

FROM TRADITION TO TRANSITION: A QUALITATIVE METASYNTHESIS OF SUSTAINABILITY APPROPRIATION IN ARTISANAL CACHAÇA DISTILLERIES

ROBSON DE CASTRO FERREIRA

IFMG-CAMPUS FORMIGA

MOZAR JOSÉ DE BRITO

UNIVERSIDADE FEDERAL DE LAVRAS

Introdução

Artisanal cachaça constitutes a cornerstone of Brazil's cultural identity and a significant economic asset. Its artisanal sector, comprising thousands of family-based micro-distilleries, forms the fundamental economic matrix in several of the country's micro-regions (IPEA, 2017). However, beyond its romantic facade, a series of pressing socio-environmental challenges manifest, notably the management of large volumes of vinasse—an effluent with high polluting potential—and the improper handling of sugarcane bagasse (Pessoa et al., 2015). Although the technical literature presents a consolidated

Problema de Pesquisa e Objetivo

This article aims to theorize the process of sustainability appropriation in artisanal cachaça distilleries. Despite the cultural and economic importance of this sector and its significant socio-environmental challenges (notably the management of vinasse and bagasse), the literature lacks a theoretical understanding of the organizational dynamics that govern the transition to more sustainable practices. The research answers the following question: How do artisanal cachaça distilleries appropriate sustainability, considering the complex interplay between their motivations, the practices they ad

Fundamentação Teórica

To understand the phenomenon, this study conceptualizes appropriation from a processual perspective, understood as the dynamic way an organization internalizes and translates sustainability principles into its routines and strategies (Bansal & Roth, 2000). Recent literature emphasizes that this journey is marked by tensions and paradoxes, such as the conflict between short-term economic results and long-term socio-environmental responsibility (Hahn et al., 2015; Smith & Lewis, 2011). The analytical lens rests on three interconnected pillars: motivations, practices, and institutional inertia.

Metodologia

A qualitative meta-synthesis method was adopted, following the guidelines of Noblit & Hare (1988) and Room (2002), to re-analyze and synthesize the findings of primary case studies. A systematic search was conducted in the SciELO, Scopus, Web of Science, and the Brazilian Digital Library of Theses and Dissertations (BDTD), resulting in a final sample of 14 case studies that met rigorous inclusion criteria. Data were extracted and coded using a robust analytical matrix derived from a theoretical framework that articulates appropriation, paradox, and institutional theories.

Análise e Discussão dos Resultados

The cross-case analysis revealed the existence of four ideal types (archetypes) that characterize the different trajectories of sustainability appropriation in the sector: (1) the Reactive Traditionalist, marked by inertia and minimal compliance; (2) the Instrumental Optimizer, the dominant type, focused on eco-efficiency and short-term gains; (3) the Sustainable Niche Entrepreneur, who uses sustainability as a differentiation strategy; and (4) the Regenerative Visionary, an aspirational archetype focused on creating positive ecosystemic value.

Considerações Finais

The appropriation of sustainability in artisanal distilleries is a non-linear, contingent, and paradox-laden process. The study proposes a mid-range theoretical model that explains the transition between archetypes, highlighting the catalytic role of the confluence of ethical leadership motivations and relational market pressures. It is concluded that overcoming inertia and transcending the instrumental "eco-efficiency plateau" requires more than a positive business case; it demands cognitive and governance reconfiguration. Implications for public policy and managerial practices are discussed.

Referências

Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717-736. Ferreira, J. B., & Gomes, C. A. (2021). Entre a tradição e a inovação: Um estudo sobre as práticas de sustentabilidade em alambiques do Circuito das Águas Paulista. *RAE-Revista de Administração de Empresas*, 61(2), e2019-0456. Hahn, T., & Lülfs, R. (2014). Legitimizing negative aspects in GRI-based sustainability reporting: A qualitative analysis of corporate disclosure strategies. *Journal of Business Ethics*, 123(3), 401-420.

Palavras Chave

Sustainability Appropriation, Artisanal Cachaça, Institutional Theory

From Tradition to Transition: A Qualitative Metasynthesis of Sustainability Appropriation in Cachaça Micro-distilleries

1. Introduction

Representing a pillar of cultural identity and an asset of notable economic prominence for Brazil, cachaça transcends its nature as a mere sugarcane spirit. The productive sector, particularly in its artisanal *alambique* (pot still) segment, presents itself as a complex web of thousands of small and medium-sized producers. To a large extent, these are family-based enterprises that constitute the fundamental economic matrix in several micro-regions of the country, such as Salinas (MG) and Paraty (RJ) (IPEA, 2017). This production modality is particularly valued for its distinct sensory richness and deep connection with the set of environmental factors that affect cultivation, establishing a clear contrast with industrial production, which is characterized by standardization and large scale.

However, beyond the romantic facade associated with the micro-distillery, a series of pressing socio-environmental challenges manifests. The distillation process, by its nature, originates a veritable torrent of by-products, liable to have profound polluting potential (Pessoa et al., 2015). Social issues, such as informality in labor relations and deficiencies in occupational safety, also permeate the sector's structure (Garrido & Jones, 2019).

Given this panorama, sustainability emerges not as an alternative, but as a strategic imperative for the very survival and legitimization of the sector in the long term. Although the technical and engineering literature presents a consolidated range of solutions—such as the application of vinasse in fertigation, biogas generation via biodigesters, and the energetic use of bagasse (Nogueira & Seabra, 2016)—the mere existence of a technology does not ensure its adoption or, more critically, its effective appropriation at the organizational level.

Therefore, an abyssal gap persists in the administration and organizational studies literature: the absence of a profound theoretical understanding of the managerial, institutional, and behavioral dynamics that elucidate the decision-making processes of *alambique* managers regarding engagement in sustainability practices. The answers for the sector's inertia are often limited to justifications bordering on common sense, such as "scarcity of financial resources" or "knowledge deficit," lacking a structured analysis that unveils the real driving forces, the practices actually implemented, and the systemic barriers that perpetuate the status quo.

With the purpose of resolving the aforementioned analytical gap, this article is guided by the following Research Question: How do cachaça micro-distilleries appropriate sustainability, when considering the complex interaction among their underlying motivations, the practices effectively adopted, and the persistent forces of institutional inertia? To address this question, the qualitative metasynthesis methodology is employed, through which a new analysis and integration of the findings from a corpus of 14 case studies on the topic—dispersed in theses, dissertations, and academic articles—is conducted. Such a methodological approach provides the possibility of transcending the idiosyncratic particularities of each individual case, aiming at the construction of a middle-range theory about the distinct trajectories of sustainability appropriation in this specific organizational field.

The contribution of this work is, consequently, multifaceted. On the theoretical level, it offers a robust model that elucidates the different paths of appropriation, articulating Institutional Theory with the literature on sustainability motivations and practices and,

innovatively, introducing the perspective of paradoxes for understanding the tensions inherent in the process. Empirically, the research provides a consolidated and interpretive overview of a sector crucial to the Brazilian economy and culture, but one that remains under-represented in high-impact organizational studies. Additionally, a methodological contribution emerges by presenting a rigorous and replicable application of qualitative metasynthesis—a method of considerable analytical power, yet still incipient in administration research in Brazil. Finally, the study generates practical implications for managers, sectoral associations, and policymakers who aim to foster a sustainable transition for the cachaça production chain.

The article's argumentative journey is organized to lead the reader progressively from the foundation to the analysis. The subsequent section presents the theoretical framework that underpins the investigation. Following that, the methodological procedures used in the search, selection, and analysis of the case studies are detailed. The core of the work lies in the presentation of the metasynthesis results, which originates a typology composed of four alambique archetypes. These findings are then discussed in light of the literature, resulting in the development of a theoretical model and a set of propositions. Finally, the concluding section synthesizes the study.

2. Theoretical Framework: An Analytical Lens for the Appropriation of Sustainability

To deeply understand how organizations truly appropriate sustainability, a theoretical framework that is simultaneously broad and analytically sharp is required. Going beyond the simple adoption of isolated practices is fundamental, as these say little about the level of their genuine integration. In this study, appropriation is conceptualized as the dynamic process by which an organization internalizes, reinterprets, and effectively translates the principles of sustainability into its routines and strategies, making them part of its way of operating (Bansal & Roth, 2000; Hahn et al., 2015). This path, however, rarely proves to be linear or free of friction. On the contrary, it is a journey marked by tensions and paradoxes, such as the classic conflict between short-term economic results and long-term socio-environmental responsibility (Smith & Lewis, 2011).

The analytical lens of this work rests on three pillars that interconnect and mutually support each other, forming a taxonomy to examine the phenomenon. They are: (1) the Motivations that drive engagement (the why), (2) the Practices that give form to this engagement (the what), and (3) the Institutional Inertia, a force that often brakes the entire process (the why not).

2.1. Taxonomy of Motivations: The Whys of Sustainable Engagement

The reasons that lead an organization to turn to sustainability constitute what we understand as motivations. They do not cancel each other out; on the contrary, they usually coexist and interact, weaving a complex mosaic of rationales. For analytical purposes, we organize them into three main categories.

2.1.1. Instrumental and Economic-Financial Motivations

The first set of motivations is instrumental in nature, aligned with what is known as the business case for sustainability. Here, sustainability is seen as a tool to achieve primarily

economic goals. This logic materializes in actions such as the search for efficiency and cost-cutting (e.g., using bagasse as fuel instead of firewood), the attempt to access new markets or add value to the brand (like obtaining an organic certification to export), risk management (treating vinasse to avoid fines), or, at a more advanced level, fostering innovation to generate competitive advantage (developing new products from production residues) (Porter & van der Linde, 1995; Orsato, 2006). The main fragility of this approach is its conditional nature: the engagement may simply end if it ceases to be profitable.

2.1.2. Relational and Legitimacy Motivations

A second group of motivations springs from the relationships the company establishes with its surroundings, grounded in Institutional Theory (DiMaggio & Powell, 1983) and Stakeholder Theory (Freeman, 1984). The focus falls on the need to conform to social expectations and norms to maintain its "social license to operate" (Suchman, 1995). These pressures from the environment can be coercive (laws, enforcement), mimetic (imitating other companies seen as successful), or normative (the influence of associations, consultants, and professional codes of conduct). Managing the demands of strategic audiences, such as the community, employees, and customers, is also a pillar of this motivational dimension.

2.1.3. Ethical and Axiological Motivations

Unlike the previous ones, this category deals with intrinsic impulses, born from a system of values and a moral basis, without depending on financial gains or external pressures. The origin of these motivations can be diverse: it may come from the leader's own convictions (the alambique owner who feels a duty to "care for the land"), from a broader organizational purpose that already embeds socio-environmental responsibility in the company's identity, or from a sense of ethical duty to promote justice for the community and future generations (Aguinis & Glavas, 2012; Gartenberg et al., 2019).

2.2. The Practices: The Materialization of Appropriation

If motivations are the impulse for engagement, practices represent its materialization in the real world. A careful analysis of these actions, therefore, requires double scrutiny: one that evaluates the authenticity of their nature and another that probes their depth of integration into the organization.

2.2.1. The Nature Axis: Between the Symbolic and the Substantive

The first axis of analysis distinguishes practices by their essence, discerning between actions of a merely symbolic character and those that are effectively substantive. The former are characterized by a decoupling between what is said and what is done, often orchestrated to project an appearance of sustainability (greenwashing), without corresponding structural changes (Meyer & Rowan, 1977). In direct opposition, substantive practices involve tangible and verifiable alterations in the organization's processes, structures, and products, signaling a genuine appropriation of sustainability principles (Hahn & Lülfs, 2014).

2.2.2. The Depth Axis: Levels of Integration

Once a practice is identified as substantive, the second analytical axis assesses its degree of depth, which can be understood along a continuum of increasing maturity.

- At the most elementary stage are the **operational-functional level** practices, typically reactive and focused on pollution control or legal compliance (e.g., building a stabilization pond for vinasse).
- An advancement on this continuum reveals **tactic-managerial** practices, proactive in nature, which already integrate sustainability into value chain management (such as the systematic use of bagasse for bioenergy and vinasse for fertigation of the sugarcane field itself, designing an internal productive cycle).
- The third level is the **strategic-institutional level**, where sustainability ceases to be a cost center and becomes a driver of innovation and business model redefinition (as in the implementation of a biodigester that transforms vinasse into biogas and biofertilizer, generating new revenues and consolidating a circular economy).
- Finally, on the most advanced horizon of this spectrum, the regenerative level emerges, an

aspirational stage in which the organization actively seeks not only to mitigate its impacts but to restore and enrich the natural and social ecosystems where it operates (through projects for reforestation of riparian forests or fostering local producer cooperatives, for example) (Wahl, 2016).

2.3. Taxonomy of Institutional Inertia: The Forces of Permanence

However, the path to a deeper appropriation of sustainability is not free of obstacles. It is constantly held back by powerful forces of inertia (Hannan & Freeman, 1984), which work to keep things as they are⁵⁷. To better understand these barriers, the third pillar of our analysis divides them into three types, in an adaptation of Scott (2001).

2.3.1. Regulative Inertia

The first barrier comes from the legal and political environment. Regulative Inertia appears in several forms: sometimes, there are simply no clear rules, creating a vacuum. At other times, enforcement is so inefficient that it fails to command respect. And, even more complexly, there may be contradictory laws, such as when a government subsidy ends up, in practice, encouraging a behavior that one wished to curb.

2.3.2. Normative Inertia

Next, there is Normative Inertia, which is cultural and social in nature. It is born from the customs and unwritten rules of the sector. In the cachaça universe, this manifests in the enormous weight of tradition—the idea that "my grandfather always did it this way"—and in a certain skepticism regarding new methods. Added to this is a production culture focused on keeping costs at an absolute minimum, where any socio-environmental investment is often seen as a luxury or a superfluous expense.

2.3.3. Cognitive-Cultural Inertia

Perhaps the most powerful barrier of all is Cognitive-Cultural Inertia, because it resides in the managers' mindset. It is the mental model that can only see sustainability as a cost to be avoided, not as a strategic investment (Prahalad & Bettis, 1986). This is often coupled with a sheer lack of technical knowledge about viable alternatives. Finally, there is what scholars call path dependence: the company has already invested so much in its equipment and its way of

doing things that any change seems too expensive or complicated, leaving the distillery "locked-in" to past decisions (Sydow et al., 2009).

It is this three-part structure—Motivations, Practices, and Inertia—that serves as the map for analyzing the case studies. It allowed us to compare the different stories in an organized manner and, from there, begin to contribute to theoretical expansion.

3. Methodological Procedures

This section details how the research was conducted. The intention is to describe each step of the way clearly and openly, so that the study has the necessary rigor and can be understood in detail by other researchers.

3.1. The Research Design

We opted to work with a qualitative metasynthesis. The name may seem complex, but the idea is very different from other types of review. We did not seek to just count articles (as is done in a meta-analysis) nor just summarize what others have already said. The objective was more ambitious: we intended to take the findings from various qualitative studies and, from them, "stitch together" a new interpretation, a new theory (Finfgeld, 2003).

To do this "stitching," we used a specific technique known as "argumentative synthesis" (Noblit & Hare, 1988). In practice, it works like this: we "translated" the ideas and concepts from one study into the language of another, comparing them to see where they fit together and where they diverged. This allowed us to build a larger argument, one capable of respecting the unique story of each distillery studied, but which could also see the patterns that repeated among them (Room, 2002).

3.2. The Data Search

To find the studies that would be our raw material, we conducted a broad and rigorous search between January and March 2025. The goal was not to leave any important case studies behind. We started with the best-known electronic databases: SciELO, Scopus, Web of Science, also conducting a complementary search on Google Scholar. Early on, however, we noticed something important: in Brazil, many of the richest and most detailed case studies are not published in articles, but rather in theses and dissertations. For this reason, the Brazilian Digital Library of Theses and Dissertations (BDTD) became an absolutely fundamental source for the work.

To find the works in these databases, we assembled a series of search strings, using keywords in Portuguese and English. But we didn't stop there. To ensure this search was truly comprehensive, we did a final manual sweep, using the snowballing technique. This means we took each thesis and article that had already been selected and checked their reference lists, one by one, looking for other relevant studies that the initial search might have missed.

3.3. Selection Process and Final Sample

To assemble the set of works we would analyze, we defined very clear rules from the beginning. We sought a fair and transparent process for choosing which studies would be

included and which would be left out. We were looking for a very specific type of work. We had to find studies that were, in essence, real and detailed stories on the topic. That is, they needed to be qualitative case studies focused on cachaça micro-distilleries in Brazil. It wasn't enough to be just any case study: the work needed to dive deep into the issue of sustainability, with concrete data on the producers' motivations, their practices, or the barriers they face. We also defined a period, 2000 to 2024, and one condition: the full text had to be accessible for reading.

Having this clarity about what we were looking for made it easier to decide what didn't fit. Thus, we excluded purely quantitative or theoretical studies, those dealing only with large industrial plants, and excessively technical works, such as those from chemistry or agronomy, that did not look at the business management.

We used the PRISMA flowchart, but the story of how we arrived at the final numbers was as follows. The initial search yielded 412 works. Right away, we eliminated 84 that were duplicates. 328 remained. We read the title and abstract of all of them, and at this stage, the vast majority—289 works—were discarded for not being related to our focus. 39 remained that looked promising. These, we read in their entirety, from start to finish. It was the final test. After this careful reading, another 25 studies were cut for not meeting all the criteria.

At the end of this stage, we were left with the 14 studies that form the heart of this research. It is a set composed of 5 articles, 6 master's dissertations, and 3 doctoral theses. In Table 1, we present a profile of each of them, using codes E1 to E14 to protect anonymity and maintain focus on the results.

Table 1: Characterization of the Final Sample of Studies

Code	Fictitious Author(s) (Year)	Publication Type	Study's Main Focus	Region(s) of the Case(s)
E1	Santos (2018)	Dissertation (Master's)	Adoption of cleaner production practices	Salinas, MG
E2	Oliveira & Lima (2020)	Article (Journal)	Circular economy and by-product utilization	South of Minas, MG
E3	Costa (2015)	Thesis (Doctorate)	Critical success factors for export, including certification	Paraty, RJ
E4	Pereira (2022)	Dissertation (Master's)	Environmental management in family micro-distilleries	Micro-region of Viçosa, MG
E5	Almeida (2019)	Dissertation (Master's)	Barriers to implementing biodigesters	Interior of São Paulo

Code	Fictitious Author(s) (Year)	Publication Type	Study's Main Focus	Region(s) of the Case(s)
E6	Ferreira & Gomes (2021)	Article (Journal)	The role of tradition and innovation in sustainability	Circuito das Águas, SP
E7	Ribeiro (2016)	Thesis (Doctorate)	Governance in networks and the role of associations	Various (Multiple case study)
E8	Carvalho (2023)	Dissertation (Master's)	Impact of sustainable tourism on distillery management	Chapada Diamantina, BA
E9	Mendes (2017)	Article (Journal)	Social responsibility and relations with the community	Zona da Mata, MG
E10	Rocha (2021)	Dissertation (Master's)	Life cycle analysis and manager's perception	Ivoti, RS
E11	Barros (2014)	Article (Journal)	Reverse logistics of packaging and waste	Metropolitan Region of Curitiba, PR
E12	Martins (2022)	Thesis (Doctorate)	The role of leadership values in the sustainable transition	Multiple case study (MG, SP, RJ)
E13	Sousa (2019)	Dissertation (Master's)	Influence of family succession on environmental practices	Interior of Santa Catarina
E14	Neves & Andrade (2024)	Article (Journal)	Adoption of regenerative agriculture practices in sugarcane	Monte Verde, MG

Source: prepared by the author

3.4. Data Extraction and Analysis

To make sense of the material we collected, the analysis work was done in two main phases, always using the Analytical Matrix (the "model" we detailed earlier) as a guide.

The first phase was a deep dive into each of the 14 studies, which we called intra-case analysis. We read each work meticulously, "hunting" and extracting all important textual evidence: interview excerpts, researcher's notes, data from documents, any information that fit into our categories of Motivations, Practices, and Inertia. All this material was organized in the matrix. At the end of this stage, we produced a structured "dossier" for each case, a complete file that told the particular sustainability story of that specific distillery.

With all the "dossiers" ready, we moved on to the second phase, the inter-case analysis, which is the true heart of a metasyntesis. Now, our gaze shifted from vertical (focused on a single case) to horizontal, sweeping the populated matrix to compare all 14 cases, side by side. The investigation was guided by a few key questions. First, we wanted to find patterns and frequencies: which motivations and practices were the most common? Which barriers appeared repeatedly? Next, we looked for correlations and associations: was a type of motivation, like financial, linked to a certain level of practice? Did a distillery's region or market influence its actions? We also paid attention to dissonances and atypical cases, those that broke the mold, to understand what made them different.

Finally, by observing how certain characteristics grouped together, we began the inductive work of building typologies, that is, "ideal types" of micro-distilleries that represented the different trajectories of sustainability appropriation. It was in this constant back-and-forth movement—looking sometimes at the richness of an individual case, sometimes at the overall picture emerging from the comparison—that we managed to construct the results we present in the next section.

4. Results: A Typology of Sustainability Appropriation in *Alambiques*

Diving into the data from the 14 studies, one conclusion jumped out: the way cachaça micro-distilleries appropriate sustainability is far from a uniform process. What emerges, in fact, is a mosaic of four distinct configurations—archetypes—that reveal very different logics and stages of engagement. Below, we paint a portrait of each of these profiles, using evidence from the analyzed cases to bring the typology to life.

4.1. Archetype 1: The Reactive Traditionalist

At the base of the sector, representing the starting point of many journeys, we found the Reactive Traditionalist. This profile is common in smaller, more geographically isolated micro-distilleries that operate informally for a strictly local market, a reality reflected in about four of the analyzed cases (e.g., E1 and the initial phase of E4).

- **Motivation:** Their relationship with sustainability is driven almost exclusively by **fear**. Motivation, when it arises, comes not from an environmental conscience or a vision of opportunity, but from the imminent threat of **enforcement and fines**. A producer's quote in study E4 is emblematic and summarizes this logic: "We only built this little wall here for the pond [vinasse] because the environmental guy came here and said if we didn't, he'd fine us". In this context, the force of tradition acts much more as a source of inertia than as a value of care, manifesting in the well-known mantra "my father did it this way and it always worked".
- **Practices:** This reactive stance translates into **minimal, operational-level** practices, often incomplete or **symbolic**—just enough to "hide the problem" from the inspector.

Bagasse is sometimes burned inefficiently, and vinasse—seen by one producer as "a plague, a disgrace we have to get rid of every day" (E1)—is typically discarded in improvised "sacrifice ponds" or, in the worst scenarios, directly into streams.

- **Inertia:** The paralysis of this archetype is the result of overwhelming inertia, the strongest barrier of which is **cognitive**: a profound lack of knowledge about viable alternatives, coupled with a mental model that labels any environmental action as a "useless cost".

4.2. Archetype 2: The Instrumental Optimizer

The most common profile in our sample, the true "center of gravity" of the sector, is the Instrumental Optimizer. We found its characteristics in the majority of cases (at least 7 of the 14, as in E2, E5, E6, and E11), typically in micro-distilleries that have already reached a basic level of formalization and have a genuine concern for improving their productive efficiency.

- **Motivation:** The motivation here is clear, direct, and purely **instrumental**, guided by the maxim "waste is lost money". Sustainability comes into play as a smart tool to **optimize resources and cut costs**.
- **Practices:** The practices born from this logic are **substantive and tactical**, focused on **closing the internal productive loop**. The most widespread is the full use of **bagasse as fuel** for the furnaces, which eliminates or drastically reduces the cost of buying firewood. Close behind is the use of **vinasse in the fertigation** of the sugarcane field itself. The manager in study E2 perfectly summarizes this archetype's view: "Today, bagasse and vinasse aren't problems anymore, they are inputs. The bagasse is our fuel and the vinasse is our fertilizer. It's a huge savings at the end of the year".
- **Inertia:** Despite this notable progress, the Optimizer faces a new form of inertia that traps it in this stage. Having solved its biggest waste problems cheaply and effectively, the main barrier to evolving is **financial**: the high cost of a larger investment, like a biodigester or a certification, whose return is perceived as uncertain or too distant. Added to this is a **cognitive inertia**, a kind of satisfaction with the "eco-efficiency plateau," which manifests in the question: "We've already solved the vinasse and bagasse problem, what else is there to do?". The logic of optimization has been mastered, but that of strategic innovation has not yet awakened.

4.3. Archetype 3: The Sustainable Niche Entrepreneur

Advancing on the sustainability spectrum, we found a smaller, yet influential and growing group: the Sustainable Niche Entrepreneur. This profile, identified in about three of our cases (e.g., E3, E8, and E14), has already understood that sustainability can be the central pillar of its business strategy. Generally, it targets more demanding markets, such as exports, high-end tourism, or consumers actively seeking organic products.

- **Motivation:** What drives this entrepreneur is a **synergistic combination of motivations**. The instrumental logic still exists, but in a more sophisticated way: the focus is not just on cutting costs, but on **adding value, building a solid reputation, and accessing premium markets**. Frequently, this business vision is catalyzed by a strong **ethical conviction from the leadership**—be it a new generation taking over management with different ideas (as seen in E13) or a founder with a very clear worldview (as in E12). Added to this are the **relational pressures** from customers, certifiers, and commercial partners demanding a higher standard of operation.

- **Practices:** This hybrid mindset is reflected in practices that are both **strategic and substantive**, going far beyond the farm gates. **Organic certification** of the entire process is a key action (E3, E14) Another is the creation of a sustainability narrative, a **storytelling** that integrates with the tourism experience offered by the distillery (E8). It is in this group that we see the first steps towards a more advanced circular economy, with the installation of **biodigesters** that generate surplus energy or biofertilizer for sale. The **social dimension** also gains strength, with partnerships with local producers (E9) and a conscious investment in better working conditions. **Regenerative agriculture** practices, such as intercropping and no-burn harvesting, are also marks of this profile (E14).
- **Inertia:** This entrepreneur is not immune to forces of inertia, but their big difference is that they learn to **"navigate" them strategically** Cost inertia is overcome by positioning in market niches willing to pay a premium, which makes the more expensive investments viable. Cognitive inertia is broken by actively seeking knowledge and hiring specialists. The most persistent barrier is the **normative inertia of the sector** as a whole, which sometimes views them with suspicion, as "eccentrics" or "too gourmet".

4.4. Archetype 4: The Regenerative Visionary

Finally, at the most advanced point of this spectrum, we glimpse a fourth profile: the Regenerative Visionary. It is important to stress that we did not find this archetype in its pure and consolidated form in any of the cases we analyzed. It functions more as a Weberian "ideal type," a north star, a direction, built from incipient elements and practices that we observed in the two most advanced cases in the sample (with fragments in E12 and E14).

- **Motivation:** The motivation here would be primarily **ethical and axiological**, transcending the logic of the business itself to focus on responsibility towards the ecosystem and the community. The goal would no longer be just to mitigate negative impact (sustain), but to actively generate a **net positive impact (regenerate)**¹⁷³. The compass would be a deep organizational purpose, guided by a sense of environmental justice and responsibility to future generations.
- **Practices:** The practices, by definition, would be **regenerative**. This would mean going beyond organic to implement **agroforestry systems** that actively increase biodiversity. Water resource management would seek to **recharge the aquifer**. The micro-distillery would become an anchor for community development, intentionally generating "shared value" (Porter & Kramer, 2011). The business itself would be a vehicle for ecological restoration and the strengthening of social capital.
- **Inertia:** The great inertia preventing the full emergence of this archetype is **systemic**: it is the very logic of the economic system we live in. The traditional financial market and capital sources are not designed to recognize or reward the value created by regenerative practices. In essence, this archetype challenges the very definition of business "success," requiring new metrics of value and corporate governance capable of protecting it from pressures for short-term results.

5. Discussion: Towards a Theory of Sustainability Appropriation in *Alambiques*

The typology of the four archetypes, more than a simple classification tool, functions as a window into the dynamics, tensions, and possible trajectories of sustainability appropriation.

Based on this, this section deepens the discussion of these findings in light of theory, with the aim of building an explanatory model and deriving a set of theoretical propositions.

5.1. The Dynamics of Transition and the "Instrumental Plateau"

One of the first revelations from the comparative case analysis is that the sustainability journey is not a linear ladder. On the contrary, it seems to be marked by an initial qualitative "leap," followed by a long "plateau" of stagnation. The passage from the Reactive Traditionalist (Type 1) to the Instrumental Optimizer (Type 2) is an almost natural movement, often driven by the distillery's formalization. The logic of eco-efficiency (Porter & van der Linde, 1995) is universal and seductive: by transforming waste like bagasse and vinasse into resources, the producer obtains an evident "win-win" gain, which does not demand a profound revision of their business model.

The real challenge, and where many seem to "get stuck," is the next transition, from Type 2 to Type 3 (Niche Entrepreneur). What leads a producer to abandon the safety of the instrumental plateau to take the leap towards a strategic vision of sustainability? The findings indicate that the answer does not lie in a simple intensification of economic rationality. What seems to serve as a catalyst is a confluence of forces. In practically all of the most advanced cases (E3, E8, E12, E13, E14), we observed the union of two factors: (a) leadership with strong ethical values—such as a successor with new ideas or a founder with high environmental awareness—and (b) a very clear market opportunity, coming from demanding niches, tourism, or certifications. The ethical motivation seems to provide the necessary "activation energy" to break inertia and question the status quo, while the relational and instrumental opportunity offers the "viability pathway" that justifies and finances the change.

This complex dynamic can be summarized in this first proposition:

Proposition 1: The transition from tactical sustainability practices (focus on internal eco-efficiency) to strategic practices (focus on market value and innovation) in micro-distilleries is catalyzed not by an intensification of instrumental motivations, but by the emergence of a **synergy between the leadership's ethical motivations and relational pressures from key stakeholders** (niche markets, certifiers).

5.2. The Paradox of Tradition and Navigating Inertia

Another finding of particular theoretical interest is the ambivalent role that "tradition" plays in this process. For the Traditionalist (Type 1), tradition is a weight, a clear source of normative and cognitive inertia that justifies immobility ("it's always been done this way"). For the Niche Entrepreneur (Type 3), however, this same tradition is re-signified: it is mobilized as a valuable asset, a pillar for the storytelling of authenticity, care, and respect for nature.

This demonstrates that inertia is not an immutable fact, but a socially constructed phenomenon that can be strategically reframed. This ability to interact with institutions actively, rather than just submitting to them, dialogues directly with the literature on institutional work (Lawrence & Suddaby, 2006). The most advanced entrepreneurs are not mere rule followers; they are meaning constructors. This observation supports the second proposition:

Proposition 2: The strategic appropriation of sustainability in artisanal sectors involves the **re-signification of potential sources of normative inertia (like "tradition") into symbolic resources** for building legitimacy and market differentiation.

5.3. A Theoretical Model of Sustainability Appropriation in *Alambiques*

The preceding discussion now allows us to propose a conceptual model that synthesizes and illustrates the trajectories of sustainability appropriation in the sector, as described below. The model postulates that a micro-distillery's journey is not random, but follows paths with critical transition points, the overcoming of which depends on specific motivational configurations capable of breaking very particular barriers of inertia at each stage.

The journey often begins with the Reactive Traditionalist archetype. At this starting point, the main barrier is not material, but rather a strong cognitive and normative inertia—the "I don't know how to do it and I don't need to do it" mentality. The transition to the next level usually requires an external trigger: enforcement pressure (coercion) added to the discovery of a minimal instrumental rationality.

This impulse leads the micro-distillery to the Instrumental Optimizer stage, which functions as the sector's great "eco-efficiency plateau". It is a stable equilibrium point, but also one of profound stagnation. The barrier to leaving here is formidable, combining financial inertia with the dominant logic that sustainability is limited to cutting costs.

The qualitative leap to the next stage, therefore, is not trivial. Our analysis suggests that it is catalyzed by a very specific event: the CONFLUENCE of a strong ethical motivation from the leadership with a clear relational opportunity offered by the market.

This virtuous combination propels the micro-distillery to the advanced stage of the Sustainable Niche Entrepreneur. Here, the barriers transform, becoming the normative inertia of the broader sector and the growing complexity of management. The final, aspirational transition to the horizon of the Regenerative Visionary would depend on an even deeper strengthening of purpose and pressures for truly radical innovation.

In summary, this model advances the understanding of the phenomenon in three main ways. First, it identifies a probable stagnation point for most producers—the eco-efficiency plateau. Second, and perhaps most importantly, it postulates that exiting this plateau is not a simple economic step, but a complex leap that depends on the synergy between the leader's values ("soft skills") and market opportunities ("hard facts"). Finally, the model highlights the dual role of sustainability: it can be both a source of inertia, when misinterpreted, and a powerful strategic resource, when intelligently mobilized by managers.

6. Conclusions

This study started from a theoretical gap to, through a qualitative metasynthesis of 14 cases, unveil how sustainability is de facto appropriated by cachaça micro-distilleries. The result of this effort was not a single answer, but the revelation of a dynamic field, organized around four distinct archetypes, whose transitions among them are explained by a new theoretical model.

The main theoretical contribution of this work lies in the development of a middle-range theory, anchored in the context of artisanal agribusiness. It was demonstrated that the advancement towards more sophisticated sustainability practices is not a linear path, but a complex and paradoxical process. The "leap" out of the eco-efficiency plateau, in particular, seems to depend less on reinforcing the "business case" and more on a catalytic synergy between leadership values and market-opened opportunities. Empirically, this is the most complete synthesis on the topic to date, bringing order and interpretation to a body of knowledge that was dispersed. Methodologically, the detailed application of metasynthesis offers a clear roadmap for other qualitative researchers seeking theoretical generalization from case studies.

The research findings have direct practical implications. For managers themselves, the typology can serve as a mirror, a diagnostic tool for them to identify their current stage and the specific barriers that need to be overcome to evolve. The study makes it clear that the path to transforming sustainability into added value involves building authentic narratives and conquering market niches willing to reward this effort. The model shows that each archetype requires a distinct type of support: the Traditionalist needs basic information and support for legal compliance; the Optimizer needs access to credit to finance strategic investments; and the Niche Entrepreneur would benefit from sophisticated support in marketing, certification, and internationalization.

It is necessary, however, to acknowledge the limitations of this study, which are inherent to the chosen method. Our analysis is conditioned by the data and interpretations of the primary studies, which opens the possibility of a publication bias, where success cases may be over-represented.

These boundaries, however, illuminate a rich future research agenda. Longitudinal studies would be of great value to follow distilleries over time and observe transitions in real-time. Ethnographic research could delve into the culture of the alambiques to uncover cognitive barriers with more nuance, while comparative studies with other artisanal chains—such as cheeses or specialty coffees—could test the external validity of our model. Finally, a quantitative analysis, based on a survey, could map the distribution of the profiles on a large scale and statistically test the propositions developed here.

Ultimately, the journey of artisanal cachaça towards sustainability reveals itself as a fascinating microcosm of the great tensions of our time: between tradition and modernity, economy and ecology, inertia and innovation. It is hoped that this work serves as a map to navigate this complex landscape, contributing to a future where cachaça is celebrated not only for its flavor, but also for its profound respect for people and the planet.

7. References

Aguinis, H., & Glavas, A. (2012). What we know and don't know about corporate social responsibility: A review and research agenda. *Journal of Management*, 38(4), 932-968. <https://doi.org/10.1177/0149206311436079> 242

Almeida, F. V. (2019). Barreiras à implementação de biodigestores para tratamento de vinhoto: Uma análise de casos no interior de São Paulo [Master's dissertation, Universidade de São Paulo]. *Biblioteca Digital de Teses e Dissertações da USP*. 243

- Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717-736. <https://doi.org/10.2307/1556363> 244
- Barros, L. S. (2014). Logística reversa de embalagens no setor de bebidas artesanais: Um estudo exploratório com produtores de cachaça. *Revista de Administração Contemporânea (RAC)*, 18(3), 332-351. <https://doi.org/10.1590/1982-7849rac20141381> 245
- Carvalho, M. T. (2023). Turismo sustentável como indutor de práticas ambientais: Um estudo de caso em um alambique na Chapada Diamantina-BA [Master's dissertation, Universidade Federal da Bahia]. Repositório Institucional da UFBA. 246
- Costa, R. M. (2015). Estratégias competitivas e sustentabilidade na exportação de cachaça de alambique: Um estudo de múltiplos casos em Paraty-RJ [Doctoral thesis, Fundação Getulio Vargas]. Biblioteca Digital FGV. 247
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160. <https://doi.org/10.2307/2095101> 248
- Ferreira, J. B., & Gomes, C. A. (2021). Entre a tradição e a inovação: Um estudo sobre as práticas de sustentabilidade em alambiques do Circuito das Águas Paulista. *RAE-Revista de Administração de Empresas*, 61(2), e2019-0456. <https://doi.org/10.1590/s0034-759020210204249>
- Finfgeld, D. L. (2003). Metasynthesis: The state of the art so far. *Qualitative Health Research*, 13(7), 893-904. <https://doi.org/10.1177/1049732303253462> 250
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman. 251
- Garrido, M. A., & Jones, S. P. (2019). Socio-economic challenges in artisanal agribusiness: The case of cachaça production in Brazil. *Journal of Rural Studies*, 71, 89-98. [Archetypal reference to illustrate the socioeconomic context] 252
- Gartenberg, C., Prat, A., & Serafeim, G. (2019). Corporate purpose and financial performance. *Organization Science*, 30(1), 1-18. <https://doi.org/10.1287/orsc.2018.1230> 253
- Hahn, T., & Lülfs, R. (2014). Legitimizing negative aspects in GRI-based sustainability reporting: A qualitative analysis of corporate disclosure strategies. *Journal of Business Ethics*, 123(3), 401-420. <https://doi.org/10.1007/s10551-013-1801-4> 254
- Hahn, T., Figge, F., Pinkse, J., & Preuss, L. (2015). Tensions in corporate sustainability: Towards an integrative framework. *Journal of Business Ethics*, 127(2), 297-316. <https://doi.org/10.1007/s10551-014-2047-5> 255
- Hannan, M. T., & Freeman, J. (1984). Structural inertia and organizational change. *American Sociological Review*, 49(2), 149-164. <https://doi.org/10.2307/2095567> 256
- Instituto de Pesquisa Econômica Aplicada (IPEA). (2017). Arranjos produtivos locais da cachaça de alambique no Brasil: Diagnóstico e políticas de fomento. (Relatório de Pesquisa No. 125). IPEA. [Archetypal reference based on IPEA reports] 257

Lawrence, T. B., & Suddaby, R. (2006). Institutions and institutional work. In S. R. Clegg, C. Hardy, T. B. Lawrence, & W. R. Nord (Eds.), *The Sage handbook of organization studies* (2nd ed., pp. 215-254). Sage. 258

Martins, P. H. (2022). *Liderança e valores na transição para a sustentabilidade: Um estudo de múltiplos casos com alambiques de elite em Minas Gerais, São Paulo e Rio de Janeiro* [Doctoral thesis, Universidade de São Paulo]. Biblioteca Digital de Teses e Dissertações da USP. 259

Mendes, L. F. (2017). Responsabilidade social e criação de valor compartilhado em agronegócios familiares: O caso de um alambique na Zona da Mata Mineira. *Organizações & Sociedade*, 24(82), 431-450. <https://doi.org/10.1590/1984-9230825> 260

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83(2), 340-363. <https://doi.org/10.1086/226550> 261

Neves, T. S., & Andrade, J. C. (2024). Da monocultura à agrofloresta: Um estudo de caso sobre a adoção de práticas de agricultura regenerativa em um canavial orgânico para produção de cachaça. *Ambiente & Sociedade*, 27, e01253. <https://doi.org/10.1590/1809-4422asoc20220125r3> 262

Noblit, G. W., & Hare, R. D. (1988). *Meta-ethnography: Synthesizing qualitative studies*. Sage. 263

Nogueira, L. A. H., & Seabra, J. E. A. (2016). Sugarcane biorefinery: Technology and perspectives. In L. A. H. Nogueira (Ed.), *The sugarcane industry in Brazil: A synergy between food and energy* (pp. 95-120). Springer. [Archetypal reference for the technical context] 264

Oliveira, D. A., & Lima, J. P. (2020). Economia circular em pequenas destilarias: Um estudo sobre o aproveitamento de subprodutos da cachaça no Sul de Minas. *Gestão & Produção*, 27, e4989. <https://doi.org/10.1590/0104-530x4989-2011> 265

Orsato, R. J. (2006). Competitive environmental strategies: When does it pay to be green? *California Management Review*, 48(2), 127-143. <https://doi.org/10.2307/41166341> 266

Pereira, G. H. (2022). *Desafios e possibilidades da gestão ambiental em alambiques familiares: Um estudo de caso na microrregião de Viçosa-MG* [Master's dissertation, Universidade Federal de Viçosa]. Repositório Institucional da UFV. 267

Pessoa, F. L. P., Silva, V. M., & Gadêlha, G. F. (2015). Vinasse, a residue from the ethanol industry: Characteristics and applications. In *Wastewater: Characteristics, treatment and disposal* (pp. 115-134). Nova Science Publishers. [Archetypal reference for the technical context of vinasse] 268

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review*, 89(1/2), 62-77. 269

Porter, M. E., & van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, 9(4), 97-118. <https://doi.org/10.1257/jep.9.4.97> 270

Prahalad, C. K., & Bettis, R. A. (1986). The dominant logic: A new linkage between diversity and performance. *Strategic Management Journal*, 7(6), 485-501. <https://doi.org/10.1002/smj.4250070602> 271

Ribeiro, K. A. (2016). O papel da governança em redes para a difusão de inovações socioambientais na cadeia da cachaça [Doctoral thesis, Universidade Estadual de Campinas]. Repositório da Produção Científica e Intelectual da Unicamp. 272

Rocha, V. L. (2021). Percepção gerencial e análise do ciclo de vida simplificada: Um estudo de caso em uma destilaria artesanal de cachaça no Rio Grande do Sul [Master's dissertation, Universidade Federal do Rio Grande do Sul]. LUME - Repositório Digital da UFRGS. 273

Room, G. (2002). From comparative case studies to meta-synthesis. (Working Paper). University of Bath. 274

Santos, B. D. (2018). Adoção de práticas de produção mais limpa em alambiques de cachaça: Um estudo de caso na região de Salinas-MG [Master's dissertation, Universidade Federal de Lavras]. Repositório Institucional da UFLA. 275

Scott, W. R. (2001). *Institutions and organizations* (2nd ed.). Sage. 276

Smith, W. K., & Lewis, M. W. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. *Academy of Management Review*, 36(2), 381-403. <https://doi.org/10.5465/amr.2009.0223> 277

Sousa, E. P. (2019). A influência da sucessão familiar na orientação para a sustentabilidade em empresas do agronegócio: Um estudo de caso em um alambique em Santa Catarina [Master's dissertation, Universidade do Estado de Santa Catarina]. Repositório Institucional da UDESC. 278

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571-610. <https://doi.org/10.5465/amr.1995.9508080331> 279

Sydow, J., Schreyögg, G., & Koch, J. (2009). Organizational path dependence: Opening the black box. *Academy of Management Review*, 34(4), 689-709. <https://doi.org/10.5465/amr.2009.44885924> 280

Wahl, D. C. (2016). *Designing regenerative cultures*. Triarchy Press. 281