including rivers, streams, irrigation canals, as well as soils and biodiversity. This is achieved through the protection and care of permanent preservation areas and the implementation of sustainable management practices for solid waste and effluents produced during the stages of the production process (Santos and Nery, 2023). These guidelines highlight a commitment to approaches that go beyond mere agricultural production, incorporating a comprehensive perspective of environmental sustainability.

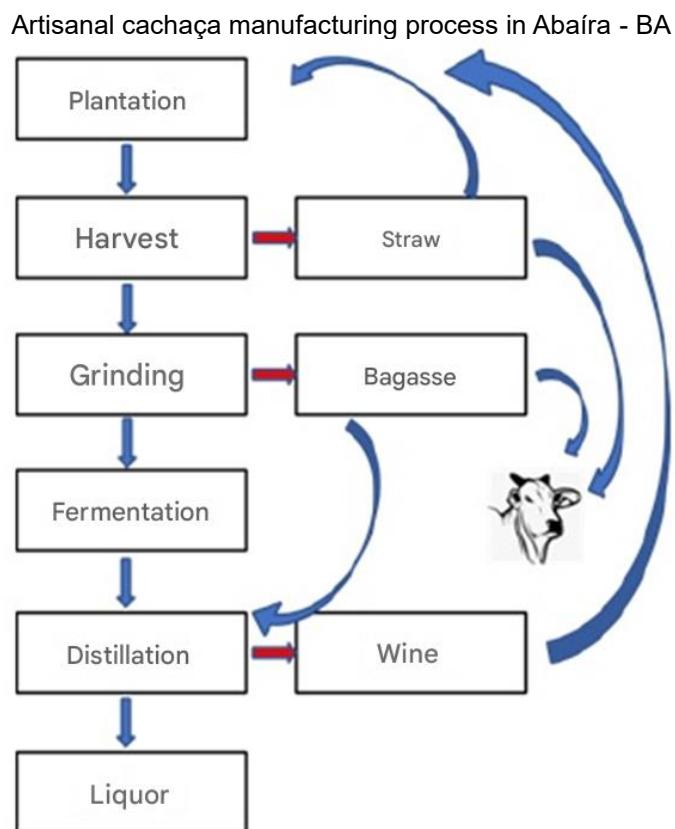
The theme of environmental sustainability, as presented by Martine and Alves (2015) refers to the practice and objective of using natural resources in a responsible and efficient manner, aiming to ensure their availability for future generations, while promoting well-being and socioeconomic development. This notion emerges in response to the growing recognition of the planet's physical limits, scarce resources, and the imperative need for a development model that harmonizes the economic, social, and environmental dimensions, ensuring the preservation of biodiversity and ecosystems.

By integrating the guidelines of the IP Use Regulation of Abaíra cachaça with the most recent evidence in the scientific literature, it is possible to better understand the practical and theoretical implications of these standards for the sustainability and quality of production. One of the highlights is found right at the beginning of the document of standards and techniques that refers to the prohibition of the use of transgenic sugarcane varieties. This rule is established in Article 2 of the regulation as a conscious strategy that consists of aligning production with market demands for organic and natural products.

For a long period, genetic alterations have been (and continue to be) sources of significant controversy. The abstention in the use of genetically modified organisms aimed to preserve biodiversity and encourage environmentally sustainable cultivation methods. However, Brookes and Barfoot (2017) and ISAAA (2018) point out that recent studies emphasize the progress of transgenics, underlining their economic benefits, efficiency in the use of resources, and reduction in the application of chemical agents. They argue that genetically modified organisms offer more sustainable agriculture by improving yields and reducing the use of land, water, and fuels, highlighting their potential to address environmental and socioeconomic challenges.

Continuing the agricultural practices involved in the production process, including steps such as planting, grinding, fermentation and the use of natural yeasts, as illustrated in Figure 1, we were able to draw a clear picture. This study allows us to understand how

compliance with GI standards results in significant advances in both quality and food safety. This compliance not only ensures the preservation of traditional techniques, but also ensures that the final products meet high quality standards. By implementing such practices, producers can make their production available on the market, promoting not only the excellence and uniqueness of their goods, but also reinforcing the importance of food safety and environmental responsibility.



Source: Santos and Nery (2023)

The Figure above describes the stages of production of artisanal cachaça, produced in stills. In it, it is possible to observe the changes in the modes of production, which occurred in Abaíra, from the implementation of the GI. The emphasis on hygiene conditions, especially during the milling process, indicated in Article 7 of the Regulation for the Use of IP in Abaíra, is in perfect accordance with the best practices of food production. Maintaining high standards of hygiene in all production stages, including production, transportation, storage, handling, and preparation of sugarcane juice, is essential to ensure the safety and quality of the final product.

With regard to this theme, Santos *et al.* (2023) point out the relevance of hygiene in the agro-industrial sphere, emphasizing the need for meticulous cleaning and maintenance practices as crucial elements for the prevention of contamination and the preservation of the integrity of products. In this way, adherence to these guidelines not only meets regulatory standards, but also manifests a commitment to maintaining a superior quality standard of cachaça produced in Abaíra.

The use of natural yeasts, as mentioned in Article 9, highlights the importance of traditional processes in the production of the beverage, contributing to the unique characteristics of the product. The employment of this fermentation process, as discussed by Bortoletto, Silvello and Alcarde (2018), not only improves the final quality but also emphasizes the authenticity and uniqueness of Abaíra's cachaça. This practice sustains the valorization of genres with Geographical Indication, where identity, tradition and quality are interconnected. In addition, the choice for natural yeasts reinforces the commitment to sustainable production methods with less environmental impact, aligning with a more ecological and responsible production.

In the artisanal production process in the micro-region of Abaíra, which covers from the harvesting stage to the storage of the distillate, practices are adopted that complement the care measures previously highlighted.

Santos and Nery (2023) mention the adoption of sustainable strategies, such as the use of agricultural residues — specifically sugarcane bagasse — as fuel for the furnaces used in the distillation process. This approach not only minimizes waste but also promotes efficient management of available resources. In addition, the practice of manual removal of straw, followed by its reuse as ground cover or as animal feed, is encouraged to the detriment of burning these wastes. Likewise, the application of vinasse as a fertilizer, as opposed to its release into water bodies, evidences a commitment to the principles of sustainability and environmental conservation.

## CONCLUSION

This work investigated the impact of the Geographical Indication (GI) on the sustainability and quality of the production of cachaça de Abaíra, highlighting how the implementation of standards associated with the GI contributes to more sustainable, inclusive and high-quality production practices. The main findings highlight the effectiveness of GIs in promoting not only environmental sustainability, but also

development and social inclusion in the Abaíra microregion. The study showed how GI regulations, such as the prohibition of the use of transgenic sugarcane and the emphasis on hygiene processes and the use of natural yeasts, reinforce product quality and food safety.

The contributions of this investigation are significant for the field of agroindustry and sustainable production, demonstrating that the adoption of GIs can be an effective strategy to improve both the quality of cachaça and the sustainability of production processes. The research highlights the importance of practices that respect the environment and ensure superior product quality, such as conserving water resources, sustainable waste management, and maintaining high standards of hygiene. In addition, by valuing traditional fermentation methods and the use of natural yeasts, the study underlines the role of GIs in preserving local identity and tradition, contributing to the authenticity and uniqueness of what is produced.

However, it is worth paying attention to the obstacles associated with the adoption of Geographical Indications, including the obligation to adhere to demanding regulations and the risk of marginalization of small farmers. Such a scenario indicates the importance of comprehensive approaches that enable the participation of all local agents in the benefits provided by the GI, ensuring that sustainable and excellent practices are not restricted exclusively to a fraction of those involved in the sector.

To complement the findings of this analysis, it would be useful to investigate the long-term impact of GIs on environmental sustainability and the development of producing regions, as well as consumers' perceptions of GI products, to better understand how this valorization contributes to the conservation of biodiversity and the promotion of responsible agricultural practices. Thus, the present study provides a basis for understanding the benefits and challenges associated with Geographical Indications, highlighting their potential as tools to promote sustainability and quality in the agribusiness.

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