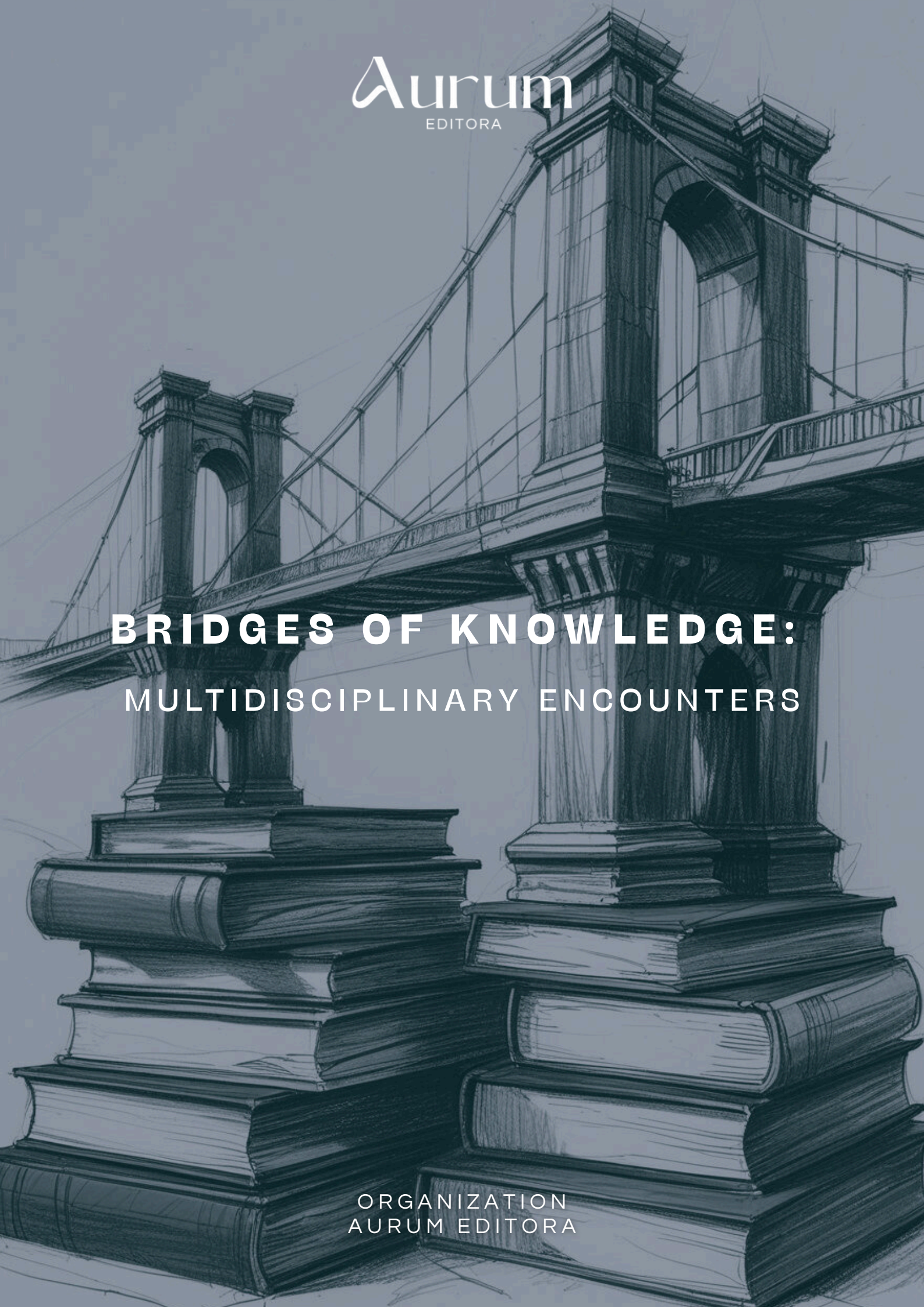
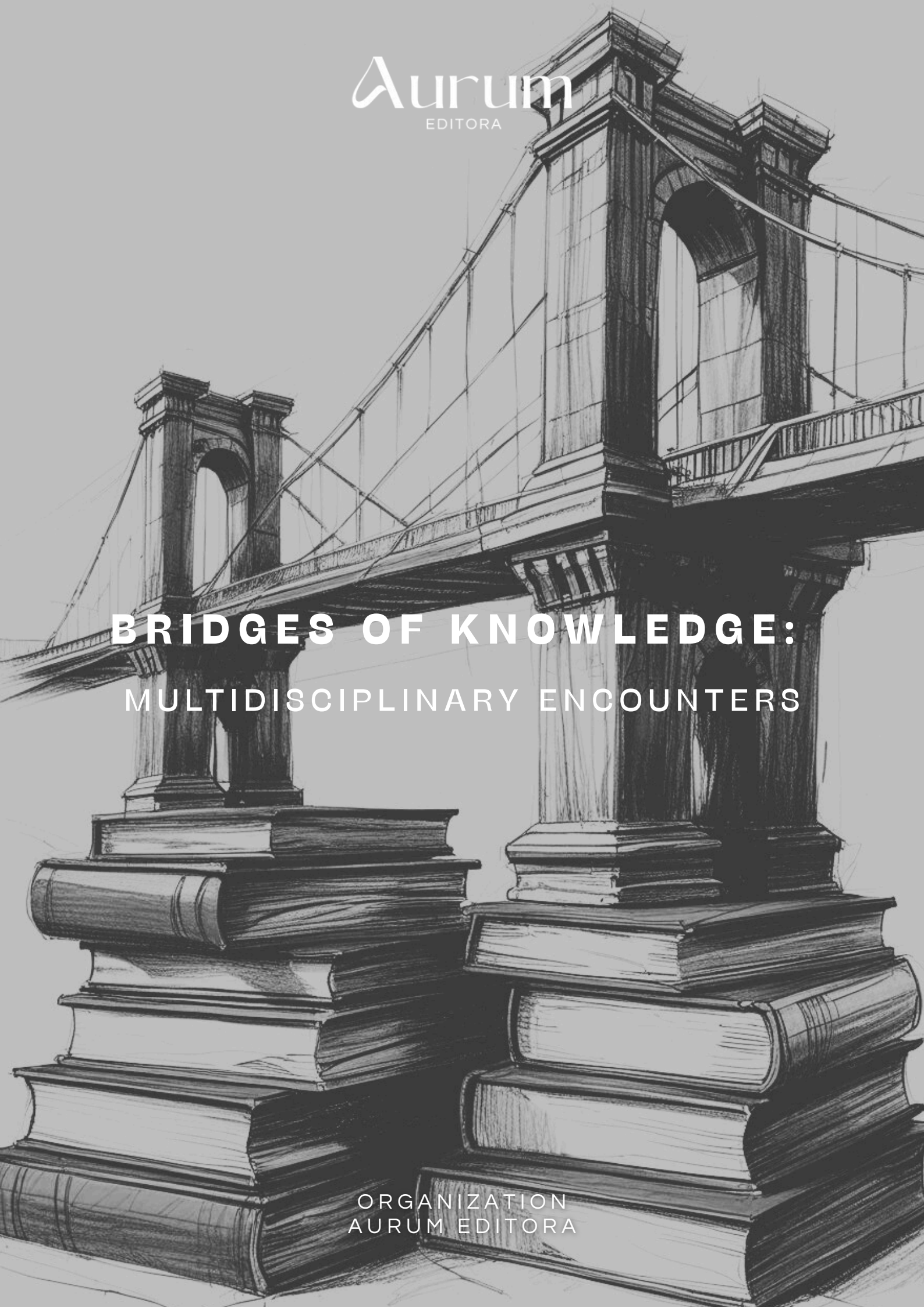




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**AN ANALYSIS OF THE CHALLENGES TO ENSURING WOMEN'S RIGHT TO LIFE,
LIBERTY, AND PERSONAL SECURITY IN BRAZIL** <https://doi.org/10.63330/aurumpub.015-001>**Milena Alves dos Santos¹****ABSTRACT**

Since the beginning of the 21st century, Brazil has advanced in the recognition of women's rights in both legal and social spheres. Feminist movements, which gained visibility in the late 1970s, shifted public attention to gender-based violence, previously confined to the private sphere. Today, these issues are debated in schools, universities, and households. Nevertheless, the increasing rates of femicide, rape—including those against vulnerable victims—and homicide underscore the complexity of Brazilian women's lived realities, deeply shaped by a colonial legacy that perpetuates structural inequalities. This article seeks to analyze the challenges to guaranteeing women's rights to life, liberty, and personal security. It also examines how the Brazilian legal tradition has historically curtailed female autonomy and how misogyny continues to hinder the full realization of such rights. The study employs a historical survey grounded in bibliographic and documentary sources to identify mechanisms that legitimized and normalized violations against women over time.

Through a qualitative approach, the analysis critically reviews these sources and reveals the formation of a theoretical tradition that profoundly influenced the collective imagination of femininity. This tradition served to justify the disciplining and exploitation of women's bodies, the restriction of free will, and the suppression of their physical and mental integrity. Ultimately, the study highlights how these processes undermined women's dignity as citizens and stresses the urgent need to dismantle such structures to effectively ensure fundamental rights.

Keywords: Gender-based violence; Misogyny; Women.

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INTRODUCTION

In the first half of 2023, according to the Brazilian Public Security Forum, there were 722 femicide victims, representing a 2.6% increase compared to 2022 and the highest victimization recorded since 2019. As femicide is the final stage of gender-based violence, other data from the study were also alarming, with a significant 16.3% increase in cases of rape and rape of vulnerable individuals involving girls and women. This means that between January and June, every 8 minutes a female child or adult was raped in Brazil. Homicides of women (not directly linked to gender issues) also rose by 2.6%, affecting 1,902 individuals. It is important to note that despite these concerning figures, the reality may be even more frightening due to underreporting.

Furthermore, the violation of rights enshrined in Article 3 of the Universal Declaration of Human Rights continues to be reproduced in Brazilian society, underpinned by a desensitized society that coexists with and shelters violators/abusers within its core without significant consequences for them. It is necessary to understand that this social phenomenon does not stem from recent or isolated events in Brazilian or global history, but rather from a historical socialization based on a misogynistic structure that demands extreme female submission (GEVEHR & SOUZA, 2014). The patriarchal model was fueled not only by religious texts and groups that use mythology to control but also by legal and social resources to legitimize structural violence against the feminine (BEAUVOIR, 2019).

However, after years of struggle and resistance against patriarchal abuses, women's mobilization through the feminist movement pressured the State to respond to their demands. In Brazil, women achieved milestones such as suffrage in the 1934 Federal Constitution, albeit with reservations, and ceased to be considered legally incapacitated in 1962. It was only in 2002 that the Civil Code was revised to recognize gender equality in family leadership, followed by the Maria da Penha Law in 2006, which supports victims of domestic violence and reinforces the defense of fundamental rights for those historically treated as second-class citizens. Lastly, in 2015, the Femicide Law was enacted—99 years after the disuse of the Philippine Ordinances, which allowed husbands to physically punish or even kill their wives if adultery was suspected (SOUZA et al., 2009). Large portions of this legislation had been in force in Brazil since 1603.

It is evident that there is a social reproduction of female vulnerability, especially among Black women, due to disparities in labor market conditions, access to economic and social resources, education, and professional development (TOLEDO, 2008). Patriarchy presents issues that transcend social classes and systematically violate fundamental rights, which are exacerbated within the domestic sphere.

Given this context, the main objective of this article is to analyze the challenges that must be overcome to ensure women's rights to life, liberty, and personal security in Brazil. It also aims to understand the Brazilian legal tradition that historically curtailed women's freedom and how misogyny



obstructs these rights. To achieve these goals, bibliographic research was conducted using previously developed materials, primarily books and scientific articles, with key authors including philosopher Simone de Beauvoir (2019), philosopher Michel Foucault (1987), Norberto Bobbio (1982), among others. Documentary research involved consulting current and historical legislation to observe societal transformations and provide theoretical grounding. With qualitative nuances, the analyses were conducted through content review.

Finally, the article discusses the roles imposed on women throughout history, the legislation regulating women's rights in Brazilian society, domestic vulnerability based on federal government data, and the implementation of women's rights in contemporary society.

METHODOLOGY

This research adopts a qualitative approach, grounded in bibliographic and documentary surveys, with the objective of analyzing the challenges to the realization of women's fundamental rights in Brazil.

TYPE OF RESEARCH

This is an **exploratory and descriptive** study, aiming to understand the social and legal reality through critical analysis of normative documents and academic productions. The choice of a qualitative approach is justified by the need to interpret complex social phenomena, such as gender-based violence and the persistence of patriarchy, which cannot be fully understood through quantitative data alone.

TECHNIQUES AND INSTRUMENTS

Two main techniques were employed:

- **Bibliographic research**, based on classical books and scientific articles, including authors such as Simone de Beauvoir (2019), Michel Foucault (1987), and Norberto Bobbio (1982), as well as contemporary studies on misogyny, patriarchy, and gender-based violence.
- **Documentary research**, encompassing current Brazilian legislation and its antecedents, such as the Philippine Ordinances, the Civil Code of 1916, the Federal Constitution of 1934, the Maria da Penha Law (2006), and the Femicide Law (2015).

SAMPLE AND DATA SOURCES

The sample consists of selected **normative documents and bibliographic sources**, as well as statistical data provided by the Brazilian Public Security Forum (2023). The selection was intentional, prioritizing materials that directly address the theme of women's rights and their violations.



GROUNDING DISCUSSION

The analysis was conducted critically and interpretatively, aiming to identify the historical reproduction of female vulnerability and the legal and social mechanisms that legitimized gender inequality. The discussion connects recent empirical data on femicides and sexual violence cases with the theoretical and normative tradition that shaped women's position in Brazilian society. This allowed for a correlation between the impacts of misogyny and patriarchy and the need to enforce the right to life, liberty, and personal security.

RESULTS AND DISCUSSION

THE OTHER: DEMONIZATION, INFERIORIZATION, AND DISCIPLINING

To understand how female experience has historically been constituted, it is essential to grasp how patriarchal ideology—guiding the social structure and reproduced hegemonically in both macro and micro power relations—establishes itself and consequently affects women's lives.

To achieve the proposed objective, it is crucial to understand how the social legitimacy of one gender's exploitation by another was constructed. This involved the creation of a framework of philosophical ideals and theological myths, successfully implemented and embedded in popular imagination and beliefs. This belief system centers on female inferiority and demonization, alongside male superiority and divinity. These concepts date back to ancient civilizations such as Greek, Roman, Jewish, and Hindu, and persist in contemporary societies (GEVEHR & SOUZA, 2014).

Historically, the negative mental construction of the female figure is ancient. However, during the medieval period, it acquired peculiar characteristics, as the harshness of material life merged with ideological machinations to produce a dubious and malevolent female being. Possibly, the concrete reality and the stimuli received were decisive in shaping the irrational collective behavior that personified women as sinister and deceptive (GEVEHR & SOUZA, 2014, p. 3).

Thus, the social objectification and demonization of women—both their bodies and psyches—have long served to justify the violation of their rights and the blaming of women for any harm they might suffer (GEVEHR & SOUZA, 2014). Even with scientific development and the secularization of the State, myths and beliefs about women have persisted to maintain patriarchy. Following Foucault's (1987) concept of the disciplining of bodies, it is evident that historically, institutions and society have made significant theoretical and practical efforts to discipline female bodies by confining them to the domestic sphere, thereby restricting their relationships and movements (SANCHES, 2017).

Moreover, “the control of their activities, which become dependent on the lives and schedules of others such as children and husbands, contributes to the organization of genealogies, a stage in which a woman's existence is justified solely by serving the male and his offspring” (BEAUVOIR, p.17, 2019).

To complete the disciplining process of the female sex, a technique of force composition is used, whereby the normalization and enforcement of this behavioral model are massively reproduced—even by those undergoing indoctrination. For those who rebel, numerous coercive mechanisms exist, such as violence and legislation.

Additionally, the construction of an ideology portraying femininity as evil and inferior—morally, physically, and intellectually—validated a supposed need for male guardianship, thereby stripping women of control over their lives, bodies, property, and even their rights. In Brazilian society, this legitimacy of female exploitation by males was enshrined not only in constitutional texts but also in the Civil Code of 1916. Article 219, item IV, considered the deflowering of a woman an essential error regarding the spouse's identity. Article 6, item II, classified married women as relatively incapacitated while in a marital union (considered indissoluble), preventing them from exercising civil rights such as accepting or rejecting inheritances, practicing professions without their husband's authorization, managing inherited or acquired assets (except from previous marriages in case of widowhood), and traveling without express permission from their spouse (BRASIL, 1916).

Despite these numerous limitations, female singleness was frowned upon, seen as a transgression of a woman's sole purpose. In other words, there were no real possibilities for a life detached from the male figure without facing social disapproval.

“With marriage, a woman was demoted to the category of a minor, dependent on her husband, yet all women wanted to marry because single women were not socially accepted. An extreme paradox: marriage offered a woman higher social status, yet it significantly reduced her legal capacity and personality. Women were thus destined to live as permanent minors. The argument of women's intellectual incapacity was widely used to demonstrate that, by nature, they lacked reason and critical thinking.” (COLLING, Ana Maria, 2015, p. 5)

However, after years of feminist mobilization and resistance to patriarchal abuses, the State began responding to women's demands. Globally, discrimination against women was only recognized as contrary to human dignity in 1967, with the Declaration on the Elimination of Discrimination Against Women, the sexual revolution enabling greater independence and birth control, and the acknowledgment of the need for women's human rights within UN member states—since not all fundamental human rights are considered legitimate for women in some nations (BOBBIO, 1982).

In Brazil, women achieved milestones such as suffrage in the 1934 Federal Constitution (with reservations), and ceased to be considered legally incapacitated in 1962 with Law 4121/62. However, it was only in the 21st century, specifically in 2002, that the Civil Code was revised to recognize gender equality in family leadership. In 2006, Law 11.340, known as the Maria da Penha Law, was enacted to curb domestic and family violence against women. Before this law, assaults against women were considered minor offenses, and even in cases of murder, the perpetrator could invoke the “honor

cleansing” defense to justify femicide—a rationale often accepted by society (SOUZA et al., 2009). In response, Law 13.104 was enacted on March 9, 2015, classifying femicide as a qualifying circumstance for homicide and categorizing it as a heinous crime (BRASIL, 2015).

Despite these achievements, deeply rooted conceptions endorsed by religious institutions and the State for centuries have cast women as “the Other”—an enemy to be fought, the inessential (BEAUVOIR, 2019, pp. 13–17). These prejudices persist in the historically constructed division of social roles, reflecting a sexist and misogynistic society that long used legislation to discipline female bodies. This has contributed to the current reality of brutal social disparity, which becomes even more pronounced when intersected with race and gender (TOLEDO, 2008).

THE CHALLENGES TO ENSURING WOMEN’S RIGHT TO LIFE, LIBERTY, AND PERSONAL SECURITY IN BRAZIL

Brazil, as a former Portuguese colony, was heavily influenced by the legal and social frameworks of the metropolis. Additionally, due to the specific context of land exploitation, forced labor, and territorial conflicts, Brazil developed its own social regulations, with a strong emphasis on violence as a tool of coercion (JUNIOR et al., 2013). In domestic environments—from the wealthiest to the poorest—under a logic that positioned the man as the central pillar and owner of the family, he became the master of life and death over all those considered his subordinates: women, children, and enslaved individuals.

“A patriarchal sadomasochistic society, where women, children, and slaves were extensions of the will of their master. A society that barely knew animal traction, where white men did not bother to walk the streets on their own legs, being carried in palanquins by Black men. It was a society driven by human traction and primitively anti-egalitarian and anti-individualist.” (SOUZA, 2011, Apud JUNIOR et al., 2013, p. 114)

Thus, the violent reality experienced by women in the legal and social spheres did not change with the country’s independence, the proclamation of the republic, or even with the Civil Code enacted in 1916. This code, inspired by Napoleonic ideals, reinforced—through new language—the notions of ownership and impunity seen in the Philippine Ordinances. Although the new legislation did not explicitly permit the extermination of women, it introduced mechanisms that legitimized the immunity of femicide perpetrators and intensified a social perception of victim-blaming.

The year 1979 marked a victory for the feminist movement against the impunity of such murders, previously considered crimes of passion. During the trial of Doca Street for the murder of his partner Ângela Diniz in 1976, feminist protests emerged for the first time against the impunity in cases of women being killed by men. Ângela, initially the victim, was accused of “corrupting good morals,” “leading a dissolute life,” and “being a woman of easy virtue.” It was as if the murderer had rid society of a threat to the moral fabric of the Brazilian family. Feminist activists managed to reverse the narrative, and the murderer was convicted. From this episode emerged the slogan “Quem ama não mata” (“Those who love do not kill”), which later became a highly popular television miniseries (COLLING, Ana Maria, 2015, p. 12).

Despite the social mobilization of women’s groups since the early 1980s to bring gender-based violence into public discourse and to end the impunity of aggressors, it was only on August 1, 2023, that the Supreme Federal Court declared the legal thesis of “honor defense” unconstitutional when used to mitigate sentences or justify femicide (BRASIL, 2023). This decision demonstrates that, even with laws such as the Maria da Penha Law and the Femicide Law, many practices rooted in misogyny still permeate Brazilian institutions at various levels. A notable example is the case of influencer Mariana Ferrer, who was revictimized through blame during her trial, sparking national outrage and leading to the creation of Law 14.245/21, named after her, which protects victims of sexual violence throughout legal proceedings (BRASIL, 2021).

Furthermore, despite the enactment of laws such as Law No. 13.718/2018 on Sexual Harassment, Law No. 12.845/2013 on Immediate Care for Sexual Violence Victims, Law No. 14.192/2021 on Political Gender Violence, and Law No. 14.188/2021 on the Red Signal Against Domestic Violence, a major gap remains in the fight against and prevention of violations of women’s rights: the accountability of aggressors. Even with Brazil’s culture of mass incarceration, punishment alone does not contribute to the deconstruction of misogyny in the public consciousness, as both aggressors and society continue to blame victims to some extent (COLLING, 2015).

Moreover, the alignment with conservative ideologies by federal administrations in the second half of the 2010s led to the dismantling of social policies aimed at combating violence against women—policies that had been achieved in previous decades. As the issue was not considered a priority by the executive branch, budget allocations declined (RIBEIRO et al., 2018). In the first half of 2015, R\$64.45 million were allocated, followed by R\$59 million in 2016, R\$27.15 million in 2017, and R\$20.35 million in 2018 (RIBEIRO et al., 2018). In 2019, only 73.87% of the R\$76.56 million allocated were used, and in 2020, during the COVID-19 pandemic, only 29.45% of the authorized R\$141 million were spent (INESC, 2023). It is worth noting that investment in gender violence prevention was inversely proportional to the increase in rights violations, which resulted in one emergency call for domestic violence every minute in 2020 (GARCIA, 2021).

Finally, the reduction in investments negatively affects the operation of the few social facilities available to support women. The dismantling of other policies—such as housing, social assistance, health,



and education—also hinders female emancipation and allows the systematic perpetuation of violations of the right to life, liberty, and personal security.

CONCLUSION

Based on the research conducted, it was identified that historically, the discussion surrounding the prevention and combat of gender-based violence is a relatively recent theme in Brazilian society, fraught with cultural and structural challenges that must be overcome. Misogyny, when normalized, becomes a major obstacle to guaranteeing women's rights to life, liberty, and personal security. Despite the barbaric nature of this reality, it is not treated as a priority by certain government officials, nor by conservative factions with significant social influence, which condemn feminist struggles and reinforce narratives that portray women as submissive and subservient to male figures. These discourses often perpetuate victim-blaming rather than holding perpetrators accountable.

It was possible to understand that the Brazilian legal tradition has historically fostered the restriction of women's freedom and their right to life, and for a long time did nothing to ensure their personal security. However, recent advances—particularly in the last decade—toward the criminalization of violent behaviors that were previously normalized against women represent a recognition of feminist activism and the importance of popular mobilization. At the same time, it is evident that within the patriarchal capitalist system, structural challenges will always exist that hinder the implementation of effective public policies for the prevention and combat of rights violations.

Finally, it is essential to develop and implement public policies within both the Unified Social Assistance System and the Prison System that focus on the self-accountability of abusers, beyond criminal proceedings. These policies should have an educational bias and encourage reflection on the perception of the male social being as aggressive and violent, as well as the normalization of male domination and ownership over the female. Combined with the legal changes that are gradually being realized, this can lay the foundation for the genuine social recognition of women's rights to life, liberty, and personal security in Brazil.

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BETWEEN FUNDAMENTAL RIGHTS AND LEGAL SUSTAINABILITY: PROTECTING THE FUTURE AS AN INTERGENERATIONAL DUTY <https://doi.org/10.63330/aurumpub.015-002>**Igor Clem Souza Soares¹ and Thiago Maciel de Paiva Costa²****ABSTRACT**

This article analyzes the constitutional basis of the right to a future and its connection to the conduct of individuals within the Brazilian legal system. The investigation begins with the notion of the fundamentality of the right to a future, understood as a normative vector that ensures the protection of present and future generations from an intergenerational perspective. The article examines the factual basis and normative effectiveness of this right, highlighting its impact on private relationships and the necessary balance against other constitutional principles. The text argues that the binding of individuals to the right to a future is not limited to a negative duty of abstention, but includes a positive commitment to conform economic and social activity to parameters of legal sustainability. Thus, the right to a future is conceived as a constitutional clause of structural protection, capable of guiding legislative, judicial, and private practice, reaffirming the role of law as a guarantor of the continuity of a dignified life.

Keywords: Right to the future; Legal sustainability; Fundamental rights; Intergenerational effectiveness; Binding of private actors.

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INTRODUCTION

Sustainability has become a central theme both nationally and internationally, permeating political, social, and legal debates. Environmental issues, in particular, occupy a prominent position in legal discussions, especially when confronted with major economic interests. The 1988 Federal Constitution recognized sustainable development as a guiding principle of the economic order, and in this context, the right to a future emerges as its facet most directly linked to intergenerational protection, ensuring present and future generations the preservation of an ecologically balanced environment conducive to a dignified life.

Understanding the right to a future is essential for the proper interpretation and application of the normative statements that incorporate it, avoiding excesses or deficiencies. The precise identification and configuration of this norm are therefore of significant legal relevance, as they allow for the delimitation of responsibilities, obligations, and limits of public power and private initiative in the protection of natural and social heritage.

This work employs the deductive method to define, both connotatively and denotatively, the right to a future, systematizing its characterization and promoting a critical debate on this dimension of sustainable development. Without the intention of exhausting the topic, the study seeks to encourage new reflections on the legal protection of the future and deepen the understanding of the application of this fundamental right norm.

The first section of the article aims to identify the right to a future as a fundamental right, qualifying and delimiting its legal contours. Based on this qualification, the consequences of this classification are analyzed, as well as examples of normative statements that materialize such a right.

Next, the investigation focuses on the factual basis of the right to a future, exploring the elements that comprise its sphere of protection, what constitutes an intervention in this sphere, and how the constitutional legitimacy (or lack thereof) of such interventions influences the qualification of conduct as a restriction or violation of a fundamental right. At this point, a distinction is made between the “prima facie right” to a future and “definitive rights” to a future, offering examples of their practical application.

The third section of the study addresses the effectiveness of norms related to the right to a future, analyzing the possible emergence of fundamental legal relationships when the factual basis of this right is fulfilled. It discusses who may be subjects of these relationships—encompassing holders and recipients, natural and legal persons, and the “not yet born”—and how the constitutionalization of the right and the horizontal effectiveness of fundamental rights influence its interpretation and application. Finally, the right to a future is examined as a formal and purposive limit to normative production, both of state norms and private acts in the exercise of autonomy of will, consolidating its preventive and structuring function in the protection of intergenerational sustainability.

IDENTIFICATION OF THE RIGHT TO A FUTURE AS A FUNDAMENTAL RIGHT

To identify the “right to a future” as a fundamental right, it is first necessary to clarify what is meant by a fundamental right. Once this classification is established, it becomes essential to exemplify which deontic commands are expressed by the norms of fundamental rights that make direct reference to the right to a future. Fundamental rights can only be understood in accordance with the constitutional frameworks in which they are embedded (Sarlet, 2014, p. 53). In this vein, the inquiry into what constitutes a provision of fundamental rights will be based on the Constitution of the Federative Republic of Brazil of 1988.

Thus, we bring to the Brazilian context the question posed by Alexy (2008, p. 66): what makes a provision of the Brazilian Constitution a provision of fundamental rights?

Ingo Sarlet (2014, p. 11) argues that fundamental rights are characterized by combining formal and material fundamentality. The latter arises from the fact that fundamental rights contain essential decisions about the basic structure of the State and society; the former refers to specific qualities granted to them by the positive constitutional order.

The attributes listed by Sarlet (2014, pp. 67–68) — which must be present for a right to be formally fundamental — are: a) fundamental rights are part of the written Constitution and therefore possess supralegal hierarchy; b) the modification of these rights must respect both the formal (*lato sensu*) and material limits of constitutional reform; and c) fundamental rights are disseminated through norms that, in accordance with Article 5, §1 of the 1988 Federal Constitution (CF/88), immediately bind public and private entities.

At this point, it is necessary to understand the right to a future and verify whether the norms that mandate its realization conform to the above framework of a “fundamental rights provision.” The 1988 Constitution marked a period of Brazil’s redemocratization. Countless social demands were addressed and incorporated into the constitutional text; during this moment of strengthening social and environmental issues, the protection afforded to fundamental rights was substantially reinforced to also encompass diffuse and collective spaces.

It is important to emphasize that “positivization allows for the establishment of communal meanings within the Constitutional Text, which are transformed into internal elements and later (re)utilized within the legal system” (Almeida; Teixeira, 2017, p. 632). The inclusion of these normative statements regarding fundamental rights — although not always accompanied by material effectiveness — significantly impacted the scope of Environmental Law, particularly concerning sustainable development. This scenario is especially evident in the guarantee of an ecologically balanced environment, ensured for present and future generations, and in the defense of the environment as one of the guiding principles of Brazil’s economic order (Bölter; Derani, 2018, pp. 212–213).

The right to a future is one of the facets of sustainable development, as it simultaneously demands the fulfillment of current needs and — in doing so — ensures that future generations can also enjoy the environment in pursuit of their own goals (Principle 2 of the Stockholm Declaration). The right to a future must be viewed from the perspective that human action upon nature has the power to severely alter it, potentially leading to its complete destruction; likewise, humans have a normative duty to prevent such environmental degradation, since maintaining a healthy environment is a condition for the existence of both human and non-human life (Morais; Saraiva, 2018, pp. 15–16).

In this context, the right to a future can be understood as the prospective aspect — although it issues commands for the present — of the right to an ecologically balanced environment. That is to say, the right to a future — inherently transindividual in nature — mandates that both current and future generations deserve an environment capable of providing a healthy quality of life (for both human and non-human beings).

It is about instilling in dominant human thought the idea that humans are not separate from nature. All people — both those living today and those yet to be born — share in the damages and losses suffered by the environment. Humans must care for the Earth and live on it responsibly, for the life of this planet conditions our own and that of all other beings around us (Morin, 2015, pp. 103–105).

The recognition of an ecologically balanced environment as a fundamental right (although not expressly included within Title II) demonstrates that the Constitution assigns special value to the protection of this transindividual good. Moreover, the normative statement in the caput of Article 225 of the CF/88 reinforces the idea that individuals are, simultaneously: a) holders of the right to a balanced environment; and b) recipients of the fundamental duty to preserve it.

Before identifying the norms that convey provisions regarding the right to a future, it is necessary — even if in simplified form — to understand the concept of “norm” intended for use. A preliminary distinction is essential: a norm is not to be confused with a normative statement. “Norms are not texts nor their collection, but the meanings constructed from the systematic interpretation of normative texts” (Ávila, 2013, p. 33). Thus, a normative statement is the linguistic provision that, once interpreted, may result in legal norms³. Eros Grau (2018, pp. 39–41) explains that the text is the linguistic sign, while the norm is what is designated/revealed from this set of signs.

The text of Article 225 of the Constitution (normative statement) is the source of various norms involving the right to a future. When the signs therein state that everyone has the right to an ecologically

³ It is important to emphasize that the relationship between norms and normative statements is not necessarily one-to-one: there are norms that do not require specific provisions to grant them physical support; provisions from which legal norms do not immediately derive; provisions that result in more than one norm; and norms that result from the combination of more than one provision. (ÁVILA, 2013, pp. 33–38)

balanced environment — a common good and essential to a healthy quality of life — and impose on the Public Power and the community the duty to defend and preserve it for present and future generations, the interpretation of this object may give rise to numerous norms.

By way of example, and in alignment with Alexy's descriptions (2008, pp. 69–71), and respecting the purpose and limits of this work, we now proceed to reconstruct basic deontic statements from the aforementioned text.

The transcribed statement essentially determines that “the right to an ecologically balanced environment for present and future generations is guaranteed” — this statement will henceforth be referred to as [A].

The right to a future is expressly inscribed in the Constitution, but it is semantically and structurally open.

It is semantically open due to the constitutional indeterminacy of the concept of “ecologically balanced environment.” The norm in Article 3, items I and II, of Federal Law No. 6.938/81 helps mitigate this indeterminacy by clarifying that the environment is “the set of conditions, laws, influences, and interactions of a physical, chemical, and biological nature that permits, shelters, and governs life in all its forms,” and that environmental degradation is “the adverse alteration of the characteristics of the environment.”

Thus, by filling in the definition of an ecologically balanced environment with the dictates of the law, “the set of conditions, laws, influences, and interactions of a physical, chemical, and biological nature that permits, shelters, and governs life in all its forms will be ecologically balanced when there are no adverse alterations to its characteristics” — statement [B].

By combining statements [A] and [B], we can establish the following: “the right of present and future generations to the set of conditions, laws, influences, and interactions of a physical, chemical, and biological nature that permits, shelters, and governs life in all its forms, without any adverse alteration to its characteristics, is guaranteed” — statement [C].

This represents the most basic version of the legal norm that provides for the right to a future. It is necessary to determine whether this norm is indeed a norm of fundamental rights. For this analysis, it is essential to verify whether this norm conforms to the previously mentioned concepts of formal and material fundamentality.

The normative statement that provides textual support for the norm encompassing the right to a future is found in Article 225 of the Constitution, and therefore outside Title II of the CF/88. Hence, the formal fundamentality of the right to a future can only be understood through a norm reconstructed from Article 5, §2 of the constitutional text, whose meaning clarifies that the list of fundamental rights is not exhausted in Title II.

That is to say, the norm that stipulates the right to a future possesses all the attributes necessary for the characterization of formal fundamentality, as it is expressly part of the written Constitution, and its normative configuration is not subject to the discretion of ordinary legislators.

Regarding material fundamentality, it is imperative to assert that the right to a future, from the perspective of sustainable development — capable of ensuring enjoyment of the environment by future generations — is “a value inseparable from the very conception of the Brazilian State” (Coutinho; Morais, 2016, p. 192). In light of this, there is no doubt that it constitutes a crucial determination of the national legal order, with the capacity to be included within the material scope of fundamental rights.

Having established that statement [C] is a provision of fundamental rights (as it encompasses a legal norm of this nature), it is now necessary to address the structural indeterminacy it contains. For example, must the right to a future be realized through some positive state conduct, or does it require state abstentions? Can these actions and/or abstentions also be directed at private individuals?

The plain text of statement [C] is not sufficient in itself to answer the structural questions posed above. Although it contains a normative statement, its grammatical format does not immediately allow for answers to questions regarding the scope of application of the right to a future.

To answer these questions, it is necessary to interpret statement [C] and reconstruct legal norms from it. These norms, resulting from interpretation, may also be expressed in the form of direct normative statements containing deontic commands of permission, prohibition, order, etc. As examples of such responses, we formulate statements [D] and [E] below:

[D] All entities and individuals have the duty to preserve and protect, for present and future generations, the set of conditions, laws, influences, and interactions of a physical, chemical, and biological nature that permits, shelters, and governs life in all its forms, employing all legitimate means to prevent any adverse alteration to its characteristics;

[E] Any entity or individual has the right to defend against any adverse alteration that harms, for present and/or future generations, any of the characteristics of the set of conditions, laws, influences, and interactions of a physical, chemical, and biological nature that permits, shelters, and governs life in all its forms.

Statements [D] and [E] refine statement [C]. It has already been demonstrated that [C] encompasses a norm of fundamental rights. In turn, [D] and [E], by substantiating [C], maintain a foundational relationship with it. Thus, [C] functions as an established norm of fundamental rights, while [D] and [E] are treated as attributed norms of fundamental rights, as they can be correctly grounded in reference to fundamental rights (Alexy, 2008, pp. 72–74).

Having addressed these initial considerations and identified at least two deontic commands related to the right to a future, it is now necessary to examine the factual basis of this right and the legal consequences that may arise from improper interventions within the scope of protection of these norms.

THE FACTUAL BASIS OF THE RIGHT TO A FUTURE

For a norm to produce its legal consequences, all its conditions must be satisfied; the factual basis of a norm is, therefore, the set of conditions that, when fulfilled, authorize the realization of the norm's legal consequences (Alexy, 2008, p. 307).

Given the normative and structural configuration of fundamental rights provisions, the definition of the factual basis of these rights is carried out in a particular manner. Virgílio Afonso da Silva (2010, p. 74) indicates that four criteria must be observed in identifying the factual basis in such cases: a) what is protected; b) against what it is protected; c) the legal consequence that the fulfillment of the factual basis may trigger; and d) what is required for that consequence to also occur.

What is protected is referred to as the scope of protection of the fundamental right. However, to configure the factual basis, another element is essential: the intervention (generally, by the State). Both the scope of protection (what is protected) and the intervention (what it is protected against) form part of the factual basis of the fundamental right, since the legal consequence provided for in the norm will only occur if there is an intervention in this scope. Nevertheless, according to the theory adopted by Virgílio Afonso da Silva (2010, p. 76), these elements alone are insufficient for a complete definition of the factual basis; another component must be added: the (non)existence of constitutional justification for the intervention in the scope of protection.

Thus, in a logical formalization of the complete structure of the factual basis, we have:

$x (AP_x \wedge \neg FC(IE_x) \leftrightarrow OCJ_x)$. From this perspective, for the legal consequence (OCJ) of a fundamental rights norm to occur, the factual conduct/event x (action, state, and/or legal position) is inserted into an analysis that encompasses the scope of protection (AP), contrasted with the State intervention (IE), and subjected to the scrutiny of constitutional justification (FC). Once it is verified that the factual basis is the set of conditions that authorize the realization of a legal consequence, such consequence will not occur if the intervention in a fundamental right has constitutional justification, as this would constitute a legitimate restriction of the fundamental right, rather than an unconstitutional violation. Therefore, it is correct to define the factual basis of a fundamental right not merely as the sum of the scope of protection and the State intervention; it is also necessary to include the absence of constitutional justification (SILVA, 2010, pp. 74–75).

Broad theories of the factual basis include within the scope of protection of each fundamental right everything that may abstractly support its safeguarding. Likewise, the concept of intervention must be

viewed broadly, encompassing all interferences, restrictions, regulations, violations, etc., of actions and positions abstractly included in the scope of protection of a fundamental right (BOROWSKI, 2003, p. 187).

Considering these initial traits of the factual basis theory to be used in the analysis of the right to a future, it becomes evident that a distinction is adopted between “*prima facie* right” and “definitive right.”

The *prima facie* protection of a fundamental right encompasses any action, state, or legal position that contains some element which, abstractly considered, is part of the “thematic scope” of the respective fundamental right. It is important to emphasize, from the outset, that this overly broad concept is a distinctive feature of broad factual basis theories, since this *prima facie* right may still undergo (and likely will undergo) modifications — resulting from factual and legal interventions that are constitutionally justified — until it reaches the applicable status of a definitive right (Alexy, 2008, p. 322).

The thematic scope of the right to a future is conceived through the ecologically qualified environment (statement [C]). Thus, the *scope of protection* of this fundamental right consists of the entire set of actions, positions, states, relationships, and legal situations that, in some way, relate to the existence, creation, maintenance, restoration, promotion, or expansion of an ecologically balanced environment capable of providing a healthy quality of life (human and non-human) and meeting the needs of present and future generations.

It is important to note that, in line with what has been stated above, the scope of protection of the right to a future encompasses much more than just the natural elements of the environment (water, air, soil, flora, fauna, etc.); it also includes its artificial and cultural aspects. The environment must be understood from anthropocentric, biocentric, and ecocentric perspectives, representing an autonomous legal good whose protection is not limited to the direct interests of human life alone (Krell, 2013, p. 2062).

In turn, *interventions* in the right to a future may be understood as the set of actions (omissive or commissive), carried out by the State or private actors, that prevent, confront, hinder, empty, burden, or in any way harm the abstract and isolated breadth of the scope of protection of this fundamental right. That is, any activity that implies a reduction in the initially foreseen scope of protection of the fundamental right may be considered an intervention.

From this broad perspective, the scope of protection of the right to a future includes, for example, the complete preservation of the Amazon Rainforest, given the richness of its fauna and flora, whose protection is of great value so that future generations may enjoy the benefits arising from the maintenance of this healthy environmental *status*. Likewise, any activity, whether by the State or private actors, that in any way threatens the full preservation of the Amazon will be understood as an *intervention* (in the broad sense).

This intervention may be legitimate or illegitimate, depending on the (non)existence of constitutional justification. If there is constitutional justification for the intervention, it constitutes a constitutional restriction of a fundamental right. Conversely, if there is insufficient constitutional justification for the intervention, it constitutes a violation of a fundamental right.

In this latter situation (violation of a fundamental right), the legal consequences of the right will be enforced. As an example of an immediate consequence of the factual basis of the fundamental right to a future, we may cite the need to cease the constitutionally illegitimate intervention, along with the duty to restore the environmental damage caused, without prejudice to any civil, criminal, and administrative liabilities that may also apply to the case.

Broad factual basis theories are linked to the existence of a “relative” essential content of fundamental rights; this relativity of essential content rejects the existence of a “core” with fixed and predefined contours for each fundamental right. The definition of what is essential here depends on the submission of the case to the principle of proportionality: a situation, position, or legal relationship will only be considered essential according to the factual conditions and legal collisions of the various rights and interests weighed in the concrete case (Silva, 2010, pp. 51–55).

The legislator, in opting for legal reserve protection at the level of 80% of the property area, conducted an analysis of the collision of principles involved: on one side, the right to a future, with all the environmental preservation consequences associated with it; and on the other, the right to economic development, reinforced by the rights to individual freedom and property. It is important to note that sustainable development does not imply stagnation of the economic facet of development, but rather demands a balanced formula, simultaneously evaluating issues of social and environmental development (Pissaldo; Sanches, 2015, p. 110).

The legislative branch understood that: a) the imposition of an 80% legal reserve is an appropriate measure to promote sustainable development in these areas of essential natural diversity; b) this measure was necessary, as there was no less burdensome way to promote sustainable development — equally effective — respecting both principles; and c) the degree of satisfaction of the protected rights — in the realization of sustainable development — is greater than the degree of “non-realization” of the colliding rights. Based on these premises, it is evident that the infraconstitutional legislator considered this intervention to be proportional and, therefore, constitutionally legitimate, constituting a justified restriction of the fundamental right to a future.

This type of restriction (based on the principle of proportionality) performed an “alchemy” on the right to a future. The *prima facie* right of this norm (scope of protection) aimed to fully safeguard the forest areas mentioned. After the intervention, the resulting definitive right was the protection — through

legal reserve — of part of the initial claim, reducing it by 20%. Therefore, the factual basis of the right to a future was not fulfilled in this case.

However, if the situation were different (e.g., a federal law protecting only 3% of the property area as legal reserve), this would constitute a violation of the fundamental right to a future, because the environment would not be sufficiently protected for future generations (perhaps not even for the present ones). In this case, the factual basis of the right would be fulfilled, and the appropriate consequences could be imposed to cease this violation of fundamental rights.

Based on this broad factual basis framework, several considerations can be listed: a) the norm that mandates the protection of a healthy environment for present and future generations has the nature of a principle, as it requires that a goal be achieved/maintained; b) the achievement/maintenance of the ideal state of affairs determined by the norm depends on the concrete situation in which the norm is applied, as factual and legal circumstances may limit the incidence of the principle of the right to a future; c) given that every right has an essential content that cannot be emptied — although this core is identified in each concrete case through verification of the limits to the norm — the circumstances that contrast with the scope of protection of the right to a future cannot completely prevent the production of effects of this principle; and d) if the interventions made in the right to a future lack proper constitutional justification, this constitutes violations of fundamental rights, configuring a sufficient situation to trigger the factual basis of this norm, which will result in the implementation of actions capable of ceasing such intervention.

Having established these premises, it is necessary to observe, from this point forward, how the “principle of the right to a future” may influence legal relationships between private individuals.

EFFECTIVENESS OF THE RIGHT TO A FUTURE

In contemporary legal theory, fundamental rights are recognized as having both subjective and objective dimensions, representing “value-laden decisions of a legal-objective nature within the Constitution, which project themselves throughout the entire legal system” (Sarlet, 2013, p. 180). That is, fundamental rights possess a subjective dimension and an objective one; the latter denotes a radiating effectiveness of fundamental rights, in the sense that they serve as guiding principles and basic values for the interpretation and application of infra-constitutional norms (Silva, 2011, pp. 47–48).

If fundamental rights can be understood as subjective rights, it is necessary to identify who their holders (titulares) are and against whom these rights may be exercised (destinatários). In this subjective function of fundamental rights, the holder is the active subject of the legal relationship; the recipient is the passive subject of this legal relationship, that is, the one against whom respect, protection, or promotion of a right is demanded (Sarlet, 2013, p. 183).

By the very structure of the legal relationship of fundamental rights, holders exercise this active role in relation to some rights, while occupying the passive role — as recipients — in relation to others. In other words, the existence of a fundamental right often corresponds to a fundamental duty.

Therefore, to identify who is the holder and who is the recipient of a fundamental right, it is necessary to analyze each right specifically. This analysis of the right to a future will be conducted using the legal position expressed in statement [E] — previously presented — and focusing, in particular, on its aspect as a defensive right.

This deontic statement initially provides that “any entity or person has the right to defense.” The conception of a fundamental right as a defensive right means that it can be invoked against illegitimate interventions perpetrated by public authorities (Bonavides, 2003, pp. 562–564). Likewise, this defensive characteristic enables the assertion of claims for abstention, annulment, and/or revocation to be used by the holder of these rights or by those with the capacity to represent or substitute them.

The exercise of the defensive right becomes actionable when an undue intervention occurs in the legal protection sphere of the fundamental right holder. The active subject holds positions, states, situations, and legal relationships of advantage — whether personal, collective, or diffuse — that cannot be infringed upon without triggering the consequences contained in the factual basis of the right.

Any person, natural or legal (including public entities) — as well as certain unincorporated entities — may be related to the right to a future, either as a holder or as a recipient. This right safeguards the maintenance of a balanced and healthy environment for present and future generations. That is, everyone has the right to enjoy a healthy environment, while also bearing the duty to preserve it for future generations. This does not disregard the need for economic, technological, and scientific development of peoples and nations, but it asserts that no development is legitimate unless it is sustainable (Morin, 2015, pp. 129–140).

The consolidation of these environmental rights and interests, of a diffuse nature, in postmodern society reinforces the understanding that solidarity, in addition to being accepted as a principle, must be understood as a value that guides the law, recognizing that human dignity is the means of preserving life and liberty with equality (Cardoso, 2012, p. 14).

Likewise, as affirmed by the Federal Supreme Court (STF) in the judgment of Writ of Mandamus (MS) No. 22.164-0/SP, this diffuse right may be enjoyed by the entire human group, regardless of gender, age, nationality, citizenship, etc.; it is a right grounded in fraternity and solidarity, whose thematic scope transcends the individual sphere.

Legal entities may be holders of certain fundamental rights. In the context of the right to a future, it is essential to emphasize that the State is one of the holders of this right, given its immediate legal interest in maintaining a healthy environment, since only with this environmental balance can it

satisfactorily fulfill its purposes. Furthermore, private legal entities may also — in certain cases — hold these rights, because the Constitution guarantees them the exercise of economic activity, but conditions this enterprise on sustainable development. Once it is established that the right to a future is one of the facets of sustainability, companies may also occupy the active role in these fundamental legal relationships.

A central question is whether “future generations” can be included in the concept of holders of these fundamental rights. These generations consist of people who have not yet been born, so it is necessary to determine at what point a natural person acquires the capacity to be part of a legal relationship or to hold a legal status.

Traditionally, a person is understood as “a physical or collective entity capable of holding rights and obligations, being synonymous with a legal subject” (Diniz, 2009, p. 518). Every person, natural or legal, is endowed with legal personality and, consequently, will have the capacity to participate in legal relationships according to the capacity granted by the legal system. Thus, for a natural person to participate in legal relationships, they must possess legal personality (Diniz, 2009, pp. 519–524). Therefore, determining whether future generations hold the right to a future necessarily involves analyzing the moment at which legal personality is acquired.

Although the issue of the beginning of personality is directly linked to fundamental rights — especially those immediately related to the condition of being human — the 1988 Federal Constitution does not contain an express provision on this matter. The normative act that addresses the issue is the Civil Code, which provides in Article 2 that “civil personality begins at birth with life; but the law safeguards, from conception, the rights of the unborn.” The interpretation of this article is the subject of doctrinal divergence.

According to natalist theories, personality begins at birth with life; for adherents of this theory, before birth with life, the unborn has no legal personality. In contrast, for those who adhere to conceptionist theories, personality begins at conception (Nader, 2014, pp. 270–271). Distinct from these two theories, Maria Helena Diniz (2009, p. 524) argues that the unborn (intrauterine life) and the embryo conceived in vitro (extrauterine life) possess *formal legal personality* with respect to personality rights; they acquire *material legal personality* after birth, when they begin to hold patrimonial and obligational rights.

Thus, having personality depends on the legal fact of “being born alive” or “being conceived,” depending on the theory adopted. Accordingly, understanding the holder status of the right to a future involves integrating this fundamental rights norm with the theories of the beginning of personality.

If a pure natalist theory is adopted, only living persons are holders of fundamental rights; thus, the preservation of the environment for future generations would merely be characterized as a fundamental

duty of the current generation. In this view, with respect to future generations specifically, there would be no qualified (or even qualifiable) natural persons as holders of this right — only recipients of this fundamental constitutional decision.

However, if a conceptionist theory is adopted, the unborn may be understood as holders of the “right to a future,” since they possess personality and, therefore, may occupy the active role in legal relationships, especially those involving fundamental rights. From this perspective, the current generation would continue to be the recipient of the fundamental duty to preserve the environment for future generations, but qualified holders of this fundamental rights provision would already be foreseeable.

Nevertheless, under both theoretical approaches, those who have not yet been conceived lack personality and, therefore, the capacity to be holders of rights. That is, someone who will be born fifty years from now can certainly be included in the context of the “future generation” of the fundamental rights norm; however, this person yet to come cannot, under any conception, be understood as a holder of this fundamental right.

Thus, these future generations can only be apprehended as “potential legal subjects”; however, the present generation has the duty to ensure that future generations are able to enjoy a balanced environment and make decisions in a context of freedom of choice. This fundamental duty is based on an ethical question of responsibility, which mandates the safeguarding of conditions for a future human life in dignity, prohibiting irreversible changes to the ecosystem and the depletion or unavailability of essential natural resources (Krell, 2013, p. 2064).

Having completed this analysis of the holder status of the defensive right represented in statement [E], we now proceed to a more in-depth examination of who is the recipient of this norm.

RECIPIENT OF THE FUNDAMENTAL RIGHT

The traditional recipient of fundamental rights is the public authority. However, the phenomenon of the constitutionalization of law — particularly through its aspect of “reinterpreting the law” — has significantly altered this landscape. The consequences of this new legal perspective include the recognition of the direct horizontal effectiveness of fundamental rights in private relationships (Souza Neto; Sarmiento, 2014, p. 43).

Thus, both public authorities and private individuals are recipients of the fundamental duty to protect and ensure a healthy and ecologically balanced environment for present and future generations, since solidarity is also a matter of social responsibility aimed at establishing a just order (Cardoso, 2012, p. 21).

Being a recipient of this fundamental duty imposes a series of material and procedural constraints on the passive subject (State or private entity) to ensure that their actions conform to the right to a future.

These constraints are present in numerous activities of the subject. The following analysis explores how these parameters influence the creation of legal norms by the recipients of this duty.

The validity of a legal norm can be assessed as a matter of one norm being immunized by another. That is, a legal norm will be considered valid, from a pragmatic standpoint, if it complies both procedurally and teleologically with the superior norm(s) — the immunizing norm(s) (Ferraz Junior, 2018, pp. 190–196).

In this context, the process of creating a legal norm must be observed under these premises. Therefore, for a legal norm to be valid, it must respect procedural limits (conditional conformity) and aim to achieve the goals intended by the norms that form part of its immunization relationship (teleological conformity).

Public authorities are bound by fundamental rights, especially by the constitutional clause of the Democratic Rule of Law. Thus, the State's process of norm creation must always be guided by fundamental rights, since the Constitution regulates both the procedure for forming normative acts and the material limits of their content (Streck, 2018, pp. 109–110). This binding of norms to fundamental rights is guaranteed by constitutional jurisdiction, understood as the interpretation and application — direct or indirect — of the Constitution by judicial authorities (Barroso, 2016, pp. 232–233).

Until now, it has been emphasized that the creation of norms must be subject to the formal and teleological content of fundamental rights. However, it is important to remember that norms are not created solely by public authorities: there are also private contractual sources of legal norms. Acts of exercising autonomy of will can create binding legal norms for those participating in the agreement (Ferraz Junior, 2018, p. 257). This creation of norms is not exempt from respecting fundamental rights; due to the horizontal effectiveness of these rights, the process of creating private norms is subject to the parameters of the Constitution.

Following this line of reasoning, two individuals may enter into a contract (a private source of legal norms) that creates binding norms between the parties. The validity of these norms depends — among other factors — on compliance with the imperatives arising from the norms related to the right to a future.

Consider the situation in which a farm owner enters into a rural lease agreement with a company that wishes to plant soybeans on the land. In the negotiated agreement, the parties stipulate that the lessee may use any means deemed appropriate for the cultivation and maintenance of the crop. The lessee begins using pesticides in large quantities; although the agricultural chemicals used are permitted by law and by the contract, they are extremely harmful to human and non-human life. A brief analysis of this proposed case follows.

The contract in question is a private source of legal norms for the parties, based on the fundamental right of autonomy of will. Despite being grounded in a constitutional principle, the actions of the parties may be configured as an intervention in the scope of protection of the aspect of the right to a future provided in statement [E]. Understood as a defensive right, it is necessary to determine whether the conduct described above constitutes a restriction or violation of this constitutional right. This final assessment involves examining the (il)legitimacy of the private legal norm, to be conducted through weighing the concrete weight of each of the colliding principles.

It should be emphasized that the social and solidarity function of the company requires not only compliance with legal commands and consideration for the community as a whole, but also collaboration in the sustainable development of society. The company is socially responsible for adopting practices that contribute to improving the quality of life in the community in which it operates (Santiago; Medeiros, 2017, pp. 114–117).

If it is understood that, in the concrete situation, the weight of individual freedom to contract is greater than the need to safeguard a healthy and ecologically balanced environment for future generations, then we are faced with a constitutionally legitimate restriction, representing a typical clash of fundamental rights. Thus, the private norm would not have violated the right to a future and would remain as the result of the balancing of colliding principles.

Conversely, if it is understood that the concrete weight of the principles related to the right to a future is greater, and that economic development must necessarily be sustainable, then we are facing a violation of a constitutional provision. From the perspective of the defensive right in this legal situation, it would be possible for the Union, for example — acting as a holder of the right to a future — to file a lawsuit to halt the environmental damage and demand the restoration of the degraded environment, in addition to any civil liability arising from these acts.

In this context, it becomes clear that the norms that provide for the right to a future possess effectiveness — understood as the capacity of a norm to produce its effects (Ferraz Junior, 2018, pp. 207–213) — in relation to acts of both public authorities and private individuals, due to the horizontal application of fundamental rights norms. The intensity with which this fundamental right affects legal transactions depends almost entirely on the specific circumstances of the concrete case.

Despite this dependency, it must be established that the execution of legal acts, even private ones, is bound to comply with the norms governing the right to a future. However, it is essential to emphasize that, to avoid excesses or deficiencies in the application of these norms, the correct procedure for verifying the factual basis of the right to a future must be carried out, with a broad analysis of the scope of incidence and the intervention, subjecting the latter to the test of constitutional legitimacy to confer validity on the legal act. That is, there is horizontal effectiveness of the norms concerning the right to a

future, but this does not dispense with the proper distinction between *prima facie* right and definitive right.

RIGHT TO A FUTURE AND LEGAL SUSTAINABILITY

The right to a future, understood as a fundamental right, emerges as an essential vector of legal sustainability, requiring the legal system to self-regulate in the face of environmental, social, and economic degradation risks. This right is not confined to the individual sphere but projects its effectiveness over the entire collectivity, linking the present to future generations and imposing a preventive and strategic vision on both public and private actions.

The notion of legal sustainability, in this context, goes beyond the mere formal maintenance of norms, consolidating itself as a normative capacity to ensure dignified and equitable living conditions for all — present and future (Sarlet, 2014).

As Sarlet (2014, p. 180) emphasizes, “fundamental rights radiate effectiveness throughout the system, projecting values and guidelines that shape the interpretation and application of law.” This radiating effect of values reveals that legal sustainability is not limited to the observance of rigid rules, but demands normative instruments capable of preventing irreversible damage to the environment and society, thereby guaranteeing intergenerational justice.

In this sense, the protection of the future is inseparable from the recognition that legal and political decisions made today directly shape the horizon of possibilities for future generations.

An ethical and ecological perspective is also fundamental to understanding the right to a future. Morin (2015, p. 105) observes that “its life conditions ours,” reinforcing that humanity bears an intrinsic responsibility for the preservation of the planet. This principle of responsibility is central to legal sustainability, indicating that the law cannot exempt itself from protecting the future, binding both public authorities and private actors. Thus, legal normativity must incorporate criteria of environmental and social sustainability, aligning contractual freedom, the social function of the company, and the preservation of natural resources in a balanced manner (Santiago; Medeiros, 2017).

Moreover, legal sustainability implies rethinking the role of the State and the judicial system. It involves conceiving the legal order as a dynamic, preventive, and adaptive structure, capable of dealing with contemporary uncertainties and risks. Recent environmental jurisprudence has demonstrated this function by recognizing the need to protect diffuse and collective rights, ensuring the effectiveness of norms in accordance with the right to a future. In this framework, civil, environmental, and social liability ceases to be merely corrective and begins to play a preventive role, consolidating the integration between law, ethics, and sustainability (Sarlet, 2014; Santiago; Medeiros, 2017).

Therefore, legal sustainability is configured as a normative paradigm capable of consolidating the binding nature of both public and private conduct to the right to a future. It is not merely about avoiding violations, but about promoting the construction of stable and coherent conditions for the preservation of life, biodiversity, and social, economic, and cultural relations. This approach reaffirms the need to rethink legal interpretation from the perspective of intergenerational responsibility, integrating environmental protection, social justice, and economic efficiency into a holistic vision of legal governance (Morin, 2015).

In summary, the right to a future acts as a structuring axis of legal sustainability, guiding normative production and the application of laws so that the interests of future generations are incorporated into present-day decisions. Legal sustainability, by becoming a guiding principle of law, ensures that the normative order not only regulates behavior but also promotes effective conditions for dignified life, environmental balance, and social equity, making the legal system an active instrument of intergenerational protection.

FINAL CONSIDERATIONS

The 1988 Federal Constitution expanded the scope of fundamental rights and sought to ensure the effectiveness of norms that establish the purposes pursued by the constituent power. Environmental Law has been strongly influenced by the constitutionalization of law: environmental norms were incorporated into the constitutional text, and the protection of the environment was elevated to the status of a legal-objective value within the constitutional order.

This prominent position granted to environmental norms, combined with the growing societal appreciation for diffuse rights and interests, has led to the rise of sustainability as one of the pillars of environmental protection. Within this framework of ensuring sustainable development, the concept of the “right to a future” emerges, mandating the preservation of a healthy and ecologically balanced environment for both present and future generations.

The right to a future thus stands out as a fundamental right that expresses various deontic commands aimed at environmental protection. This constitutional norm safeguards life in all its forms and ensures that future generations will have conscious access to preserved essential environmental resources, allowing them to enjoy the benefits derived from such preservation.

The thematic scope of this right is occupied by the promotion and, once achieved, the maintenance of an ideal state of affairs. It seeks to guarantee the existence of a healthy environment for current generations, while also requiring that economic, technological, and scientific development be conducted in a sustainable manner. Sustainability is the indispensable element of this diffuse right.

Any intervention that is not constitutionally justified within the scope of protection of the right to a future may trigger the legal consequences contained in the factual basis of these norms. Among these consequences are the cessation of the intervention, environmental restoration, and the imposition of liability on those responsible for degradation.

Given the constitutionalization of this right, it gives rise to subjective legal positions that its holders may invoke — including through judicial means — to assert claims for the protection of a healthy environment. Furthermore, due to its objective dimension, the right to a future serves as a guiding principle for the interpretation and application of other norms, demonstrating its radiating effectiveness within the legal system.

Another significant consequence of the constitutionalization of law is the recognition that even private legal arrangements must respect constitutional norms. Thus, the right to a future has the power to shape legal norms, even those arising from private contractual acts, by ensuring that no undue interventions occur within its protective framework.

It is essential that the application of the right to a future be preceded by its correct interpretation, as an excessive application of this norm may unjustifiably hinder economic development, while an insufficient application may allow irreversible environmental damage, depriving future generations of the enjoyment of a healthy quality of life.

It must be emphasized that the right to a future is an ally of progress, for only through sustainable development — capable of ensuring the continued existence of natural resources, abundant fauna and flora — will humanity be able to thrive in a symbiotic relationship with the environment that surrounds and sustains all its aspirations and dreams.

Having examined these characteristics of the right to a future, it is clear that it constitutes a fundamental right, possessing all the formal and material qualities of norms of this nature. Moreover, given the horizontal effectiveness of fundamental norms, it can be applied to private relationships to support a variety of legal claims.

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GOOD PRACTICES IN FOOD PREPARATION FOR MEAL SERVICES: CASE STUDY IN A LONG-TERM CARE INSTITUTION IN SÃO LUÍS, MA

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ABSTRACT

The increase in the elderly population in today's society leads to an ever-increasing demand for institutionalization. One of the responsibilities of Long-Term Care Facilities (LTCFs) is to ensure the preparation and provision of safe meals, given the greater vulnerability of residents. The study was conducted at a Food and Nutrition Unit of an LTCF in São Luís, Maranhão, to identify the application of best practices in meal preparation. A descriptive case study was conducted, including bibliographical research and an exploratory quantitative approach. A checklist based on RDC No. 216/2004 (ANVISA) was used to assess compliance with Good Manufacturing Practices (GMP). Of the 46 items evaluated, only 75.6% were in compliance, classifying the Food and Nutrition Unit (FNU) as regular. Along with the Checklist, a report was prepared that showed the compliance conditions of the Facilities, Equipment, Furniture, and Utensils (75%); Food Handlers (71.43%); Raw Materials (100%); Food Preparation (71.4%), Food Storage (50%), and Display and Consumption of Prepared Food (83.3%). It was concluded that the LTCF studied presented a satisfactory diagnosis. However, it is suggested that the activities of the professionals responsible for the sectors be increased in order to achieve greater satisfaction, since qualified professionals promote significant improvements in the hygienic and sanitary conditions of food establishments, as well as training the entire team of food handlers in the area of good food production and handling practices.

Keywords: Long-term care facility; Food; Handling; Good practices.

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INTRODUCTION

Aging is a natural stage of the human life cycle. It is an increasingly common phenomenon, as the rise in the number of elderly individuals is evident worldwide due to the exponential increase in life expectancy (Ratuchnei et al., 2021).

In recent years, the aging process of the population has emerged as a demographic trend in both developed and developing nations. Data provided by the Brazilian Institute of Geography and Statistics (IBGE) revealed that the trend of population aging has intensified, and the number of individuals over 60 years old in Brazil already surpasses the number of children up to 9 years old (IBGE, 2020).

Aging occurs as a result of a series of bodily changes that take place over time—a normal developmental process involving numerous endogenous and exogenous factors that must be carefully considered in an integrated manner. It is also true that aging manifests differently in each individual, as it depends on natural and genetic changes as well as lifestyle (Brandão; Zat, 2015).

As soon as functional problems begin to appear, mental, cognitive, and especially physical limitations arise, and many elderly individuals start requiring special care. When families cannot provide such care for any reason, dependent elderly individuals move to Long-Term Care Facilities (LTCFs). This applies to any governmental or non-governmental organization (Brazil, 2021).

Although all people are susceptible to Foodborne Diseases, it is known that the elderly belong to a high-risk group for infections of any nature, especially microbiological, due to changes in the immune system. Based on these facts, it can be stated that proper nutrition plays a vital role in supporting the health and well-being of the elderly, and healthy eating is important at all stages of life. In this context, Karlsen et al. (2017) affirm that good practices consist of procedures adopted to ensure food quality and safety, reduce contamination risks, and guarantee the provision of adequate meals for the population. Similarly, Martins et al. (2018) and Santos et al. (2019) emphasize that adopting these practices contributes to preventing foodborne diseases, improving the nutritional quality of meals, and increasing consumer satisfaction.

With this perspective in mind, the National Health Surveillance Agency (ANVISA) published RDC No. 216/2004, which addresses the Technical Regulation of Good Practices for Food Services. In Brazil and other countries, good practices generally follow the recommendations of the Codex Alimentarius and must be formally described in a Good Practices Manual specific to each establishment (Brazil, 2004).

Considering the current scenario of long-term care institutions in São Luís, Maranhão, this study is justified by the need to ensure the quality and safety of food provided to residents of these institutions. Therefore, the research aimed to evaluate good practices in meal preparation services and verify whether well-being practices are present in the meals offered to residents.



THEORETICAL FRAMEWORK

POPULATION AGING

Population aging is a universal phenomenon that has become increasingly relevant for both developed and developing countries. This phenomenon is characterized by an increase in both the absolute number and the percentage of elderly individuals within the total population (Alves, 2019).

In the state of Maranhão, the elderly population has also grown at an annual rate of 3.1%. The share of elderly individuals in the total population rose from 9.3% (630.2 thousand) in 2012 to 12.0% (856.5 thousand) in 2022, as shown in Figure 1 (IBGE, 2022). During this period, the proportion of people aged 60 or older increased from 11.3% to 15.1% of the population. Based on these official data from the Brazilian Institute of Geography and Statistics (IBGE), it is evident that there has been a significant increase in the proportion of people aged 60 or older, indicating that Brazil's population is aging.

This demographic shift is particularly intense in Brazil, a country that until recently had a predominantly young population. This has resulted in significant changes in the age composition of the population, with a notable increase in the proportion of individuals aged 60 or older. According to Carvalho and Martins (2016), the elderly population grows every year in several countries. In Europe, it is estimated that this population will reach 207 million in 2025 and 220 million in 2050.

Discussions on population aging began on the international stage during the 1982 World Assembly on Aging, which formulated the Vienna International Plan of Action on Aging. As a signatory to the plan, Brazil began to incorporate this topic more confidently into its political agenda, both in public policies and in initiatives led by civil society. Brazilian legislation establishes in Article 230 of the 1988 Federal Constitution that the care of dependents is the responsibility of the family, society, and the State (Brazil, 2022). Given these issues, population aging has received increasing attention and concern from civil society.

To establish minimum standards for the operation of LTCFs, the Collegiate Board Resolution (RDC) No. 283 of 2005 was created, later revoked by RDC No. 502 on May 27, 2021. This RDC enshrined in legislation the guarantee of the rights of the elderly population, the obligation to prevent and reduce health risks for institutionalized elderly individuals, and the need to improve the quality of public and private services provided in LTCFs.

LONG-TERM CARE INSTITUTIONS (LTCFs)

The increase in life expectancy, along with changes in family structure, has contributed to a proportional rise in the number of elderly individuals living alone. Providing care for the elderly within

the family environment has become increasingly difficult due to smaller family sizes, geographic dispersion, and complex family dynamics (Campos, 2018).

LTCFs are facilities that provide services to elderly individuals through various care modalities and legal structures, including philanthropic institutions with a history of offering homes for the elderly. The purpose of an LTCF is to accommodate elderly individuals who require social support, have weakened family ties, and, in most cases, lack family connections. Other facilities combine service provision with health-related similarities, but essentially, LTCFs are social institutions (Alcântara; Camarano; Giacomini, 2016).

The emergence of institutions for the elderly is not a recent phenomenon. Their history dates back to ancient Greece, where gerontokomeions (from the Greek géron, gérontos, old + kómeo, meaning care) served as hospices, hospitals, asylums, shelters, or dormitories for the elderly (Araujo; Souza; Faro, 2010). In the West, the first residence for the elderly was founded by Pope Pelagius II (520–590), who renovated his own home and converted it into a hospital for the elderly. In 10th-century Great Britain, there are records of houses called asylums located near monasteries, which provided shelter for defenseless elderly individuals and were maintained through donations from the church and the community.

The term *Instituição de Longa Permanência para Idosos (ILPI)* was originally proposed by the Brazilian Society of Gerontology (SBGG) and accepted in 2003, defining it as an integrated care unit aimed at individuals aged 60 or older, whether dependent or independent, providing social and health services to ensure quality of life in an environment with residential characteristics similar to a home (SBGG, 2008). However, in literature and legislation, these institutions are referred to by various terms, such as ILPI, sanatorium, asylum, nursing home, rest home, clinic, and others. The English equivalent is Long-Term Care Institution, commonly translated as long-term care facilities (Scherrer Júnior, 2020). Thus, LTCFs are defined as residential institutions, governmental or non-governmental, intended for collective housing of individuals aged 60 or older, with or without family support, in conditions of freedom, dignity, and citizenship. These institutions are regulated by the Collegiate Board Resolution (RDC) No. 502 of 2021, issued by the National Health Surveillance Agency (ANVISA), which establishes minimum operating standards for these facilities, covering aspects such as human resources, physical infrastructure, hygiene, health, and food services (Brazil, 2021).

Nogueira (2022) states that LTCFs are committed to providing comprehensive care to elderly individuals who, for various reasons, cannot or do not wish to continue living alone or with their families. Thus, the institutionalization process offers the elderly comprehensive health care, thereby improving their quality of life.

GOOD FOOD PRACTICES

Food is one of the most important human activities because its acquisition, selection, and preparation involve not only biological aspects but also social and cultural dimensions. Cooking, therefore, is an ancient art that has accompanied humanity throughout history, going beyond food preparation techniques to encompass the symbolic, sensory, and cultural aspects of a group, particularly in the home context, where shared meals are constructed, providing both the pleasure of eating and food-related rituals (Nogueira, 2022). An appropriate diet for the elderly is essential to prevent common nutritional complications in this group, such as chronic diseases, malnutrition, overweight, and obesity. Foods intended for the elderly should be flavorful and preferably seasoned with natural ingredients, as taste perception tends to decline with age. In this situation, elderly individuals often consume excessive amounts of salt, which should be avoided in this age group.

It is important to note that, in addition to selecting appropriate foods, it is equally essential to follow certain precautions when purchasing, storing, and preparing them. These precautions include maintaining personal hygiene and ensuring a clean environment during meal preparation. Those responsible for handling food must exercise extreme care to avoid contamination and preserve the nutritional value of foods, keeping away microorganisms that can cause foodborne illnesses (Brazil, 2009).

Good Manufacturing Practices (GMP) are standards or practices related to the handling, storage, and transportation of inputs, raw materials, packaging, and utensils, aiming to ensure quality and compliance with food legislation, from raw material to the finished product (Nuvolari, 2019).

According to Veronezi and Caveião (2016), the implementation of GMP in food services, in addition to being a legal requirement, improves product quality, ensures food safety, reduces costs, and provides greater security and satisfaction for consumers.

Good Practices can be defined as procedures aimed at producing and marketing food that poses no health risks. Due to a lack of knowledge about sanitary legislation, food handlers often perform their activities unsatisfactorily, outside the established standards (Lima et al., 2021).

The most recent regulation is RDC No. 216, dated September 15, 2004, which addresses the “Technical Regulation of Good Practices for Food Services.” It applies to all activities involving food, such as handling, preparation, portioning, storage, distribution, transportation, display for sale, and delivery of prepared food for consumption, including cafeterias, buffets, commissaries, confectioneries, industrial kitchens, institutional kitchens, delicatessens, snack bars, bakeries, pastry shops, restaurants, rotisseries, and similar establishments (Brazil, 2004). Based on this resolution and as determined by ANVISA, Food and Nutrition Units (FNUs) must also present a Good Manufacturing Practices Manual, detailing the operations carried out by the establishment, as well as Standard Operating Procedures



(SOPs) that describe a step-by-step guide for tasks to be followed in food services (Vasques; Madrona, 2016).

METHODOLOGY

The LTCF selected for this study has the capacity to accommodate 40 individuals. Its staff includes nursing technicians, stretcher-bearers, general service assistants, laundry workers, administrative technicians, a director, and professionals in social work, nursing, psychology, physiotherapy, speech therapy, occupational therapy, and security. In the meal production area (Food and Nutrition Unit – FNU), there are 14 employees, including a nutritionist, a food technologist, cooks, kitchen assistants, and administrative staff, working on a rotating schedule.

The research was conducted in three stages: First stage: A bibliographic review was carried out through the analysis of scientific articles and current sanitary regulations established by ANVISA. Second stage: A field study was conducted using an observational approach, with data collection based on a checklist derived from RDC No. 216 of September 15, 2004 (Brazil, 2004), in accordance with RDC No. 275 of October 21, 2002 (Brazil, 2002), which served as the basis for data collection.

Additionally, a questionnaire was administered to the coordinator of the Food and Nutrition sector of the LTCF under study. The checklist covered aspects such as: buildings, facilities, and equipment; food handlers; raw materials and ingredients; food preparation; storage of prepared food; and food display.

Based on the analysis of the results obtained through the application of the checklist in the Food and Nutrition Unit, the factors were classified into three groups: Group 1 – Good: 76% to 100% compliance; Group 2 – Regular: 51% to 75% compliance; Group 3 – Poor: 0% to 50% compliance. The third stage consisted of data analysis and tabulation.

RESULTS AND DISCUSSION

In accordance with the tool used for quality control diagnosis—the checklist—and the sanitary legislation, it was possible to verify the compliance percentages of the Long-Term Care Institution under study. The institution presented an overall compliance score of 75.6%, with 24.4% of items non-compliant, and was therefore classified in Group 2, considered to be at regular sanitary risk, meaning it did not fully meet all the criteria required by RDC No. 216/2004.

According to Santos (2019), in a study on long-term care institutions, the classification was also Group 2 (Regular), with a compliance rate of 52.96%. That study analyzed 14 LTCFs, and only one achieved compliance above 75%, qualifying for Group 1 (Good), while the vast majority met less than 50% of the checklist items.

Other studies also found Food and Nutrition Units (FNUs) classified in Group 2 (Soares et al., 2018). Silveira et al. (2016) analyzed 35 articles published between 2004 and 2013, evaluating 1,326 food service units, and observed that FNUs had an average compliance rate of 55.5%, thus also classified in Group 2, which is similar to the findings of the present study.

Eight items related to the physical and structural characteristics of the institution were analyzed, such as floors, walls, ceilings, doors, windows, sanitary facilities, lighting, ventilation, water supply, among others. The compliance percentages identified were 75.61% of items in conformity and 24.4% of items non-compliant. In the external area, access is wide, direct, paved, adapted for accessibility, and clean. Inside the kitchen, the ceiling has a good finish and is light-colored, while in the dining area (refectory), signs of infiltration and mold were observed. The walls and floor are light-colored, have a smooth finish, and are easy to clean, at an appropriate height.

The waste bins are equipped with lids and operated without manual contact. The washbasins have odorless antiseptic liquid soap and non-recycled paper towels, also operated without manual contact, ensuring proper hygiene.

Eight items related to personal hygiene and food hygiene were analyzed, resulting in a compliance rate of 75% in relation to RDC No. 216/2004. During the research, the following conformities were observed: health control of food handlers; absence of lesions or illnesses; proper handwashing; use of hairnets in the food area and by visitors; and periodic training of handlers. On the other hand, non-conformities were also noted, such as the use of adornments and inappropriate uniforms, which were dark-colored and tight-fitting.

Similar observations were reported by Oliveira et al. (2014), who noted the use of adornments by handlers during food preparation, which facilitates contamination. Likewise, Oliveira et al. (2016) found the same issue in 81.2% of the establishments evaluated, in addition to handlers not wearing light-colored, exclusive uniforms for the production area.

According to RDC No. 216, personal hygiene is of utmost importance. Handlers must wear uniforms and change them daily; personal objects and clothing must be stored in designated areas; hair must be tied and covered with protective hairnets. The regulation also requires the removal of adornments during handling; failure to comply with these measures poses a risk to consumer health due to the high probability of microbiological and/or physical contamination. Furthermore, health control of handlers must be carried out and documented, and any handler showing symptoms must be removed from activities to prevent contamination of food and the work environment (Brazil, 2004).

Five items related to suppliers of raw materials, ingredients, and packaging were analyzed, and the performance in this category was 100% compliance. During the application of the checklist, it was observed that the food storage areas were clean, organized, and equipped with protective screens. It was

reported that raw materials and ingredients are acquired through bidding processes or donations. A list is prepared by a food technologist, and dry goods are purchased monthly. For perishable foods (fruits, vegetables, greens), purchases are made weekly, referred to as a “basket,” to avoid food waste. Upon arrival, the food is sent to storerooms I and II, where it is removed from secondary packaging and placed on shelves, pallets, freezers, and refrigerators.

When it comes to food preparation sixteen items were analyzed, resulting in a compliance rate of 71.4%. Among the conformities, it was noted that the raw materials and foods used for meal preparation were in suitable condition for consumption. In the food preparation area, there are three stainless steel counters designated for raw foods, stationary foods, and ready-to-eat foods, arranged to prevent cross-contamination. However, during the application of the checklist, some practices were observed that do not comply with legislation, such as thawing chicken portions at room temperature on the countertop. This non-conformity was also identified in the study by Lemos et al. (2021), where meat thawing was carried out at room temperature, immersed in containers with water, and without temperature checks of the prepared food. Based on these observations, it was found that 60% of Food and Nutrition Units presented poor compliance according to legislation. The legislation recommends that thawing should be carried out under refrigeration at a temperature below 5 ± 2 °C or in a microwave oven when the food will be immediately cooked (Brazil, 2004).

Another non-conformity observed was the absence of temperature recording and monitoring during food storage and cooking. It is important to highlight that similar findings were reported by Lopes et al. (2014) and Barbosa (2018), who also noted the lack of temperature records in food production processes in Long-Term Care Institutions.

Regarding the storage of prepared foods two items were analyzed, and overall compliance was 50%. It is worth highlighting that during meal preparation, care was taken to portion the meals, that is, to prepare and place individual meal portions in separate, labeled containers. The results found in this category are consistent with the research by Silveira et al. (2016), who, in a study conducted through a literature review evaluating 35 articles and totaling 747 FNUs across all regions of Brazil, assessed sanitary conditions using a checklist and found that, among all FNUs analyzed, only 50% were in compliance with this category.

Regarding the exposure of prepared food seven items were analyzed, and a compliance rate of 83.3% was obtained. The areas presented adequate hygienic-sanitary conditions and were free of ornaments and plants in the production area.

To ensure food safety, it is necessary that the area where meals remain on display is organized and maintained under proper hygienic-sanitary conditions, as well as that the equipment functions properly and is compatible with the activities performed. It is important that the equipment is kept at controlled

temperatures, appropriately sized, and equipped with protective barriers to prevent contamination by the consumer or any other source (Silva et al., 2016).

In an interview with the nutritionist and coordinator of the Food and Nutrition Unit (FNU), it was reported that the institution provides its residents with 186 conventional meals and 40 special meals daily (for elderly individuals with dietary restrictions, such as diabetes, or those who are bedridden). These meals are distributed across various eating occasions: breakfast, morning snack, lunch, afternoon snack, and supper. Regarding the presentation of the meals offered, there is variety in the menu, which is prepared weekly by the nutritionist.

The diet of elderly individuals must be balanced and include foods that replenish nutrients lacking in the body, helping to correct nutritional deficiencies and prevent certain diseases common in this age group. The nutritionist must implement changes in eating habits through planning and management, always controlling the consumption of certain foods and complementing them with others that can meet the body's needs, providing proteins, carbohydrates, lipids, vitamins, and minerals.

The main challenges faced by the institution in implementing well-being practices for the elderly are related to bureaucracy. Being a government institution, all food procurement requires formal bidding processes, which can delay the supply of meals to the elderly. Finally, it is evident that the institution welcomes its residents and seeks the necessary resources to ensure they have a better quality of life, making the environment resemble their former home.

CONCLUSION

Long-Term Care Institutions accommodate elderly individuals and people in situations of vulnerability, who often depend exclusively on the meals provided by these institutions. Therefore, it is essential to ensure that these meals are prepared in accordance with best production practices, guaranteeing both nutritional adequacy and food safety for this population.

Through the development of this study, it was possible to confirm the objectives proposed, which were: to identify the hygienic-sanitary conditions in the Long-Term Care Institution and to verify compliance with good food practices and well-being measures in the meals offered to the elderly, as established by current legislation in the Food and Nutrition Unit analyzed.

It was possible to identify that the compliance index found reflects good hygienic-sanitary conditions, as the facility met most of the adequacy criteria required by RDC No. 216/2004, achieving a compliance rate of 75.6%, classified as regular.

To ensure the provision of safe meals from a hygienic-sanitary perspective, some aspects need improvement, such as: carrying out upgrades in buildings and installations, improving equipment, providing continuous training for food handlers, and enhancing procedures during food preparation. By



implementing these measures, the LTCF will have the possibility of increasing compliance rates and, consequently, ensuring greater safety of meals and protecting consumer health against waterborne and foodborne diseases.

Therefore, it is recommended to intensify the actions of professionals directly involved in the nutrition sector and correct the deficiencies identified in the evaluated items, so as to achieve greater consumer satisfaction and improve the hygienic-sanitary conditions of the facilities and the food produced.

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HIDDEN RISKS: AN INVESTIGATION INTO THE EFFECTIVENESS OF GOOD FOOD HANDLING PRACTICES IN SEASIDE RESTAURANTS IN THE CITY OF SÃO LUÍS – MA

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ABSTRACT

Food safety has become a topic of increasing importance in the field of public health, especially in regions with intense tourist activity, such as the city of São Luís, capital of the state of Maranhão. Given the need to guarantee consumer health and ensure the quality and maintenance of services in the local

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tourism sector, the objective is to identify potential hidden risks in food handling and storage processes, in addition to assessing the degree of compliance of these establishments with the criteria established by the legislation of the National Health Surveillance Agency (ANVISA). To this end, a checklist developed based on Resolution RDC No.216 (Brazil, 2004) was applied, document that regulates good practices for food services in Brazil. Thus, it was observed that an average of 65.5% of responses were positive, which, according to the adopted criteria, classifies the fifteen restaurants evaluated as having a regular level of GMP compliance. This allows us to conclude that there are good intentions and specific efforts on the part of the establishments, but also highlights the urgent need for structural improvements, ongoing training of food handlers, and greater rigor in the application of health protocols.

Keywords: Food safety; Hygiene; Food handling; Sanitary risks.

INTRODUCTION

Food safety constitutes a central element in discussions on public health, especially in urban contexts where eating outside the home has become a daily practice. Restaurants, as environments for large-scale food production and consumption, play a critical role in this scenario, while also representing potential points of sanitary vulnerability. Improper handling and storage of food are directly associated with the incidence of waterborne and foodborne diseases (WFDs), highlighting the need for a rigorous analysis of the practices adopted by these establishments.

It is essential to ensure food safety, the quality of the meals served, and consumer health. Improperly handled or inadequately stored food can become contaminated, causing foodborne illnesses. Proper storage—with control of temperature, humidity, ventilation, and expiration dates—prevents spoilage, losses, and contamination, while maintaining the flavor, texture, and nutritional value of food.

In the city of São Luís – MA, there has been significant expansion of the food sector, driven by factors such as population growth, tourism, and diversification of eating habits. However, this progress is not always accompanied by the adoption of effective hygiene and food safety practices. Previous studies indicate that, despite the existence of regulatory standards such as ANVISA Resolutions RDC No. 275 and 216, recurring failures in the implementation of Standard Operating Procedures (SOPs) and in the training of food handlers compromise the effectiveness of preventive measures.

Supporting these concerns, Costa et al. (2023) analyzed samples of fish sold in restaurants along the São Luís seafront, revealing the presence of pathogenic microorganisms with potential risk to public health. The research identified deficiencies in handling and storage practices, emphasizing the need for stricter application of Good Manufacturing Practices (GMP) and compliance with current sanitary legislation. These findings reinforce the relevance of local investigations into the hygienic-sanitary quality of food offered in areas with high tourist traffic.

The present study aims to critically and systematically analyze the effectiveness of hygiene and food safety practices in handling and storage processes in restaurants located in the city of São Luís – MA. The analysis will be based on technical-scientific criteria that allow not only the identification of nonconformities but also an understanding of the structural, behavioral, and institutional factors that contribute to the persistence of hidden risks in this sector. It is expected that this will provide relevant input for the formulation of more effective intervention strategies adapted to the local reality, promoting advances in consumer health protection and the quality of food services.

THEORETICAL FRAMEWORK

GOOD MANUFACTURING PRACTICES (GMP) FOR FOOD

Good Manufacturing Practices (GMP) are recognized as fundamental tools for ensuring the quality and sanitary safety of food. They encompass operational standards that guarantee control over physical, chemical, and biological hazards throughout all stages of food production and handling. The application of GMP in food services is an effective strategy for preventing outbreaks of waterborne and foodborne diseases (WFDs), as it provides guidance ranging from personal hygiene control of food handlers to monitoring environmental conditions (Oliveira, Santos & Costa, 2021).

Studies indicate that failures in adopting good practices are frequently associated with foodborne illnesses and the loss of service quality. Furthermore, health surveillance authorities have emphasized the importance of continuous training for food handlers as a strategy to ensure compliance with established standards (Franco & Landgraf, 2008).

According to ANVISA Resolution RDC No. 275, dated October 21, 2002 (Brazil, 2002), GMP covers aspects such as the physical infrastructure of the facility, pest control, cleaning and sanitization of equipment and utensils, storage conditions, health and hygiene of handlers, and process traceability. Proper implementation of these measures significantly contributes to preventing contamination and foodborne outbreaks, promoting food safety and consumer confidence.

QUALITY AND SAFETY IN FOOD SERVICES

Quality in food services is directly related to process standardization, hazard control, and the application of specific technical standards that ensure the integrity of the food offered. These factors involve everything from raw material selection, temperature control, and handler hygiene to monitoring environmental conditions (Pereira & Costa, 2020).

Food safety, in this context, is achieved through a preventive approach based on good practice programs and continuous staff education. The absence of effective control can result in outbreaks of foodborne diseases, compromising consumer trust and business sustainability (Silva & Santos, 2018).

The implementation of sanitary control systems in food services must be constant and adaptable to local realities. In coastal and tourist regions, where there is high turnover of food and people, this control becomes even more sensitive, requiring strict application of standards and close monitoring of internal procedures (WHO, 2020).

WATERBORNE AND FOODBORNE DISEASES (WFDs)

Waterborne and foodborne diseases (WFDs) represent one of the greatest challenges to public health in the context of food services. These diseases are caused by the ingestion of food or water

contaminated by pathogenic microorganisms such as bacteria, viruses, and parasites, as well as toxins produced by these agents. The occurrence of WFDs is strongly associated with failures in good handling practices, inadequate hygiene conditions, and the consumption of raw or undercooked food (WHO, 2020).

In coastal areas with high tourist density, such as the São Luís seafront, the risk of WFD outbreaks can be amplified by the high circulation of people, specific environmental conditions, and, often, negligence regarding food safety. Sanitary monitoring of restaurants located in tourist regions must be rigorous, as the presence of contaminated water or poorly preserved food can compromise consumer health and negatively impact the tourism sector (Souza & Lima, 2023).

To prevent the spread of waterborne and foodborne diseases, it is essential to implement continuous good practices, combined with worker training and systematic inspection of establishments. According to Silva Júnior & Martins (2016), many risks present in the handling environment are invisible to the customer, making sanitary surveillance an essential component for ensuring safe food.

HYGIENIC-SANITARY CONTROL IN SEASIDE RESTAURANTS

In collective food establishments, hygienic-sanitary control is a central element for preserving public health and preventing foodborne diseases. This control involves the systematic application of standards and procedures aimed at ensuring food safety throughout all stages of the production process, from raw material reception to distribution to the final consumer (Almeida et al., 2019).

In food services that operate with a high volume of daily meals, such as restaurants located along the São Luís seafront, the risk of sanitary failures is heightened by environmental conditions, high product turnover, and pressure for quick service. Non-compliance with cleaning protocols, improper food storage, and lack of continuous inspection are recurring factors that compromise sanitary control in these environments (Oliveira, Santos & Costa, 2021).

ANVISA Resolution RDC No. 275/2002 establishes specific guidelines for the organization, hygiene, and maintenance of physical facilities, as well as for the adoption of Standard Operating Procedures (SOPs) that ensure food safety. These measures are essential to prevent cross-contamination and eliminate microbiological risk points (Brazil, 2002).

In addition to adequate physical structure, the human factor also plays a decisive role in this control. Continuous training of handlers and awareness of the risks associated with sanitary negligence are fundamental strategies for promoting a culture of responsibility and food safety within establishments (Ferreira & Mendes, 2022).

METHODOLOGY

This research adopts a quantitative and descriptive approach with an exploratory character, aiming to evaluate the hygienic-sanitary conditions in food handling and storage processes in restaurants located along the São Luís seafront (MA).

The study was conducted in fifteen restaurants situated along the São Luís seafront, selected by convenience, considering criteria such as location, customer flow, and the owners' willingness to participate in the study. The choice of restaurants in this region is justified by the intense tourist activity and the economic relevance of these establishments to the local food sector.

For data collection, a structured checklist was used, developed based on the criteria established by ANVISA Resolution RDC No. 216/2004 (Brazil, 2004). The instrument included items related to Good Manufacturing Practices (GMP), covering aspects such as: personal hygiene conditions of food handlers; physical structure of the handling environment; temperature control and food storage; cleaning and sanitization procedures for equipment and utensils; pest and vector control.

The checklist was applied during scheduled visits to the establishments, respecting all ethical and biosafety protocols. The data obtained were organized in electronic spreadsheets, enabling descriptive analysis of the results.

Conformities and nonconformities identified were expressed in absolute and relative frequencies (%), facilitating the identification of the main critical points related to hygienic-sanitary practices in the evaluated restaurants.

The study complied with the ethical principles established by Resolution No. 466/2012 of the National Health Council, ensuring the anonymity of participating establishments and the confidentiality of collected information.

To obtain the research results, a numerical score was assigned to the evaluated items, following the methodology proposed by Valente et al. (2003), as shown in Table 1. The collected information was organized in Microsoft Excel, which allowed the calculation of percentages related to items that showed compliance, considering only those with a positive response ("yes"), totaling 100% adequacy. In cases where certain criteria were classified as "not applicable" (NA), these were excluded from the reference total, considering only valid items for each analyzed restaurant. After analysis, the data were presented in tables to facilitate comparison among establishments.

Table 1 – Classification criteria for establishments according to the percentage of items met in the verification checklist.

SCORE (%)	CLASSIFICATION
91 - 100	Excellent
75 - 90	Good
50 - 74	Regular
30 - 49	Poor
< 30	Very Poor

Source: Mallon & Bortolozo, 2008

RESULTS AND DISCUSSION

According to the previous table, a tabulation was carried out evaluating the following items: Hand hygiene; Appearance and personal hygiene; Infrastructure, cleaning, and functioning of the establishment; Food handlers' perception of GMP; Profile of food handlers. A total of 600 items were addressed in the checklists, and an average of 65.5% positive responses was obtained, which means that the fifteen restaurants are classified as Regular regarding Good Food Handling Practices (Table 1).

HAND HYGIENE

One of the items evaluated in the checklist was “hand hygiene,” a fundamental practice to ensure food safety and prevent cross-contamination. The results showed that 74.07% of establishments presented positive responses regarding the correct adoption of this practice, while 25.93% were negative. Based on these percentages, this item was classified as Regular, indicating that although most restaurants comply, a significant portion still does not adequately follow this essential protocol.

Hand hygiene is one of the pillars of Good Handling Practices, as required by ANVISA RDC No. 216/2004. The absence or inadequate execution of this procedure can substantially increase the risk of pathogen transmission to food. According to studies such as Valente et al. (2003), failures in this aspect are recurrent in commercial food establishments and often reflect a lack of continuous training or ineffective supervision.

Thus, the data suggest the need for immediate corrective actions, such as periodic training programs for handlers and reinforcement of personal hygiene routines. These measures are essential to increase compliance and, consequently, promote greater consumer safety.

Chart 1: Personal Hygiene in Seaside Restaurants of São Luís – MA

HANDLER PERSONAL HYGIENE	COMPLIANCE (%)	CLASSIFICATION
Hand hygiene	74,07	Regular

Source: Prepared by the authors.

APPEARANCE AND PERSONAL HYGIENE

Another item evaluated was the “appearance and personal hygiene of handlers,” a fundamental criterion within Good Handling Practices as it is directly related to preventing physical and microbiological contamination of food. The data revealed that 57.46% of establishments presented positive responses, indicating that just over half of the handlers meet the minimum requirements established by sanitary legislation. With this performance, the item was classified as Regular, highlighting the need for significant improvements. The main problems observed included the use of adornments (rings, earrings, and bracelets), long or polished nails, unprotected beards, and the absence of hairnets or caps. These failures contradict the standards of RDC No. 216/2004, which establishes clear criteria regarding the personal presentation of workers who handle food directly.

Low adherence to these care measures may be associated with a lack of regular training, negligence in internal supervision, or even the absence of a properly qualified technical supervisor. Studies such as Silva et al. (2017) indicate that handlers’ personal appearance, in addition to being a sanitary requirement, directly impacts consumer trust, especially in tourist regions.

Chart 2: General Conditions of Handlers’ Personal Hygiene

HANDLER PERSONAL HYGIENE	COMPLIANCE (%)	CLASSIFICATION
Appearance and Personal Hygiene	57,46	Regular

Source: Prepared by the authors.

Thus, there is an urgent need to invest in continuous training, strengthen internal inspection routines, and promote a food safety culture within establishments. Appearance and personal hygiene should not be seen merely as a legal requirement but as an essential practice to ensure safe food and the credibility of the service provided.

INFRASTRUCTURE, CLEANING, AND FUNCTIONING OF THE ESTABLISHMENT

The item “infrastructure, cleaning, and functioning of the establishment” encompasses essential elements for maintaining a safe and hygienic environment for food preparation and distribution. The results indicated that 63.33% of the evaluated restaurants presented positive responses, resulting in a Regular classification for this criterion.

During technical visits, partially adequate physical structures were observed, with some establishments showing cracks in walls, worn floors or residue accumulation, insufficient ventilation, and lack of protective screens against vectors. These conditions compromise the physical barrier necessary to prevent the entry of contaminants and hinder efficient cleaning processes.

Regarding cleaning, most establishments maintained reasonably organized preparation areas, although in some cases there was dirt accumulation in hard-to-reach areas and a lack of documented cleaning and sanitization schedules. The absence of proof of cleaning routines is a recurring failure, contrary to RDC No. 216/2004, which requires standardized procedures and constant monitoring of facility cleaning.

Additionally, operational flow in some establishments did not follow the ideal production sequence, causing cross-contact between raw and ready-to-eat foods, which represents a significant risk of cross-contamination. Therefore, establishments must invest in structural adjustments, process standardization, and implementation of internal cleaning controls to ensure not only legal compliance but, above all, food safety for consumers.

Chart 3: Infrastructure Conditions of Seaside Restaurants

INFRASTRUCTURE	COMPLIANCE (%)	CLASSIFICATION
Infrastructure, Cleaning, and Functioning	63,33	Regular

Source: Prepared by the authors.

HANDLERS' PERCEPTION OF GMP

This aspect was evaluated in the study with the objective of understanding the degree of knowledge, awareness, and engagement of professionals with food safety principles. The data obtained indicated that 82.66% of the responses were positive, resulting in a “Good” classification for this item.

This result demonstrates that most of the handlers interviewed understand the importance of Good Manufacturing Practices (GMP), recognizing their application as essential for ensuring food quality and preventing health risks to consumers. Issues related to hand hygiene, proper use of uniforms, separation between raw and ready-to-eat foods, and temperature control were, in general, correctly mentioned by the professionals. Despite this good performance, a portion of respondents still showed partial lack of knowledge regarding more technical procedures, such as the importance of systematic verification of equipment temperature, the need for activity records, and the correct storage of cleaning products away from food. These points indicate the need for continuous reinforcement through training and educational actions.

According to Santos (2019), positive perception on the part of handlers is a key factor for the effective implementation of good practices. When professionals understand the risks associated with poor handling and are involved in quality control processes, there is greater adherence to standards and a lower rate of nonconformities in establishments.

Although the results are promising, it is recommended that restaurants maintain regular training programs with a practical focus and accessible language, in addition to encouraging active participation of employees in the food safety culture, reinforcing the role of each individual in maintaining the quality of services provided. As shown in Chart 4, 82.66% of the tabulated data are in compliance, demonstrating a positive aspect of the study.

Chart 4: Handlers' Perception of GMP

HANDLERS' PERCEPTION	COMPLIANCE (%)	CLASSIFICATION
Perception of GMP	82,66	Good

Source: Prepared by the authors.

PROFILE OF HANDLERS

The analysis of the item "profile of handlers" in the investigated restaurants revealed 80% positive responses, thus classified as Good. This topic focused on aspects related to job performance, specifically whether the handler enjoys performing their role in the food sector.

Most handlers expressed interest in working in the food area, which is an excellent indicator. However, throughout the research, many shortcomings were still observed regarding the provision of quality service, which directly affects those consuming the food offered. It was also observed that in some establishments there are handlers with low educational levels or without recent formal training, which may compromise the correct understanding and application of Good Practices. According to ANVISA Resolution RDC No. 216/2004, it is essential that handlers undergo periodic training and be supervised by qualified technical personnel to ensure compliance with operational procedures.

Studies by Oliveira et al. (2021) indicate that the profile of handlers directly influences the quality of the service provided, especially when there is low technical qualification or high staff turnover, which hinders the consolidation of an organizational culture focused on food safety.

Chart 5: Profile of Food Handlers

HANDLER PROFILE	COMPLIANCE (%)	CLASSIFICATION
Handler Profile	80,0	Good

Source: Prepared by the authors.

Although the results indicate a generally satisfactory profile, the importance of continuous investment in handler training is reinforced, both through internal training and by encouraging formal qualification. Establishments with well-prepared teams tend to show greater adherence to good practices and, consequently, lower risks to consumer health.

CONCLUSION

Based on the results obtained, it can be concluded that, on average, 65.5% of responses were positive, which, according to the adopted criteria, classifies the fifteen evaluated restaurants as being at a regular level of compliance with Good Manufacturing Practices (GMP). This result points to the existence of good intentions and specific efforts on the part of the establishments but also highlights the urgent need for structural improvements, continuous training of food handlers, and greater rigor in the application of sanitary protocols.

Thus, the study reinforces the importance of more effective monitoring by regulatory agencies, in addition to continuous investment in education and training for professionals who work directly in food production and handling. Only through these measures will it be possible to ensure safe food for the population and tourists who visit the region, contributing to the appreciation of local gastronomy and the promotion of public health.

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INFLUENCE OF HOSPITALITY AND HOSPITAL HOTEL MANAGEMENT ON NURSING SERVICES: A CASE STUDY IN A PUBLIC HOSPITAL IN SÃO LUÍS - MA <https://doi.org/10.63330/aurumpub.015-005>

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ABSTRACT

The practice of hospitality manifests itself in diverse forms and settings. When applied in social spaces, it tends to provide a positive experience for individuals involved in human relationships. The relevance of this application is evident in the introduction of hospitality techniques and services in hospitals. This research aimed to analyze the influence of hospitality and hospital hospitality on nursing services at a public hospital in São Luís, Maranhão. To this end, a single, exploratory, and descriptive case study was conducted, based on semi-structured interviews with nursing professionals at the hospital. Subsequently, the collected data were analyzed using content analysis. It was found that the interviewees had some limited understanding of relevant topics, especially regarding the concepts of hospitality and hospital hospitality. However, professionals relate these concepts to both tangible and intangible aspects. Regarding humanization, they demonstrate a perception aligned with the literature on the topic, although limited for healthcare professionals. When asked about the main services offered, it was observed that nursing professionals can go beyond their specific responsibilities, focusing not only on physical well-being but also on the patient's emotional and psychological needs, such as a warm welcome.

Keywords: Hospitality; Hospital hotel management; Humanization; Nursing.

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INTRODUCTION

Hospitality, as a social and cultural phenomenon, is an essential practice that permeates various spheres of human coexistence. Since ancient times, hospitality has been recognized as a fundamental virtue, marking the relationship between hosts and guests through gestures of welcome and generosity. This concept goes beyond a mere exchange of goods or services; it begins with a spontaneous act of giving—a gift that does not expect immediate return, but rather initiates a continuous cycle of offering and reciprocity. According to Camargo (2004), human contact in hospitality is established through a dynamic process of giving and receiving, where each act of reciprocation becomes a new gift, perpetuating an infinite cycle of interactions and exchanges.

The practice of hospitality manifests in diverse forms and is influenced by cultural, social, and economic factors, reflecting the values and traditions of different societies. A contemporary and relevant example of this application is the introduction of hospitality techniques and services in hospitals. This approach, as described by Godoi (2008), brings significant benefits not only in the social dimension but also in the physical, psychological, and emotional realms for patients, families, and staff. Implementing hospitality practices in hospital environments aims to humanize care, providing a more welcoming and comfortable atmosphere that contributes to the recovery and well-being of all involved.

Furthermore, hospital hotel management is a growing trend that seeks to transform the traditional institutional appearance of hospitals, adapting to new market realities through the introduction of new processes, services, and behaviors, as highlighted by Taraboulsi (2006). For this transformation to be effective, hotel management within a hospital must respect and adapt to hospital rules and functions.

Conversely, hospitality services should be understood as indicators of quality in the provision of welcoming services, based on operational and management principles that must be accepted and implemented by the entire hospital team, as pointed out by Boeger (2003).

Understanding hospitality from this broad and multidimensional perspective is crucial for deepening the study of human relationships and the social dynamics involved. Therefore, this scientific research aims to explore the different facets of hospitality, analyzing its importance and impact on social interactions and the construction of bonds between individuals and communities.

The interest in this research emerged from professional experience in a hospital unit. The hospitality sector was unknown until the moment of taking the hospital hotel management course, when the entire universe of this concept was introduced, and the relevance of hospitality in the patient care and stay process was recognized. This discovery sparked curiosity and a desire to delve deeper into research on the application of hospitality in the nursing sector of a public hospital in São Luís, MA.

Surveys on the topic were conducted using Google Scholar, SciELO, and the CAPES portal for journals, theses, and dissertations. The existence of research related to the subject was confirmed, notably

the study by Castro and Rodrigues (2021), which addresses hospitality from the perspective of analyzing the food and beverage sector of a public hospital in Ceará. Within the Hospitality Program at the Federal University of Maranhão (UFMA), research was conducted through the UFMA Hospitality Projects and Research Center (NuPPHo), confirming the existence of studies related to hospitality from various perspectives in private hospitals in São Luís.

However, the present research differs from others as it focuses on hospitality in the nursing sector of a public hospital in São Luís, MA. The study contributes to the development and construction of information and knowledge about how hospitality and hospital hotel management influence the provision of nursing services in the public sector. The research aims to analyze the influence of hospitality and hospital hotel management on nursing services in a public hospital in São Luís, Maranhão. It also seeks to understand nursing professionals' comprehension of the concepts of hospitality and hospital hotel management; investigate staff perceptions regarding the influence of hospitality on nursing services and hospital hotel management; and identify actions that reflect hospitality in the nursing services provided.

THEORETICAL FRAMEWORK

HOSPITALITY AND HOSPITAL HOTEL MANAGEMENT

Hospitality is a broad and multifaceted concept, whose evolution reflects changes in social and cultural practices over time. This section explores the history and conceptual foundations of hospitality, as well as its most relevant aspects, based on contributions from various authors such as Camargo (2015), Lashley and Morrison (2004), Gotman (2001), and Grinover (2007). It also presents the significant contribution of hospital hotel management to the quality of healthcare services. This approach seeks to improve the patient experience and, consequently, clinical outcomes. The section further addresses the evolution of hospital hotel management and highlights its most relevant aspects, drawing on works by Boeger (2017), Godoi (2008), and Taraboulsi (2009).

In the early civilizations, hospitality was limited to providing shelter and food to those away from their homes. This basic act of welcoming was essential for the survival and safety of travelers. Over time, hospitality evolved to encompass a wide range of services and structures, from hotels and inns to transportation and intangible services that promote physical and psychological well-being for guests (Dalpiaz et al., 2012).

The concept of hospitality is broad and varies according to different perspectives and contexts. According to Grinover (2007), hospitality is a specialized relationship between two actors: the one who receives and the one who is received. This relationship can occur in institutional, public, private, or familial contexts. Baptista (2002) defines hospitality as a set of services, attitudes, and structures in an



environment different from where the individual resides, aimed at providing well-being, comfort, safety, and quality reception.

Camargo (2004) describes hospitality as a set of unwritten laws that regulate the social ritual of welcoming. These rules still operate strongly in contemporary societies, establishing a contrast between hospitality and hostility. Hospitality, according to Camargo (2004), should be a positive attitude within any ethical code. Lashley and Morrison (2004) describe hospitality as the relationship built between host and guest, where emotional bonds are strengthened through the offering of food, drink, and accommodation.

Dias (2002) emphasizes that hospitality becomes a product, characterized as a service that provides physical and psychological comfort to the guest through interaction between strangers and physical and cultural structures. Praxedes (2004) defines hospitality as a human relationship based on reciprocal action between host and guest, depending on the values and principles of both.

Regardless of the time and space analyzed, hospitality holds the premise of the visitor's well-being and satisfaction (Costa, 2015). Hospitality is governed by ancestral unwritten rules, where the invitation to welcome initiates the ritual of socialization (Camargo, 2015). The violation of this ritual results in hostility, the opposite of hospitality. "Hospitality transforms strangers into acquaintances, enemies into friends, friends into best friends, outsiders into intimates, non-relatives into relatives" (LASHLEY; MORRISON, 2004, p.26).

In organizational environments, hospitality is evaluated by customer satisfaction, usually measured after payment for services received (Lashley and Morrison, 2004). In the hospital context, hospitality is closely linked to care, being essential for the patient's recovery and the satisfaction of their family members (Godoi, 2008). Boeger (2011) affirms that care is one of the clearest forms of practicing hospitality in healthcare institutions, improving service delivery. The relevant aspects of hospitality involve a complex network of social, cultural, and commercial interactions. According to Castelli (2003), demands in the healthcare field are inherently human, and the response to these demands fundamentally depends on the human elements involved in care. This concept emphasizes the centrality of the human being both in identifying needs and in providing healthcare services. Patients' needs are varied and complex, reflecting the diversity of human experiences and conditions. Therefore, the quality of healthcare service provision is intrinsically linked to the capacity, competence, and empathy of healthcare professionals. These professionals play a crucial role in interpreting and responding to patients' needs, offering care that goes beyond technical aspects and includes emotional and psychological support. Godoi (2008) suggests that the anguish and anxiety caused by prolonged hospitalizations can be alleviated through planned activities aimed at humanizing care and rescuing cultural values. The author further highlights that this interdisciplinary approach not only improves the patient experience but also

contributes to a more holistic approach to health, where care goes beyond medical treatment to encompass emotional and cultural well-being.

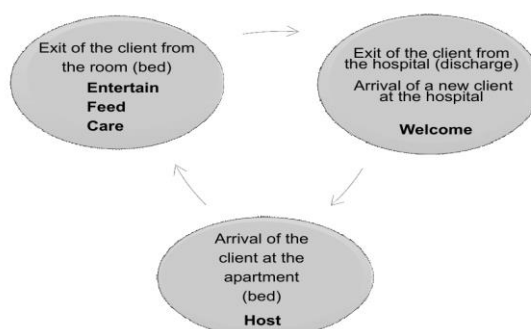
The origin of hospital hotel management is intrinsically linked to the growing concern with the quality of patient care. In recent years, hospitals worldwide have recognized the importance of offering more than just efficient medical care; the patient experience has become a critical component in healthcare service delivery. According to Boeger (2017), hospital hotel management emerges as a response to the need for humanization in hospital care, providing comfort and well-being to patients.

Historically, hospitals focused primarily on curing diseases, often neglecting patient comfort. However, with advances in medicine and increased competition in the healthcare sector, hospitals began adopting hospitality practices to differentiate themselves and attract patients. Godoi (2004) highlights that this evolution intensified in the early 21st century, with the integration of services such as quality food, welcoming environments, and personalized care—essential elements of hospital hotel management.

Thus, it is necessary to understand these new concepts. Boeger (2008, p.24) defines hospital hotel management as “the gathering of all support services which, combined with specific services, offer internal and external clients comfort, safety, and well-being during their hospitalization.” Godoi (2008) defines it as “the introduction of hospitality techniques and services in hospitals with consequent social, physical, psychological, and emotional benefits for patients, families, and hospital staff.” Boeger (2017) details that the evolution of hospital hotel management has come to incorporate advanced technologies and more efficient resource management, emphasizing the importance of sustainability and service personalization to better meet patient needs. Gonçalves and Ferreira (2013) understand that providing appropriate conditions during the patient’s stay should not only focus on infrastructure but prioritize a humanized and welcoming service.

In this regard, Boeger (2011) describes three critical moments in the patient’s hospital journey: admission, hospitalization, and discharge. Each of these moments is essential to ensure a positive patient experience. As shown in Figure 1:

Figure 1 - Patient Moments in the Hospital



Source: Boeger, 2011

As illustrated, all moments of the patient's hospital experience are important—from admission, which is the first contact with the hospital and where a warm and efficient reception is essential to reduce initial anxiety, to the hospitalization period, where the comfort of the environment, the quality of meals, and the attention of healthcare professionals are crucial for recovery. Boeger (2011) also points out that the discharge moment should be handled with care, ensuring that the patient receives all necessary guidance for continuing treatment at home.

From this perspective, Taraboulsi (2004) emphasizes that one of the pillars of hospital hotel management is the humanization of care. The author stresses that humanization involves treating the patient with dignity, respect, and empathy. This aspect is particularly relevant in hospital environments, where stress and anxiety are common. Humanization is not limited to medical treatment but extends to the physical environment and services offered. Comfortable rooms, pleasant décor, and nutritious meals are examples of how hospital hotel management can enhance the patient experience.

According to Godoi (2004), efficient resource management is a constant challenge in hospital hotel management. The author highlights that implementing this practice requires significant investments in infrastructure and training. However, the long-term benefits—such as patient satisfaction and reduced hospitalization time—justify these investments. Sustainability is also a relevant aspect, with the adoption of environmentally friendly practices and responsible management of natural resources contributing to hospitals' social and environmental responsibility.

Taraboulsi (2006) identifies key elements for the success of hospital hotel management. By focusing on hospitality services, hospitals not only improve the quality of care but also transform the hospital experience for patients and their families. The author lists several common hospitality services that can be adapted to the hospital environment, as shown in Table 1:

Table 1 – Hospitality Services Adaptable to Hospital Activities

Hotel	Hospital
<i>Reception – Check-in/Check-out</i>	Reception – Admission/Discharge
<i>Concierge (social reception)</i>	Information Desk
Food and beverages	Nutrition
Laundry	Hospital Laundry
Reservations	Scheduling/Programming

Source: Taraboulsi, 2006

Patient satisfaction is one of the main indicators of success in hospital hotel management. Taraboulsi (2009) points out that satisfied patients tend to have better clinical outcomes and adhere more faithfully to prescribed treatments. The perception of care and attention from healthcare professionals, combined with a welcoming environment, can reduce anxiety and stress, facilitating recovery.

Hotel management must respect and follow the norms and protocols established by the hospital. This includes aspects such as hygiene, safety, infection control, and public health regulations. Adapting hospitality practices to meet these requirements is essential to ensure that the introduction of hospitality elements does not compromise the safety and effectiveness of medical care. The future of hospital hotel management points toward greater integration of technologies, such as automation and artificial intelligence, to further enhance the patient experience. Additionally, service personalization, based on individual patient needs and preferences, is expected to become a common practice.

METHODOLOGY

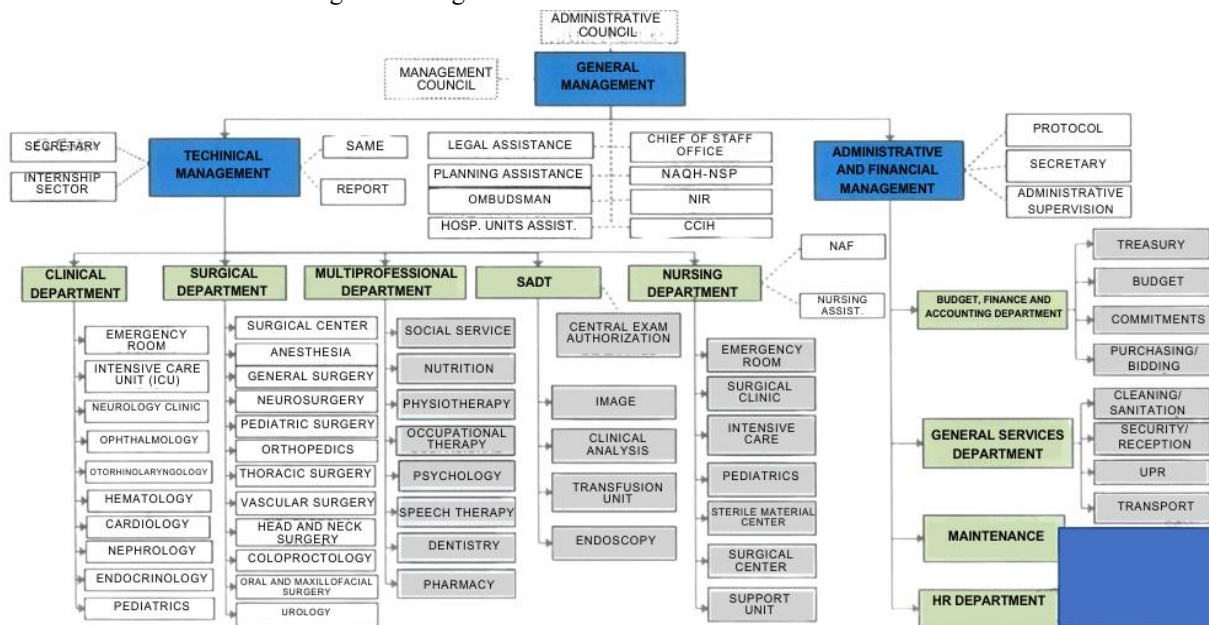
This research is characterized as a case study, given its features and the investigative needs it addresses. According to Vergara (2007), a case study is defined by the in-depth and detailed analysis of one or a few units, which may include a person, a family, a product, a company, a public agency, a community, or even a country. This type of study may be conducted in the field or not, depending on the researcher's objectives and methods.

A healthcare unit in the municipality of São Luís was selected for the study. The choice of this unit is justified by its significance within the municipal healthcare landscape of São Luís. Operating since 1972, the unit is currently one of the city's main healthcare institutions. After its founding in 1982, the hospital was donated by the Brazilian Red Cross to the Municipality of São Luís, becoming part of the municipal health network. According to the institution's official website, the hospital currently provides emergency and urgent care in the areas of general medicine, surgery, and pediatric orthopedics.

The characteristics of the research, as well as its nature, problem statement, and objectives, led to its classification as a qualitative study with an exploratory and descriptive approach. Gil (2019) notes that this type of research is essential in the initial stages of investigation, as it helps to define the problem more clearly and precisely. By exploring the topic in depth, researchers can identify relevant aspects that may not have been initially considered.

Currently, the healthcare institution under investigation has an average of 933 nursing technicians and 316 nurses. Below is the organizational chart of the research site, intended to provide a better understanding of the relevance of the research locus.

Figure 2 – Organizational Chart of the Public Health Unit



Source: Adapted from the website saoluis.ma.gov.br, 2024

To achieve the research objectives, four nursing professionals were interviewed: two nurses and two technicians. To understand the profile of each interviewee, questions were asked regarding their educational background, role within the healthcare unit, and length of service at the institution.

According to Vergara (2011), the population in a research study is defined as a set of elements that share specific characteristics to be investigated. These elements may include companies, products, individuals, among others. This definition underscores the importance of clearly identifying the group to be studied, as precision in defining the population is crucial for the validity and relevance of the research findings. By understanding the population's characteristics, researchers can develop appropriate methodologies and ensure that the data collected are representative and meaningful for the study's objectives.

The selection of interviewees was based on the availability of staff in the nursing sector of the chosen healthcare unit. The aim was to contribute to the research, which seeks to analyze the influence of hospitality and hospital hotel management on nursing services in a public hospital. Data were obtained from the institution's website, including organizational structure, staff numbers, services provided, roles, and additional information gathered on-site.

To generate positive results for the research, methodological tools were employed, considering that during the development of an academic study, potential limitations may arise. Thus, it was decided to follow an interview script, applying a questionnaire with open-ended questions. Gomes (2008) points out that interviews are verbal accounts that may present issues related to bias, information retrieval, and imprecise articulation.

Gomes' (2008) observation about interviews highlights the inherent limitations of this data collection method. By characterizing the interview as a verbal account susceptible to bias, difficulties in retrieving information, and imprecise articulation, the author emphasizes the need for caution when interpreting data obtained through this technique. Such limitations may compromise the validity and reliability of the collected information, requiring researchers to adopt strategies to mitigate these issues, such as data triangulation, careful question preparation, and interviewer training. This commentary is particularly relevant for qualitative studies, where interviews are a common tool, underscoring the importance of a critical and rigorous approach to data analysis.

Interviews allow for the collection of data related to various aspects of social life and offer flexibility, enabling the interviewer to clarify doubts and adapt to the circumstances in which the interview is conducted (Gil, 2008). The following procedures were adopted for conducting the interviews: preparation of a script with relevant questions, contact and scheduling with the responsible department. The interviews were conducted in person.

Table 2 - Interview Schedule

Interviewee Role	Interview Date	Duration
Nurse	25/07/2024	9min 24seg
Nursing Technician	01/08/2024	11min 17seg
Nurse	25/07/2024	8min 36seg
Nursing Technician	26/07/2024	5min 34seg

Source: Authors

The interviews conducted with healthcare professionals were audio-recorded using a mobile device and subsequently transcribed for the beginning of the analysis according to categorization.

RESULTS AND DISCUSSION

The semi-structured interviews provided a detailed perspective from professionals in the nursing sector. This approach enabled the exploration of nuances in the relationships between hospital hotel management and hospitality, considering essential aspects such as humanization in the services provided. The questions formulated during the interviews not only facilitated a deeper understanding of hospitality practices but also highlighted the particularities of hospital hotel management, humanization, and services—especially within the context of nursing services in a public hospital in São Luís, Maranhão.

Based on the survey conducted at the site, it was found that the majority of interviewees were female—two nurses and one nursing technician. Among male participants, there was one nursing technician. It was also observed that all professionals interviewed had completed higher education.

According to the data collected, all interviewees had been working at the institution for more than twenty (20) years.

The responses revealed that some participants directly associated hospital hotel management with accommodation and patient care, indicating a partial understanding of the concept as explained by Boeger (2017), who suggests that hospital hotel management arises in response to the growing need for humanization in hospital care, aiming to provide comfort and well-being to patients.

Boeger (2017) emphasizes the role of hospital hotel management as a fundamental strategy for improving patient experiences in healthcare settings. By focusing on comfort and well-being, hospital hotel management not only enhances the quality of care but also contributes to patients' emotional and physical recovery. This approach reflects a significant shift in how hospital care is delivered, valuing the human aspect and creating a welcoming environment that can positively impact the healing process.

A satisfactory understanding was observed among half of the interviewees. For two of them, hospital hotel management is seen as a support unit that aims to sustain other services offered by the hospital in the best possible way. These participants also demonstrated an understanding of the importance of hospital hotel services in ensuring the provision of humanized care. For the remaining interviewees, the understanding of hospital hotel management was more limited, with both referring only to aspects of hygiene and linen services.

Boeger (2008) highlights hospital hotel management as an essential component for creating an environment that goes beyond traditional medical care. By integrating support services with specific care, this approach seeks to ensure a more complete and satisfactory hospital experience. The emphasis on comfort, safety, and well-being not only improves the quality of care provided to patients but also meets the expectations of their families and the hospital staff, reinforcing the importance of a holistic approach to healthcare service delivery.

Taraboulsi (2009) underscores the importance of patient satisfaction as a determining factor for the success of medical treatments. The relationship between a welcoming environment and attentive care reinforces the idea that the patient's emotional well-being has a direct impact on physical recovery. This perspective emphasizes the need for a patient-centered healthcare approach, where the quality of interactions and the treatment environment play crucial roles in the effectiveness of medical care. From the results obtained, it is noted that all interviewees perceive hospital hotel management primarily through the provision of linen services. In other words, their perception is limited when compared to the significant scope of hospital hotel services. Overall, the responses collected reveal a limited understanding of the breadth of hospital hotel management as described by scholars.

Boeger (2017) argues that hospital hotel management goes beyond simply increasing comfort; it also plays a crucial role in patient safety. He highlights that clean and organized environments, along with

excellent service, help reduce the risk of infections and other health issues. Furthermore, the theorist emphasizes the importance of continuous training for healthcare professionals to ensure humanized and efficient care. Boeger's (2017) analysis underscores the multifunctionality of hospital hotel management, which not only promotes patient well-being but also significantly contributes to safety within the hospital environment. By emphasizing the importance of maintaining a clean and organized space, the author suggests that these factors are essential for infection prevention, which in turn improves clinical outcomes. The reference to ongoing professional development reinforces the need for a constant commitment to quality care, ensuring that humanization and safety practices are effectively implemented and maintained.

Hospital staff were asked about their understanding of the concept of hospitality. Overall, the responses indicated a limited grasp of the subject. Interviewees mentioned both intangible and tangible aspects, but not in a clear or structured manner. One staff member associated hospitality with the moment of welcoming the patient and the way their needs are met. Another extended the concept to include necessary support such as appropriate clothing and food.

Baptista (2002) emphasizes the multifaceted nature of hospitality, which goes beyond basic services to include attitudes and structures that together create a positive experience for the individual. By highlighting aspects such as well-being, comfort, and safety, hospitality is seen as a fundamental factor in creating welcoming and satisfying environments. This approach is especially relevant in hospital settings, where providing a sense of care and welcome can significantly impact recovery and overall patient well-being.

Regarding staff perceptions of the presence of hospitality in the hospital's daily routine, interviewees cited intangible aspects. One staff member perceived hospitality through the humanized care provided to patients. Another saw it through quality care, where the patient is viewed holistically. These perceptions align with theoretical explanations.

Derrida (1999) proposes the concept of "unconditional hospitality," in which the host must be willing to receive the other without imposing prior conditions or expectations. Derrida's (1999) proposal challenges traditional conceptions of hospitality, emphasizing the idea of welcoming the other with complete openness and without reservations.

This concept suggests a form of hospitality that transcends norms and conventions, requiring a genuine willingness to accept the other in their entirety, regardless of who they are. In practical contexts, such as healthcare environments, this approach can be seen as an ideal of reception, where care is offered unconditionally, prioritizing the patient's well-being and dignity above all else.

One interviewee mentioned that hospitality in the hospital's daily routine is reflected in patient receptiveness, while another explained that practicing hospitality is challenging due to the hospital's fast-

paced routine. The interviewee also emphasized the importance of building relationships to ensure quality care.

Praxedes (2004) defines hospitality as a human relationship based on reciprocity between host and guest, where the quality of the relationship depends on the values and principles shared by both. Praxedes' (2004) definition highlights the bidirectional nature of hospitality, emphasizing that the success of this interaction is linked to the values and principles of both parties. This suggests that hospitality is not merely about offering services or reception but involves mutual understanding and respect for each party's expectations and norms. In healthcare services, this view reinforces the importance of building relationships based on trust and mutual understanding, where the care provided reflects the patient's values and needs, creating a more harmonious and effective environment.

When asked about the concept of humanization, the staff presented intangible aspects, associating the theme with actions such as empathy and well-being. According to Ribeiro (2013), humanization in care should not be limited only to the patient, but must also include all those involved in the process of restoring health.

This perspective broadens the concept of humanization by considering that care should encompass not only the patient but also all professionals and family members involved in their recovery. One staff member, when explaining humanization, drew attention to interpersonal relationships among staff, which, according to the respondent, directly reflect on the patient's well-being.

This understanding aligns with Ribeiro (2013), who emphasizes the importance of a collaborative and inclusive healthcare environment, where each person—from the patient to the healthcare team—receives attention and support. This holistic approach contributes to a more effective and harmonious recovery process, promoting a sense of community and shared responsibility within the hospital setting.

One interviewee stated that the concept of humanization is related to love for what one does, while another extended the concept to meeting the patient's needs while considering their individuality. In this sense, a satisfactory understanding was identified among the staff, consistent with authors who discuss the topic. One particularly noteworthy explanation came from a staff member who emphasized the importance of putting oneself in the other's place for humanization to be effectively practiced in the hospital's daily routine.

Humanization is described as a collective and agreed-upon construction, based on the exchange of knowledge and networked work with multidisciplinary teams. This process includes identifying the needs, desires, and interests of those involved, and recognizing managers, workers, and users as active subjects and protagonists of health actions (Brasil, 2004).

The citation from Brasil (2004) underscores that humanization in healthcare is not an individual effort but a collaborative process involving the active participation of all stakeholders. By emphasizing

the exchange of knowledge and networked work, it highlights the importance of an integrated and multidisciplinary approach, where each professional and user is valued as an important agent in the care process.

Interviewees were asked about their perception of the presence of humanization in the hospital's daily routine. Godoi (2008) emphasizes the importance of humanization in the hospital environment as a means of alleviating negative feelings, creating a more welcoming and safe space for patients. Elements such as décor, meal quality, and psychological support are mentioned as key factors in transforming the hospital into a less intimidating and more comfortable place.

Staff presented vague perceptions regarding humanization in the hospital's routine. One interviewee highlighted immediate care provided by the hospital to the patient, meeting their needs without delay. Another perceived humanization in viewing the patient as a whole, as a being requiring care in various aspects.

In this regard, Rios (2009) emphasizes that humanization in healthcare not only improves the patient experience but also has a direct impact on quality indicators. In other words, by treating patients with empathy and attention, hospitals and clinics can provide more humane care and improve clinical and operational outcomes, creating a more efficient and safer healthcare environment. One staff member did not present a clear perception of humanization in the hospital's routine. Another mentioned reciprocity in relationships between professionals and patients, demonstrating mutual respect among those involved.

The responses collected align with Dias (2006), who sees humanization in recognizing the dignity and uniqueness of each patient. This approach emphasizes the importance of effective communication, empathy, respect, and consideration for the individual needs of patients and their families. By focusing on these aspects, humanization creates an environment where care is personalized, promoting more complete and meaningful service.

One interviewee mentioned the importance of the nursing staff being emotionally and spiritually well in order to transfer that well-being to patients, promoting healthy interaction. Gotman (2001) adds that hospitality involves more than simply offering services; it is about integrating the other into the community, creating a meaningful connection between host and guest. This interaction goes beyond mere reception, establishing a mutual relationship that strengthens social bonds and promotes a sense of belonging and inclusion.

In the hospital environment, the concept of welcoming is fundamental to ensuring not only the physical well-being of patients but also their emotional comfort. According to Boeger (2017, p. 54), "to welcome means to promote efficiency in a cozy, comfortable, and safe environment." This statement highlights the importance of creating a space that, in addition to being technically efficient, is also humanized and welcoming. In a hospital, this implies practices that go beyond medical care,

encompassing an approach that values care and empathy, clear communication, and respect for the patient's individuality, creating an environment that fosters recovery and trust in the treatment provided.

When asked about the services provided by the hospital's nursing sector, all staff unanimously mentioned their assigned duties, such as bedside bathing, patient transfers when necessary, escorting patients to exams, administering medications, supervising meals, among others.

Viera (2004) describes services as actions that, unlike tangible products, are characterized by their intangible nature, resulting in emotions and perceptions. According to this view, the value of a service is measured by the emotional impact it generates—whether satisfaction or dissatisfaction—highlighting the importance of the experiences and feelings that accompany service delivery.

When asked about the influence of hospital hotel management and hospitality on nursing service delivery, the interviewees were able to perceive the importance of both in the hospital's routine. One interviewee emphasized that without hotel services, it would not be possible to offer proper reception to the patient.

Grinover (2007) stresses the fundamental importance of initial reception in a hospitable environment. A warm welcome, symbolized by greetings and expressions of goodwill, is essential for creating a climate of comfort and safety, which is crucial for a positive experience for the visitor or patient. This principle is particularly relevant in hospital settings, where a welcoming environment can alleviate stress and anxiety, contributing to a smoother and more effective recovery.

One staff member pointed out that, in addition to positively contributing to the hospital environment's routine, the relationship between hotel management and hospitality is interdependent, as one implies the functioning of the other. In this sense, the presence of hospitality is reflected in the interaction between healthcare professionals and patients, while hotel services provide the necessary resources. Boeger (2008) highlights how hospital hotel management develops to meet the growing need to make hospital environments more welcoming and humanized.

By focusing on the comfort and well-being of patients, this approach goes beyond traditional medical treatment, recognizing the importance of an environment that promotes not only physical recovery but also emotional healing. This reflects a significant shift in hospital practices, where comprehensive patient care is central, contributing to a more positive experience during hospitalization. Boeger (2003) reinforces the idea that hospitality involves not only the act of hosting but also the quality of reception, characterized by freedom, kindness, and warmth in the way people are received.

Boeger's (2003) explanation broadens the understanding of hospitality, emphasizing that it goes beyond simply offering a space for lodging. It involves, above all, the way the host receives their guests, with an emphasis on kindness and the creation of a welcoming and receptive environment. This suggests that hospitality is an essential component in any context where the well-being and comfort of visitors or

patients are prioritized, being especially relevant in healthcare settings, where humanized care is fundamental to patient recovery and satisfaction.

CONCLUSION

Hospitality establishes its importance through its positive effects across various social spaces. In the context of a healthcare unit, these results become even more evident, considering the physical and consequently emotional vulnerability of the patient. In this regard, the practice of hospitality proves essential for a good and swift recovery, as well as for fostering a welcoming and humanized environment.

Thus, it is concluded that the presence of hospitality and hospital hotel management in nursing services has a significantly positive influence in the public hospital selected for this research. However, overall, after analyzing the results, a certain limitation was observed in the staff's understanding of relevant topics when questioned.

When asked about the concept of hospital hotel management, some respondents directly associated it with accommodation and patient care. Meanwhile, the other half viewed hospital hotel management as a support unit aimed at sustaining the other services offered by the hospital in the best possible way, demonstrating a broader understanding of the subject.

All interviewees perceived hospital hotel management primarily through the provision of linen services, indicating a limited perception of the topic. The respondents mentioned both tangible and intangible aspects, but not in a precise manner. Regarding their perception of hospitality in the day-to-day nursing services provided, the interviewees cited only intangible aspects, associating the practice with humanized care and meeting the patient's needs. One interviewee also described the practice of hospitality as challenging, given the hospital's intense pace.

As for their understanding of the concept of humanization, the staff presented intangible aspects, associating the theme with actions such as empathy and well-being. One staff member emphasized the importance of good interpersonal relationships among staff, as the outcome directly reflects on the patient's well-being.

Regarding their perception of humanization in the daily nursing services provided, the staff expressed views consistent with authors who discuss the topic, although limited considering these perceptions come from healthcare professionals. The interviewees mentioned immediate care for the patient, viewing the patient holistically as a being requiring care in various aspects, and reciprocity in relationships between professionals and patients, demonstrating mutual respect among those involved.

Concerning actions that reflect the presence of hospitality in the daily nursing service, most interviewees provided responses that deviated from the focus of the question, mentioning only physical

aspects. One staff member cited intangible aspects, such as welcoming the patient and informing family members about hospital rules and procedures—an essential practice.

Regarding the main services offered by nursing professionals at the institution, all interviewees unanimously mentioned their assigned duties, such as bedside bathing, escorting patients to exams, administering medications, among others. On this point, one staff member also highlighted intangible aspects, explaining that the services provided by the nursing staff can go beyond specific duties focused on physical well-being, aiming to meet the emotional and psychological needs of the patient, such as offering a warm welcome.

Through the interviews conducted with healthcare professionals at the public hospital, it is concluded that the general objective of the study was successfully achieved. In light of the findings, it is proposed that future research be conducted on hospitality in public hospitals. Specifically, it is recommended to investigate the implementation and effectiveness of training and development programs aimed at healthcare professionals and staff in such public institutions, with the goal of expanding knowledge and practical application of the concepts of hospitality and hospital hotel management.

It is also suggested to conduct research focused on the perception of hospitalized patients in public hospitals regarding the application of hospital hotel management concepts. Such a study could compare patient expectations with the reality offered, identifying areas for improvement and aspects that contribute to the sense of welcome and well-being during the hospital stay.

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THE ARIAN CONTROVERSY AND THE COUNCIL OF NICAEA

 <https://doi.org/10.63330/aurumpub.015-006>**Marcelo Henrique Silva de Santana¹****ABSTRACT**

This work analyzes the Arian Controversy (4th century) and the Council of Nicaea (325) in their theological and political dimensions. It begins with the theses of Arius, a presbyter of Alexandria, who affirmed the creation of the Son by the Father and His consequent subordination, and presents the responses of opponents—especially Athanasius—culminating in the affirmation of homoousios ("of the same substance") in the Nicene Creed. It examines how the legalization of Christianity and the actions of Emperor Constantine shaped the course of the conflict, highlighting the interdependence between Church and State in the Late Roman Empire. It shows that, although Nicaea condemned Arianism and established guidelines for Trinitarian Christology, the dispute continued for decades, with episcopal support and imperial interference, until later developments in Constantinople (381). It is concluded that the controversy not only consolidated central definitions of the Christian faith regarding the divinity of Christ and the Trinity, but also redefined institutional relationships and mechanisms of authority between imperial power and ecclesiastical leadership.

Keywords: Arianism; Council of nicaea; Constantine; Athanasius; Homoousios; Trinity; Church and state.

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INTRODUCTION

In the fourth century, during the rule of Constantine, the Roman empire saw a political and theological debate start: Arianism. The controversy, which lasted several years and led eventually to a final decision by the political leaders was over the nature of the divinity of Jesus Christ. Even though a decision was made about this issue, some modern-day Christians have not reached a unanimous opinion on the subject (Mormons, Jehovah Witnesses, etc.).

Understanding the first part of the controversy is an easy task. Several details must be analyzed before arriving at an opinion, however, on the real issue of the debate. The theological issues are what most stick out in this debate. The man that helped mold these issues in such a way was a priest from Alexandria by the name of Arius. He believed that Jesus Christ came after God the Father and that he was subservient to his Father. Jesus, being created by God, should not be considered equal to him, but rather worshiped as a perfect human being. This theology was named Arianism.

Another aspect we must analyze is the political one. With the rise of Arianism begin a long series of debates within the Church that leads us to the political factors behind the welding of this storm. Guido Berndt and Roland Steinacher, write that the rise of this controversy era was all about, and also taught me that this controversy brought light of “Constantinian Shift”.² That was right the time what Roman Emperor Constantine, just legalized Christianity in the Roman Empire. It had gotten much more complicated than that because it wasn’t the Official Religion under Constantine yet, but it became legal because they made a basic agreement. Constantine knew that in order to bring the Roman Empire back together it will be much easier for to implement Christianity as a universal religion to the people of Rome. The Universal Religion begins and so does the political threats. There are a few church counsels convened at this time trying to get the politics out and deity upper part of the church.³

This was a critical mark of the in the early Christian Church that had various consequences. The theological disagreement challenged the doctrine regarding the nature of Christ's divinity and ignited debates that resulted in fundamental shifts in Christian theology.⁴ Furthermore, the controversy also shed light on the intertwined relationship between the Church and the state, with political factors significantly impacting the direction of theological discourse.

² Guido M. Berndt and Roland Steinacher. *Arianism: Roman Heresy and Barbarian Creed*. (Routledge, NY), 2016. Pg. 2

³ Henry Melvill Gwatkin. *The Arian Controversy*. (Longmans, London), 1914. Pg. 18

⁴ Carlos R. Galvão-Sobrinho, *Precision, Devotion, and Controversy in Alexandria*. In *Doctrine and Power: Theological Controversy and Christian Leadership in the Later Roman Empire*, 1st ed., 35–46. University of California Press, 2013 <http://www.jstor.org/stable/10.1525/j.ctt7zw0vs.9>.



HISTORICAL CONTEXT

It is known that the early Christian Church went through significant theological developments in the centuries leading up to the Arian Controversy. Christianity emerged as a distinct religious tradition within the broader context of the Roman Empire. Initially, it faced persecution and struggled to gain recognition and acceptance, having its followers be called “atheists” and “cannibals”.⁵ However, with the conversion of Emperor Constantine in the early fourth century, Christianity began to transition from being a marginalized faith to becoming the official religion of the Empire. This shift in status had profound implications for the Church and its theology.

Christianity was becoming politically powerful. As a result, the Church became an increasingly formalized institution. The turning point in this process came in 325 at the Council of Nicea, which Constantine called to address a divisive issue within the Church itself. The Council was called to settle the controversy over Arius, a presbyter from the Egyptian city of Alexandria. Arius’s teachings about Christ, hence the name Arianism, would cause the first great Christian schism since Paul’s death. In its simplest form, Arianism said that Christ was created by God the Father at some time before the creation of the universe. This meant that he was less powerful and eternal than the Father, thus leading a number of those who followed the traditional teachings of the Church to think about the nature of Christ.

What sounds absurd to modern evangelical ears today was much more complex back then. For instance, Arianism is known to have found support among several influential figures in the Church, most notably Eusebius of Nicomedia and Eusebius of Caesarea. These bishops possessed significant political and theological influence, which complicated even more the controversy.⁶ They contended that Arius’ teachings were consistent with the Scriptures, and accused those who opposed Arianism of promoting a new form of polytheism. They considered it more important for the unity of the church to be preserved than it was to squabble among themselves. This led to a paradox arrangement among the theologians and church leaders; all were in agreement with one of two competing factions, Arianism and the counter-position.

THEOLOGICAL DEBATE

The debate centered around two individuals, a presbyter named Arius and a bishop named Alexander, who resided in the city of Alexandria. According to his opponent, Alexander, Arius taught that Christ did not always exist, but was created by the Father. Arius taught that the Son was the very first and

⁵ Justo González. *The Story of Christianity: Volume 1: The Early Church to the Dawn of the Reformation*. Kindle Edition (New York, HarperOne), 2010. Pg. 47

⁶ Justo González. *The Story of Christianity: Volume 1: The Early Church to the Dawn of the Reformation*. Kindle Edition (New York, HarperOne), 2010. Pg. 79



highest creature created by God, and that the Father created the universe through him. This teaching, referred to by the later church as Arianism, posed a serious challenge to the established view that the Father, Son, and Holy Spirit were equal and coeternal.

Arius supported his beliefs with biblical passages that seemed to indicate the subordination of the Son to the Father, such as John 14:28 where Jesus says, "the Father is greater than I." He also emphasized the unity and indivisibility of God, arguing that if Jesus was truly God in the same sense as the Father, it would imply that there were two Gods, violating the doctrine of monotheism. Arius thought he was being unjustly persecuted by the Pope of Alexandria, Alexander. He truly believed his interpretation of the Scriptures.⁷

The Arian doctrine gained popularity among both clergy and laity, leading to a rise in controversy and division within the Church. Many bishops, including Eusebius of Nicomedia and Eusebius of Caesarea, supported Arius and his teachings, seeing them as a way to preserve monotheism while preserving the distinctiveness of God the Father.

However, the orthodox response to Arianism was led by Athanasius, the Bishop of Alexandria, who energetically defended the faith of Nicea. Jesus, he maintained, was "of the same substance" (homousios) as the Father.⁸ He wasn't a merely similar being, but the same God who was in the beginning with God. The Son of God--being completely God, completely divine, of no lesser order than the Father in power and eternity--had no beginning; he wasn't a created thing. Athanasius argued that only a true God, and a true man, could accomplish the restoration of fallen humanity from sin: "What man could do this except the Word of God?" Denying the full divinity of Christ, Arianism robbed the redemption of its efficacy, and the incarnation of its significance.

POLITICAL CLIMATE

As it's clear, one of the most important figures in this particular controversy was the Roman Emperor Constantine the Great (ruled 306–337), the first ruler of the Roman Empire to be converted to Christianity. Constantine had given Christians the freedom to worship in the Edict of Milan, ending their century of persecution. He declared in the Edict, "We also give them joyously our approval, that as Catholics they may have permission to build and to gather in those places they wish."

Constantine's political influence did not stop with the Edict of Milan. In 325, as previously mentioned in this text, he led the First Council of Nicaea, using his authority to bring together bishops from across the empire and personally presiding over the proceedings.⁹ At this council, the question of

⁷ Henry Bettenson and Chris Maunder. *Documents of the Christian Church, 4th Edition*. (Oxford, New York, 2011). Pg. 42

⁸ William Bright. *The Orations of St. Athanasius Against the Arians*. (Cambridge University Press, Cambridge, 2014) Pg. 35

⁹ Ramsay MacMullen. *Constantine*. (Routledge, NY, 2014) Pg. 161

Arianism was fiercely debated, with the emperor himself advocating for the condemnation of Arius and his teachings. Although the matter was much beyond his knowledge, Constantine's direct involvement in calling the council demonstrated the significant role of political leadership in shaping the religious discourse of the time.¹⁰

The political decisions made during and after the Council of Nicaea had a profound impact on the development of Arianism and its opposition. Despite Constantine's efforts to achieve unity, the council failed to resolve the Arian Controversy decisively. While the council condemned Arius and his teachings, it did not eradicate Arianism. Instead, it sparked a wave of political and theological conflicts that would persist long after Constantine's reign.

The intense political will to ensure some degree of religious unity within the empire was passed on to the men who would now rule it. These men produced an avalanche of decrees and laws which made it clear that political power lay almost entirely on the side of the anti-Arians. Arian bishops were exiled. Later Arians were excluded from any civil office, from the administrative command of the army and from the imperial court. By the time of the First General Council, there was no legal doubt that the official, preferred religion of the empire was orthodox Christianity. But this same activity inflamed the still unresolved question of Arianism and thus a rift was not only created between the court and the many Arian sympathizers on its staff and in the army, but also between the Church and the state.¹¹ Moreover, the political climate of the fourth century had a disastrous effect on the development of theology itself. Emperors demanded and often received a considerable amount of control over the policies and teachings of what just half-a-century before Constantine had declared the official religion of the now rotten and military state. That employed Church and state in an ever-tightening and mutually useful grip. The Church was condemned to an alliance with a state which might have at any time replaced it with another state religion. And the state won a measure of control over a body of theologians who were finding new ways to suggest that the representatives of the official religion in the imperial court were in fact corrupt or even, in their theology, diminished.

The interplay between religious and political power during the Arian Controversy was complex and far-reaching. The emperors not only exercised political control over the Church but also relied on religious authority to legitimize their rule. In turn, the Church leveraged its influence to gain political favor and secure its doctrinal position. This symbiotic relationship between the two institutions meant that any shift in the political climate directly impacted the religious landscape.¹²

¹⁰ *Ibid.* Pg. 170

¹¹ Guido M. Berndt and Roland Steinacher. *Arianism: Roman Heresy and Barbarian Creed.* (Routledge, NY), 2016. Pg. 312

¹² Ramsay MacMullen. *Constantine.* (Routledge, NY, 2014) Pg. 183

The emperors' involvement in theological debates blurred the lines between the religious and political spheres. The Council of Nicaea, for example, highlighted the extent to which the emperor's opinion held sway over the Church's decisions. This fusion of religious and political authority set a precedent for future debates and controversies within the Christian Church.¹³

ESCALATION AND RESOLUTION OF THE ARIAN CONTROVERSY

The debates at Nicea were marked by intense argumentation on theological matters, the outcome of which was a triumph for the defenders of the orthodox, Trinitarian position. The council's chief pastoral achievement was the formulation of the Nicene Creed, which defined the divinity of Jesus Christ as "of one substance with the Father." This durable creed, which offered a response to the Arian heresy, settled the longstanding dispute about the nature of Christ and defined the limits of orthodoxy. Yet there were political motivations behind Nicaea. The unity of the Church was of utmost importance to Constantine, who saw the stability of the State as dependent on the unity of the Church. The Arian Controversy had not only split the Church, but created ongoing conflicts throughout the empire. The goal of the emperor, by convening the council, was to put an end to the dispute and declare a definitive and official teaching that would pave the way for religious harmony in the empire.

The outcomes of the Council of Nicaea were multifaceted. On one hand, the council succeeded in refuting Arius and his followers, reaffirming the traditional teaching of the Church. The Nicene Creed became the central statement of orthodox Christian faith and served as a safeguard against future heresies. However, the council did not completely resolve the Arian Controversy, as some factions continued to oppose the creed and promote Arianism.¹⁴ The aftermath of the Council of Nicaea witnessed continued theological debates and political turmoil. Arianism persisted as a popular doctrine, finding support among various bishops and even some emperors. This led to subsequent councils and synods that aimed to further clarify and solidify the orthodox Trinitarian doctrine. These councils, namely the Council of Constantinople in 381 AD and the Council of Chalcedon in 451 AD, played crucial roles in the ongoing resolution of the Arian Controversy.

It was not until the Council of Constantinople that Arianism was definitively condemned, and the orthodox Trinitarian doctrine was reaffirmed. The council affirmed the divinity of the Holy Spirit and further articulated the relationship between the three persons of the Trinity. This final resolution of the Arian Controversy had significant consequences for both the Church and the state. Doctrinal unity was achieved within the Church, laying the foundation for its future theological developments.¹⁵

¹³ Charles Odahi. *Constantine and the Christian Empire*. (Routledge, NY, 2010). Pg 221

¹⁴ *Ibid.* 183

¹⁵ Guido M. Berndt and Roland Steinacher. *Arianism: Roman Heresy and Barbarian Creed*. (Routledge, NY), 2016. Pg. 64

In addition to its theological implications, the Council of Nicea had serious political implications for Roman emperors, particularly those who had previously espoused Arianism. Emperor Constantius II had been a supporter of Arianism, but afterwards he accepted the Nicene Creed. Now, for the time being, the emperors were united, and arguing would not be a part of their lives again until 381, when Theodosius revoked the Edict of Milan, making Christianity the official religion of the Roman Empire. The victim of the political move was the Homoian political party. They had lost all credibility with their imperial patrons and in the Church.

CONCLUSION

So, in conclusion, the Arian Controversy was an event of major significance in early Christianity, and subsequently world history. The significance of the Arian Controversy lies in the fact that it ignited and sustained theological discussions about the relation between the Trinity, the divinity of Christ and the nature of God for more than half a century. The disputes and debates were written down and from them kigit took the support of people from all over the world in considering it. The lead-up to the Arian Controversy was an eventful one; the human nature of Christ was contemplated for the first time ever. The Council of Nicaea was held in 325 in order to resolve any remaining questions about the relation between God and Jesus. The position stated at the Nicene Creed became the final and eternal dogma of Christian orthodoxy regarding the nature of Christ.

Secondly, the Arian Controversy was a highly significant event in the history of the world because it put on trial the entire social-political system of the late Roman Empire. The dispute hardly begins with Arius, who was a highly suspect troublemaker only later on. The problems began when the Emperor Constantine applied for a Christian priest to be built in Byzantium, intending Christianity for the first time to be accepted into the secular realm of things. Continuing with the theme of controversy between religion and politics, we see that Arianism was used as a mass of combatant religious groups over the significant issue, first between the Arians and the Orthodox church and then between an entire range of mutually warring minority Arian sects and factions in the church. If no trust or agreement can be established between the state and the church with regard to the establishment of a policy of church and state, then the differences between the two factions mentioned above should obviously not be settled through secular diplomatic channels.

Finally, the significance of the Arian Controversy is agreed upon, as it did have a profound and everlasting impact on Christianity and the world. The Arian Controversy must be understood in the light of maintained discussion s and arguments of the vital theological ideas of the Trinity, the divinity of Christ and the nature of God. The political world utilized the religious world, and the religious world used the others.

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THE BAPTISM OF JESUS

 <https://doi.org/10.63330/aurumpub.015-007>**Marcelo Henrique Silva de Santana¹****ABSTRACT**

This work examines Jesus' baptism in the Jordan as the inaugural milestone of his public ministry, articulating historical-ritual and theological-biblical dimensions. In light of Second Temple Judaism, John's baptism is compared with ritual baths (e.g., at Qumran) and with the baptism of proselytes, highlighting distinctions in frequency, audience, and meaning: while baths were repeated and linked to purity, and the baptism of proselytes to the incorporation of Gentiles into Judaism, John's rite calls Israel to repentance in view of the coming kingdom. Based mainly on Matthew 3:13–17 (and parallels in Mark 1, Luke 3, and John 1), it explores “fulfilling all righteousness,” Jesus’ vicarious representation on behalf of sinners, and the recapitulation of the history of Israel. The Trinitarian theophany (open heavens, Spirit, voice) and the intertexts of Psalm 2 and Isaiah 42, which configure Jesus as the beloved Son and Servant, are highlighted. It is concluded that Jesus' baptism is not a rite of personal purification, but the public inauguration of his messianic mission, anticipating the cross and resurrection and offering keys to New Testament Christology and soteriology.

Keywords: Baptism of Jesus; John the Baptist; Second temple judaism; Qumran; Baptism of proselytes; Repentance; Theophany; Trinity.

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INTRODUCTION

The life and public ministry of Jesus contain many significant and, in some cases, extraordinary moments narrated throughout the four Synoptic Gospels. Miracles are perhaps the signs that most readily come to mind when we speak of the life of Jesus. We could mention some healings, such as that of the woman with the issue of blood (Luke 8:43–48) and that of blind Bartimaeus (Mark 10:46–52). He cast out demons (Mark 5:15) and commanded them to enter a herd of pigs, which then hurled themselves off a cliff. Furthermore, among the extraordinary events of His ministry, Jesus Christ raised the dead, including His own friend Lazarus (John 11:1–29), and ultimately, not even death could hold Him, for on the third day Christ rose from the dead, proving that He died for the sins of those who believed in His name.

One of these moments, however, marks in a very striking way the beginning of all this and introduces us to important Christological concepts (such as Jesus Christ being the Messiah promised in the Old Testament), presents us with essential figures (John the Baptist, the forerunner of Jesus who would prepare His way in the wilderness), and compels us to return to the Old Testament to fully understand the event addressed in this paper. This moment is the baptism of Jesus Christ, administered by John the Baptist in the Jordan River.

THE PRACTICE OF BAPTISM

At that time—most likely in the year 27 or 28 A.D.²—there were certain rituals among the Jews that were similar to the one in which Jesus participated, which was administered by John the Baptist (about whom we will discuss further ahead). Examples include the *Qumran practice* and the *Baptism of Proselytes*, which were regularly performed among the Jewish people. However, these rituals had significant differences from the baptism administered by John, both in the manner in which they were practiced and in their ultimate meaning.

The *Qumran practice* functioned as a type of ritual washing associated with repentance and was repeated regularly among the Jews.³ The *Baptism of Proselytes* was exclusively for Gentiles who wished to convert to Judaism. Along with circumcision and animal sacrifice, this baptism was part of the conversion experience for those who desired to become Jews and, in some way, be included among the chosen people.

In contrast, a striking figure drew the attention of the Jewish people as well as the local authorities. John the Baptist preached, warning the Jews not to boast about having ancestors who were patriarchs, kings, and part of God's plan for Israel. John's baptism was different from all other rituals of the time. He declared: "And do not presume to say to yourselves, 'We have Abraham as our father'; for I

² F. B. Meyer, *João Batista*. (HardPress), 2015) p.47

³ Robert H. Stein, *Jesus, o Messias: Um Panorama da Vida de Cristo*. (Intervarsity Press, Downers Grove, Illinois), 1996) p.90

tell you, God is able from these stones to raise up children for Abraham” (Matt. 3:9 – *Almeida Corrigida Fiel*).

Robert H. Stein, in his book *Jesus the Messiah*, concludes regarding the difference between John’s baptism and those practiced by the Jews at that time, stating:

“John the Baptist clearly rejected the notion that a person could enter the coming messianic kingdom simply because of their ancestry. Lineage would not be sufficient. Only the repentant of Israel would enter the kingdom of God.”⁴

WHO WAS JOHN THE BAPTIST?

Little is known about the life of John the Baptist before he began his ministry in the wilderness. According to the Gospel of Luke, it is believed that John the Baptist was the son of Zechariah and Elizabeth, both devout Jews who served God along with their family. Zechariah, for instance, was a priest who went to Jerusalem every two years to fulfill his duties. The birth of John, according to Jewish tradition, was a miracle because his mother Elizabeth was barren.⁵ It is possible that Elizabeth was either the sister or cousin of Mary, the mother of Jesus, though this cannot be firmly established.

What we do know with certainty about this significant figure in the history of Jesus Christ is what the Holy Scriptures report in the four Gospels. We know, for example, that John the Baptist was in the wilderness, gathering crowds with a powerful message of repentance. His clothing and diet carried a messianic and prophetic tone. He wore “a garment of camel’s hair with a leather belt around his waist” (Mark 1:6), which was striking to the Jewish people because this was the same type of clothing worn by the prophet Elijah—about whom it had been prophesied that he would return (Mal. 4:5). The early Christians associated John the Baptist with Elijah, as the Gospels attest. In fact, in Mark 9, the author shows that the teachers of the law taught that Elijah would come to restore all things. In Malachi 4, it was prophesied that “Elijah would come before the great and dreadful day of the Lord.”

With all this evidence—including Jesus Himself calling John the greatest prophet who ever lived (Matt. 11:11)—it is not difficult to understand why John the Baptist attracted so many people. Many of these people even thought John was Elijah or the Messiah himself, although John never made such a claim; on the contrary, he consistently denied it and, when he saw Christ, recognized Him as the Son of Man.

In John the Baptist, we perceive the fulfillment of what God had said would happen. This prophetic figure, preaching repentance in the wilderness and announcing the day of the Lord, aligns perfectly with the prophecy in Isaiah: “The voice of one crying in the wilderness: Prepare the way of the

⁴ *Ibid.* P. 92

⁵ F. B. Meyer, *João Batista*. (HardPress), 2015) p.47

Lord; make straight in the desert a highway for our God” (Isa. 40:3 – *Almeida Corrigida Fiel*). He is the one who came in the spirit of Elijah (not as Elijah resurrected) and who prepared the way for the Messiah, proclaiming His coming kingdom.

His preaching, according to the Gospel accounts, was centered on repentance, for, as John himself declared, the Kingdom of Heaven was at hand. It was as if the eschatological wrath of the Lord was already upon Israel. The seriousness of John’s message is evident when he sees some religious leaders passing by and exclaims: “You brood of vipers! Who warned you to flee from the wrath to come?” It is possible to affirm, as Gordon Fee states in his book *How to Read the Bible Book by Book*, that “the good news of Jesus begins with the announcement that the new Exodus of Isaiah has begun: ‘Prepare the way of the Lord,’ says John the Baptist—the new Elijah (Mal. 4:5–6)—who introduces Jesus, the Messiah, to Israel.”⁶

Therefore, we can conclude that the life of John the Baptist can be divided into two missions: 1. To be the forerunner of the Messiah, proclaiming His message in the wilderness; and 2. To demonstrate how much greater Jesus Christ is in contrast to his own life.

No matter how “important” or “famous” John the Baptist was, the One who came after him was far greater than “the voice crying in the wilderness.”

THE BAPTISM OF JESUS

The account of Jesus’ baptism appears in all the Gospels. The Gospel according to Matthew contains the most extensive description of the event (Matt. 3), and it is on this account that we will primarily focus, precisely because of its greater detail. Luke (Luke 3) and Mark (Mark 1) briefly mention the event, while John only alludes to it (John 1:29–34). This is one of the events recorded in all four Gospels, thereby reinforcing its historical reliability. Some historians have attempted to argue that Jesus’ baptism did not actually occur, but there is, in fact, very little evidence to support such a claim.

As previously noted in this paper, John the Baptist’s baptism was for the repentance of sins.⁷ Therefore, a question naturally arises when studying the baptism of Jesus: Why did Jesus need to submit to a baptism of repentance, given that He Himself committed no sin (1 Pet. 2:22)?

The narrative provided by Matthew offers several clues as to why this baptism was necessary in the ministerial life of Jesus Christ. After examining Matthew’s account, we will also consider the same episode in the other Gospels to provide a fuller understanding of the event under discussion.

⁶ Gordon D. Fee, Douglas Stuart, *Como Ler a Bíblia Livro a Livro* (Zondervan, Grand Rapids, Michigan) 2002, P. 280

⁷ Darrell L. Bock, Benjamin Simpson – *Jesus de Acordo com as Escrituras: Restaurando os Acontecimentos dos Evangelhos* (Baker Academic, Grand Rapids, Michigan, 2002) Pg. 149

MATTHEW 3:13–17

At the beginning of this chapter, the author introduces us to the prophetic figure of John the Baptist. In verse 3, John himself references the prophecy of Isaiah that we examined earlier. The author describes what John did and how he did it, even mentioning his clothing and diet (Matt. 3:4), and emphasizes how popular this prophet was. Matthew makes it clear that all *Judea* went out to him. It is noteworthy that John was not in the city center, in synagogues, or in places where crowds could be easily drawn. On the contrary, John the Baptist was in the wilderness, which underscores the magnitude of his popularity, influence, and significance among the Jewish people of that time.

However, as John himself would later acknowledge, there was One coming who was greater than he,⁸ one who would not baptize merely with water (symbolizing death and resurrection) but with the Spirit and with fire (language of judgment). This One who was to come appears in the same chapter of Matthew, while John is baptizing people and confronting the religious leaders of the day. He was Jesus of Nazareth, the promised Messiah, and according to Matthew's account, John seems to understand very well who he is dealing with. The first words exchanged between them come from John the Baptist, perhaps astonished to see the Messiah approaching to be baptized. John protests: "I need to be baptized by You, and do You come to me?" (Matt. 3:14). He knew that he needed to be baptized by the One who was greater—Jesus was greater than John.

The reason Jesus gives for why He must be baptized is: "to fulfill all righteousness" (Matt. 3:15). In Matthew's Gospel, the term *righteousness* consistently denotes the will of God, or God's divine plan and intention. Therefore, we can conclude that it was God's will for Jesus' baptism to take place at that moment so that His divine purpose might be fulfilled. Two things occur in Christ's baptism, both of which were God's will.⁹

First, there is an anticipation of the cross of Calvary: Jesus stands in a place that does not belong to Him—He who is without sin—but to all those who have sinned. In baptism, it is sinners who should be in the waters of the Jordan River, yet Jesus takes the place of sinners and goes there to be baptized in their stead. Second, there is a recapitulation of Israel's history. John the Baptist is calling Israel to repentance, and there is the idea that Jesus is also taking Israel's place. Throughout the Old Testament, Israel failed to remain obedient to the Lord. They repeatedly disobeyed His commandments, regardless of how greatly they were blessed. Thus, we can conclude that it was God's will for Jesus—the sinless One—to take the place of those who had sinned. Jesus would now be the obedient Israel, since in the past, despite experiencing God's promises and blessings, Israel could not remain faithful to the end. It is also

⁸ Sung Wook Chung, *Christ: The One and Only* (Baker Academic, Grand Rapids, Michigan, 2005) Pg. 26

⁹ Darrell L. Bock, Benjamin Simpson, *Jesus de Acordo com as Escrituras: Restaurando os Acontecimentos dos Evangelhos* (Baker Academic, Grand Rapids, Michigan, 2002) Pg. 147

noteworthy, in this same typology of Israel, that in the following episode Jesus is tempted by the devil in the wilderness, being led there by the Spirit—just as Israel was led by the Spirit through the Red Sea and into the wilderness.

Matthew narrates Jesus' baptism in an apocalyptic and Trinitarian manner: the heavens open, a heavenly voice alludes to Psalm 2 (a Davidic psalm with messianic overtones), a dove descends from heaven, and the Son is baptized. We see all three persons: God the Father in the voice, God the Son being baptized, and God the Holy Spirit descending from heaven in the form of a dove (Matt. 3:15–17).

Perhaps the most striking element of Jesus' baptism is the voice from heaven declaring: "This is My beloved Son, in whom I am well pleased" (Matt. 3:17). This statement alludes to two things: the Servant Song of Isaiah 42, which focuses on the suffering servant, and Psalm 2, which concludes with the coronation of David. Christologically, the baptism signifies that Jesus is the suffering servant, the triumphant Messiah, the beloved Son who assumes the place of sinners.

MARK 1:9–11, LUKE 3:21–22, AND JOHN 1:29–34

With fewer verses, Mark—historically recognized as the earliest Gospel and likely one of Matthew's sources—provides a very concise account of the baptism, consistent with his literary style.

Mark introduces John the Baptist much like Matthew does: a striking figure, clothed in camel's hair, eating locusts, living in the Judean wilderness, and baptizing those seeking repentance along the Jordan River. Mark, likely serving as the source (known as *Q*)¹⁰ for Matthew, does not differ significantly from Matthew in his description of Jesus' baptism and John's role.

The baptism of Jesus occurs in just three verses, and unlike Matthew's account, there is no dialogue between the two. Nevertheless, as Millard Erickson notes, the baptism is a *Trinitarian* event: the Son is baptized, the Father speaks from heaven, and the Spirit descends like a dove.¹¹

In Luke, Jesus' baptism is described in only two verses, yet the Gospel provides a more detailed portrayal of John the Baptist and his significance to the Jewish people of that time. Luke notes that the people regarded John with awe and curiosity, wondering if he might be the promised Christ. John consistently denied being the Messiah, often citing Isaiah's prophecy that he was merely a voice crying in the wilderness, preparing the way for the true Messiah who was to come.

In John's Gospel, the event is recounted only as a testimony given by John the Baptist about the day he baptized Jesus. Once again, he affirms to the people that he is not the promised Messiah, but that Jesus—the one whom he baptized—is truly the Son of God.

¹⁰ Ulrich Luz, *Teologia do Novo Testamento: A Teologia do Evangelho de Mateus* (Cambridge University Press, 2005) Pg. 7

¹¹ Millard J. Erickson, *Teologia Cristã* (Baker Academic, Grand Rapids, Michigan, 1998) Pg. 355



THE OLD TESTAMENT AND THE BAPTISM OF CHRIST

There are at least two Old Testament passages that help us better understand the event of Jesus' baptism. These are biblical texts that either prophesy about the event itself or symbolically relate to what occurred at Christ's baptism. Given the significance of Jesus' baptism, there are many other passages in the New Testament that also contain symbolic connections to baptism; however, although they will be mentioned in this section, they will not be analyzed in depth.

THE VOICE OF THE LORD: PSALMS 2 AND ISAIAH 42

The voice that comes from heaven after the baptism of Jesus Christ is the voice of God the Father declaring who the Son truly is. In the Gospels of Mark and Luke, the voice says: "You are My beloved Son; with You I am well pleased." In these cases, as Darrell Bock comments in his book *Jesus According to Scripture*, "the use of the second person singular (you) when addressing Christ supports the idea of a private and personal experience."¹² This voice recalls two Old Testament texts.

The first is Psalm 2:7, which "affiliates" the chosen king of the nation. This is a *Davidic psalm* of coronation for King David himself. This coronation language is present at the baptism and also at another pivotal moment in Jesus' life: the Transfiguration. The heavenly voice affirms the same truth in both events, though they signify different realities: at the baptism, we see the obedient One taking the place of sinners, symbolizing the cross; at the Transfiguration, we see the obedient One appearing alongside Elijah and Moses, symbolizing the resurrection. In both cases, the voice from heaven declares the same truth: Jesus is the new King whom the Jews had long awaited.

The other passage is found in Isaiah 42:1, which points us to the *Suffering Servant*, who would bring about a second Exodus for the people of Israel, causing them to forget the first. In this passage, Israel is still "blind" and "deaf." God, in His infinite mercy, will deliver them from their misery—all for His own glory, for He is the Redeemer of Israel.

CONCLUSION

In light of the foregoing, we can conclude from all the evidence presented that the baptism of Jesus marked the beginning of the *good news* of salvation for humanity. The *Gospel* began there, on the banks of the Jordan River, when a man who preached repentance administered baptism to the One who had no need of repentance, but who submitted to it "to fulfill all righteousness" (in other words, to

¹² Darrell L. Bock, Benjamin Simpson – *Jesus de Acordo com as Escrituras: Restaurando os Acontecimentos dos Evangelhos* (Baker Academic, Grand Rapids, Michigan, 2002) Pg. 159



accomplish the will and plan of God) and to take the place of sinners: the Messiah, God incarnate—Jesus Christ.



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DETERMINATION OF ETHANOL CONTENT IN GASOLINE

 <https://doi.org/10.63330/aurumpub.015-008>**Francisca Núbia Alves da Silva¹****ABSTRACT**

The National Agency of Petroleum, Natural Gas, and Biofuels (ANP) has established that the alcohol content standard for gasoline has increased from 27% to 30% by volume. Therefore, if the percentage obtained is lower or higher than the established standard, the gasoline will be considered an adulterated product. This was observed in the sample of the compound tested during the Organic Chemistry Laboratory course of the Bachelor's Degree in Chemistry at the Federal Institute of Education, Science, and Technology of Ceará (IFCE) - Ubajara Campus, a practice related to the year 2022. Therefore, this article aims to determine, through an experiment, the ethanol content present in a commercial gasoline sample, using volumetric titration. The method initially measured the alcohol content of commercial gasoline mixed with a saline solution (NaCl + distilled water). Subsequently, the alcohol content of the respective sample, mixed with distilled water, was measured. As a result, and according to the ANP's update on the alcohol content of gasoline, the data obtained demonstrated that the ethanol content in the laboratory-tested sample of the respective product was adulterated, as the values found were far from the percentage permitted by the ANP.

Keywords: Gasoline; Alcohol content; Adulteration.

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INTRODUCTION

The monitoring carried out by the National Agency of Petroleum, Natural Gas, and Biofuels (ANP) regarding the presence of ethanol content in gasoline is a factor of utmost importance in the composition of the product, as it has a direct economic impact, particularly concerning issues related to improving octane rating and engine performance, as well as an environmental impact by reducing pollutants in the environment. In this regard, Silvana (2013, p.12) argues that: “The lack or excess of alcohol in relation to the limits established by the ANP compromises the quality of the product that reaches Brazilian consumers. Thus, evaluating the composition of gasoline, verifying whether the alcohol content is adequate, is a very important measure.”

Due to the increase in fuel adulteration, specifically gasoline, the ANP, through inspections, sets the alcohol content of this product at 30% by volume (National Agency of Petroleum, Natural Gas, and Biofuels, 2025). Based on this, it is understood that product quality is a crucial factor, given that gasoline can be adulterated with different organic solvents, which are primarily responsible for impacting both the economy and the environment.

The organic solvents used for gasoline adulteration generate various consequences, which may include economic benefits and environmental impacts; however, they can also cause disadvantages, such as increased fuel consumption, engine malfunction (Takeshita, 2006, p.1), among others.

Therefore, the present study seeks to determine the alcohol content in a sample of commercial gasoline, verifying whether it complies with the technical standards established by the ANP.

Accordingly, this article is structured as follows: (i) The first section presents the methodology followed, divided into three stages: sample collection, materials and reagents, and experimental procedure. (ii) The second section discusses the results obtained.

METHODOLOGY

This article is characterized as experimental in nature, aiming to analyze the alcohol content in a sample of commercial gasoline extracted from the stock solution used in a practical activity conducted during the Organic Chemistry Laboratory course of the Chemistry Licentiate Degree at the Federal Institute of Education, Science, and Technology of Ceará (IFCE), Ubajara Campus, in 2022. The purpose was to verify whether the ethanol levels found still comply with the 2025 legislation.

RESEARCH STAGES

The present work was developed in the following stages:

1st Stage: Sample Collection

For the laboratory practice, a significant amount of gasoline sample was collected from the stock solution, which was provided to the students of the Chemistry Licentiate Degree at IFCE, Ubajara *Campus*, during the Organic Chemistry Laboratory course in 2022. This amount was then placed in a graduated cylinder, which was later used for the corresponding experiment.

2nd Stage: Materials and Reagents

In this stage, the materials and reagents used for the experiment were prepared. Table 1 below presents the list.

Table 1 – Materials and reagents used in the determination of ethanol content in gasoline.

Materials	Reagents
Pasteur pipette	50 mL of distilled water
Volumetric flask (50 and/or 100 mL)	50 mL of gasoline sample
100 mL beaker	NaCl solution
Spatula	
100 mL graduated cylinder (with stopper)	
Semi-analytical balance	
Funnel	
Volumetric flask containing stock solution (gasoline)	
Wash bottle	

Source: Prepared by the author (2022).

3rd Stage: Experimental Procedure

For the execution of the practice, some steps were followed, which are presented in detail below.

In the first part of the experiment, the container with NaCl was taken to the semi-analytical balance, and 5 g of salt was weighed and placed in a beaker. After that, another beaker was used, 50 mL of distilled water was added, and it was gradually transferred into the container with the salt until a saline solution was formed.

With the saline solution prepared, the gasoline stock solution was taken, and an aliquot was transferred to a larger volumetric flask, which served as the base for extracting the necessary amounts for the preparation of the experiment. After that, 50 mL of the portion extracted from the initial gasoline solution was placed in a 100 mL graduated cylinder, and the prepared saline solution was added together, which were then stirred with the aid of a spatula. After that, the solution was left to rest for an interval of 10 minutes until the mixture reached equilibrium. Soon after, the alcohol content of the gasoline and saline solution mixture was calculated.

In a second step, following the same procedure as the first part of the practice, another 50 mL of gasoline was taken, placed in a 100 mL graduated cylinder, and 50 mL of distilled water was added. Subsequently, the container with the mixture was stirred with a spatula and left to rest for 10 minutes until the solution reached equilibrium. Later, the alcohol content contained in this mixture was also calculated.

After carrying out the experimental procedures, the differences in alcohol content in the gasoline were analyzed, referring to both the mixture of gasoline with the saline solution and the mixture of gasoline with distilled water.

RESULTS AND DISCUSSION

According to Brazilian legislation, the National Agency of Petroleum, Natural Gas, and Biofuels (ANP) establishes that the standard alcohol content in gasoline must be 30% by volume (National Agency of Petroleum, Natural Gas, and Biofuels, 2025). Therefore, if the percentage obtained is lower or higher than the established standard, the gasoline will be classified as an adulterated product, a detail that was analyzed in the sample of the compound tested in the laboratory practice.

Based on this, it is noted that in the first and second parts of the experiment, the alcohol contents found in the analyzed gasoline showed variations of 6% and 8% from the expected percentage, respectively, with the values found being 24% and 22%. These variations above or below the target value of 30% ethanol in gasoline occurred due to the influence of some factors.

Initially, it is pointed out that one of the contributing factors to the margin of error observed in the steps is related to the moment of reading the meniscus, since during the practice the amount in mL of gasoline may not have reached the meniscus mark, which significantly contributed to the final result obtained in the experiment.

A second interference concerns the possible adulteration of the product itself, which does not rule out other factors during the practice, such as the calibration of the semi-analytical balance, since the instrument showed a significant margin of error, which may have caused discrepancies in the expected results.

Thus, it is analyzed that if the instrument is not well calibrated, there will be considerable distortions in the results obtained throughout the experiment, that is, errors that originate from the beginning of the practice and consequently persist throughout the experiment.

A third interfering factor is related to the distiller used, as the equipment was not in proper working condition, given that it was not cleaned and had other maintenance issues. Therefore, it is observed that the distilled water used was not completely pure, as required for this part of the experiment.

The fourth aspect raised during the execution of the experiment concerns possible errors in measuring the concentrations of the substances used, as can be seen from the initial measurement of 5 g of NaCl on the semi-analytical balance. As a result, incorrect values were obtained compared to the expected results.



ANALYZING THE RESULTS

For a better understanding of the results generated, in items 3.2 and 3.3, the calculations related to the first and second parts of the experiment are presented, corresponding to (Gasoline + Saline Solution) and (Gasoline + Distilled Water), respectively.

GASOLINE + SALINE SOLUTION

Below is the calculation of the first part for determining the alcohol content in gasoline through its mixture with the saline solution.

$$\begin{array}{ll} \text{A) 12 mL} & 50 \text{ mL of initial gasoline} \\ X\% & 100 \% \\ & 50 \text{ mL. } X\% = 100 \% \cdot 12 \text{ mL} \\ & 50 \text{ mL. } X\% = 1200 \text{ mL. } \% \\ & X\% = \frac{1200 \text{ mL.}\%}{50 \text{ mL}} \\ & X = 24\% \text{ Ethanol in gasoline} \end{array}$$

For this, the variation in the volume of the saline solution with the initial amount of gasoline was used. These were $\Delta V = 12 \text{ mL}$ and $V_i = 50 \text{ mL}$, respectively.

From the result obtained, it is observed that the alcohol dissociated from the gasoline and migrated to the aqueous solution. This occurred because ethanol has a polar part and a nonpolar part; its nonpolar part is attracted to the gasoline molecules, which are also nonpolar, and its polar part, which contains the OH group, is attracted to water molecules, which are polar, forming hydrogen bonds that are much stronger than the bonds with nonpolar molecules.

Table 2 below presents the differences between the initial and final volumes of the respective solution.

Table – 2. Volume differences

Initial volume (mL)	Final volume (mL)	Ethanol content (measured in practice) %
Gasoline 50 mL	38 mL	24%
Saline Solution 50 mL	62 mL	

Source: Prepared by the author (2022).

As observed, the analyzed gasoline does not fall within the limits established by the National Agency of Petroleum, Natural Gas, and Biofuels (ANP), showing a significant discrepancy of 6% from the expected value set by the Agency.

According to the rules established by the ANP, the margin of error accepted in the percentages found in gasoline analyses can be either above or below, with a discrepancy of 1%. That is, in the first stage, the result obtained was 24% alcohol content, which clearly shows that the analyzed gasoline does not comply with the Agency's standards and is therefore classified as an adulterated product.

O quadro 3 abaixo apresenta o teor de etanol teórico, ou seja, permitido pela ANP e o percentual experimental obtido.

Table – 3. Discrepancy between theoretical ethanol content and the value obtained in practice

Solution	Updated ethanol content (theoretical) allowed by ANP	Ethanol content (measured in practice) %
A) Gasoline + Distilled Water + NaCl	30%	24%

Source: Prepared by the author (2025).

GASOLINE + DISTILLED WATER

In the second stage of the practice, it was expected that the mixture of gasoline with distilled water would have an ethanol content of 30% by volume; however, the value obtained was 22% by volume. Thus, this solution showed a significant reduction of 2% by volume compared to the solution in the first stage, which showed 24% alcohol.

Below is the calculation related to the mixture of gasoline with distilled water.

$$\begin{aligned}
 &\text{B) } 11 \text{ mL} && 50 \text{ mL of initial gasoline} \\
 &\text{X\%} && 100 \\
 &50 \text{ mL X\%} = 100 \text{ \%. } 11 \text{ mL} \\
 &50 \text{ mL. X\%} = 1100 \text{ mL.\%} \\
 &\text{X\%} = \frac{1100 \text{ mL.\%}}{50 \text{ mL}} \\
 &\text{X} = 22\% \text{ Ethanol in gasoline}
 \end{aligned}$$

Following the same calculation procedure as in the first part (gasoline with saline solution), in this second part, referring to the mixture of gasoline with distilled water, the variation in the volume of distilled water with the initial amount of gasoline was used. These were $\Delta V = 11 \text{ mL}$ and $V = 50 \text{ mL}$, respectively.

Thus, it is analyzed that for this second moment of the experiment, in addition to showing a reduction of 2% by volume compared to the value found in the first stage, it also differs from the value determined by the current legislation. Table 4 below shows the differences between the initial and final volumes of this solution.

Table – 4. Volume differences

Initial volume (mL)	Final volume (mL)	Ethanol content (measured in practice) %
Gasoline 50 mL	37 mL	22%
Distilled Water 50 mL	61 mL	

Source: Prepared by the author (2022).

The percentage result identified for the above solution reinforces the possibility of adulteration of the analyzed gasoline sample, since the ethanol result does not comply with the standards established by the National Agency of Petroleum, Natural Gas, and Biofuels (ANP). Likewise, possible errors in laboratory execution cannot be ruled out, such as the purity of the distilled water used in the practice, as well as other errors already mentioned in this work.

Below is Table 5, which shows the discrepancy between the ethanol content measured experimentally and the content allowed by the current regulation for the proper use of the product.

Table – 5. Discrepancy between theoretical ethanol content and the value obtained in practice

Solution	Updated ethanol content (theoretical) allowed by ANP	Ethanol content (measured in practice) %
B) Gasoline + Distilled Water	30%	22%

Source: Prepared by the author (2025).

CONCLUSION

The present work sought, through a laboratory experiment, to measure the ethanol content present in gasoline. For this purpose, the experiment proved to be an important tool to verify whether the alcohol content in the gasoline sample used in this practice was in compliance with the technical standards established by the National Agency of Petroleum, Natural Gas, and Biofuels (ANP).

Thus, even though the experiment presented some minor laboratory interferences during the practice, the experiment followed the established protocols. Therefore, it is concluded that, according to the ANP update, the commercial gasoline used in this specific practice is adulterated, bringing several consequences not only economically but also environmentally.

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**DIAGNOSIS OF ENVIRONMENTAL IMPACTS IN THE INHAMUM STREAM WATERSHED
IN CAXIAS – MA** <https://doi.org/10.63330/aurumpub.015-009>**José Manoel Morais Silva¹ and Jéssica Cristina Oliveira Frota²****ABSTRACT**

Environmental impacts in watersheds are a global concern, resulting from actions such as deforestation, urbanization, and pollution. These processes compromise water quality and the balance of ecosystems. The environmental impact caused by deforestation in the Inhamum stream basin in Caxias (MA) is evident, especially regarding the degradation of hydrographic systems and native vegetation cover. The destruction of riparian vegetation promotes erosion and river siltation, reducing flow and compromising water quality, alongside urbanization processes. Given this, the general objective of the research is to identify the impacts of deforestation on the banks of the Inhamum stream and its effects on the hydrography in the Caxias-MA region. To this end, the following specific objectives were defined: to characterize the physiographic aspects of the study area; to identify the main consequences of anthropogenic actions within the watershed; and to analyze the effectiveness of public policies and environmental management practices implemented to combat deforestation and preserve water resources. The research has a qualitative nature and a descriptive approach, with data collection through direct observation, photographic records, and the use of geotechnologies such as QGIS software. The results indicate that the loss of vegetation cover has directly affected the basin's hydrological cycle, contributing to erosion, siltation, and reduced water availability. The study aims to contribute technical input for the development of environmental management strategies and the strengthening of public policies aimed at protecting natural resources and promoting the sustainable development of the region.

Keywords: Preservation area; Conservation; Ecosystem; Resource management.

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INTRODUCTION

Water is an essential resource for the maintenance of life and the balance of ecosystems. However, increasing anthropogenic actions, especially deforestation and the disorderly occupation of land, have significantly compromised the quality and availability of this resource in various regions. The municipality of Caxias, located in eastern Maranhão, contains two important rivers—Itapecuru and Parnaíba—as well as a network of streams that, in recent decades, have been impacted by environmental degradation processes, particularly in the Inhamum stream basin.

The removal of vegetation, especially riparian forests, leaves the soil exposed to erosion, contributing to the siltation of watercourses and the loss of biodiversity (Castro; Martinez; Souza, 2013). According to Moreto et al. (2021), monitoring the dynamics of land cover is essential to ensure the maintenance of environmental quality, enabling planning and management actions for natural resources.

The Inhamum stream basin is particularly sensitive to these dynamics due to its proximity to urban areas and the presence of the MA-127 highway, which crosses the Inhamum Environmental Protection Area (APA), facilitating access and disorderly occupation. This dynamic not only leads to ecosystem degradation but also directly threatens the water supply capacity of the basin, which serves part of the population and economic activities of Caxias. Additionally, cultural and traditional practices, such as wood extraction for local festivities (Araújo, 2012), combined with hunting, firewood extraction, and urban expansion, intensify the degradation scenario.

Thus, the research problem arises: What are the main environmental impacts resulting from deforestation in the Inhamum stream basin in Caxias (MA), and how do anthropogenic actions and public policies influence the conservation of the region's water resources? To address this question, the general objective was formulated: to identify the impacts of deforestation on the banks of the Inhamum stream and the effects on hydrography in the Caxias-MA region. To achieve this objective, the following specific goals were outlined: to characterize the physiographic aspects of the study area; to identify the main consequences of anthropogenic actions within the Inhamum stream watershed; and to analyze the effectiveness of public policies and environmental management practices implemented to combat deforestation and preserve water resources in the region.

The research is qualitative in nature and adopts a descriptive approach, with emphasis on direct observation and environmental analysis. According to Gil (2019), this type of approach seeks to understand phenomena from their context. Data collection was conducted through field research in the Inhamum stream basin in Caxias (MA), as highlighted by Cunha and Silva (2001), using observation, notes, and photographic records (Trivinos, 2008). QGIS 3.4 software was used to create the location map, supported by GIS, an essential tool for representing and analyzing spatial dynamics (Câmara et al., 2001). The data were interpreted through descriptive analysis, which, according to Yin (2016), allows for the

identification of patterns and the development of preliminary diagnoses of observed environmental impacts.

Therefore, the research is justified by the urgency of diagnosing these impacts, understanding their causes, and proposing strategies to support public policies aimed at preserving native vegetation and protecting water resources. Furthermore, the proximity of the APA to urban areas and the presence of the MA-127 highway amplify the effects of anthropogenic actions and hinder enforcement, making a technical and analytical perspective on the local reality even more necessary. By diagnosing the main problems and their consequences, the study strengthens the discussion on the preservation of natural resources and sustainable development in Caxias and its surroundings.

LITERATURE REVIEW

DEFORESTATION AND ITS IMPACTS ON WATER RESOURCES AND ECOSYSTEMS

As Fausto et al. (2023) affirm, deforestation and vegetation removal—characterized by tree cutting through machinery—are primarily associated with agricultural activities. Pre-use land clearing often involves burning, a practice that has become routine yet remains highly harmful.

Land use along riverbanks and lakes can severely degrade their ecosystems, affecting springs, streams, and creeks they traverse or interact with, leading to rapid siltation and significant loss of local flora and fauna, potentially resulting in their disappearance. According to Bastos (2022), although natural causes exist, deforestation is predominantly driven by human activities such as logging, agricultural expansion, and unregulated urbanization.

There is a profound impact on biodiversity, with native devastation especially in the Cerrado and other Brazilian biomes, causing ecological imbalance. Castilho (2010) argues that this demands the creation of public policies focused on conservation and protection of remaining areas. Gelain (2012) views these issues within a broader framework of destructive practices tied to the globalized economy, which intensify predatory deforestation and sustain deep environmental degradation. Carepa (2010) notes that streams, creeks, and springs may also be classified as lakes and reservoirs, where riparian forests are found. These phytophysiologicals occur in moist or waterlogged soils prone to periodic flooding.

The removal of forests in riparian zones and vegetation suppression in watersheds directly impacts the hydrological cycle, impairing water infiltration and increasing surface runoff and erosion. According to Soares et al. (2019), such actions may alter the microclimate, increase rainfall variability, prolong droughts, and accelerate the manipulation of natural environments.

The lack of effective public policies and environmental oversight exacerbates this situation. Araújo et al. (2009) highlight the absence of controlled management of natural resources, negatively affecting both the quality and quantity of available water. Garcia (2016) emphasizes that unplanned

anthropogenic actions damage drainage systems and ecosystems, also impacting geomorphological stability and intensifying progressive environmental imbalances.

It is imperative to implement sustainable practices such as deforestation monitoring, ecological restoration, and deforestation verification, all of which must be backed by the conservation of Permanent Preservation Areas (APPs). As Carvalho (2012) demonstrates, such interventions are crucial to ensure ecological system resilience and consistently reduce threats that could render natural resources unsustainable.

Another important point is the link between deforestation and climate change. According to Santos (2017), vegetation plays a fundamental role in regulating atmospheric gas balances, particularly in CO₂ sequestration. The removal of vegetation cover contributes to increased atmospheric concentrations of this gas, worsening the effects of global warming. Gil (2020) goes further, stating that the advance of deforestation compromises not only biodiversity but also the health of aquatic ecosystems, deteriorating water quality and availability.

Fausto et al. (2023) emphasize the need for governmental actions, such as those outlined in the National Plan for Controlling Illegal Deforestation and Recovering Native Vegetation, prioritizing bioeconomy, land regularization, and territorial planning as measures to combat deforestation. Research by Rocha and Vianna (2008) and Araújo et al. (2009) reinforces that addressing the impacts of deforestation requires joint action among the State, society, and environmental institutions, with the goal of developing public policies capable of effectively promoting natural resource conservation and environmental sustainability.

PUBLIC POLICIES AND ENVIRONMENTAL MANAGEMENT IN WATER RESOURCE CONSERVATION

Natural resources, such as water, require public policies for environmental management aimed at their preservation and protection. These policies serve functions such as regulating the use of geographic space, controlling human activities that impact the environment, and ensuring the sustainable management of resources. To this end, legal frameworks addressing environmental issues have been established. Coutinho (2007) states that “the environment is increasingly a collective concern [...] scientific knowledge and governmental action are indispensable.” There has been a historical evolution of environmental concerns, from cultural/religious roots to agendas centered on public policies (with presence in constitutional texts).

In Brazil, the National Water Resources Policy was established by Law No. 9,433/1997, which outlines important instruments to optimize water use and management efficiency. These include Water

Resource Plans, classification of water bodies by usage categories, granting or charging for water use, and an information system on water resources (Berlinck, 2003).

According to Araújo et al. (2018), despite the availability of a legal framework, the effectiveness of environmental policies still faces challenges such as deficiencies in enforcement, sanctioning mechanisms, and insufficient investment in regulatory and oversight agencies. These issues necessitate an integrated, multi-level environmental management approach, where all levels of government—federal, state, and municipal—collaborate to implement truly effective solutions. Kersting (2023) argues that central water resource management policy should be decentralized, as this would strengthen environmental governance through integration among various public spheres, considering that water management affects other urban, environmental, and territorial policies.

Paula et al. (2024) add that the administration of natural resources must aim for sustainability by ensuring equitable access to water with minimum quality standards essential for use, as well as for environmental conservation and preservation. Santoro et al. (2021) also emphasize the importance of societal involvement in policy implementation and in monitoring government actions.

However, the implementation of these policies often encounters obstacles such as shortages of human, financial, and institutional resources. As Brandão et al. (2022) warn, political instability and budget cuts affect oversight agencies like IBAMA and ICMBio, making it impossible to properly carry out essential functions and directly impairing their operational capacity. Losekann and Paiva (2024) highlight that, in addition to financial limitations, there are also social challenges and weaknesses in environmental control mechanisms, which compromise the effectiveness of protection efforts.

According to Andreoli (1992), environmental policy reflects the development model adopted by a society. Thus, the more committed this model is to conservation, the more effective the existing public policies will be in promoting environmental preservation. Breaking away from predatory models to move toward more sustainable practices requires not only informed political will but also significant social engagement and the strengthening of necessary legal instruments.

SUSTAINABLE USE CONSERVATION UNITS AND THEIR CHALLENGES IN ENVIRONMENTAL PROTECTION

Conservation Units (CUs) serve as essential tools for the protection of natural resources and are primarily classified into two distinct groups: full protection and sustainable use. These include Ecological Stations (Esec), Biological Reserves (Rebio), National Parks (Parna), Natural Monuments (Monat), Wildlife Refuges (RVS), and Environmental Protection Areas (APA); as well as National Forests (Frona), Extractive Reserves (Resex), Fauna Reserves (Refau), Sustainable Development Reserves (RDS), and Private Natural Heritage Reserves (RPPN).

Brazil has made significant progress in environmental management following the creation of the National System of Conservation Units (SNUC), regulated by Law No. 9,985 of 2000 and Decree No. 4,340 of 2002. Gartner (2003) provides insights into how SNUC established standardized guidelines that shaped policies for an ecologically sound climate, aiding not only in environmental maintenance but also in incorporating offenders and locations into governance procedures.

The Environmental Protection Area (APA) falls under the sustainable use category, allowing for the coexistence of economic and social activities, provided they align with the conservation of natural resources. Rente (2006) notes that the development of APAs was driven by the need to mitigate environmental impacts caused by nature exploitation and to make such activities more sustainable. According to Brandão et al. (2022), Federal Decree No. 4,340/2002 provides criteria for the development of management plans, the operation of management councils, and the definition of secure rights to natural resources within these units.

However, Bethonico (2009) argues that although APAs represent a significant advancement in integrated environmental management, they are limited by the lack of participatory social monitoring. Literature on conservation units also indicates that the challenges faced are reflections of the current socio-environmental crisis. Oliveira (2023) points out that even in legally designated protected areas, there is intense competition for urban expansion, agriculture, economic extractivism, and other activities that exceed permitted limits and degrade the CUs.

Rosa (2015) emphasizes that these contradictions allow for reflection on the country's historical trajectory, which has been marked by predatory practices and, more recently, by a sustained attempt to build a development model aligned with sustainability. Gartner (2003) reinforces that although the concepts of preservation and conservation have theoretical differences, both aim to ensure the maintenance of ecosystems and environmental services for current and future generations.

In this context, protecting the effectiveness of Conservation Units, especially APAs, requires more than a public and regulatory political framework—it also demands a comprehensive constructive approach focused on improving management instruments, responsible action by environmental authorities, and active engagement and advocacy by society regarding shared environmental commons.

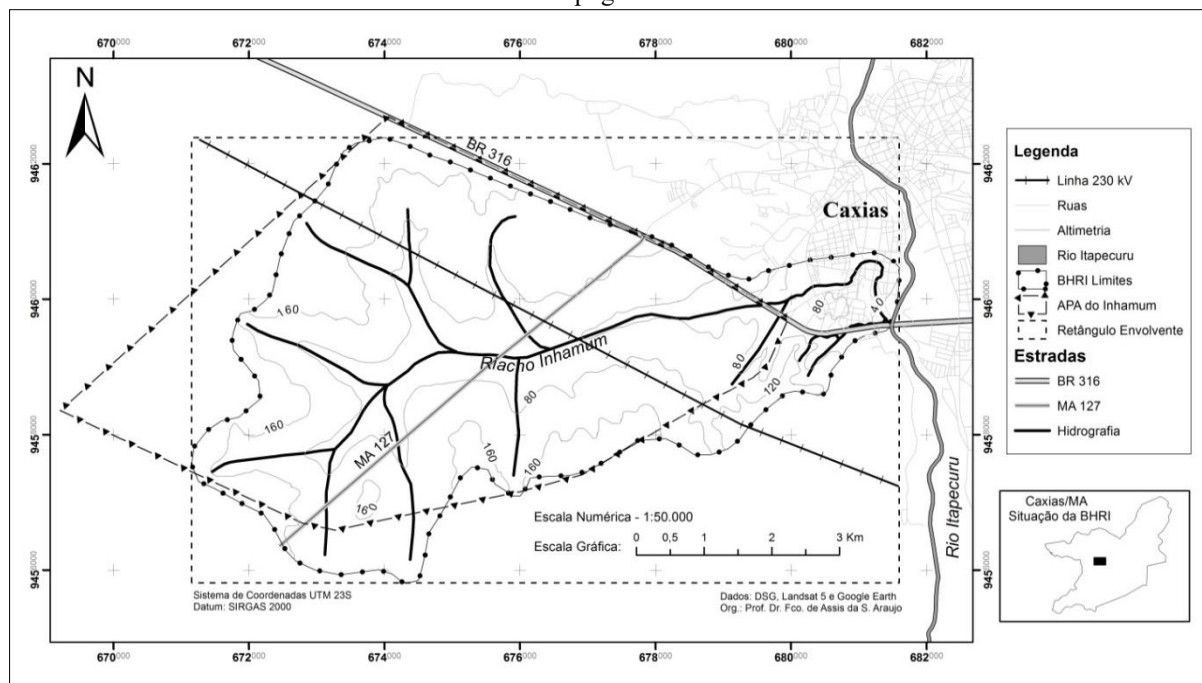
METHODOLOGY

CHARACTERIZATION OF THE STUDY AREA

The Inhamum Stream watershed (Figure 1) encompasses a significant area within the municipality of Caxias, Maranhão. It is located on the right side of the BR-316 highway and is intersected by the MA-127 road. Designated as an Environmental Protection Area (APA) by Law No. 1,464/2001 and

officially established in 2001, the area faces serious challenges due to unregulated urban growth and anthropogenic activities, which have contributed to its environmental degradation.

Figure 1- Location of the Municipal Environmental Protection Area and the Inhamum Stream watershed, with some natural and anthropogenic elements.



Source: Org: Prof. Dr. Assis Araújo (2024).

The map illustrates the limits of the Inhamum Stream Watershed (BHRI) and the Municipal Environmental Protection Area (APA do Inhamum), located in the municipality of Caxias, Maranhão. It highlights hydrographic features, altimetry curves, the Itapecuru River, and major roads (BR-316 and MA-127), as well as the 230 kV transmission line. The cartographic base uses the UTM 23S coordinate system with SIRGAS 2000 datum. The inset shows the location of the watershed within the municipality of Caxias.

The Inhamum Stream basin plays a direct role as a water source for Caxias, supplying water to industries, residences, and local agriculture. However, the area has been frequently subjected to illegal invasions and activities such as hunting and wood extraction, which compromise its environmental integrity. The ongoing pressure on this region threatens its ability to maintain biodiversity and the quality of available water resources.

METHODOLOGICAL PROCEDURES

This research is characterized as a qualitative study with a descriptive approach, based on methodological procedures that integrate field research, spatial analysis, and environmental interpretation.

As Gil (2019) states, qualitative research seeks to understand phenomena from the perspective of the subjects and the context in which they are situated.

This approach aligns with environmental and territorial studies, where social and ecological relationships are intertwined. Most scholars focus on field surveys, which, according to Marconi and Lakatos (2017), involve direct observation of phenomena in their natural environment, allowing researchers to collect data through notes, photographic or video records, and situational analysis of the dynamics under study. In the municipality of Caxias (MA), the activities were conducted within the boundaries of the Inhamum Stream sub-watershed, aiming to identify and document the predominant environmental impacts in the area.

Observations were guided by a systematic environmental analysis framework, developed based on criteria proposed by Cunha and Silva (2001). During data collection, the method of direct participant observation was employed, supported by photographic records and field diary notes, in accordance with Trivinos (2008), who recommends such methods for environmental and territorial studies.

For spatial representation of the study area, geotechnologies were utilized, particularly the QGIS 3.4 geoprocessing software, which enabled the creation of a location map based on cartographic data and satellite imagery. As Câmara et al. (2001) point out, Geographic Information Systems (GIS) are essential for visualizing, analyzing, and understanding spatial and environmental dynamics, making them a fundamental tool in watershed research.

Upon completion of field activities, descriptive and interpretative analysis of the collected data was conducted, integrating empirical records with specialized literature. According to Yin (2016), descriptive analysis is effective in identifying patterns and relationships among environmental variables, allowing for the formulation of preliminary diagnoses.

RESULTS AND DISCUSSION

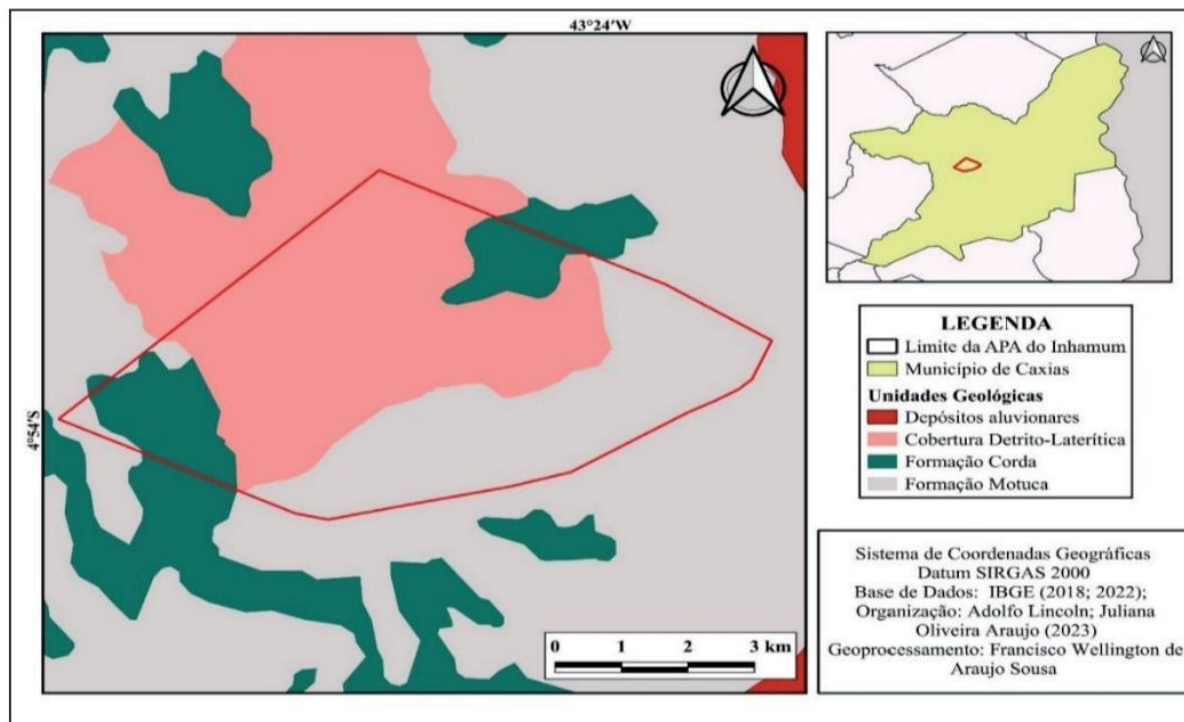
CHARACTERIZATION OF THE PHYSIOGRAPHIC ASPECTS OF THE INHAMUM STREAM BASIN

The Inhamum Environmental Protection Area, located in the municipality of Caxias, Maranhão, possesses physiographic characteristics that include climatic, hydrographic, geomorphological, and geological conditions. The region's climate exhibits relatively regular rainfall distribution, with annual precipitation ranging between 1,600 and 1,800 mm, and consistently high temperatures throughout the year, with an average exceeding 24°C (Araújo, 2012).

The Inhamum watershed is drained by the Inhamum stream, a second-order watercourse with permanent flow, as well as by small tributaries of the Itapecuru River basin, especially near the MA-127 highway. The area is situated within the sedimentary basin of the Meio-Norte region, characterized by

depressions with alluvial soils and quartz sand deposits commonly found along the stream's margins. The Motuca and Corda formations predominate geologically, forming the rocky substrate that influences the local morphology (Figure 2). These features make the landscape vulnerable to erosive processes and siltation (Araújo et al., 2024).

Figure 2 - Geological Base of the Inhamum Environmental Preservation Area (APA), Caxias, Maranhão, Brazil.



Source: Sousa (2023).

The map shows the boundary of the APA do Inhamum (red polygon) superimposed on mapped geological units within the municipality of Caxias. Geological units displayed in the legend comprise: Alluvial deposits, Detrital–Lateritic cover, Corda Formation, and Motuca Formation. The main panel contains a scale bar (0–3 km) and a north arrow; an inset map locates the APA within the municipal boundaries of Caxias. Geographic coordinates and graticule marks are indicated (approx. 43°24'W longitude and 4°45'S latitude). Cartographic datum and coordinate system: SIRGAS 2000 (geographic). Data sources and processing are noted in the map: IBGE (2018; 2022); organized by Adolfo Lincoln and Juliana Oliveira Araújo (2023); geoprocessing by Francisco Wellington de Araújo Sousa.

IDENTIFICATION OF NEGATIVE IMPACTS IN URBAN SECTIONS OF THE INHAMUM STREAM BASIN

From the analysis carried out during the research on deforestation and water resources in Caxias, it was possible to identify some elements that are degrading the space in this region. The results and data

collected through field observation and photographic records, such as the suppression of forest vegetation, the improper disposal of garbage, and the sewage discharged without prior treatment in the vicinity and into the stream bed, are the main agents causing negative environmental impacts that directly affect the region's water resources.

The sections of the Inhamum stream that cut through the urban area of the municipality have been receiving irregular uses, configuring new untreated domestic sewage outlets and accumulation of solid waste, which are often dumped directly into its bed. Such practices significantly contribute to the degradation of water quality and the imbalance of the local environmental system.

Cantinho do Céu, Marinha, Ponte do Babá, Travessa da Glória, Piscina da Ponte, and the bridge at Travessa da União are the main segments impacted by these anthropic actions. Figure 3 highlights a section of the Inhamum stream, popularly known as Cantinho do Céu:

Figure 3 - A: Bridge over the Inhamum stream, in a section known as Cantinho do Céu; B: Preserved riparian forest vegetation.



Source: author (2025).

The section of the Inhamum stream, popularly known as Cantinho do Céu, as shown in Figure 3 above (images A and B), is located within the urban perimeter, where partially preserved riparian forest vegetation is observed. However, anthropic interventions are evident, such as the construction of a bridge over the watercourse and the installation of an electric pole directly in the channel bed.

The irregular discharge of domestic sewage and the significant accumulation of solid waste on the stream's banks are evidenced in Figure 4, constituting a relevant environmental degradation factor, in addition to representing a potential public health risk.

Figure 4 - Section of the Inhamum stream known as Mariinha.. A: Presence of solid waste improperly discarded. B: Construction of houses very close to the stream bed area.



Source: author (2025).

As highlighted by Silva et al. (2011), solid waste improperly discarded in unsuitable locations has a high pollution potential and can favor the emergence of infectious diseases, especially considering the ease with which this improper disposal attracts animals such as rats, mosquitoes, flies, cockroaches, among other types of insects, as well as other biological and chemical agents, such as fungi, bacteria, and protozoa. It is also observed that the riparian forest in this section is significantly reduced, which directly contributes to the siltation process of the stream bed.

Figure 4, image B, illustrates the presence of residential buildings located near the riverbed. This configuration, in addition to intensifying negative environmental impacts on the watercourse, represents a potential housing risk, since in flood situations, residents may be exposed to inundations. Furthermore, unregulated land occupation is observed, which may result in various socio-environmental implications.

In the analyzed section shown in Figure 5, the presence of a structure was observed whose foundation was compromised due to erosion caused by the stream's current. As a result, the structure collapsed, falling into the watercourse and causing a partial obstruction of the channel.

Figure 5 - Section of Ponte do Babá.



Source: author (2025).

Additionally, the absence of riparian vegetation along this segment was noted, which further aggravates the environmental degradation processes in the area. In Figure 6, artificial narrowing of the stream bed is observed, resulting from an attempt to channel the water flow.

Figure 6 Section of Ponte do Babá.



Source: author (2025).

The presence of accumulated bamboo branches is observed, forming a small natural dam, which can retain water and increase the risk of overflows. Thus, unplanned human intervention is evident in this

scenario. Figure 7 shows the construction of a new building very close to the stream bank, as well as the visible discharge of untreated sewage.

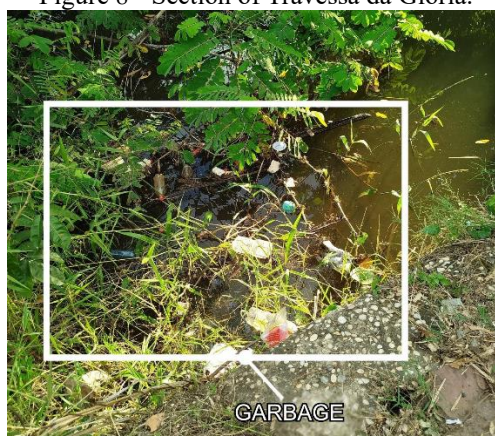
Figure 7 - Section of Travessa da Glória.



Source: author (2025).

It is noted that the irregular urbanization process, by suppressing the remaining riparian forest trees, directly contributes to environmental degradation and the compromise of water quality. The area is used as a space for urban expansion without environmental control, which demonstrates failures in municipal oversight. In several sections of the basin, the presence of solid waste inside the channel is noticeable, especially plastics and organic waste, such as human feces. This indicates a continuous pollution process, which transforms the stream into an open sewer (Figure 8). As a result, water quality is compromised, affecting the aquatic ecosystem and the population that may eventually use this water for consumption or recreation.

Figure 8 - Section of Travessa da Glória.



Source: author (2025).

The lack of environmental education policies and basic sanitation infrastructure is therefore alarming, considering that waste such as plastic bags and cleaning product packaging, discarded directly into the stream by laundry workers, are significant sources of water contamination (Santos et al., 2015).

Residential constructions near the stream bed are also identified as determining factors for its destruction. Given this scenario, the absence of effective preservation actions may lead to the irreversible loss of this water source, essential for supplying a large portion of the local population, as shown in Figure 9.

Figure 9 - Section popularly known as Piscina do Ponte.



Source: author (2025).

The presented section is, among all, the most well-known in the municipality, as it houses a dam called “Piscina do Ponte.” It was possible to identify the presence of solid waste and a large amount of sewage being discharged directly into the stream. It is observed that much of the riparian vegetation in this area has been suppressed, and the banks have been paved with concrete and asphalt, which hinders rainwater infiltration. This impermeabilization increases the runoff force of rainwater, contributing to the transport of waste improperly discarded on public roads, instead of in appropriate containers. In contrast, the section in Figure 10 shows a greater presence of native vegetation, suggesting a less impacted area.

Figure 10 - Section of Travessa da União.



Source: author (2025).

It is noted, however, that the image reveals the cutting of a medium to large tree, evidencing the continuity of human intervention. There are also clear signs of siltation on the stream banks, resulting from sediment transport caused by the lack of vegetation cover. The contrast between the existing vegetation and the negative impacts indicates a transitional stage between conservation and degradation. In this context, Figure 11, which highlights the same section, confirms the signs of human interference and degradation.

Figure 11 - Section of Travessa da União with signs of siltation.



Source: author (2025).

Figure 11 confirms the signs of human interference and degradation presented in the previous figure. The still-resistant vegetation shows that there is potential for ecological recovery, provided that preservation and reforestation actions are implemented. However, the presence of accumulated sedimentary material on the banks alerts to the need for intervention, aiming to contain the advance of siltation and restore the ecological functionality of the stream.

The landscape mismatches caused by degradation in a watershed area or its boundaries, such as valleys, slopes, meanders, or springs, may become irreversible depending on the extent of the devastation, bringing harm not only to nature but also social losses near the basin areas (Rocha and Viana, 2008).

As previously mentioned, although the study area presents well-preserved sections, it also shows signs of anthropic interventions. Figure 12 exemplifies a well-preserved section of the basin area. The site is known as Sumidouro do Padre, accessible via trails in the conservation unit.

Figure 12 - Sumidouro do Padre.



Source: author (2025).

This environment presents significant environmental integrity, with well-preserved riparian vegetation and high-quality water resources, referring to a spring area, characterized by clear waters and continuous flow, without the presence of anthropic barriers that compromise the natural dynamics of the water. Figure 13, in turn, presents a lagoon formed near the Alambique trail.

Figure 13 - Point near the Alambique trail.



Source: author (2025).

At this point, it is already possible to identify evidence of anthropic intervention, considering that a distillery operated in the vicinity, which in turn demonstrates negative impacts directly on the soil and water resources. Despite this intervention, the riparian forest vegetation remains preserved, with only a few tree trunks that apparently fell naturally over time, but which may possibly be associated with some type of previous negative impact, such as selective cutting, wood extraction, or trail opening. Figure 14 presents a photograph of the margins of Lagoa da Soledade, located closer to the MA-127.

Figure 14 – Area on the margins of Lagoa da Soledade. (A): Apparently preserved riparian forest. (B): Tree cutting representing deforestation.



Source: author (2025).

It is observed that the riparian forest surrounding the lagoon remains in excellent conservation condition, characterized by dense, well-structured vegetation with few signs of direct anthropic intervention. On the other hand, a clear indication of human intervention on the environment is observed (Figure 14B), represented by a recently cut tree trunk. It was also possible to observe, at the beginning of the Lagoa do Padre trail (Figure 15), signs of deforestation directly resulting from human action.

Figure 15 - Signs of deforestation at the beginning of the Lagoa do Padre trail.

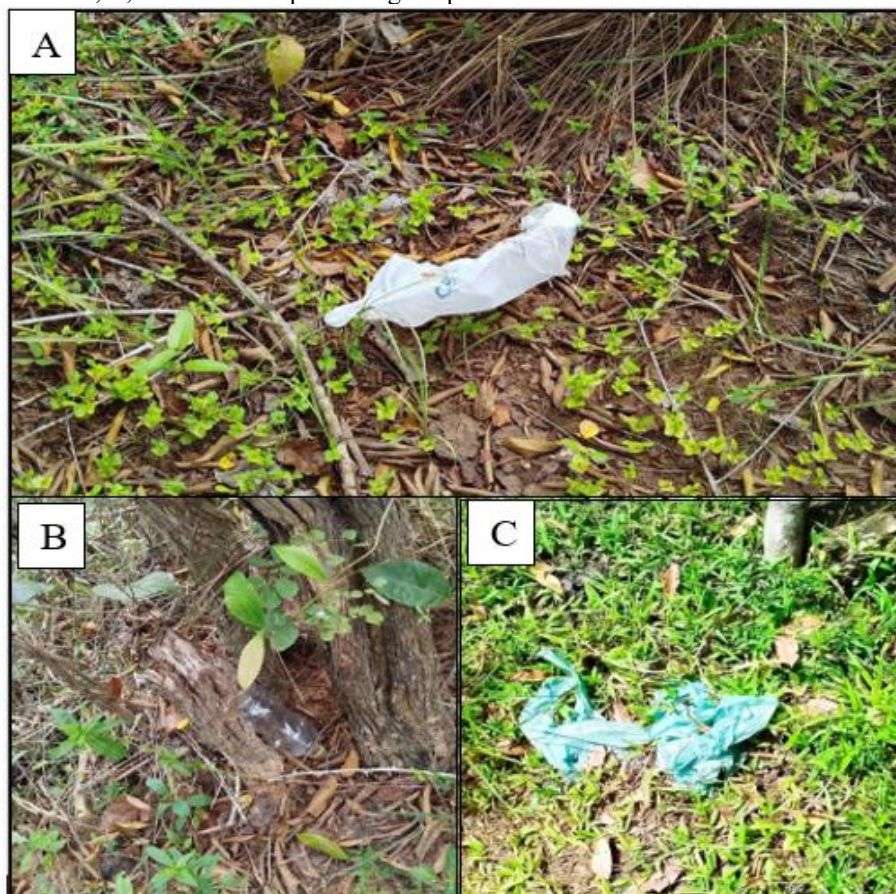


Source: author (2025).

The site presents evident signs of deforestation, characterized by the opening of clearings amid denser vegetation, resulting from anthropic interventions. Such actions represent potential risks to the Environmental Protection Area (APA), compromising ecological balance and the maintenance of ecosystem services.

Continuing the route around the basin area, it was once again possible to perceive the presence of solid waste improperly discarded in the APA (Figure 16).

Figure 16 - A, B, C – Mosaic representing the presence of solid waste in the center of the APA.



Source: author (2025).

This situation constitutes an environmental degradation factor, negatively impacting the local ecosystem, in addition to revealing the fragility of existing monitoring and control mechanisms. This scenario, therefore, proves inconsistent with the assumptions that underpin the current conservation policy of the referred conservation unit.

After the on-site analysis in the Inhamum Environmental Protection Area (APA), it was noted that although some sectors maintain a high degree of preservation, characterized by well-preserved riparian vegetation and quality water resources, it is also possible to observe clear signs of anthropic impacts. The presence of old structures such as the distillery tank, traces of deforestation, and improper solid waste disposal demonstrate pressure on the local ecosystem. This scenario highlights the importance of increasing monitoring, control, and environmental awareness actions to ensure the conservation of natural resources and the functionality of the conservation unit.

THE EFFECTIVENESS OF PUBLIC POLICIES AND ENVIRONMENTAL MANAGEMENT PRACTICES IMPLEMENTED TO COMBAT DEFORESTATION AND PRESERVE WATER RESOURCES IN THE REGION

Although there are many laws and guidelines, such as the Master Plan of Caxias (Law No. 1,631/2006) and the National Water Resources Policy, they are not applied with due comprehensiveness. The absence of interregional coordination, the scarcity of resources, and low oversight hinder the implementation of the planned actions. Furthermore, many environmental policies are disjointed, poorly coordinated, or discontinuous, which makes their implementation fragile and undermines their preservation objectives.

Basic sanitation in Caxias is subject to a range of federal, state, and municipal laws, as well as plans, such as the Municipal Basic Sanitation Plan (PMSB). At the federal level, Law No. 11,445/2007, called the National Basic Sanitation Law, provides general guidelines for these services. It requires municipalities to create their own plans, define universalization goals, and methods of social control.

This law was modernized by Law No. 14,026/2020, the New Legal Framework for Sanitation, which strengthens the expansion of access to water and sanitation by 2033. It encourages private sector participation and imposes stricter rules for oversight and regulation. At the state level, the State Basic Sanitation Policy is governed by Law No. 8,923/2009, defining principles such as universal access, environmental and financial sustainability, and integration with Maranhão's Water Resources Plans.

At the municipal level, the PMSB of Caxias was established by Municipal Law No. 2,361/2017, an essential urban planning instrument aimed at the four crucial pillars of sanitation: water supply, effective sanitary sewage, urban drainage, and solid waste treatment.

Recently, Municipal Decree No. 310/2023 instituted a commission tasked with reviewing the PMSB, seeking to align it with new legal demands and local issues. Even with these laws already in force, establishing precise guidelines for sanitation management, the reality in the rural communities of Caxias reveals incomplete oversight, poorly executed actions, and a notable failure to educate the population about the importance of sanitation, delaying progress toward the planned goals.

According to Assis et al. (2012), the environmental issue is complex and involves multiple actors with divergent perspectives. In the debate on the Forest Code, for example, the requirement for Legal Reserves and Permanent Preservation Areas is viewed differently by various groups. While some agricultural sectors consider these restrictions an obstacle to development, others argue that they are essential to ensure the sustainability of natural resources, such as water and soil, for future generations.

The effectiveness of environmental public policies depends on the collaboration and awareness of all social segments. Each sector has an important role to play, and it is essential that governments share decision-making power with the population, including those who have historically been excluded from

this process, without ignoring the legitimate interests of other economic and social sectors (Siqueira, 2008).

The designation of an area as an Environmental Protection Area (APA), within the scope of the National System of Conservation Units (SNUC), implies less stringent protection rules than other conservation units. This flexibility allows for the sustainable use of natural resources, provided that the rules established by SNUC are respected. However, the absence of a management plan developed and implemented by the municipality may violate regulations and encourage inappropriate anthropic activities, leading to biodiversity loss.

The research revealed the urgent need to raise public awareness about the importance of environmental preservation. The local community, often without access to environmental education, contributes involuntarily to degradation, without understanding the effects of their actions. It is essential to invest in educational campaigns, strengthen environmental oversight, and create effective public policies that involve community participation and ensure the protection of the region's water resources. A joint and practical action by public authorities, civil society, and research institutions will be necessary to reverse the current deterioration and ensure the sustainability of the Inhamum stream basin.

CONCLUSION

The analysis of deforestation and water resources associated with the Inhamum Stream in Caxias (MA) demonstrates that the degradation of the area is largely due to the removal of riparian vegetation, the dumping of garbage and sewage into watercourses and bodies of water, and the irregular and intensive occupation of its banks, consequently compromising water quality and posing health risks, especially in the most impacted urban sections.

Despite the fact that the Inhamum APA still has well-preserved sections, such as the Sumidouro do Padre, the presence of selective deforestation processes, garbage, and pressure from the urban area prove distressing in terms of oversight and environmental management in the region. The absence of an effective management plan and the disarticulation of public policies aggravate this situation.

Thus, the loss of riparian vegetation cover harms the local hydrological cycle, with the consequent reduction in water infiltration into the soil, affecting aquifer recharge and increasing vulnerability to floods and droughts. Therefore, vegetation must be preserved to safeguard water supply and the environmental balance of the basin. Finally, the research indicates that more integrated actions involving public authorities, civil society, research institutions, more environmental education, and oversight are needed so that we can collaborate and overcome the current degradation situation.

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PREDICTIVE BIOLOGY: THE REVOLUTION DRIVEN BY ARTIFICIAL INTELLIGENCE <https://doi.org/10.63330/aurumpub.015-010>**Abraham Guerra¹, Nilo Ricardo Corrêa de Mello Júnior², Anderson Manares-Romero³ and Luzia Micaele Alves Barbosa⁴****ABSTRACT**

The convergence of artificial intelligence and bioinformatics has initiated a scientific revolution, transforming our ability to interpret biological complexity. This paper argues that the recent solution to the protein folding problem, achieved by AI tools such as AlphaFold, has provided an unprecedented technological arsenal to address global health crises such as antimicrobial resistance (AMR). The concept of “digital bioprospecting” is introduced as a new paradigm that, instead of cultivating microorganisms, directly explores genomic and proteomic data. This method now enables the investigation of previously inaccessible biological frontiers, highlighting the domain of Archaea as a target of particular interest. Due to their unique biochemistry and status as a largely unexplored branch of life, recent computational analyses of their proteomes have revealed a rich potential for new families of antimicrobial compounds (“archaeasins”), thereby validating their importance as a crucial source for the discovery of future antibiotics. Thus, the transition from a descriptive to a predictive science, driven by this synergy, inaugurates a new era in drug design and biological engineering.

Keywords: Machine learning; Bioinformatics; AlphaFold; Antimicrobial resistance; Archaea.

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INTRODUCTION

At the confluence of biology and computing, a scientific revolution of unprecedented scale is emerging. This transformation is grounded in the convergence of two fundamental languages: the genetic code—the sequence of nucleotides that dictates the form and function of every living being—and the computational code of artificial intelligence (AI), which grants us the ability to process and comprehend biological complexity at a speed and depth previously unimaginable. The fusion of these two codes does not represent an incremental improvement but rather a paradigm shift that is redefining the boundaries of discovery. For the first time, it enables us to decipher the hidden “grammar” of proteins, the macromolecules that execute life’s instructions (Jumper et al., 2021).

This new era is defined by our capacity to confront challenges that, for a long time, were considered intractable. The first of these is the “grand challenge” of protein folding, an enigma that has occupied the scientific community for more than 50 years (Anfinsen, 1973; Jumper et al., 2021a). Predicting the intricate three-dimensional structure of a protein from its linear amino acid sequence was a task of astronomical computational complexity, yet fundamental, since structure determines function. The second challenge is an urgent global public health crisis: antimicrobial resistance (AMR). Declared by the World Health Organization (WHO) as one of the top ten threats to humanity, AMR threatens to reverse a century of medical progress, rendering common infections once again lethal due to stagnation in the discovery of new antibiotics (Murray et al., 2022a).

The central argument of this work is that the recent solution to the first challenge, driven by AI through tools such as AlphaFold, has provided us with an entirely new conceptual and technological arsenal to tackle the second. By deciphering the structural code of proteins, we open innovative pathways for discovering and designing the drugs of the future, ushering in a new era in which the code of life is no longer merely read but begins to be understood and, potentially, rewritten.

BIOINFORMATICS: THE LANGUAGE OF BIOLOGY IN THE DIGITAL ERA

DEFINITION AND FOUNDATIONS

Bioinformatics is the scientific discipline situated at the intersection of biology, computer science, mathematics, and statistics (Carolina Cabral da Silva; Cidinaria Silva Alves, 2024; Uesaka et al., 2022). Its fundamental purpose is to develop methods and tools for storing, analyzing, and, crucially, interpreting the vast amount of biological data generated by modern technologies (Carolina Cabral da Silva; Cidinaria Silva Alves, 2024; Diniz; Canduri, 2017; Uesaka et al., 2022). In essence, bioinformatics functions as the “linguistic component of genetics.” Just as a linguist studies language patterns to understand meaning and structure, a bioinformatician analyzes patterns in DNA and protein sequences to identify genes, determine their functions, establish evolutionary relationships, and predict their three-dimensional conformation.

This discipline serves as the indispensable bridge linking raw biological data—such as the billions of bases in a sequenced genome—to applicable biological knowledge and functional understanding (Uesaka et al., 2022).

The need for bioinformatics arose from an inescapable reality: advances in technologies such as next-generation sequencing (NGS) have produced millions of biological data points (Rabbani; Tekin; Mahdiah, 2014). This volume of information exceeded the capacity of traditional analytical methods. Without a computational framework to organize, query, and analyze these data, the Human Genome Project, for example, would have resulted in an unintelligible collection of letters rather than a functional map of our species. Bioinformatics provided this framework by combining massive biological databases with sophisticated algorithms and statistical models (Clark; Lillard, 2024; Sayers et al., 2021). Therefore, the birth of “*big data* biology” was not solely a product of sequencing technologies but the result of a symbiosis between large-scale data generation and bioinformatics’ ability to transform these data into structured knowledge.

THE TRANSFORMATIVE IMPACT ON SCIENCE AND MEDICINE

The catalyst that demonstrated the power of bioinformatics on a global scale was the completion of the Human Genome Project in 2004 (Hood; Rowen, 2013). This milestone was not only a triumph of molecular biology but also a bioinformatic feat that rendered manageable a task of enormous scale and complexity. Since then, its applications have permeated nearly every field of life sciences, generating a transformative impact.

Among its most notable applications are:

- **Drug Development:** Bioinformatics tools drastically accelerate the discovery of new drugs. They enable the identification of therapeutic targets at the molecular level and the execution of computational simulations to predict how a potential drug will interact with its target, reducing costs and time in the early stages of research (Behzadi; Gajdács, 2022; Bian; Xie, 2018; Xia, 2017; Zhang et al., 2025).
- **Public Health and Epidemiology:** The role of bioinformatics was crucial during the COVID-19 pandemic. Rapid computational analysis of the SARS-CoV-2 genomic sequence allowed scientists to decipher the molecular structure of its proteins, an essential step for designing and developing effective vaccines in record time (Abdelsattar et al., 2021; Al-Janabi, 2022; Ma et al., 2021; Sawyer; Free; Martin, 2021; Torrington, 2022). Additionally, bioinformatic models are used to predict the evolution and spread of epidemics.
- **Industry, Biotechnology, and Agriculture:** In the industrial sector, bioinformatics is essential for “genome mining,” which involves exploring microbial genomes for genes that

produce enzymes of interest. These biocatalysts are optimized and employed to develop more efficient and environmentally friendly industrial processes for manufacturing detergents, biofuels, and food products (Beller et al., 2018; Costessi et al., 2018; Mitra et al., 2022; Van den Bogert et al., 2019).

Similarly, in agriculture, the integration of bioinformatics with non-destructive technologies has opened new frontiers. Methods such as near-infrared spectroscopy (NIR) have shown promise for assessing fruit quality, enabling simultaneous analysis of multiple attributes with minimal sample preparation. This technique has proven effective in crops such as mango (Da Silva Alves et al., 2025; De Freitas et al., 2022), pineapple (Amuah et al., 2019), avocado (Subedi; Walsh, 2020), orange (Borba et al., 2021), nectarine (Scalisi; O’Connell, 2021), banana (Sripaurya et al., 2021), melon (Kim et al., 2021), apple (Pourdarbani et al., 2022), pear (Lu et al., 2022), tangerine (Huang et al., 2022), and kiwi (Basile; Marsico; Perniola, 2022). By combining these large volumes of spectral data with bioinformatic algorithms, it becomes possible not only to predict quality attributes but also to identify patterns related to nutrition, ripening, and even physiological disorders, bringing agriculture closer to an increasingly data-driven approach.

ARTIFICIAL INTELLIGENCE: THE COMPUTATIONAL ENGINE OF BIOLOGICAL DISCOVERY

In the context of life sciences, artificial intelligence is not an abstract consciousness but a set of advanced computational tools designed to analyze complex biological data, model natural processes, and, fundamentally, make predictions based on patterns often undetectable by human analysis. AI enables researchers to decode vast genomic datasets, simulate molecular behaviors, and model ecological interactions at an unprecedented scale and speed (Hamid Jamialahmadi et al., 2024).

To understand its application, it is useful to distinguish two key concepts:

Machine Learning: A branch of AI in which algorithms are trained with large datasets to “learn” how to perform specific tasks without being explicitly programmed for each rule (Janiesch; Zschech; Heinrich, 2021). For example, a machine learning model can be fed thousands of genetic mutation sequences, some labeled as benign and others as pathogenic. Over time, the algorithm learns to identify the distinctive patterns of each class and can predict the nature of a new mutation it has never encountered before (Diaz et al., 2023; Zhu; Ong; Huttley, 2020).

Neural Networks and Deep Learning: Deep learning is a subfield of machine learning that employs architectures called artificial neural networks, loosely inspired by the structure of the human brain^{40,41}. These networks consist of multiple layers of interconnected “neurons” (hence the term “deep”), where each layer learns to recognize increasingly complex and abstract features of the data⁴⁰. This

hierarchical structure is particularly effective for analyzing biological data, which are massive, high-dimensional, and often unstructured, such as genomic sequences or microscopic images. A key advantage of deep learning is its robustness in handling large-scale, unstructured datasets. Alharbi et al. (2022) note that “*deep learning methods have shown unprecedented performance in genomics, especially when analyzing large-scale, high-dimensional data sets*”⁴². This capability has enabled significant advances in bioinformatics, such as genomic sequence analysis, pattern recognition in biomedical images, and protein structure prediction.

Moreover, deep neural networks have achieved performance comparable to or even surpassing that of human experts. As Goodfellow et al. (2016) describe, “*deep learning has drastically improved the state of the art in speech recognition, visual object recognition, object detection, and many other domains,*” and this technological revolution now extends to predictive biology (Goodfellow; Bengio; Courville, [n.d.]).

The true revolution of AI in biology lies not merely in automation or increased analytical speed but in a fundamental paradigm shift: from a predominantly descriptive science to a predictive one. Traditional biology and classical bioinformatics focused on describing and cataloging the natural world: sequencing a genome, determining a protein structure, annotating a gene’s function. AI, particularly deep learning, excels at prediction. It does not merely describe what exists but anticipates what could exist or what will occur. Examples include predicting a protein’s three-dimensional structure from its linear sequence, forecasting the pathogenicity of a genetic variant, or estimating the efficacy of a pharmacological compound (Hsu; Lu; Hsu, 2024; Jumper et al., 2021; Zhou; Astore; Skolnick, 2022). This predictive power allows laboratory experiments to be guided by computationally generated hypotheses with a high probability of success, drastically optimizing the use of time and resources in research.

FUNDAMENTAL APPLICATIONS OF AI IN BIOLOGY

The predictive capabilities of AI are already being harnessed across a wide range of biological and medical applications:

- **Genomics:** Tools such as Google’s DeepVariant employ deep neural networks to analyze millions of genomic sequences and identify genetic variants with accuracy surpassing previous methods, which is crucial for diagnosing genetic diseases (Poplin et al., 2018).
- **Drug Discovery:** AI is transforming the lengthy and costly process of drug development. Algorithms can analyze vast chemical libraries to identify candidate molecules with therapeutic potential, predict their pharmacological properties, and even optimize their structures to enhance efficacy and safety (Blanco-González et al., 2023; Rehman et al., 2025).

- **Systems Biology:** AI enables the modeling of complex networks of interactions among genes, proteins, and metabolites that govern cellular processes (Dasgupta; De, 2023; Kannan et al., 2025; Kitano, 2012). These models help scientists understand how small perturbations—such as a mutation or the action of a drug—can affect the entire biological system.
- **Medical Diagnostics:** Deep learning algorithms, particularly those based on computer vision, have demonstrated remarkable ability to analyze medical images. They can, for instance, identify early signs of melanoma in skin lesion photographs, detect anomalies in radiographs, or predict Gram-staining outcomes directly from microscopy images, thereby automating and accelerating bacterial identification (McMahon et al., 2025; Seven et al., 2025).

THE SOLUTION TO THE PROTEIN FOLDING ENIGMA

In 1973, biochemist Christian Anfinsen postulated his “thermodynamic hypothesis,” which states that all the information necessary for a polypeptide chain to fold into its unique, functional three-dimensional structure is contained within its own sequence (Anfinsen, 1973). This principle laid the foundation for one of the greatest challenges in computational biology: predicting the three-dimensional (3D) structure of a protein based solely on its sequence. The problem is overwhelmingly complex; a protein can theoretically adopt a number of possible conformations that exceeds the number of atoms in the universe (Hou et al., 2024).

Solving this enigma was of paramount importance. A protein’s biological function—whether catalyzing a reaction, transporting a molecule, or transmitting a signal—depends intimately on its 3D shape. Therefore, knowing the structure is a prerequisite for understanding disease mechanisms at the molecular level, designing drugs that bind to specific targets, and engineering new enzymes for industrial applications. For decades, the “gold standard” for determining these structures relied on experimental techniques such as X-ray crystallography and nuclear magnetic resonance (NMR) spectroscopy (Rahimi et al., 2022; Smyth; Martin, 2000). However, these methods are slow, extremely costly, and not applicable to all proteins (Bertoline et al., 2023). This created a massive knowledge gap: while databases contained hundreds of millions of protein sequences, only a small fraction—about 200,000—had experimentally resolved structures (Bertoline et al., 2023).

ALPHAFOLD 2: THE REVOLUTION IN STRUCTURAL BIOLOGY

In 2020, during the 14th edition of the biennial Critical Assessment of protein Structure Prediction (CASP14), the AI system AlphaFold 2, developed by Google’s DeepMind, delivered results described as transformational and highly accurate (Jumper et al., 2021). For the first time, a computational method was

capable of predicting protein structures with an accuracy comparable to experimental methods, effectively solving a 50-year-old problem.

The functioning of AlphaFold 2 represents a milestone in the application of deep learning to scientific challenges. Unlike previous models, it is an end-to-end system that integrates physical and biological knowledge directly into the design of its deep neural network architecture (Jumper et al., 2021). The process can be summarized as follows:

1. The system takes as input the amino acid sequence of the target protein.
2. It searches massive public databases for genetically related sequences to construct a multiple sequence alignment (MSA). The MSA reveals positions of amino acids that have tended to mutate together throughout evolution—a strong signal that these residues, although distant in the linear sequence, are likely in physical contact in the folded 3D structure (Jumper et al., 2021).
3. A neural network based on an “attention mechanism” (a concept borrowed from natural language processing) analyzes the complex relationships within the MSA to infer distances and orientations between amino acid pairs.
4. This information is used to build a “spatial graph” representing the protein’s structure. The system iteratively refines this graph, passing information back and forth between the 1D sequence representation, a 2D distance map, and the final 3D structure until it converges on a high-confidence prediction.

The impact of this breakthrough was monumental. The paper describing the method became one of the most influential scientific works in recent history, accumulating more than 40,000 citations by September 2025 (Jumper et al., 2021). However, the strategic decision by DeepMind to make the source code publicly available and, in collaboration with the European Bioinformatics Institute (EMBL-EBI), to create the AlphaFold Protein Structure Database truly catalyzed the revolution (Varadi et al., 2022). This open-access database democratized access to more than 300,000 structural predictions. This open-science strategy functioned as a massive feedback loop: it allowed millions of researchers worldwide to use, validate, and build upon the technology. This not only accelerated discoveries in areas as diverse as malaria vaccine development, enzyme engineering for plastic degradation, and the fight against antibiotic resistance (Behling et al., 2023; Ko et al., 2022; Liu et al., 2024; Yang et al., 2023), but also established AlphaFold as the gold standard far more rapidly and robustly than a proprietary approach could have achieved.

ALPHAFOLD 3: THE ARCHITECTURE OF MOLECULAR INTERACTION

If AlphaFold 2 solved the problem of protein structure as individual actors, AlphaFold 3, introduced in 2024 by Abramson et al., represents the logical and conceptual next step: understanding proteins as components of an interactive molecular ecosystem (Abramson et al., 2024). Biological function rarely results from a single molecule; proteins constantly interact with other biomolecules to perform their tasks. The evolution from AlphaFold 2 to AlphaFold 3 is not merely a technical improvement but a computational reflection of a maturing biological perspective—shifting from a “part-centered” approach to one focused on the complete “molecular machine.”

The improvement in accuracy is remarkable: the model demonstrates at least a 50% enhancement in predicting interactions between proteins and other types of molecules compared to existing methods (Abramson et al., 2024). This is achieved through a completely redesigned neural network architecture based on a “diffusion model.” This approach begins with a disordered “cloud” of atoms and, through an iterative refinement process, converges on the most probable three-dimensional structure of the entire molecular complex (Abramson et al., 2024).

CASE STUDY: THE HUNT FOR ANTIBIOTICS IN THE “THIRD DOMAIN” OF LIFE

Antimicrobial resistance (AMR) is a silent pandemic advancing at an alarming pace. According to 2019 data, drug-resistant infections were the direct cause of at least 1.27 million deaths worldwide and were associated with nearly 5 million additional deaths (Murray et al., 2022b). Projections are even more dire: a United Nations-backed report warns that, without drastic measures, annual deaths from AMR could reach 10 million by 2050 (Naddaf, 2024). The economic impact is equally devastating, with costs including longer hospital stays, the need for more expensive medications, and a potential reduction of \$3.4 trillion in global GDP (Ahmed et al., 2024; Naddaf, 2024).

Faced with the escalating AMR crisis, the need to discover new classes of antibiotics is desperate. Traditional searches, focused on soil bacteria and fungi, have yielded diminishing returns, prompting researchers to explore more unconventional biological frontiers. One of the most promising is the domain of Archaea—the “third domain” of life—comprising unicellular organisms with genetic and biochemical characteristics that distinguish them from both bacteria and eukaryotes, such as their unique cell wall and membrane structures (Baker et al., 2020; Spang; Offre, 2019).

Archaea are known for thriving in some of Earth’s most extreme environments, from boiling hot springs to hypersaline waters and deep-sea hydrothermal vents (Baker et al., 2020; Chaban; Ng; Jarrell, 2011). Their ability to survive under such conditions suggests a unique biochemistry. However, their relevance is not limited to these niches, as they are also part of complex microbiomes such as the human gut, making them a potentially significant and directly relevant source of new bioactive compounds

(Guerra, 2024). Despite this potential, many archaea are extremely difficult to culture, a barrier that has limited their study.

To overcome this barrier, a paradigm shift has emerged: digital bioprospecting. Instead of relying on the constraints of microbial cultivation, this approach directly explores genomic and proteomic information stored in databases. Artificial intelligence acts as a virtual “prospector,” analyzing these vast repositories for sequences with antimicrobial potential. This methodology not only radically accelerates discovery but also reveals the potential of previously inaccessible organisms.

A recent study demonstrates the power of this approach. Using a machine learning platform (APEX 1.1), researchers conducted a systematic search across the proteomes of 233 archaeal species (Torres; Wan; De La Fuente-Nunez, 2025). The results were extraordinary: the AI model identified more than 12,000 peptide sequences with high antimicrobial potential, which the authors named “archaeasins.” To validate these predictions, the team synthesized 80 of these archaeasins, and in vitro tests showed that an astonishing 93% exhibited activity against drug-resistant bacteria. The tests progressed to animal models (in vivo), where the most promising candidate, archaeasin-73, demonstrated efficacy in treating infections comparable to that of polymyxin B, a potent last-resort antibiotic (Torres; Wan; De La Fuente-Nunez, 2025). This pioneering work not only validates archaea as a new and rich source of antibiotics but also establishes the power of AI to unlock the hidden potential encoded in the genomes of life’s most unexplored corners.

THE FUTURE OF BIOLOGY IS COMPUTATIONAL

The synergy between artificial intelligence and bioinformatics has consolidated a fundamental paradigm shift, transforming biology from a descriptive science into a predominantly predictive one. The success of AlphaFold in solving the protein folding problem does not represent an endpoint but rather the catalyst for a new era of applied research, whose potential is exemplified by its use in prospecting new antibiotics from underexplored biological lineages to combat the antimicrobial resistance crisis. The ability to predict with high precision the structure and interactions of molecular complexes now allows laboratory experimentation to be guided by computationally generated hypotheses, drastically optimizing discovery cycles. This predictive power lays the foundation for future applications, such as the design of personalized treatments based on the structural dynamics of proteins and the development of synthetic biology to create biomolecules with tailored functions. The convergence of the biological and computational codes has equipped science with the tools to interpret and, potentially, rewrite the molecular logic of life, establishing that the future of biological research is, unequivocally, computational.

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BEYOND BIOLOGY: ENVIRONMENTAL EDUCATION AS A CENTRAL ELEMENT IN THE PPCS OF THE BACHELOR'S DEGREE IN BIOLOGICAL SCIENCES

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ABSTRACT

This article analyzes the inclusion of Environmental Education in the Pedagogical Course Projects (PPC) of undergraduate programs in Biological Sciences. This qualitative study used document analysis as the primary method to investigate how EE is approached and integrated into the curricula. The research focused on five courses offered at a public university, both in-person and hybrid formats. We sought to go "beyond Biology," understanding Environmental Education not only as a disciplinary subject but as a guiding principle that should permeate the entire training of future teachers. The results show that EE is included as a specific discipline or addressed in a transversal and interdisciplinary manner in Pedagogical Practice courses. The study demonstrated the importance of reformulating the PPCs, promoting EE as a transversal and central axis, capable of empowering undergraduates to act as agents of transformation, prepared to deal with the complex socio-environmental challenges of our time.

Keywords: Political pedagogical project; Public university; Environmental education.

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INTRODUCTION

Environmental Education (EE) transcends the mere status of a curricular subject, establishing itself as a fundamental and strategic pillar in the training of future teachers of Biological Sciences. The global ecological crisis—marked by climate change, accelerated biodiversity loss, and resource depletion—demands an educational response that is critical, transformative, and action-oriented. The Biological Sciences Teaching Degree, by its intrinsic nature linked to living systems and their ecosystems, constitutes a privileged *locus* for shaping the educator as an agent of transformation, capable of bringing environmental awareness into the classroom and society at large. The relevance of Environmental Education in teacher training also lies in preparing for pedagogical practice. Biology, due to its experimental and field-based nature, offers a wide range of opportunities for practical Environmental Education; however, higher education must provide the methodological framework to make effective use of these opportunities (SATO, 2002).

Environmental Education (EE) is a field of knowledge and practice that seeks to promote awareness and behavioral change regarding the environment. It is not limited to providing information about nature but encompasses political, social, and ethical dimensions aimed at transforming society.

Reigota (2011, p. 11) defines Environmental Education as “a continuous and permanent educational process for the formation of conscious, critical citizens capable of relating to the environment in a balanced and respectful manner.” In this sense, it seeks more than the transmission of data; it aims to form individuals capable of understanding the complex interactions among society, economy, and nature.

A critical approach to Environmental Education is essential to prevent it from becoming a mere tool of “greenwashing.” Layrargues (2017, p. 25) criticizes what he calls “the cynicism of environmental education,” manifested in attempts to present sustainability as a magical solution to the environmental crisis without questioning power structures and the prevailing development model.

In this context, EE must act as an instrument of emancipation, empowering individuals to question the *status quo* and seek alternatives for building a more just and sustainable society. As highlighted by Law No. 9.795/99, which establishes the National Environmental Education Policy, EE must be “an essential and permanent component of national education, to be developed at all levels and modalities of the educational process, in both formal and non-formal contexts.”

Environmental Education is, therefore, an educational process aimed at forming an “ecological subject” (SATO, 2002), that is, an individual who internalizes values of respect, responsibility, and solidarity toward the environment and perceives themselves as an integral part of nature rather than superior to it. In this sense, EE becomes a tool for building a more equitable and sustainable future for all.

Environmental Education should be addressed in a transversal and interdisciplinary manner within the Biology curriculum, as recommended by the National Curriculum Guidelines (BRASIL, 2012). This

means that, when studying Plant Physiology, the future teacher should be able to discuss the impact of deforestation and monocultures; when addressing Genetics, they should analyze the risks and ethical issues of biotechnologies and Genetically Modified Organisms (GMOs) in environmental contexts (REIGOTA, 2011).

Thus, this study analyzed the inclusion of Environmental Education in the Pedagogical Course Projects (PPC) of Biological Sciences Teaching Degrees, investigating how EE is addressed and integrated into curricula.

METHODOLOGICAL APPROACH

This work was developed based on Creswell's (2014) discussions on qualitative research, which he conceptualizes as research grounded in assumptions that address the meanings individuals or groups attribute to a social or human problem, including the researcher's reflection, a complex description, and interpretation of the problem, aiming to contribute to the literature or propose a call for change (CRESWELL, 2014, p. 49).

The present study is characterized by document analysis of the syllabi, curriculum matrix, and Pedagogical Course Project (PPC) of the Biological Sciences program at a public university located in the state of Piauí, offered in both in-person and hybrid modalities. The research initially developed through document analysis and discussion of the data obtained from the PPC, syllabi, and curriculum matrix. The PPCs were provided by the coordinators of the Teresina campus (in-person modality) and the campuses of Piripiri, Oeiras, Bom Jesus, and Simões (hybrid modality). As criteria for data analysis, we proceeded with reading and searching the PPCs, syllabi, curriculum matrix, and bibliographies using the keyword "Environmental Education" within the analyzed documents. These searches were conducted by observing the names of the courses, refining the search to identify where Environmental Education was present. We analyzed the content of syllabi that focused on Environmental Education, as well as the interdisciplinarity among the program's courses. For data analysis, we considered courses that included Environmental Education in their titles, topics, and/or bibliographies. All data were provided by the coordinators of the university's programs, which is a public institution. Therefore, for ethical reasons, the name of this institution was omitted to protect the identities of the participants and coordinators who did not wish to be identified.

RESULTS AND DISCUSSION

The analysis of the inclusion of Environmental Education (EE) in the Biological Sciences programs of a public university in the state of Piauí, offered in both in-person and hybrid modalities, was conducted through the review and verification of data obtained from the PPC, syllabi, and curriculum

matrices. The findings revealed that, in the hybrid modality, the Biological Sciences Teaching Degree includes Environmental Education as a mandatory course. The mandatory inclusion of EE as a subject in teacher education programs is highly relevant, as it equips future educators to disseminate sustainable knowledge and practices. Several authors and official documents address this issue, advocating for its inclusion as a means to ensure that biology teacher training aligns with contemporary socio-environmental needs.

In the analyzed PPC, this curricular component has a workload of 30 hours, offered in Block 2, with the following syllabus: History of Environmental Education; Main objectives and purposes of EE; Political, educational, and social organization of EE in Brazil; Trends and currents of EE; Methodologies and practices used in EE. Its objectives include:

- Understanding the historical development of Environmental Education nationally and internationally;
- Deepening knowledge of historical and regulatory aspects of EE in Brazil;
- Promoting reflection on the role of the biology educator in EE, focusing on humanistic values, knowledge, skills, attitudes, and competencies that contribute to building sustainable societies;
- Understanding different conceptions of EE and analyzing one's own perspective;
- Critically evaluating the main legal instruments of EE in Brazil (National Environmental Education Policy; National Environmental Education Program; National Curriculum Guidelines for EE);
- Carrying out practical activities and current discussions on the environment and the school setting, which can be replicated in schools;
- Exploring possibilities for interdisciplinary work on environmental themes in elementary and secondary education.

These competencies are to be developed through learning scenarios such as dialogued lectures, field classes, and seminar presentations.

Including EE as a mandatory subject is a fundamental step toward ensuring a more comprehensive education aligned with 21st-century demands, forming educators who can act as agents of transformation in their communities. According to Layrargues (2006), critical environmental education in teacher training is essential so that professional practice does not remain confined to the mere “biologization” of environmental issues but considers their complex socio-environmental dimensions (LAYRARGUES, 2006, p. 89).

Although Brazilian legislation, through the National Environmental Education Policy (Law No. 9.795/99), establishes that EE should not be mandatory as a separate subject, the law determines that EE must be a permanent and integrated component of Brazilian education:

“Environmental education is an essential and permanent component of national education and must be present, in an articulated manner, at all levels and modalities of the educational process, in both formal and non-formal contexts.” (BRASIL, 1999, art. 2)

Several authors emphasize the importance of EE as a social and political practice that goes beyond the mere transmission of information. Reigota (2007) argues that EE should promote critical reflection and active student participation. For this author, EE must be understood as a social and political practice capable of forming critical individuals engaged in seeking solutions to environmental problems. Jacobi (2003) discusses the need for EE in biology teacher training to be grounded in complexity and interdisciplinarity, incorporating EE as a fundamental and transversal dimension that considers the complexity of environmental problems. Layrargues (2006) further argues that a critical approach to EE in teacher education programs is essential to demystify the purely biological view of environmental issues and integrate social, political, and cultural dimensions.

In the in-person modality, EE was observed as a central theme, both as a specific subject and within courses such as Curricular Components – PCC and Extension Curricularization Activities – ACE, which are mandatory components of the program and serve as spaces for developing pedagogical practices.

In the PPC analyzed for the Teresina campus (in-person modality), this curricular component also has a 30-hour workload, developed theoretically, with a syllabus similar to that of the hybrid modality. It is scheduled for Block 7 and uses learning scenarios such as dialogued lectures, field classes, and seminar presentations to develop the desired competencies.

The activities in PCC and ACE courses allow future educators to articulate theory with classroom realities. In this context, EE ceases to be merely content and becomes a transformative teaching approach. These activities involve actions directed toward society, encompassing a diverse range of initiatives that enable students to extend the educational process beyond the university walls, encouraging them to act as agents in the production and dissemination of knowledge.

Carvalho (2012) argues that Pedagogical Practice is the ideal moment to deconstruct the traditional view of the teacher as a mere transmitter of knowledge. Instead, the discipline should promote an educational praxis aimed at solving concrete environmental problems:

“Pedagogical practice, by incorporating the environmental dimension, ceases to be merely the application of a method and becomes the praxis of an engaged educator who acts upon reality with the objective of transforming it.” (CARVALHO, 2012, p. 104)

Loureiro (2006) emphasizes the importance of teacher education going beyond content reproduction, encouraging the development of pedagogical projects that foster student participation and autonomy:

“Environmental education in teacher training must focus on building participatory pedagogical projects that develop the capacity for reflection and intervention of individuals in their realities.” (LOUREIRO, 2006, p. 67)

Similarly, Guimarães (2004) highlights that EE work within Pedagogical Practice must be interdisciplinary and contextualized, as environmental problems are complex and require an approach that integrates different areas of knowledge:

“Environmental education must be understood as an integrated educational process that permeates all curriculum subjects, and pedagogical practice is the privileged space for this integration to occur effectively.” (GUIMARÃES, 2004, p. 25)

The application of EE in PCC and ACE courses, developed as pedagogical practice, allows teaching degree students to design and implement EE projects addressing real environmental problems in the school or local community. This transforms theory into a meaningful learning experience, enabling the use of teaching methods that go beyond the traditional classroom and providing an ideal space for future teachers to plan actions that connect biology with other disciplines, demonstrating the complexity of environmental issues. Furthermore, by experiencing EE as a theme in PCC and ACE courses, students develop a more critical and engaged perspective, perceiving themselves as educators capable of contributing to social and environmental transformation.

FINAL CONSIDERATIONS

The document analysis of the Pedagogical Course Projects (PPCs) for the Biological Sciences Teaching Degree revealed a paradoxical reality: although Environmental Education (EE) is a theme intrinsically linked to the field, its inclusion in curricula remains fragmented and superficial. What should serve as a guiding principle—a course philosophy permeating all subjects and activities—often amounts to a few mentions in syllabi or the existence of a single, isolated EE course.

Our research demonstrated that the concept of EE in the analyzed documents is, for the most part, restricted to a content-based perspective. This approach fails to recognize the transformative potential of EE in shaping future educators. By confining it to a niche, PPCs miss the opportunity to prepare graduates



to face the complexity of socio-environmental crises, which demand interdisciplinary action and a critical stance.

To move beyond Biology, it is imperative that higher education institutions revise their Pedagogical Course Projects. We suggest that Environmental Education be elevated to a transversal and structuring axis of the program, influencing not only the curriculum but also teaching methodologies, extension activities, and research.

Training Biology teachers with a solid foundation in Environmental Education is crucial for building a more conscious and sustainable society. Therefore, our study is not merely a diagnosis; it is an invitation to reflection and action. We believe that the full integration of EE into PPCs is the path to forming educators who can truly act as agents of change, inspiring new generations to value and protect our planet.

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THE USE OF TECHNOLOGY IN BIOLOGY TEACHING: AN INTEGRATIVE REVIEW <https://doi.org/10.63330/aurumpub.015-012>**Kellyton Rafael Alves de Sousa¹, Marina da Silva Veras Amorim² and Maria Gardênia Sousa Batista³****ABSTRACT**

Technology is fundamental to education, as it facilitates access to knowledge, expands learning opportunities, and allows students and teachers to connect more dynamically and efficiently. Therefore, this scientific article addresses the use of technology in Biology teaching. Its objective is to demonstrate, through an integrative literature review, how technology has been incorporated into Biology teaching in everyday school life. The research methodology, an integrative review, aims to gather and synthesize the results of previously published research on the topic. To this end, the methodology employed was a bibliographic survey of specialized academic databases: Redalyc and Google Scholar. At the end of the research, 13 (thirteen) articles were selected for analysis, of which 10 (ten) were found on Google Scholar and 3 (three) found on Redalyc. Regarding the year of publication, it is noted that 3 (three) were published in 2021, 4 (four) were published in 2020, 5 (five) in 2019 and 1 (one) in 2018. The research identified a gap in the scientific knowledge worked, since regarding recent studies in the area of knowledge studied, no academic works published between 2022 and 2025 were found in the databases used.

Keywords: Technology; Biology; Technological tools; Teaching-learning.

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INTRODUCTION

Over the past few years, technology has become fundamental in various areas, including education. Through technological advances, knowledge has been transmitted much more quickly and to an increasingly larger number of people.

As a result, schools and other educational institutions must prepare students to live in an “information society,” incorporating the so-called Information and Communication Technologies (ICT) into their curriculum (Ghavifekr; Rosdy, 2015).

According to Silva (2024), technology plays a fundamental role in the school environment, as it allows for working with the particularities of each student, such as individualized teaching practices and the use of adaptive learning platforms, which enable students to progress at their own pace and level of understanding.

In this sense, the current technological context has enabled the establishment of new paths in online education, via the internet, especially in distance learning, as well as in face-to-face education, since the advent of the internet is generating new challenges for the classroom, both technological and pedagogical. Thus, technologies alone do not transform the school, but they offer countless possibilities for supporting teachers and fostering mutual influence among students (Moran; Masetto; Behrens, 2000).

Therefore, the use of technology, digital tools, mobile applications, and online learning platforms has also been transforming the way biological concepts are taught and understood (Rosa, 2025). The emergence of educational technology and the advancement of various digital media have made it increasingly possible to explore its use as a strong pedagogical resource for teaching biology.

Thus, biology teaching can be offered more efficiently, making classes more engaging and enabling students to understand the topics addressed more quickly, maintaining focus and developing critical thinking. In line with this view, Leite (2020) argues that methodological resources are indispensable for the effectiveness of the teaching-learning process, as the rapid pace at which technological innovations evolve brings changes in the way people learn and interact, strengthening and developing students so that they become socially critical and expressive individuals.

Therefore, this research is justified by the constant and evident incorporation of technology into people’s daily lives, including students and teachers in the school environment, a fact that leads to reflection on the need to apply technological tools in biology teaching, as a pedagogical resource that will assist in students’ learning in the classroom. The relevance of this work lies in gathering and disseminating data, studies, and knowledge about the importance of using technologies in teaching and how this use is occurring today. In doing so, it seeks to support future research conducted by students, teachers, professionals in the field, or those interested in the topic, creating a database of theoretical studies that will aid in the academic sphere.

From all that has been presented, it is clear that the current “technological society” demands a reinvention of the way classes are taught, with the organization and effective use of available technologies. In this context, this work has the general objective of demonstrating, through an integrative literature review, how technology has been incorporated into Biology teaching in everyday school life.

To this end, the research is guided by the following question: “How has technology been incorporated into Biology teaching in everyday school life?” To answer this question, the following specific objectives will be pursued: to identify the importance of technology for the educational process; to verify whether technology has been used in Biology teaching based on the results of the integrative review; and to highlight the main technological tools used in the classroom for Biology teaching.

MATERIALS AND METHODS

This study consists of an exploratory bibliographic research, with a qualitative approach, based on data collection from secondary sources. Data analysis was carried out using the integrative review method, aiming to gather and synthesize research results on the use of technology in Biology teaching in a comprehensive and systematic manner, allowing for an understanding of the current state of scientific knowledge.

According to Mendes, Silveira, and Galvão (2008), this type of review enables the incorporation of evidence into professional practice, the identification of gaps in scientific knowledge, and the formulation of guidelines for future research. Whitemore and Knafl (2005) reinforce that the integrative review favors a comprehensive critical analysis by including both quantitative and qualitative studies, making it a useful tool for researchers and professionals in the field.

The process of preparing this integrative review involved the following phases: I. Definition of the guiding question; II. Literature search strategy; III. Identification of studies and data collection; IV. Analysis of included studies; V. Discussion of results; VI. Presentation of the integrative review.

Thus, the guiding question of this work is: “How has technology been incorporated into Biology teaching in everyday school life?” Regarding the literature search strategy, the bibliographic survey was carried out using specialized academic databases: *Redalyc* and *Google Scholar*.

To locate relevant studies on the subject, the following search strings were used:

Table 1 – Search Strings

	Search Terms
1	Biologia “and” Tecnologia; (<i>Biology and Technology</i>)
2	Biologia “and” Ensino “and” Tecnologia; (<i>Biology and Teaching and Technology</i>)
3	Biologia “and” estratégias de ensino e tecnologias “and” ensino de biologia. (<i>Biology and teaching strategies and technologies and biology teaching</i>)

Source: Authors (2025).

From this point, information was collected from the databases through reading and examining scientific articles available in the archives, which were relevant to the topic under analysis and fit the time frame of 2018 to 2025. The publications resulting from the database search were selected using inclusion and exclusion criteria to identify what would actually be used as a data source

Thus, the criteria for the inclusion of works were:

- Publications available in Portuguese;
- Texts available in their original version;
- Publication period from 2018 to 2025;
- Thematic compatibility;
- Specific search for scientific articles (excluding theses, dissertations, books, and reviews).

On the other hand, the exclusion criteria used to define the data to be used were publications duplicated in different databases and those in which the object of study did not establish a relationship with the topic addressed.

After the criteria were defined, the search strings were used on the *Redalyc* and *Google Scholar* platforms, where 16 (sixteen) studies were found, which were separated into folders with the same name as the strings for duplication checking. Then, they were listed by the article name and by the databases in a table in Word and, subsequently, the classification tool was applied, which listed them in alphabetical order for manual counting.

After carefully reading the title of each work and the abstract of each one, 13 (thirteen) studies compatible with the theme addressed and located on the *Redalyc* and *Google Scholar* platforms were identified. After data collection and processing, separating what would be useful, the analysis and discussion of the data began, in which the first stage referred to reading the articles selected by theme; the second stage, observation of concepts, historical importance and contribution; and, in the third, the writing done by combining the notes.

RESULTS AND DISCUSSION

The discussion stage of the results was carried out in an exploratory and comparative manner, based on the interpretation and synthesis of the authors addressed, relying on the scientific literature on the subject and aiming to meet the proposed objective of the study. Thus, 13 (thirteen) articles were selected for analysis, of which 10 (ten) were found on the *Google Scholar* platform and 3 (three) on the *Redalyc* platform.

Regarding the year of publication, it is noted that 3 (three) were published in 2021, 4 (four) were published in 2020, 5 (five) in 2019 and 1 (one) in 2018. At this point, it is important to draw attention to the absence of more recent publications, from the year 2022 onwards, which makes the field of study

even more relevant, because despite the growing technological expansion, studies on the theme combined with Biology teaching have not stood out in the academic research arena.

Table 2 – Base studies of the research

Article Title	Year	Authors	Databases
Tecnologia e inovação aliadas à educação: o uso de softwares educacionais para o ensino de ciências e biologia (<i>Technology and innovation allied to education: the use of educational software for teaching science and biology</i>)	2021	Ailton Donizetti dos Santos e Derli Barbosa Dos Santos	Google Scholar
O uso da tecnologia digital da informação e comunicação como ferramenta didática para o ensino de biologia celular no ensino médio (<i>The use of digital information and communication technology as a didactic tool for teaching cell biology in high school</i>)	2021	Amanda do Amaral Luna	Google Scholar
As tecnologias da informação e comunicação no ensino de Biologia: Aproximações teóricas (<i>Information and communication technologies in Biology teaching: Theoretical approaches</i>)	2021	Ítalo Câmara de Almeida, Luciana Canário Mendes e Rícael Spirandeli Rocha	Google Scholar
Potencial pedagógico do aplicativo whatsapp no ensino de biologia: percepções dos professores (<i>Pedagogical potential of the WhatsApp application in biology teaching: teachers' perceptions</i>)	2020	Douglas Carvalho Amorim	Google Scholar
Ensino de ciências e o uso de tecnologias digitais: uma proposta de sequência de ensino investigativa sobre o sistema reprodutor humano (<i>Science teaching and the use of digital technologies: a proposal for an investigative teaching sequence on the human reproductive system</i>)	2020	Caroline Oenning de Oliveira e André Luís de Oliveira	Google Scholar
A tecnologia digital potencializando o ensino de biologia celular: a utilização do blog aliado ao canva (<i>Digital technology enhancing cell biology teaching: the use of blogs combined with Canva</i>)	2020	Mariana Teixeira Santos Figueiredo Salgado e Vanda Leci Bueno Gautério	Google Scholar
Ações educacionais em tempos de pandemia: reflexões sobre a biologia no ensino médio (<i>Educational actions in times of pandemic: reflections on biology in high school</i>)	2020	Walkíria dos Reis Lima, Joana Peixoto e Adda Daniela Lima Figueiredo Echalar	Redalyc
A importância do uso da tecnologia digital no ensino de ciências e biologia (<i>The importance of using digital technology in science and biology teaching</i>)	2019	Emillayne Paloma Santos Sedícias; Karoline Barbosa da Silva; Ellen da Silva Santiago; Kátia Fernanda Alves de Andrade; Ubirany Ferreira Lopes	Google Scholar
Utilização de mídias sociais no ensino de biologia vegetal: buscando novas estratégias de ensino (<i>Use of social media in plant biology teaching: seeking new teaching strategies</i>)	2019	Karina Moreira Freitas e Reinaldo Richardi Oliveira Galvão	Google Scholar
Utilização de jogos digitais como estratégia didático-pedagógica: uma experiência com alunos de ensino médio na disciplina de biologia (<i>Use of digital games as a didactic-</i>	2019	Marcelo Alexandre Bruno, Regina Barwaldt e Sueli Aparecida Thomazine	Google Scholar

<i>pedagogical strategy: an experience with high school students in the biology discipline)</i>			
A Utilização das Tecnologias da Informação e Comunicação no Ensino de Biologia: Uma Revisão Bibliográfica (<i>The Use of Information and Communication Technologies in Biology Teaching: A Literature Review</i>)	2019	José Rufino Silva dos Santos e Brenda Thaise Cerqueira de Souza	<i>Google Scholar</i>
Uma análise do conteúdo de Botânica sob o enfoque Ciência-Tecnologia-Sociedade (CTS) em livros didáticos de Biologia do Ensino Médio (<i>An analysis of Botany content under the Science-Technology-Society (STS) approach in high school biology textbooks</i>)	2019	Cássia Luã Pires de Souza e Rosane Nunes Garcia	<i>Redalyc</i>
Tecnologias digitais, biologia do conhecer e pesquisa-ação no ensino de línguas (<i>Digital technologies, biology of knowing and action research in language teaching</i>)	2018	Rodrigo Camargo Aragão e Iky Anne Fonseca Dias	<i>Redalyc</i>

Source: Authors (2025).

Science and Biology teachers have constantly sought methodological approaches that go beyond the limits of the traditional curriculum, aiming to incorporate the use of technology as a strategy to encourage students to explore and expand their scientific knowledge, in response to the demands of the modern world (Sedícias et al., 2019).

Alexandre Bruno, Barwaldt and Thomazine (2019) clarify that the traditional teaching model, in which there is a hierarchy where the teacher is the protagonist, the only “owner of knowledge” in the classroom, is being questioned, as it does not meet the profile of “digital native” students. For this reason, Information and Communication Technologies (ICTs) bring to reflection and discussion the urgent need to rethink traditional teaching models.

Information and Communication Technologies (ICTs) are part of people’s daily lives, being responsible for transmitting and receiving information through different devices, such as computers, the internet, tablets and smartphones. In addition to these, ICTs also include older technologies, such as television, newspapers and even the mimeograph. According to the literature, some researchers began to use the term *New Technologies* to refer specifically to digital technologies, also called Digital Information and Communication Technologies (TDICs), which represent a technological advance by incorporating the use of the internet through software and applications.

In Biology teaching, it is common for teachers to resort to analogies to facilitate content understanding. However, they often encounter students who, despite growing up in an environment permeated by technologies, do not recognize these resources as allies in the learning and professional training process. In many cases, Information and Communication Technologies (ICTs) are still seen by students themselves and by the community — including parents, schools, pedagogical coordination, education professionals and even legislators — only as means of entertainment. Thus, there is an urgent need to socialize and insist on the insertion of ICTs in the teaching-learning process, that is, to reduce the

gap between theory, concepts and practical applications, including ICTs (Alexandre Bruno; Barwaldt; Thomazine, 2019).

Prensky (2001) warns that educators, devalued and demotivated by various economic and social aspects, are not always available and/or open to new proposals that require changes. Thus, the changes that should happen within each professional and then extend to the school environment and, consequently, to the classroom, float in a sea of uncertainties between the “must do” (because ICTs must be part of the process) and other issues of “how to do it.”

For the author, this phenomenon is explained by the fact that individuals fear the “new,” changes and even confrontation with these “digital native” students who seem to know everything about digital tools. Natives grew up under this digital technology, while previous generations, especially teachers, are migrating to these technologies (digital immigrants).

Salgado and Gautério (2020) point out that Information and Communication Technologies (ICTs) can be applied in Science teaching through active learning methodologies, such as Inquiry-Based Learning, blended learning and the use of educational technologies, such as virtual laboratories and activities carried out in Virtual Learning Environments (VLE). The author highlights that these elements are integrable and viable within the classroom context, contributing to overcoming challenges faced by Brazilian schools and enabling teachers to adopt new pedagogical approaches, while offering students different ways of learning.

According to Santos and Santos (2021), the problem of optimizing Science and Biology teaching, due to the lack of didactic/pedagogical resources in public schools, can be solved through educational software. Educational software is one that enables teachers to efficiently exercise their pedagogical practice. Thus, these are tools that, through various resources such as images, texts, animations and others, address curricular content.

Regarding educational software, Luna (2021) mentions the *Phet Colorado* simulator, a computational tool that promotes the learning process, motivating students and teachers and fostering interactivity. He also highlights the educational website “www.celuladidatica.ufpr.br,” classified as a thematic repository in the area of Cell Biology, that is, a collection of selected educational objects on cell structure and function, which provides motivating digital resources of scientific relevance and facilitates the teaching-learning process, grouped by content related to cell structure and function. Finally, attention is also drawn to the use of the *Pixton* software, developed by the company *Pixton Comics Inc.*, a tool aimed at creating comic strips, intended for teachers and students, companies and individuals who seek to create comics.

Although the use of educational software in Science and Biology classes is efficient, it is conditioned by some factors that cannot be disregarded. The use of this software must result from

coherent planning by the teacher and from directed and conscious mediation. More than simply making the software available in class for students to explore arbitrarily, it is necessary to select the best software considering the lesson objectives, alignment with the curriculum and the availability of basic resources, such as operating system, internet and others (Santos and Santos, 2021).

Another technology identified as a tool for Biology teaching, according to Salgado and Gautério (2020), is the Blog and Canva.

The learning construction category highlighted how the Blog and Canva can assist in the learning process. Among the aspects listed, it was highlighted that the use of digital tools made learning more dynamic and fun, in addition to the development of the platforms being an interesting way to review the theoretical concepts seen in class. Considering the difficulty students have in learning content related to Biology, we found in the use of the Blog and Canva an efficient way to build this learning. The possibility of visualizing the abstract during the creation of the platforms was another highlighted aspect, associated with the ability to escape traditional teaching, forming the third category. We demonstrated that the Blog and Canva helped in teaching Cell Biology by enabling the visualization of complex structures and processes, which cannot be done when using only the blackboard and chalk. Students highlighted that the use of digital tools allowed them to “break the routine,” which, in our interpretation, is the distancing from traditional teaching that is so commonly used (Salgado and Gautério, 2020, p. 125).

The use of technology in Biology teaching has proven to be a diversified tool, given the vast number of educational technologies that support the students’ teaching-learning process.

Santos and Souza (2019) listed some of the main educational technologies that have been used in Biology teaching: YouTube, Khan Academy, Google Classroom, blog creation, websites such as Portal do Professor, Escola Digital, Biblioteca Digital de Ciências, applications, programs and simulators aimed at Biology teaching that can be used both on computers and smartphones.

- YouTube, which allows both posting and viewing video lessons and also offers numerous other management tools such as channel creation and integration with other social networks (...).
- Khan Academy aims to provide high-quality education accessible to all; its platform offers a wide variety of articles, exercises and educational videos, including Biology, also allowing the creation of classes for management (...).
- Google Classroom, which helps students and teachers organize tasks, increase collaboration and improve communication, also allowing the creation of classes, distribution of tasks, grading, sending feedback and viewing everything in one place.
- The creation of blogs, which allow editing messages, as well as making texts, images and sounds available at any time and place. A tool similar to the blog and easy to handle is scoop.it, which is an online platform where it is possible to define, monitor and share information and data;
- Websites such as Portal do Professor, Escola Digital and Biblioteca Digital de Ciências are spaces for teachers to access lesson plan suggestions, download support media, get news about education or even share a lesson plan, participate in a discussion or take a course.
- Use of applications, programs and simulators aimed at Biology teaching that can be used both on computers and smartphones (Santos and Souza, 2019, p. 13-14).

Through the work of Amorim (2020), another important, if not the main, technological tool is highlighted, which is widely used in the school environment by teachers, students and all those who make

up the school community. According to the information compiled by the author, WhatsApp can be used for clarifying doubts through the formation of discussion groups, but with care regarding the information posted and how students help each other in answering questions, demonstrating that the teacher's mediating role is essential to validate the scientific information presented. In addition, it showed that it creates an emotional bond, is a space for clarifying doubts and conducting research, as well as sharing materials, assisting in the teaching process.

It is noted that the use of these technological tools can be an alternative to the methodologies employed in teaching, positively influencing the dynamics of classes and facilitating the understanding of more difficult concepts, considering that they can illustrate phenomena in a simpler and more dynamic way, helping students understand complex processes.

Castro et al. (2015) state that technology linked to teaching is interactive, where teachers and students are responsible for teaching and learning. It is worth noting that the mere use of technologies is not enough, even if these tools collaborate with the teaching and learning processes. There must be a combination of technology use with face-to-face interactions.

Thus, given technological advances, it is clear that the development of technologies has significantly impacted different sectors of society, including education. In this scenario, technological tools can act as pedagogical resources, but it is important to emphasize that their isolated use, only as a visual or illustrative support in classes, does not imply, by itself, a pedagogical transformation. For there to be a real improvement in the teaching and learning process, it is essential that these technologies be used as mediators of knowledge construction. This requires the creation of strategies that go beyond the limits of the textbook, providing students with new ways of accessing knowledge. Therefore, discussing the difficulties and limitations faced by teachers in using technologies becomes an important step to promote their insertion and dissemination in the school environment.

FINAL CONSIDERATIONS

The purpose of this work was to demonstrate, through an integrative literature review, how technology has been incorporated into Biology teaching in everyday school life in recent years.

In this context, the importance of using technological means in the classroom does not diverge from the use of traditional supports, such as the blackboard, markers, and textbooks, but rather emerges as a complement, a resource that facilitates teaching practice and instruction, contributing to meaningful and dynamic learning. Thus, it is up to school managers and teachers to keep up with the main trends, increasingly investing in teaching methods that bring technology into the classroom.

It is evident that Biology teaching is undergoing valuable methodological transformations for the teaching-learning process, as this area faces challenges related to the complexity of its content, which is

often abstract and difficult for students to assimilate. This difficulty is aggravated by the predominance of traditional methods based on memorization, often disconnected from students' reality and lacking practical activities that promote the understanding of biological concepts. The absence of these practices limits the development of critical thinking and hinders a more meaningful relationship with the topics addressed. Therefore, the use of technology emerges as a viable alternative for improving teaching.

It is necessary to highlight the relevance of continuous teacher training as an essential element for achieving the main purpose of education, which is to form critical citizens capable of actively participating in social, political, scientific, and technological decisions, thus contributing to the improvement of society as a whole.

Finally, it is noted that all the objectives of this research were achieved, both the general one—namely, to demonstrate, through an integrative literature review, how technology has been incorporated into Biology teaching in everyday school life—and the specific objectives, which were achieved by identifying the importance of technology for the educational process, verifying how technology has been used in Biology teaching based on the results of the integrative review, and highlighting the main technological tools used in the classroom for Biology teaching.

As for the limitations of this research, it can be mentioned that it was carried out using only two databases (*Google Scholar* and *Redalyc*) and with a short time frame, from 2018 to 2025. Therefore, it is possible that if a larger number of databases had been used, as well as a longer time frame, more results would have been obtained. However, the limitation was intentional, since when dealing with technology, it is prudent to work with the most recent scientific knowledge.

Finally, it is important to mention that a gap in the scientific knowledge addressed was identified, since regarding recent studies in the area of knowledge studied—namely, the use of technology in Biology teaching—no academic works published between the years 2022 and 2025 were found in the databases used. Therefore, this scientific article enabled the formulation of guidelines for future research, as by identifying the knowledge gap, it can be suggested that more current field research be carried out, aiming at the production of more recent scientific knowledge on the subject.

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RECRUITING MICROBIOMES FOR SUSTAINABLE AGRICULTURE: THE FOUNDATION OF THE NEXT AGRICULTURAL REVOLUTION <https://doi.org/10.63330/aurumpub.015-013>

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ABSTRACT

Conventional agriculture, while successful in boosting yields, has caused systemic soil degradation, threatening global food security. This chapter argues that the next agricultural revolution will be microbial, requiring a paradigm shift from a chemical-centric approach to one that actively recruits the soil microbiome. It begins by analyzing the physical, chemical, and biological decay resulting from industrial farming practices before framing soil as a living ecosystem, contrasting the properties of a healthy, biodiverse matrix with a degraded, dysfunctional one. The "bio-input toolkit"—a suite of microbial inoculants—is then presented as a key strategy for intervention, with an overview of its lab-to-field production pipeline. Ultimately, the chapter concludes that while bio-inputs serve as critical tools for intervention, the long-term goal is ecological integration through regenerative agriculture, fostering resilient, self-sustaining agroecosystems founded on a renewed partnership with the living soil.

Keywords: Soil degradation; Agricultural biotechnology; Soil; Biofertilizers; Bioinput; Fertilizer; Pesticides.

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INTRODUCTION

The 20th century witnessed an unprecedented agricultural transformation. The green revolution, driven by advances in crop breeding, intensive use of agrochemicals, and mechanization, led to substantial increases in agricultural yields, contributing to global food security for a rapidly growing population and strengthening the economy (Pingali, 2012).

However, the achievements of conventional agriculture come with an environmental backdrop that cannot be ignored. Soil should be understood as a living and dynamic edaphic system, integrating the topsoil, subsoil, biota, groundwater, and atmosphere, maintaining essential physical, chemical, and biological exchanges for life (M Roper; V S R Gupta, 2007). This complex system regulates nutrient and energy cycles, structures habitats for countless organisms, and connects different ecological levels, forming the foundation of terrestrial ecosystems (Adão; Pádua; Sousa, 2025a; Dixon et al., 2022; Jiang et al., 2024; Mesele et al., 2025; Tarafdar, 2022).

Human activity, especially agriculture, intervenes in this system, modifying its structure, altering biogeochemical cycles, and influencing productivity. However, the primary function of soil is not to sustain agriculture but to maintain ecosystem balance and resilience, of which agricultural production is only one of its many expressions (Davis; Huggins; Reganold, 2023).

Soil plays an essential role in the geosphere, reinforced by its most abundant and active biological component: microorganisms, which constitute the biological engine of life. These communities form an integrated system that interacts with the physical and chemical environment of the soil, performing vital functions such as organic matter decomposition, nutrient cycling, and the formation of structures that support plant life (Creamer et al., 2022a; David C. Coleman, 2018). This network of organisms and their interactions, encompassing diversity, metabolism, communication, and ecological relationships, constitutes what is known as the soil microbiome (Hopkins; Dungait, 2010; Wang; Chi; Song, 2024a; Zhou et al., 2023).

While conventional agriculture focused primarily on managing the physical and chemical properties of soil, modern studies of the microbiome and soil biology show that soil fertility and resilience fundamentally depend on its biological components and the interactions they establish (Creamer et al., 2022b; Montgomery; Biklé, 2021a).

Historically, and in some cases still today, conventional agriculture neglected the environmental impact of unsustainable practices, with consequences that are now evident. Soil degradation, a crisis affecting approximately 33% of the planet's lands due to erosion, salinization, compaction, and contamination, directly threatens global food security (Bachman, 2015; Brown, 2015; Kopittke et al., 2025a).

This deterioration not only reduces the productive capacity of agricultural systems but also contaminates water bodies, contributes to climate change, and imposes high economic costs on both farmers and society. The loss of fertile soils and contamination of existing ones necessitates the use of new land for agriculture, which is increasingly limited due to urban expansion and land use for human settlements. In a context marked by interconnected global crises —climate change, biodiversity loss, and the challenge of feeding nearly 10 billion people by 2050(Lam, 2025)— the current agricultural paradigm proves unsustainable.

A new agricultural revolution is therefore required, one that is not based on intensive exploitation of resources but on collaboration with nature and the strengthening of ecological processes that sustain life. This chapter proposes that the next agricultural revolution will be microbial. It will involve a profound paradigm shift: moving from a focus solely on soil chemistry and productivity to a comprehensive understanding of its biology and interactions with the ecosystem.

The central strategy of this new era will be to actively recruit the soil microbiome, a vast invisible workforce composed of bacteria, fungi, and other microorganisms, to restore natural functions weakened or displaced by intensive and anthropocentric industrial practices. This recruitment goes beyond the mere application of inoculants; it encompasses a range of strategies, from targeted microbial interventions to ecological redesign of agricultural systems through regenerative practices, intelligent crop rotations, permanent soil cover, and reduced chemical inputs.

By partnering with these microscopic allies, we can rebuild agroecosystems that are not only productive but also resilient, self-regulating, and capable of sustaining life at multiple levels, from the microscale of soil to the global scale of ecosystems. In other words, this microbial revolution does not aim to dominate nature but to work with it, integrating scientific knowledge, technological innovation, and conscious agricultural practices to ensure adequate food production without compromising planetary health.

To support the proposal presented, this chapter is structured into four main sections. It begins with a diagnosis of the soil crisis, demonstrating how conventional agricultural practices such as the intensive use of chemical inputs, reliance on monocultures, high-yield crop varieties, and frequent tillage have progressively degraded soils. These practices have resulted in pollution, erosion, loss of organic carbon, a decline in microbial biodiversity, and substantial economic costs. The second section frames soil as a living ecosystem. It contrasts the complexity and resilience of healthy soils with the dysfunction of degraded systems, emphasizing the critical roles played by the soil microbiome, including nutrient cycling and natural pathogen suppression. Finally, the last section introduces the development and production of the bio-input toolkit, a set of microbial-based products designed to strategically restore essential soil functions. All interventions are framed within the broader paradigm of regenerative

agriculture, which prioritizes microbial recruitment and ecosystem resilience as the foundation for a productive, sustainable, and microbially driven agricultural future.

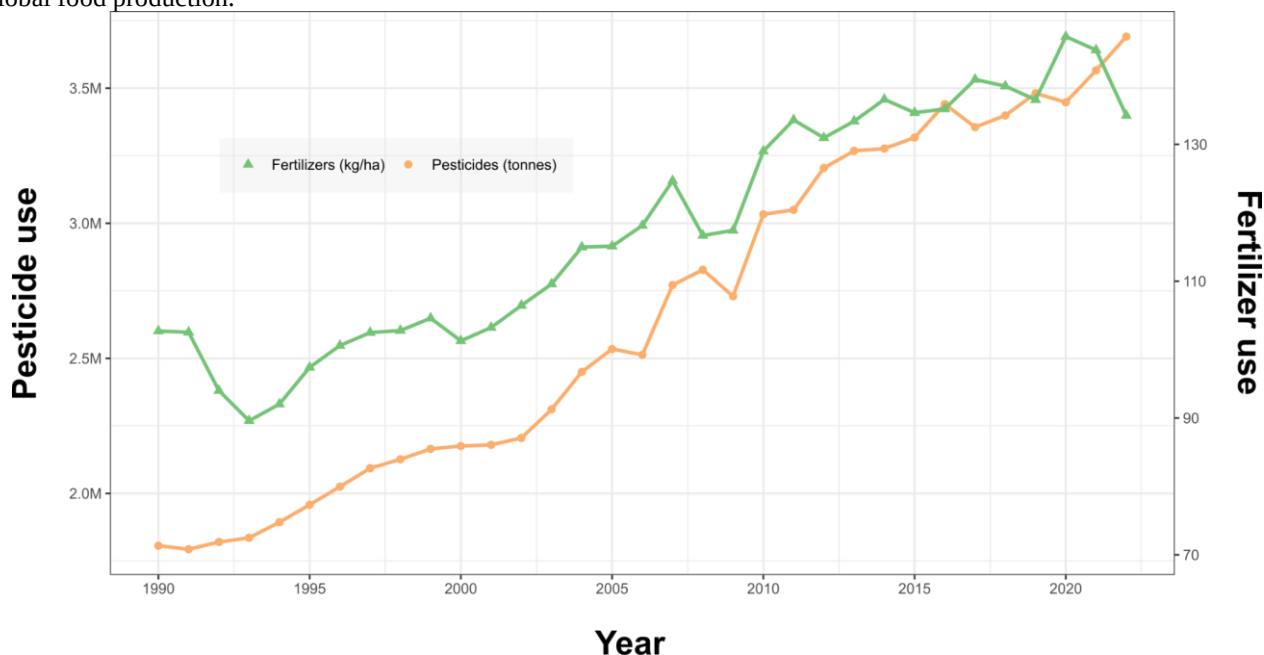
THE LEGACY OF CONVENTIONAL AGRICULTURE: A DEPLETED SOIL

The functional dynamics of conventional agriculture, which has dominated global food production for over half a century, is based on a set of practices involving intensive use of chemicals such as fertilizers, pesticides, and herbicides, a trend that has steadily increased over the last three decades (Fig. 1), heavy machinery, frequent and deep tillage, large-scale monocultures, high-yield varieties selected to maximize productivity but dependent on external inputs, intensive irrigation that alters water availability and promotes salinization, as well as production systems primarily oriented toward immediate yield, often disconnected from biodiversity conservation and the ecological balance of the soil (Angon et al., 2023; Belete; Yadete, 2023; Betancur-Corredor; Lang; Russell, 2022; Elkot et al., 2024; Karaca; Ince, 2023; Montgomery; Biklé, 2021b).

Although agriculture has accompanied humanity since its origins and has transformed over time, the high-yield model consolidated during the 20th century did not arise with the intention of degrading the soil. Rather, it emerged as a response to urgent needs such as hunger and economic growth. However, this productivist approach, designed from an anthropocentric perspective, proved short-sighted: it offered immediate benefits in terms of production but ignored the biological and microbiological processes that sustain soil fertility and resilience.

We now know that for decades negative effects have been accumulating, now expressed in pollution, loss of edaphic biodiversity, and progressive infertility. According to the FAO, 90% of the world's soils could be at risk of degradation by 2050 if these unsustainable practices persist. The magnitude of the problem is striking: approximately 24 billion tons of fertile soil are lost to erosion each year (Smith et al., 2024), equivalent to the disappearance of a football field of productive land every five seconds.

Figure 1. Global trends in fertilizer and pesticide use. Annual evolution of global fertilizer use (kg/ha) and pesticide use (tonnes) between 1990 and 2022. A general trend of consistent increase in the use of both agricultural inputs is observed throughout this period. This highlights the intensification of agricultural practices and the increasing reliance on external inputs in global food production.



This degradation is not an isolated phenomenon but a complex syndrome of interconnected physical, chemical, and biological deterioration. Intensive cultivation has caused the loss of 25–75% of soil organic carbon reserves, compromising nutrient cycling and water retention capacity (Lehtinen et al., 2014). Experimental studies suggest that microbial biodiversity and soil functionality can decrease significantly in monoculture systems compared to diversified systems (Bender; Wagg; Van der Heijden, 2016).

Soil alterations not only cause ecological damage but also have repercussions on agricultural productivity. Excessive nitrogen fertilization contributes to nitrous oxide (N_2O) emissions, a potent greenhouse gas (GONZALEZ-ESTRADA; Camacho Amador, 2017), while indiscriminate pesticide use alters the soil microbiome, affecting essential processes such as biological nitrogen fixation and natural pathogen suppression (Swaine et al., 2025). This erosion of soil health constitutes a critical threat to the long-term viability of food systems.

Rethinking soil as a living ecosystem and adopting regenerative, agroecological practices based on bioinputs is not an idealistic option but a necessary strategy to ensure food security, ecosystem resilience, and future climate stability.

THE THREE DIMENSIONS OF SOIL DEGRADATION: PHYSICAL, CHEMICAL, AND BIOLOGICAL DECAY

Soil degradation manifests as a multidimensional decline in its physical, chemical, and biological properties, a contrast clearly illustrated by the key indicators distinguishing healthy from degraded soil (Fig. 2).

Soil physical degradation is a complex process in which soil structure is compromised, affecting its capacity to support ecological, hydrological, and productive processes. At its core lies the destabilization of soil aggregates, formations that result from the interaction between mineral particles, organic matter such as humus and plant exudates, adsorbed water, and bioactive compounds produced by microorganisms. These aggregates act as the “cement” of the soil, providing cohesion, resistance to erosive forces, and a porous structure that regulates the flow of water, nutrients, and gases (Bedolla-Rivera et al., 2023a; Nunes; Karlen; Moorman, 2020; Weidhuner et al., 2021a, 2021b).

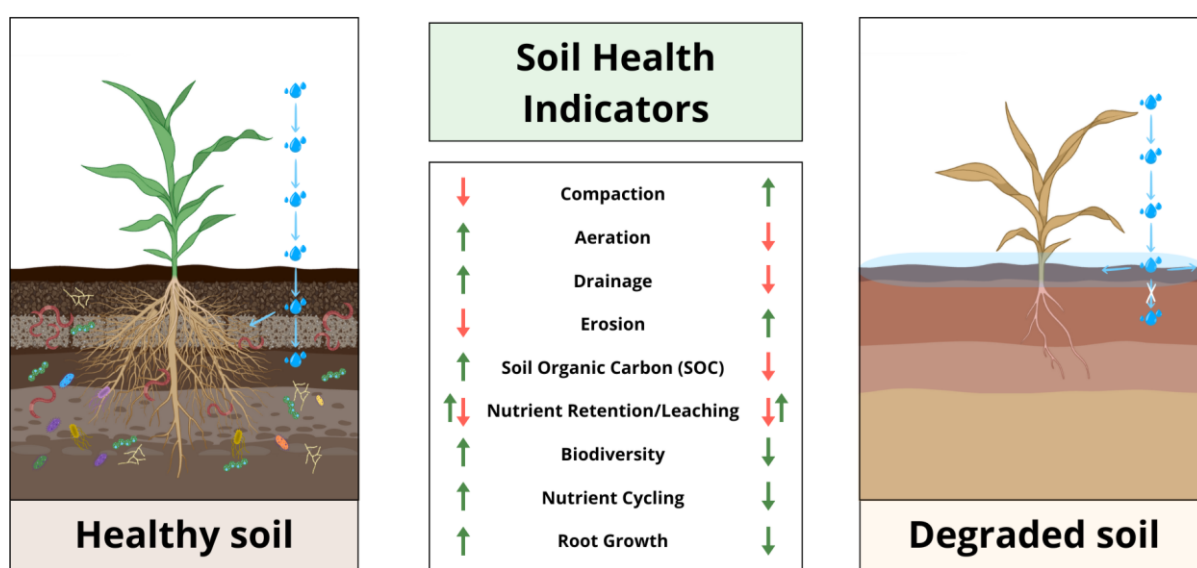
The soil microbiota plays a central role in this aggregation. Bacteria and fungi contribute to the formation and stabilization of aggregates through the decomposition of organic matter and the production of extracellular polymers that bind mineral particles. This microbial activity ensures structural integrity, promotes porosity, and facilitates efficient gas exchange, which is essential for root respiration and soil biochemical activity. The loss of this microbial community, as occurs under intensive tillage or exposure to agrochemicals, triggers a progressive weakening of aggregates, increasing compaction, restricting root growth, and reducing the soil’s capacity to retain water and oxygen (Frene; Pandey; Castrillo, 2024; Montgomery; Biklé, 2021c; Pandey; Bennett, 2024a; Weidhuner et al., 2021b).

From a physical perspective, aggregate degradation alters pore distribution, decreasing macropores that facilitate drainage and increasing micropores that hold water in a form largely unavailable to plants. This leads to denser soils, reduced infiltration, and higher susceptibility to water and wind erosion, where the fertile topsoil is quickly lost. The combination of compaction, lower water retention, and increased surface exposure also raises soil temperature and alters the rhizosphere microclimate, directly affecting biological activity and nutrient cycling (Bedolla-Rivera et al., 2023b; Correa et al., 2019; Frene; Pandey; Castrillo, 2024; Pandey; Bennett, 2024b).

Therefore, physical degradation is not an isolated phenomenon but a synergistic process in which the loss of aggregates and the decline of microbiota generate a vicious cycle: compacted soils reduce porosity and oxygenation, accelerating erosion and ultimately decreasing fertility. This process has direct consequences on agricultural productivity, soil water storage capacity, and the resilience of agroecosystems to droughts, intense rainfall, and climate change (Bedolla-Rivera et al., 2023b; Correa et al., 2019; Frene; Pandey; Castrillo, 2024; Pandey; Bennett, 2024a).

At a global scale, physical degradation is a critical factor in the loss of fertile soil, affecting large regions in the United States (32%), Africa (16%), China (31%), Europe (17%), and India (45%), posing a significant threat to food security and the sustainability of cropping systems (Borrelli et al., 2017; Guo; Hao; Liu, 2015; Lal, 2003; Singh et al., 2020; Tamene et al., 2017).

Figure 2. Soil health indicators between healthy and degraded soil. Fundamental contrast in the physical, chemical, and biological properties between a healthy agricultural soil and a degraded one. The central table details key soil health indicators, using arrows (↑ high/good, ↓ low/poor) to compare their levels in both scenarios: compaction, aeration, drainage, erosion, soil organic carbon (SOC), nutrient retention/leaching, biodiversity, nutrient cycling, and root growth. For the healthy soil, a porous structure with stable aggregates is observed, facilitating water infiltration and supporting a rich microbial community. Plant roots extend deeply, indicating good aeration and access to resources. In contrast, degraded soil exhibits a compacted structure and a crusted surface that impedes infiltration, leading to superficial water accumulation and runoff. Plant roots are shallow, and the soil shows a clear scarcity of microbial life.



The chemical degradation refers to the progressive deterioration of its internal balance, characterized by the loss of organic carbon reserves and the alteration of conditions that sustain fertility. Soil organic carbon (SOC), a key component of organic matter and the foundation of the soil's biological network, is reduced by intensive tillage, which accelerates its oxidation and microbial consumption (Bedolla-Rivera et al., 2023c; Córdova et al., 2025; Joshi et al., 2025; Muhammed et al., 2018; Toth et al., 2025). This decline not only decreases nutrient retention and structural stability but also increases CO₂ emissions, closely linked to climate change.

The recurrent use of synthetic fertilizers, particularly nitrogen-based ones, exacerbates this issue. At high doses, they induce acidification, alter micronutrient availability, and release toxic elements such as aluminum (Bedolla-Rivera et al., 2023d). Their low efficiency promotes nitrogen and phosphorus leaching into groundwater and surface water, triggering eutrophication and the deterioration of aquatic ecosystems (Bedolla-Rivera et al., 2023d; Montgomery; Biklé, 2021d).

This scenario directly impacts soil life: microbial and mycorrhizal communities are impoverished, while contaminants such as heavy metals and hydrocarbons, derived from industrial and atmospheric sources, disrupt processes like nitrogen fixation and microbial respiration (Angon et al., 2024; Bedolla-Rivera et al., 2023d). As a consequence, agroecosystems become less resilient to droughts, intense rainfall, and external pressures, forcing farmers to rely increasingly on external inputs, which raises costs and poses risks to food security.

In response, alternatives focused on SOC restoration and regenerative practices are gaining attention. Strategies such as crop rotation, the use of green manures, biochar, or microbial biofertilizers show promise in counteracting acidification, improving nutrient availability, and reducing contaminants. These approaches not only restore productive capacity but also pave the way toward more sustainable agricultural systems under growing climatic and social pressures.

The biological degradation is perhaps the most fundamental and damaging aspect, as it represents the loss of life in the soil. The combined pressures of monoculture, which provides a limited diet for soil organisms, intensive tillage that destroys their habitats, and the application of broad-spectrum pesticides and fungicides that directly eliminate them have decimated soil biodiversity (Bedolla-Rivera et al., 2023d; Tripathi et al., 2020). This includes a drastic reduction in the abundance and diversity of the entire soil food web, from microorganisms responsible for nutrient cycling to the large ecosystem engineers, such as earthworms (Hofer, 2022; Li; Wang; Shao, 2021; Liu et al., 2025; Tripathi et al., 2020).

Adding to this scenario is a critical collateral effect: physical and chemical degradation acts as a trigger for biological degradation, especially at the microbiological level. Compaction and erosion reduce pore space and oxygen availability, while the loss of organic carbon and intensive use of synthetic fertilizers at uncontrolled doses create a toxic environment that restricts microbial growth (Bellabarba et al., 2024; Longepierre et al., 2022). Acidification, accumulation of heavy metals, and the non-specificity of biocides directly alter the composition and functionality of the soil microbiota, limiting essential processes such as biological nitrogen fixation, decomposition of organic residues, and natural pathogen suppression (Alengebawy et al., 2021; Hussain et al., 2009).

This loss of biological functionality is the main cause of physical and chemical problems: without the living agents that build soil structure, stabilize aggregates, and naturally recycle nutrients, the entire system collapses. Moreover, a cascade of impacts occurs that compromises other levels of the soil food web, including protozoa, nematodes, microarthropods, and earthworms, weakening the resilience of agroecosystems to droughts, floods, or pests, and forcing an increasing dependence on external inputs, with far-reaching economic and ecological consequences (Yan et al., 2025).



QUANTIFYING THE ECONOMIC FALLOUT

The environmental damage caused by soil degradation has direct and escalating economic consequences, threatening both farm-level viability and regional economic health. The most immediate threat falls upon farmers themselves. As the innate fertility of the soil declines, growers are forced to compensate by applying ever-increasing quantities of expensive synthetic inputs to maintain yields (Panagos et al., 2018, 2024; Pimentel et al., 1995). This creates a dependency that erodes farm profitability (Tey; Brindal, 2015). A landmark study on U.S. corn agriculture revealed that fertilizer applied annually serves not to boost yields, but merely to compensate for the ongoing loss of soil fertility from degradation (Jang et al., 2021). This compensatory application costs U.S. corn farmers more than half a billion dollars every year (Jang et al., 2021; Panagos et al., 2018). The problem is compounded by the volatility and sharp increases in fertilizer prices, which have risen dramatically in recent years, placing even greater strain on farm budgets (Hernandez; Torero, 2013; Vos et al., 2025).

Beyond the farm gate, the societal costs of soil degradation are an order of magnitude larger. These off-farm externalities represent the costs that are not paid by the producer but are borne by the public at large (Kopittke et al., 2025b; Laamouri; Khattabi, 2025). The most significant of these is the environmental damage caused by nutrient runoff. Excess nitrogen and phosphorus from agricultural fields are the primary cause of the hypoxic "Dead Zone" in the Gulf of Mexico, an area depleted of oxygen and unable to support marine life, devastating commercial fisheries and coastal economies (Li et al., 2025; Restore the Mississippi River Delta, [S.d.]). The costs of water purification to remove nitrates from drinking water, the loss of recreational value in lakes and rivers plagued by algal blooms, and the damage to aquatic ecosystems are immense (Akinnowo, 2023; Amorim; Moura, 2021). This reveals that what is often considered efficient food production, when judged by short-term outputs or narrow economic indicators, is, in fact, heavily subsidized by the degradation of natural capital and the depletion of public resources.

MICROBIAL DRIVERS OF THE NUTRIENT CYCLE

Given the economic unsustainability of compensating for lost fertility with chemical inputs, it becomes crucial to understand the natural, self-sustaining alternative: the microbial engine that drives the nutrient cycle. In any natural ecosystem, nutrients are continuously cycled, moving from organic matter back into forms that plants can use. The soil microbiome is the primary engine of these biogeochemical cycles (Basu et al., 2021; Mohanty et al., 2021). Without this microbial machinery, essential nutrients would remain locked in unavailable forms, rendering the soil infertile.

One of the most critical of these functions is nitrogen fixation. The Earth's atmosphere is approximately 78% nitrogen gas (Zhang; Low; Xiong, 2025), but this form is inert and unusable by

plants. Certain specialized bacteria, known as diazotrophs, possess the unique ability to "fix" atmospheric nitrogen, converting it into plant-available ammonia (Chen et al., 2024a; Hu et al., 2023; Martinez-Feria et al., 2024). This biological process is the natural equivalent of the energy-intensive Haber-Bosch process used to create synthetic nitrogen fertilizers (Rouwenhorst et al., 2021). Nitrogen-fixing bacteria operate in two main ways: symbiotically, such as *Rhizobium* and *Bradyrhizobium* species that form nodules on the roots of legume plants (e.g., soybeans, peas), and as free-living organisms in the soil, such as *Rhizobia* and *Burkholderia* (Kiprotich et al., 2025; Mahmud et al., 2020; Mowafy et al., 2022). In the symbiotic relationship, the plant provides the bacteria with energy in the form of carbohydrates, and in return, the bacteria supply the plant with a steady source of nitrogen .

Equally important is phosphorus solubilization. Phosphorus is an essential nutrient for plant energy transfer and root development, but it is often the most limiting nutrient in agricultural soils because it is typically bound in insoluble mineral compounds or tied up in organic matter (Alewell et al., 2020; Khan et al., 2023). A diverse group of microorganisms, collectively known as phosphate-solubilizing microorganisms (PSMs), are capable of unlocking this unavailable phosphorus. Bacteria like *Pseudomonas* and *Bacillus*, and fungi such as *Aspergillus* and *Rhizopus* secrete organic acids that dissolve mineral phosphates and produce enzymes called phosphatases that mineralize organic phosphorus, releasing it into the soil solution where plant roots can absorb it (Bashir et al., 2024; Wang et al., 2023a).

Beyond nitrogen and phosphorus, the microbiome orchestrates the cycling of virtually all other essential nutrients. Microbes decompose complex organic matter, releasing potassium, sulfur, calcium, magnesium, and a host of micronutrients in plant-available ionic forms (Chen et al., 2024b; Wang; Chi; Song, 2024b) This constant process of microbial decomposition and mineralization is what constitutes natural soil fertility.

THE SOIL AS AN ECOSYSTEM: A TALE OF TWO FIELDS

To comprehend the shift toward a microbial-centric agriculture, it is essential to fundamentally reframe our concept of soil. Traditionally, the industrial agricultural model treated soil as a passive medium, merely a physical substrate for plant roots and chemical inputs. The ecological reality, however, is that soil is a dynamic, living system (Chen et al., 2024c; Minami, 2021). The difference between a vibrant, healthy agricultural soil and a depleted, degraded one lies in its ecological functionality and biological complexity. Understanding this contrast is key to embracing the “living soil” paradigm and rethinking agriculture from the ground up.

THE SOIL: A LIVING, DYNAMIC SYSTEM

The modern scientific understanding of soil is encapsulated in the definition of soil health as "the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans" (Fausak et al., 2024a; Lehmann et al., 2020a). This definition is transformative. It moves beyond simple measures of chemical fertility and recognizes that a healthy soil must perform a suite of complex, interconnected ecological functions.

According to the U.S. Department of Agriculture, a healthy soil ecosystem provides five essential and interconnected functions (Natural Resources Conservation Service, [S.d.]). Fundamentally, it regulates water by controlling whether rainfall infiltrates the ground to recharge aquifers or runs off the surface, causing erosion. This ability to manage water allows it to sustain a vast diversity of plant and animal life and provide the physical stability necessary to anchor roots and support human structures. Beyond this foundational role, the soil operates as a dynamic biochemical processor. Its mineral and microbial communities filter and buffer potential pollutants by degrading and detoxifying them. Simultaneously, this same biological engine drives the cycling of essential nutrients, transforming elements like carbon, nitrogen, and phosphorus to make them available for the entire ecosystem.

DEFINING PROPERTIES OF HEALTHY SOIL

A healthy, living soil is characterized by a synergistic interplay of its biological, chemical, and physical properties. While numerous indicators of soil health exist, their interconnected nature across multiple processes often complicates a single, clear-cut definition (Lehmann et al., 2020b). At its core, healthy soil is defined by its rich biodiversity, which can include billions of microorganisms such as bacteria, fungi, protozoa, and nematodes (Fausak et al., 2024b; Lehmann et al., 2020c). This microscopic community is complemented by a host of larger organisms, such as earthworms, ants, beetles and other invertebrates, which together form an intricate soil food web (Ahmed; Al-Mutairi, 2022a; Hajji et al., 2024; Menta; Remelli, 2020; Wilder et al., 2025; Wu et al., 2015). These organisms are not passive inhabitants; they are active ecosystem engineers. Earthworms and insects burrow through the soil, creating channels that improve aeration and water infiltration, while the vast networks of fungal hyphae bind soil particles together (Ahmed; Al-Mutairi, 2022b).

This biological activity is fueled by high organic matter. Soil organic matter (SOM) is the carbon-based material derived from the decomposition of plant and animal residues, and it is the foundation of the soil food web (De Vries et al., 2013). SOM acts as a slow-release reservoir of essential nutrients, improves the soil's capacity to hold onto water and nutrients (cation-exchange capacity), and provides the energy that drives the entire soil ecosystem (SCHNITZER, 1965; Solly et al., 2020).

The combination of high biodiversity and abundant organic matter creates a robust physical structure. This leads to the formation of soil aggregates, another critical indicator of health (Rillig; Muller; Lehmann, 2017). A well-aggregated soil has a crumbly texture and is filled with a network of interconnected pore spaces (Kravchenko et al., 2015; Yang et al., 2025a). This porosity is critical; it allows the soil to function like a sponge, rapidly absorbing rainwater and storing it for plants to use during dry periods (Lipiec et al., 2006; Menon et al., 2020; Robinson et al., 2022). This structure resists compaction and erosion, making the entire agricultural landscape more resilient to the extremes of drought and flood (Adão; Pádua; Sousa, 2025b; Yang et al., 2025b).

A thriving biological community, abundant organic matter, and a well-aggregated structure are mutually reinforced by—and in turn, support—a balanced pH, optimal nutrient levels, and a rich mineral composition, among numerous other factors (Lehmann et al., 2020d).

THE DEGRADED MATRIX: A SYSTEM IN COLLAPSE

In stark contrast, a degraded soil is a dysfunctional system where these vital properties have been deteriorated. The primary symptom of this dysfunction is a collapse of the soil's biological community. Decades of intensive tillage, monocropping, and agrochemical applications have decimated the soil's living community (Montgomery; Biklé, 2021e). The soil food web has collapsed, leading to a dramatic reduction in both the abundance and diversity of microorganisms, and a absence of visible life like earthworms (Bai et al., 2020; Montgomery; Biklé, 2021e; Wang et al., 2023b). With its biological engine stalled, the soil loses its capacity to perform essential functions like nutrient cycling and disease suppression.

This leads to a state of chemical imbalance. With low organic matter, the soil lost its natural fertility and nutrient-holding capacity (Bai et al., 2020; Montgomery; Biklé, 2021e). It becomes entirely dependent on external inputs of synthetic fertilizers to support crop growth. This often results in an overload of the primary macronutrients, nitrogen (N), phosphorus (P), and potassium (K), while becoming deficient in essential trace minerals that are no longer being cycled by microbial activity. The soil's pH can also become unbalanced, swinging to acidic or alkaline extremes that further lock up nutrient availability for plants (Barrow; Hartemink, 2023; Ferrarezi et al., 2022).

Loss of organic matter and biological activity leads to structural collapse: without the biological glues that form and maintain aggregates, soil becomes compacted and dense (James J. Hoorman; João Carlos de Moraes Sá; Randall Reeder, *[S.d.]*), eliminating pore spaces and severely restricting movement of air, water, and plant roots (Bodner et al., 2023; Dorau; Luster; Mansfeldt, 2018; Peng et al., 2024). Water can no longer infiltrate effectively; instead, it ponds on the surface or runs off, carrying away loose soil particles and valuable nutrients in a process of accelerated erosion (Ju et al., 2024; Peng et al., 2024).

The soil feels hard and solid to the touch, and plant roots struggle to penetrate the compacted layers, limiting their access to water and nutrients (Jobbágy et al., 2023; Ju et al., 2024). This degraded matrix is brittle and dysfunctional, highly vulnerable to environmental stresses, and incapable of sustaining productive agriculture without massive and continuous artificial life support.

ARCHITECTS OF PLANT HEALTH AND RESILIENCE

The soil microbiome's role extends far beyond that of a simple nutrient provider. It functions as a dynamic, interactive partner with plants, directly influencing their growth, health, and ability to withstand environmental stress. Many soil microbes, particularly those inhabiting the rhizosphere—the narrow zone of soil surrounding plant roots (Olanrewaju; Glick; Babalola, 2017a; Poria et al., 2022; Thepbandit; Athinuwat, 2024), are classified as plant growth-promoting bacteria (PGPB). These organisms enhance plant development through several mechanisms, one of the most important being the synthesis of phytohormones.

PGPB can produce auxins, which coordinate plant cell elongation and directional growth (Olanrewaju; Glick; Babalola, 2017b; Rolón-Cárdenas et al., 2022); gibberellins, which stimulate stem elongation and seed germination (Castro-Camba et al., 2022; Olanrewaju; Glick; Babalola, 2017c; Shtin; Dello Ioio; Del Bianco, 2022); and cytokinins, which regulate cell division and shoot formation (Akhtar et al., 2020; Giron et al., 2013; Olanrewaju; Glick; Babalola, 2017c; Wu et al., 2021).

These microbial-derived hormones act as key regulators in plant interactions with other organisms, including both beneficial microbes and insect herbivores. By supplementing the plant's own hormone production, PGPB can significantly boost overall growth, development, and adaptive responses to biotic and abiotic stress.

The microbiome also serves as the plant's first line of defense against disease, providing biotic stress resistance through a variety of biocontrol mechanisms (Ali; Tyagi; Bae, 2023; Du; Han; Tsuda, 2025). Beneficial microbes can outcompete pathogenic organisms for space and nutrients on the root surface, effectively crowding them out (Ali; Tyagi; Bae, 2023; Chakraborty, 2023). Much produce a potent arsenal of antimicrobial compounds, including antibiotics and antifungal enzymes, that directly inhibit or kill pathogens (Ali; Tyagi; Bae, 2023; Das et al., 2021; Roca; Monge-Olivares; Matilla, 2024; Shodmonova et al., 2025). Furthermore, the presence of certain beneficial microbes on the root can trigger a state of alertness in the plant's own immune system, a phenomenon known as Induced Systemic Resistance (ISR) (Pieterse et al., 2014). This primes the entire plant to respond more quickly and effectively to a future pathogen attack.

A healthy microbiome is crucial for conferring abiotic stress tolerance, enhancing the plant's resilience to environmental challenges like drought and salinity (Ali et al., 2023; Ullah et al., 2025a).

Among the most important microbial contributors are arbuscular mycorrhizal fungi (AMF), which form symbiotic associations with the roots of most crop plants. These fungi develop extensive networks of microscopic filaments (hyphae) that extend far beyond the reach of the roots themselves (Berruti et al., 2016; Ortiz et al., 2015a; Sagar et al., 2021; Ullah et al., 2025b). This hyphal network acts as a highly efficient extension of the root system, dramatically increasing the plant's ability to explore the soil and absorb water and immobile nutrients, thereby improving drought tolerance (Ortiz et al., 2015a; Ruiz-Lozano; Azcón, 1995). Other microbes can help plants tolerate salinity stress by producing osmo-protective compounds that enable plant cells to maintain water balance in high-salt environments. These include species such as *Bacillus* and *Pseudomonas*, among other (Goszcz et al., 2025; Ortiz et al., 2015b).

APPLIED MICROBIOLOGY: THE BIO-INPUT TOOLKIT

Recognizing the central role of the microbiome in soil health and plant productivity has catalyzed the development of a new class of agricultural technologies: microbial inoculants. Whether the so-called biofertilizers, biostimulants, or biopesticides, these products are formulations containing specific, living beneficial microorganisms. When applied to seeds, soil, or the plant itself, they act as a targeted intervention, reintroducing key microbial functions that have been lost in degraded agricultural systems. They represent a tangible way to deliver a concentrated dose of beneficial microbes directly where they are most needed, jump-starting the process of ecological restoration.

The creation of these products is a sophisticated, science-driven process that bridges microbiology, fermentation science, and agronomy.

SCALING UP BENEFICIAL MICROBES: THE BIO-INPUT DEVELOPMENT

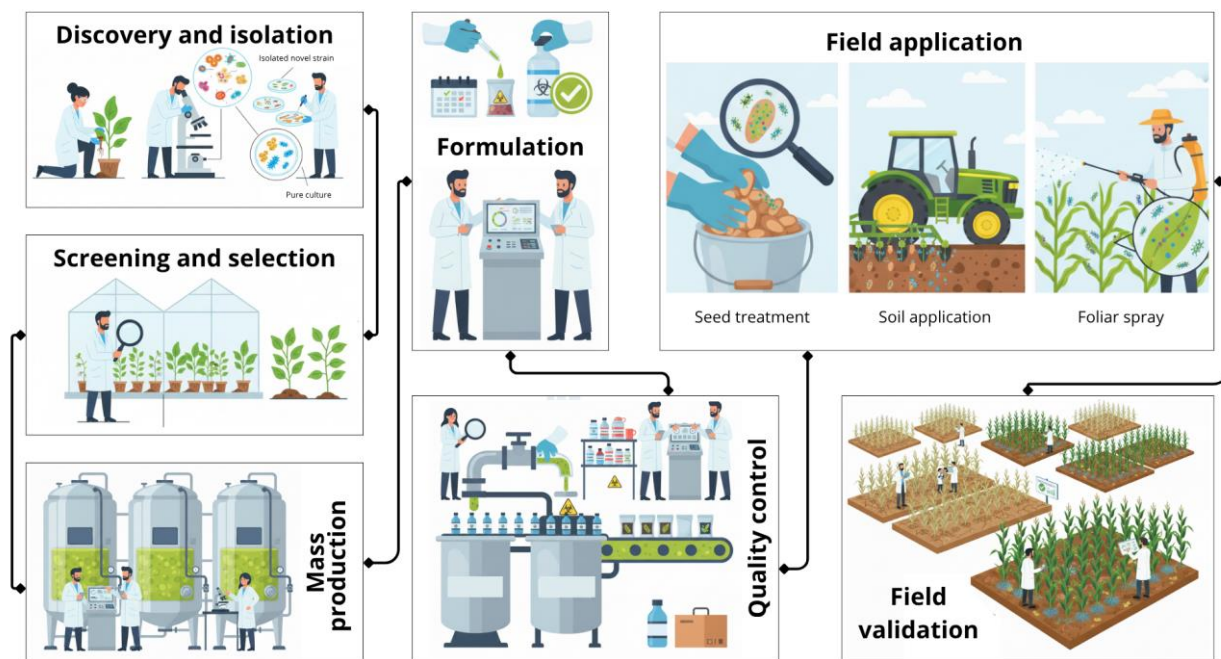
The journey of a microbial inoculant from a promising microorganism in a petri dish to a commercial product on a farm shelf is a rigorous, multi-stage pipeline designed to ensure efficacy, safety, and stability (Fig. 3). This process transforms a biological concept into a reliable agricultural tool.

- **Discovery and isolation:** The process begins with bioprospecting. Scientists search for candidate microorganisms in diverse environments, such as the rhizospheres of healthy plants, pristine soils, water, or even plant tissues themselves. The goal is to isolate novel strains of bacteria or fungi that exhibit beneficial traits.
- **Screening and selection:** Thousands of isolated strains are then put through a rigorous screening process. In laboratory and greenhouse trials, they are tested for specific functions, such as the ability to fix nitrogen, solubilize phosphorus, produce growth hormones, or inhibit pathogens. Only the most effective strains are selected for further development.
- **Mass production (fermentation):** The selected strain is then grown to a massive scale. This

is typically done through liquid fermentation in large, sterile bioreactors (Dos Reis et al., 2024; Hernández-Álvarez et al., 2023; Yunus et al., 2022). The microbes are provided with a specific nutrient medium and grown under precisely controlled conditions (temperature, pH, oxygen) to achieve a very high population density, often in the billions of cells per milliliter (Dos Reis et al., 2024; Yunus et al., 2022).

- **Formulation:** The concentrated microbial culture is then formulated into a stable, easy-to-use product. This involves mixing the live microbes with a carrier material. Formulations can be liquid, often containing stabilizers and cell protectants to prolong shelf life, or solid, such as powders mixed with peat, clay, or biochar (Dos Reis et al., 2024; Figiel et al., 2025; Sharma, 2023; Sifton; Smith; Thomas, 2023; Yunus et al., 2022). The formulation is critical for protecting the microbes from environmental stress and ensuring their survival until they reach the field.
- **Quality control:** Throughout the process, strict quality control is essential. Each batch is tested to verify the concentration of the target microorganism, to ensure the product is free from contaminants, and to confirm its viability and shelf life (Figiel et al., 2025; Prisa; Fresco; Spagnuolo, 2023). This step is crucial for building farmer trust and ensuring consistent product performance.
- **Field application:** The final product is designed for easy application by the farmer. Common methods include seed treatment, where seeds are coated with the inoculant before planting, soil application, where the product is applied directly into the furrow during planting or broadcast over the field, or foliar spray, where a liquid formulation is sprayed onto the plant's leaves (Da Silva Medina; Rotondo; Rodríguez, 2024; Dzvene; Chiduza, 2024; Lawal; Babalola, 2014; Prisa; Fresco; Spagnuolo, 2023; Santos; Nogueira; Hungria, 2019).
- **Field validation:** Before full commercialization, the final formulated product undergoes extensive field trials across various geographical regions, soil types, and climatic conditions. These large-scale trials validate the product's effectiveness under real-world farming conditions and provide the data needed for regulatory approval and agronomic recommendations (Da Silva Medina; Rotondo; Rodríguez, 2024; Ibáñez et al., 2023; Maaz et al., 2025).

Figure 3. Schematic overview of the microbial bio-input production and application process, from lab to field. This flow diagram details the critical stages in the development of microbial bio-inputs for agriculture. The process begins with discovery and isolation, where scientists identify and cultivate beneficial microbial strains. This is followed by screening and selection through laboratory and greenhouse trials to identify the most effective strains. Selected strains then proceed to mass production in large-scale bioreactors, utilizing liquid fermentation to achieve high cell densities. Subsequently, formulation converts the concentrated microbial culture into stable, ready-to-use products (liquid or solid), using carrier materials and stabilizers. The quality control stage ensures the viability, purity, and concentration of microorganisms in each batch. Finally, bio-inputs are prepared for field application through methods such as seed treatment, direct soil application, or foliar spray, and their efficacy is rigorously validated in the field validation phase through controlled field trials under diverse conditions prior to commercialization.



CULTIVATING A MICROBIAL FUTURE

The arc of modern agriculture is bending back toward its biological roots. The industrial paradigm, with its reliance on chemical force, has pushed our agroecosystems to their breaking point, revealing a systemic failure that demands a systemic solution. This chapter has argued that the solution lies beneath our feet, within the complex, living world of the soil microbiome. The path forward for a sustainable, resilient, and productive agriculture is not to further intensify our chemical interventions but to learn how to recruit the vast, powerful, and efficient microbial workforce that has been driving planetary ecosystems throughout time.

This recruitment is a dual strategy, a journey from intervention to integration. In the depleted soils that are the legacy of industrial farming, targeted bio-inputs—the biofertilizers, biopesticides, and biostimulants of the burgeoning agricultural biologicals market—serve as essential tools for intervention. They are the ecological catalysts reintroducing critical functions and jump-starting the dormant biological engine of the soil. The rapid growth of the global bio-input market, driven by consumer demand,

regulatory pressure, and a growing recognition of their economic and environmental benefits, signals that this phase of the microbial revolution is already well underway.

Yet, these powerful tools are ultimately a means to a greater end. The long-term strategy, embodied by the principles of regenerative agriculture, is one of integration. By minimizing soil disturbance, keeping the soil covered, maximizing biodiversity, and maintaining living roots, we can create agroecosystems that are designed to be ideal habitats for microbial life. These practices shift the farmer's role from that of a chemical applicator to that of an ecosystem cultivator—one who focuses not on feeding the plant directly, but on feeding the soil life that, in turn, nurtures the plant. This approach creates a positive feedback loop of regeneration, where improving soil life leads to better soil structure, enhanced nutrient and water cycling, and greater resilience to pests, diseases, and climate shocks, ultimately building a farm that is self-sustaining and self-regulating. This transition from a chemical to a microbial future demands a concerted effort from all sectors.

The scientific community must accelerate its exploration of the soil frontier. We need deeper research into the efficacy of multi-strain microbial consortia, the complex chemical dialogues that govern plant-microbe interactions, and the development of next-generation bio-inputs. Crucially, this lab-based work must be complemented by more long-term, systems-level field trials that assess the synergistic effects of bio-inputs and regenerative practices over time.

Governments must create an enabling environment for this transition. This requires policies modeled on the success of nations like Brazil: sustained public investment in agricultural, the creation of streamlined, specific regulatory pathways for bio-inputs that recognize their unique biological nature, and the implementation of financial incentives—such as subsidies, tax credits, or robust carbon markets—that reward farmers for the public goods they provide when they adopt regenerative practices and build soil health. Policymakers must also recognize the profound national security and public health co-benefits of this shift, from enhanced food sovereignty to mitigating the crisis of antibiotic resistance.

The most fundamental shift must occur in the fields and in the minds of farmers, agronomists, and agricultural advisors. The transition requires moving beyond a mindset of isolated problems and silver-bullet solutions. It demands embracing complexity and adopting a new paradigm: to "feed the soil" with a diverse diet of carbon through plants, and in doing so, to empower the soil's own microbial workforce to do the heavy lifting of nutrient provision and plant protection.

Cultivating this microbial future is one of the great challenges and opportunities of the 21st century. It promises an agriculture that is not a source of environmental degradation but a powerful engine of ecological regeneration. It offers a pathway to producing abundant, nutritious food while simultaneously building soil, cleaning water, protecting biodiversity, and sequestering atmospheric



carbon. The foundation for this future is not a new chemical or a new machine, but a renewed partnership with the oldest and most powerful force in agriculture: the living soil.

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PHILOSOPHY OF GEOGRAPHY: THINKERS, PERCEPTION, AND CONTRIBUTIONS TO THE TEACHING OF GEOGRAPHY¹ <https://doi.org/10.63330/aurumpub.015-014>**Carlos Eduardo da Silva Galante²****ABSTRACT**

Throughout one's educational path it is customary that at some point there are questions about various subjects that are constantly proposed for discussion and reflection. Among these subjects is Philosophy and the reasons for which it is useful. To propose a definition of what Philosophy is is not one of the easiest tasks, because the various existing concepts are the result of the thoughts of different philosophers, each one at his or her own time. The present work provides, albeit in summary, a brief exposition and philosophical reflection on the role, the importance and the foundation of Geography in and for the world. Furthermore, the present text will try to call the attention of those who study Scientific Geography and who maintain that it is a lofty and supreme knowledge when it comes to the analysis of the real in the cultural context of the people of various nations in various places around the world. The study is based on theoretical bibliographic data. The scope of the theme is in the field of social sciences, focused on education, mainly Philosophy of Education and Geography.

Keywords: Philosophy; Education; Geography; Society; Social sciences.

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INTRODUCTION

When examining the contemporary educational landscape, it is common to hear that education is facing a crisis. In truth, such a crisis is not new. Throughout the history of Education, it is possible to find educators who have written about this crisis. This is not solely due to economic and financial aspects, but also concerns the quality of the education being offered.

For instance, the discipline of Geography has been employed since times preceding antiquity. The analysis of geographical territory has always been—and continues to be—fundamental for various cultures and countries around the globe, whether in the identification of borders or in the pursuit of territorial expansion.

It is in this context that the theme "Philosophy in Education" emerges. It is believed that Philosophy leads to the act of thinking, reflecting, reasoning, and thus awakens critical thinking and, consequently, helps to construct a new vision of learning, since it is assumed that education is the primary agent of change.

Historically, it is observed that education has undergone transformations, which, in turn, aim to make it more appropriate to reality. However, Philosophy maintains that it is through the interaction and activities of the human being with and in relation to the real world that one develops and organizes oneself.

Thus, it is evident that common sense regarding education is that of a fragmented, incoherent, disjointed formation—ultimately, entirely devoid of certainty. In contrast, philosophical consciousness offers the opposite: a conception with complete coherence, unity, and articulation. Moreover, it provides education with an analysis of the society in which it is situated.

Nevertheless, it is understood that education is open to questioning. For this reason, it is believed that Philosophy can be one of the various options for reflecting on education as a means of social transformation. In this regard, we agree with LUCKESI³ when he states that, “philosophical reflection on education is what gives tone to pedagogy, ensuring its understanding of the values that currently guide educational practice and the values that should guide it in the future.” Thus, it is evident that Pedagogy can be understood as a philosophical vision of Education, which needs to be applied in practice in order to achieve the best results.

Based on these reflections, the main objective of this study is to investigate the relevance and contribution of Philosophy in the field of Education, with a special focus on the social and geographical sciences. More specifically, it seeks to highlight the properties of philosophical reasoning, the most

³ LUCKESI, Cipriano Carlos. *Filosofia da Educação*. São Paulo: Cortez, 1990.

influential philosophers who helped shape educational foundations, and also to discuss the relevance of teaching Philosophy in educational institutions.

Consequently, it is necessary to extract data from sources where we find the places and situations we need to research. Therefore, this study uses theoretical and bibliographic sources.

Thus, the scope of the theme lies in the field of social sciences, focused on education, more specifically on the Philosophy of Education.

In summary, it is understood that one does not educate merely for the sake of educating, but also to achieve an end: to perfect, to awaken man to the world or to his freedom, to adjust a nature, to build collective progress, to invent, among many other things. Hence, the philosophy of each being in itself.

The philosopher has never been merely a contemplator of the world, as some people think, but has always been a producer of ideas. And only ideas can significantly change the world, since we are always evolving. As the poet once said: "Time doesn't stop..." (Cazuza). However, the greatest enemies of philosophers are the vicious circles of ideas. If they cannot transcend them, overcome them with new concepts and ideas, they will forever remain mediocre thinkers, stuck in time and space, unable to see beyond the reality they live or have lived.

Thus, the philosopher must abandon the naivety and prejudices of common sense, not allowing themselves to be guided by submission to dominant ideas and established powers, but rather seeking to understand the meaning of the world, of culture, of History. For by knowing the meaning of human creations in the arts, sciences, and politics, the philosopher can provide each of us and our society with the means to become aware of our actions in a practice that aspires to freedom and happiness for all, in a process of educational transformation—since all of this is, ultimately, education.

METHODOLOGICAL CONTEXT: THE PURSUIT OF RESEARCH QUALITY

The development of this research is qualitative in nature, characterized by the in-depth exploration of phenomena, conducted in natural environments, where meanings are extracted from the data and not based on statistics.

The process is inductive, recurrent, analyzes multiple subjective realities, and does not follow a linear sequence. It offers benefits such as depth of meaning, breadth, interpretative richness, and contextualization of the phenomenon⁴.

An exploratory study is conducted when the objective is to examine a topic or research problem that has been little studied, about which there are many doubts, or which has not been addressed before. It

⁴ SAMPIERI, Roberto Hernández; COLLADO, Carlos Fernandes; LUCIA, Maria del pilar Baptista. *Metodologia de pesquisa*. 5. ed. - Porto Alegre: Penso, 2013.

serves to familiarize us with an unfamiliar topic and to gather information about the feasibility of conducting a more comprehensive study related to a particular context.⁵

Bibliographic research is built upon works that have already been published. Typically, this form of research encompasses physical materials such as books, journals, tabloids, theses, dissertations, and records of scientific meetings⁶. Furthermore, as stated by Marconi and Lakatos⁷, the purpose of bibliographic research is to connect the researcher with all available content—whether written, spoken, or filmed—on a specific topic, including lectures that have subsequently been debated and recorded in some form. In this way, the investigation is not limited to repeating what has already been said or recorded about a given topic, but rather enables the analysis of a subject from a new point of view or perspective, resulting in original findings.

“The most important aspect of the analysis process is theoretical sensitivity, that is, the ability to recognize what is important in the data and to assign meaning to it. This sensitivity derives both from technical literature and professional experience, but it is also acquired throughout the three stages of decoding, through continuous interaction with the data”.⁸

The purpose of qualitative evaluation is to organize information, understand the context, interpret and analyze units, categories, and topics, connect the results of the investigation with grounded theory, among other objectives.⁹

THE PHILOSOPHY OF EDUCATION: CONCEPTUAL CONTEXTS

Some believe that Philosophy should concern itself with the essence of facts, while others argue that it should focus on phenomena. Still, others believe that the pursuit of truth is Philosophy’s primary function. Another perspective holds that it is through faith that this science is realized, which, in theory, may blend it with religious concepts. However, it is important to recognize that all these definitions aim at the development of knowledge in pursuit of human benefit and happiness. Therefore, if Philosophy, as a form of knowledge, seeks to resolve the most practical ends of life, it offers us answers to fundamental goals such as freedom, fraternity, and both personal and collective happiness.

Philosophy has a clear social function, as it is the responsibility of philosophers to remain attentive to the fundamental issues of their time, seeking to find an action plan that can provide explanations and possible solutions. In this way, we can say that Philosophy is highly useful to society, as it provides an

⁵ Ibid., p. 16.

⁶ GIL, Antônio Carlos. *Como elaborar projetos de pesquisa*. São Paulo: Atlas, 2010

⁷ LAKATOS, Eva Maria; MARCONI, Marina de Andrade. *Fundamentos de metodologia científica*. 5. ed. - São Paulo: Atlas 2003.

⁸ Ibid., p. 24.

⁹ Op. Cit., p. 18.

understanding of social issues based on moral foundations. History has repeatedly demonstrated the contributions philosophers have made to society, including in political, social, economic, and religious spheres. Therefore, Philosophy is one of the best means by which we can engage with the world, using our reason to question the obvious and crucial points of everyday life, thereby fostering better education and citizen transformation.

More specifically, the Philosophy of Education explores essential questions related to teaching, such as its purposes, methodologies, and principles. Over time, various theories and thinkers have influenced the different currents of educational philosophy.

Among the main Fundamental Theories of Educational Philosophy are: Idealism, which argues that education should be based on universal ideas and principles, aiming at the improvement of the individual as a rational and autonomous being; Realism, which holds that education should focus on the objective knowledge of what is real, emphasizing observation and sensory experience; Pragmatism, which views education as a continuous experiment and a process for solving problems, where learning arises from lived experience; Marxism, which examines education through the lens of social classes and the prevailing economic structure. According to this theory, the school can act as a means of perpetuating social inequalities, but it can also become a space for resistance and awareness; The New School Movement, which emerged as a pedagogical renewal that valued the active participation of students in learning, experimentation, and the connection between school and everyday life; Constructivism, which proposes that the learning process is an active endeavor in which the student constructs their own knowledge.

Educational philosophy, by analyzing history and various theoretical frameworks, provides tools for educators and scholars to understand and question pedagogical practices. The diversity of perspectives enables critical reflection on the role of the school, the purposes of education, and the different ways of acquiring knowledge.

Ultimately, it is believed that Philosophy leads to the act of thinking, reflecting, reasoning, and thus awakening critical thinking and, consequently, helping to build a new vision of society, where education is presumed to be the main driver of its transformation.

THE PHILOSOPHY OF GEOGRAPHY AND ITS HISTORICAL CONTEXT

The Philosophy of Geography is a branch of Philosophy that addresses epistemological, metaphysical, and axiological themes within Geography. It also encompasses general geographic methodology and broader topics such as how we perceive and represent space and places. In this sense, Geography has been utilized since before antiquity; the study of geographic space was—and continues to

be—of great importance to different peoples and nations around the world, whether in the process of territorial recognition or even in expansion efforts.

Although methodological questions related to geographic knowledge have been debated for centuries, Richard Hartshorne (1899–1992) is often credited with the first systematic treatment of the subject in English. His work, *The Nature of Geography: A Critical Survey of Current Thought in the Light of the Past*, published in 1939, was followed by several volumes of critical essays in the subsequent decades. John Kirtland Wright (1891–1969), a prominent American geographer known for his work in cartography and the analysis of the evolution of geographic thought, introduced the term geosophy in 1947 to refer to this broad type of inquiry into geographic knowledge.

Other frequently cited foundational texts in the field include *Explanation in Geography* by David Harvey, published in 1969, and *The Production of Space* by Henri Lefebvre, published in 1974. Discussions around the issues raised by the latter partly inspired the founding of a “Society for Philosophy and Geography” in the 1990s.

The “Society for Philosophy and Geography” was established in 1997 by Andrew Light, a scholar from George Mason University, and Jonathan Smith, a geography expert from Texas A&M University. Three volumes of a peer-reviewed journal, *Philosophy and Geography*, were published by Rowman & Littlefield Press, which later became a biannual journal published by Carfax Publishers. In 2005, this journal merged with another publication initiated by geographers, *Ethics, Place, and Environment*, to become *Ethics, Place & Environment: A Journal of Philosophy and Geography*, published by Routledge. The journal was edited by Light and Smith until 2009 and published works by philosophers, geographers, and scholars from related fields on issues of space, place, and broadly interpreted environmental concerns. It came to be recognized as instrumental in expanding the scope of environmental ethics to include work on urban environments.

In 2009, Smith retired from the journal, and Benjamin Hale from the University of Colorado became the new co-editor. Hale and Light relaunched the journal in January 2011 as *Ethics, Policy & Environment*. Although the journal has since focused more on the relationship between ethics and environmental policy, it still accepts submissions of relevant work from geographers.

A book series, initially launched by Rowman & Littlefield and later by Cambridge Scholars Press, began in 2002 with the publication of the proceedings from the annual meetings of the Society for Philosophy and Geography, coordinated by Gary Backhaus and John Murungi of Towson University. In 2005, the sponsoring society of these annual meetings became the “International Association for the Study of Environment, Space, and Place,” and in 2009, the book series gave way to a peer-reviewed journal, *Environment, Space, Place*, published semiannually and currently edited by C. Patrick Heidkamp, Troy Paddock, and Christine Petto of Southern Connecticut State University.

THE METHODOLOGY OF GEOGRAPHY TEACHING AS AN ONGOING METHODOLOGICAL CHALLENGE

The methodology of Geography presents a continuous challenge, as the field must adapt to the complex and rapid changes of the world. More than a simple exercise in memorization, Geography requires strategies that enable students to critically assess reality.

In Geography education, the interaction between human beings and their impact on the surrounding environment stands out. According to Kimura¹⁰, the analysis of daily life is seen as a broadened analysis that integrates political, social, and economic aspects, which complement each other as explanatory elements.

With this approach, Geography aims primarily to understand human characteristics, both of the natural environment—studied by Physical Geography—and of the built environment, shaped by human actions and interactions, as discussed in Human Geography. Currently, geographic education has been adopting more critical and impartial methodologies, focusing on an analysis that goes beyond the context in which individuals live and centers on the relationships that have led to that reality—a movement known as Critical Geography.

The methodology of Geography teaching faces the challenge of overcoming the traditional, encyclopedic, and decontextualized approach to become a dynamic and critical discipline, capable of enabling students to understand the complex reality that surrounds them. Overcoming this model requires constant innovation in pedagogical practices, closer alignment with students' realities, and the use of more effective teaching resources.

Among its main methodological challenges, one can point to its fragmented and decontextualized approach. Geography teaching is often marked by a classical dynamic that fragments space into topics such as climate, relief, and vegetation, making it difficult for students to understand the interconnections of reality. The content becomes distant and abstract, lacking connection to their lived experiences.

Student disinterest and lack of motivation also stand out. The absence of a relationship between content and the student's daily life generates disinterest, leading to the perception that Geography is a merely decorative or useless subject. The traditional methodology, based on memorization, contributes to this lack of engagement. Likewise, the lack of critical thinking due to the use of inadequate methodology can limit the development reality constructively. The challenge is to go beyond description, promoting the analysis of the social relationships that shape space.

In this context, the limitations of teaching resources become evident. Excessive dependence on outdated textbooks, poorly illustrated or reproducing classical Geography, represents an obstacle. The

¹⁰ KIMURA, Shoko. *Geografia no ensino básico: questões e propostas*. São Paulo: Contexto, 2008.

lack of other resources, such as technologies and appropriate materials, also compromises the quality of teaching.

The insufficiency in teacher training contributes to this challenging scenario. Training teachers to adopt new methodologies and integrate technologies into the classroom is a real difficulty. The teacher needs to act as a mediator, not just a transmitter of content.

Structurally, educational inequality also falls within the realm of challenges. Disparities in access to resources and infrastructure in Brazilian schools directly affect the ability to implement more innovative and effective teaching methodologies, especially in rural areas and marginalized communities.

In such a challenging context, it is necessary to think of alternatives and possibilities for overcoming obstacles. To overcome these challenges, the methodology of Geography teaching must focus on more active and critical approaches.

Connecting with everyday life offers a reliable path to overcoming such obstacles. The teacher should start from the reality and lived space of the student, using their experiences as a starting point for analyzing local, regional, and global issues.

Also contributing to this challenging scenario is the application of Critical Geography. Its adoption allows for the analysis of human relationships that generate social inequalities and shape space, forming more conscious and autonomous citizens.

The use of active methodologies as a means of overcoming the difficulties encountered includes the student as the protagonist of learning, using investigative practices and problem-solving strategies. Field activities, games, case studies, and group work stimulate engagement and participation.

The use of technologies, including the incorporation of geotechnologies such as Geographic Information Systems (GIS) and other digital resources (apps, virtual maps, videos), fosters more dynamic and visual learning. Despite the availability of tools like Google Earth, simple GIS platforms, GPS, and mapping software, teachers often lack the training to use them beyond surface-level illustrations.

Interdisciplinarity connects Geography with other disciplines, demonstrating the complexity of reality and how knowledge is constructed. Thus, learning gains in breadth and depth. In this context, the use of new teaching resources beyond textbooks—such as films, music, cartoons, and satellite images—diversifies the approach and perception of content.

The greatest challenge of Geography teaching methodology is, essentially, to transform the discipline into a tool for deciphering the world. This means going beyond memorization and equipping students with concepts and skills to understand spatial relationships, the dynamics of power inscribed in territory, and the impacts of human actions.

Geography, when well taught, is profoundly empowering. It allows individuals to understand their place in the world—from the local to the global scale—and to act more consciously and critically within

it. Overcoming these methodological challenges is not merely a pedagogical issue but a necessity for forming citizens capable of confronting the complex socio-environmental problems of the 21st century.

THE RELEVANCE OF GEOGRAPHY TEACHING IN THE CONTEXT OF CONTEMPORARY LEARNING

Geography teaching highlights the relationships between people and their influence on the environment. According to Kimura¹¹, the examination of daily life is an expanded investigation that encompasses political, social, and economic aspects, which are interdependent as explanatory factors. This subject plays a fundamental role in the current educational context, as it enables students to understand a constantly changing world and to position themselves critically as active participants. Geography goes beyond merely memorizing names and places; it investigates the intricate relationships between society, geographic space, and the environment.

In an increasingly interconnected world, geographic education is vital for forming active and informed citizens. This discipline contributes to the development of awareness about the changes and processes occurring in geographic space, helping students to better understand contemporary reality.

The relevance of Geography teaching is profound and multifaceted, going far beyond memorizing capitals and geographical features. In a world marked by globalization, environmental crises, and accelerated social transformations, school Geography becomes a fundamental discipline for shaping critical, conscious, and active citizens.

The main object of study in Geography is geographic space, that is, the space transformed and organized by society throughout history. Geography teaching allows students to understand the relationships between society and nature (how humans modify the environment and how they suffer its consequences), to critically analyze urban and rural landscapes, identifying problems such as socio-spatial segregation, lack of infrastructure, and environmental destruction, and to perceive themselves as agents who produce, consume, and modify space, leading to more conscious and responsible action.

Geography is a powerful tool for the critical reading of the world. It enables students to interpret news and information in depth, contextualizing local, national, and global events; to understand land conflicts, resource wars, migration crises, and geopolitical disputes, going beyond the superficiality of headlines; to question social and spatial inequalities, understanding how power and wealth are unequally distributed across territory, within a city or between countries.

The relevance of Geography also reaches important social aspects today, such as socio-environmental awareness and sustainability. On a planet under threat from climate change and resource

¹¹ KIMURA, Shoko. *Geografia no ensino básico: questões e propostas*. São Paulo: Contexto, 2008.

depletion, Geography is essential for promoting environmental education in a concrete way, showing the interdependence between natural elements (climate, relief, vegetation, hydrography); for discussing the concept of sustainability in a practical manner, analyzing real problems such as deforestation, pollution, water scarcity, and overconsumption; for encouraging responsible habits and an ethic of care for the planet.

Geography works with a specific and fundamental language for orientation and analysis, such as reading and interpreting maps, graphs, tables, and satellite images. These are essential cognitive skills in the 21st century, applied in various fields of knowledge and the job market. The use of geospatial technologies such as GPS and Geographic Information Systems (GIS) is increasingly present, and Geography introduces these concepts.

The relevance of Geography can also be noted in the early stages of learning. With the appreciation of identity and belonging, the study begins with the student's place of living (the street, the neighborhood, the city) and then expands to the world. This process strengthens the sense of identity and belonging to the local community and the country. It also allows for the appreciation of the cultural and landscape diversity of one's own territory and of the planet, combating prejudice and stereotypical views about other places and peoples.

In a century with many global transformations and technological advances, Geography prepares individuals for this globalized world. Geography provides the keys to understanding the complexity of globalization, as it explains networks and flows that connect the world, such as international trade, information flows, and migrations. It also contextualizes economic issues, such as the international division of labor and the formation of economic blocs (such as Mercosur and the European Union), and shows how the local is connected to the global (how a consumption decision in one country can affect the environment and economy of another).

The relevance of Geography teaching lies in transforming the student into an interpreter of the space in which they live. It is a discipline that combines natural and human knowledge to answer fundamental questions: Where? How? Why? And, most importantly: So what?

It equips young people with the critical capacity to understand common news such as climate change, commodity price analysis, how urban mobility challenges in a city compromise quality of life, how development projects for their country are currently unfolding, among others. Ultimately, good Geography teaching is essential for forming citizens who not only inhabit the world but understand it and feel capable of transforming it for the better.

Contemporary Geography is full of instability and change. The discipline helps in understanding contemporary geopolitics, territorial disputes, and conflicts that reshape the map of nations. The

discipline contributes to the analysis of interactions between society and the environment, promoting sustainability and awareness regarding environmental variables.

Geography teaching currently faces challenging issues but also finds new possibilities for innovation. The goal is to overcome resistance to new methodologies and abandon memorization in favor of more active, critical, and experiential learning. New technologies, such as digital cartography and interactive maps, can be used to make learning more dynamic and contextualized, forming critical readers and creators of maps. The practice of field studies, reminiscent of educators like Pestalozzi and Lourenço Filho, remains relevant and can be enriched with technologies, connecting local experiences to a global understanding.

Finally, Geography teaching is significant in the current context due to its ability to form critical and conscious citizens who understand the complex interconnections between the local and the global, enabling them to act in transformative ways within society. The discipline offers students the necessary tools to interpret reality, question inequalities, and seek solutions to the world's problems.

CENTRAL CHARACTERISTICS OF PHILOSOPHICAL THOUGHT: THE AUTONOMY OF THOUGHT

Since the 6th century B.C., with the emergence of Philosophy, a new way of thinking arose. However, we cannot say that the mere introduction of a new way of thinking is enough to characterize Philosophy. Within it, there is freedom of thought, which makes it impossible to find a single definition. What is observed, in fact, is an incessant search for learning how to philosophize. As the renowned German philosopher Immanuel Kant stated, “There is no Philosophy that can be taught; one only learns to philosophize.”¹²

In this regard, it is essential to understand the etymological origin of the word Philosophy, which derives from the Greek *philosophein*, whose verbal root expresses the love of wisdom, seen as the human being's reflection on life and the universe. Thus, we can see that Philosophy is not *sofia* itself, which implies science and wisdom simultaneously, but rather the aspiration, the pursuit of that *sofia*. In this sense, PILETTI highlights¹³:

“The essence of Philosophy is the search for knowledge and not its possession. If [...] it is a search and not possession, we can say that philosophical work is a work of reflection. The word reflection comes from the Latin verb *reflectere*, which means to turn back. To philosophize, therefore, means to revisit, reconsider the available data, review, examine thoroughly, pay attention, and analyze carefully.”

¹² PILETTI, Claudino. *Filosofia da Educação*. 3 ed. São Paulo: Ática, 1991, p.12.

¹³ *Ibid.*, p. 13

Indeed, we understand that Philosophy serves as a tool for human beings to become more critical, for it is from the moment one begins to think, reflect, and examine the dominant concepts in society that one perceives oneself as a capable member of living in and modifying its functioning. It is in this way that we can present new ideas and engage with the environment around us. Therefore, we do not merely accept what is presented to us as absolute truth to be followed. Thus, when we begin to philosophize, we also begin a reflection on the routine of human beings.

To support what has been said, Luckesi¹⁴ states:

“Philosophy is a body of knowledge, constituted from an effort that the human being has been making to understand their world and give it meaning, a comprehensive meaning. A body of knowledge, in Philosophy, means a coherent and organized set of understandings about reality. [...] In this way, philosophy is a body of understandings that comprehends and directs human existence in its most varied dimensions.”

In general, Philosophy is present in us all the time; it only needs to be awakened and put into action. As Leôncio Basbaum says¹⁵:

“Philosophy is by no means a mere abstraction independent of life. On the contrary, it is the very manifestation of human life in its highest expression. Sometimes through a simple practical activity, other times in the depths of a profound and existential metaphysics, but always within human activity, physical or spiritual, there is philosophy [...]. Philosophy translates the feeling, thinking, and acting of man. Evidently, he does not feed on philosophy, but undoubtedly, with the help of philosophy.”

In this context, the main characteristics of philosophical thought differentiate it from everyday thinking and other forms of knowledge. These are based on reason, depth, and the pursuit of a broader understanding of reality, going beyond appearances and questioning what is considered truth.

Radicality in Philosophy focuses on investigating the roots, origins, and foundations of problems. In this way, philosophical reasoning does not accept ready-made or simplistic explanations. It explores questions to locate fundamental causes, seeking the essence of phenomena and the difficulties of existence. In this realm, Philosophy challenges common sense and accepted knowledge, promoting the immediate rejection of what is obvious or socially imposed.

It is emphasized that Philosophy encourages the autonomy of thought, allowing the individual to create their own ideas consciously and independently. Unlike passive acceptance, this philosophical autonomy involves the ability to examine and evaluate arguments, distinguishing valid ones from

¹⁴ LUCKESI, Cipriano Carlos. *Filosofia da Educação*. São Paulo: Cortez, 1990.

¹⁵ Ibid. p.23.

fallacies. The philosophical stance challenges social norms and seeks unprecedented answers, adopting an active and critical position toward reality.

Philosophical thought is organized into an integrated system, rather than being a set of scattered ideas. From this realization, Philosophy seeks to develop logical ideas and concepts to elucidate complex questions about the world and human life. The characteristic rigor of Philosophy is revealed in the use of reason and logic to reach truth, distinguish arguments, and confirm the validity of knowledge.

Philosophical reflection implies a daily questioning of the reasons behind our thoughts, speech, and actions. Philosophy involves the act of thinking while reflecting on itself, in a critical and conceptual way, exploring the meaning of existence. Thus, philosophical thought seeks answers to essential questions related to truth, moral and ethical values, language, and existence.

The central characteristics of philosophical thought interrelate to foster a rational and critical pursuit of understanding the world. Radicality, autonomy, systematicity, and reflection are the foundations that sustain philosophical activity and distinguish it from other forms of knowledge.

It is essential to highlight the message that CORDI¹⁶ shares about the significant lesson from the ancient Greek philosophers: “Never accept existing structures as if they were the only viable ones. Those who wish to be innovators in their time must analyze carefully and critically: it is necessary to philosophize.”

PHILOSOPHY, EDUCATION AND GEOGRAPHY: KEY PHILOSOPHERS WHO CONTRIBUTED TO THE EDUCATIONAL FOUNDATIONS IN THE CONTEXT OF THE PHILOSOPHY OF GEOGRAPHY

Philosophy has always been linked to Education, as a mode of thought aimed at making human beings concerned with understanding and participating in the reality in which they live. In this case, we consider it a reflection (radical, rigorous, and comprehensive) on the real problems presented within the educational sphere. Thus, regarding the philosophical role in education, it is worth noting that it also consists of reflecting on the problems that educational reality presents. Just as in social reality, in educational reality the role of philosophy is also to awaken people’s critical thinking.

Demerval Saviani¹⁷ points out that thought construction begins with the empirical, moves through the abstract, and thus reaches the concrete. Likewise, according to him, in terms of worldview, there is a transition from common sense to philosophical consciousness. This corresponds to the passage of man from the obscured world in which he lives to a new visible and real world that he can certainly provide for himself and, consequently, for others. As the author states:

¹⁶ CORDI, Cassiano. Et al. *Para Filosofar*. São Paulo: Scipione, 2000.

¹⁷ SAVIANI, Demerval. *Educação: do senso comum à consciência filosófica*. 9 ed. São Paulo: Cortez, 1989.

“It is concluded that the transition from common sense to philosophical consciousness is a necessary condition to situate education in a revolutionary perspective. Indeed, this is the only way to convert it into an instrument that enables members of the popular classes to move from the condition of ‘class in itself’ to the condition of ‘class for itself.’ Now, without the formation of class consciousness, there is no organization, and without organization, revolutionary transformation of society is not possible.”

Education has been a subject debated from ancient times to the present by philosophers and educators, based on the idea that it is responsible for the development of intellectual, moral, and physical faculties of the human being. Thus, we state that the educational role of philosophy focuses on developing critical thinking, increasing reflective awareness directed toward oneself and the world. In this regard, Morandi¹⁸ offers a concept of education associated with philosophical consciousness:

“Education: this term expresses the generative principle of individual cultural and social behaviors, as well as the knowledge inscribed in each person. Education designates the process that links a subject to their immediate environment, to a system of society, culture, and values (in which educational institutions take place) and allows them to integrate. This formative–foundational dimension is the challenge of a realization, of a freedom, of the meaning of the educational endeavor itself, objects of philosophical reflection.”

In this sense, it leads to the understanding that one cannot speak of education without speaking of the human being. Thus, it is perceived that in every society there is a different conception of man, as each one projects onto him an “ideal image,” that is, the ideal man to be part of it.

The organization of teaching emerged in Greece through the dialogical approach. Thus, the first great educator in history stands out: Socrates. According to him, knowledge is within each person, it only needs to be awakened. To do this, he used his dialogical method, where he engaged in critical dialogues with his interlocutors, enabling them, through his questions, to bring forth their own ideas. He also stated that the educator should not give the answer to the student’s doubt, but rather stimulate them to seek that answer within themselves.

SOCRATES (470/469 B.C. – 399 B.C.) affirms that we all have the capacity to become philosophers. However, for this to happen, we must be aware of our own ignorance and be in constant pursuit of true knowledge, which lies beyond the appearances of material things, in the world of ideas—immutable and perfect.

PLATO (428/427 B.C. – 348/347 B.C.), a disciple of Socrates, can be considered the founder of the theory of education. He claimed that true knowledge is only attainable through the method he proposed: dialectics. This was a means of refuting the assertions made by others. For him, true knowledge is found in the world of ideas, which we only reach when we leave behind the sensory world. In short, he

¹⁸ MORANDI, Franc. *Filosofia da Educação*. São Paulo: EDUSC, 2002. p. 18.

says that what we know was contemplated by the soul in the world of ideas. However, the education proposed by Plato aimed at the moral formation of man in relation to the State.

ARISTOTLE (384 B.C. – 322 B.C.), another great Greek philosopher, had a very different view from Socrates and Plato, disagreeing with Platonic idealism. He developed a theory focused on the real. According to him, the purpose of education in human beings is the pursuit of happiness or the good, which lies in the highest functioning of human nature—that is, in reason, which directs human conduct.

SAINT AUGUSTINE (354 – 430 A.D.) and Saint Thomas Aquinas (1225 – 1274 A.D.) refined these theories: the former, Platonic; the latter, Aristotelian. However, they considered the religious aspect. Regarding teaching, both admitted that God is the true teacher who teaches within our soul, but emphasized the need for external help.

JOHN AMOS COMENIUS (1592 – 1670), considered one of the greatest educators and the father of modern didactics, active in the 17th century and during the transition from the Middle Ages to Modernity, believed in God but innovated in philosophical-educational thought by giving more importance to didactics—a dimension that medieval education did not consider. He stated that the educational goal should be achieved through self-mastery, which is ensured by knowledge of oneself and of all useful things.

Later came the Enlightenment, a movement that sought to spread the light of reason everywhere, not bound by dogmatism but by rationality. Enlightenment education, like its scientific approach, was free from religious influences and allowed freedom of thought.

At the height of this movement, JEAN-JACQUES ROUSSEAU (1712–1778) initiated a new stage in educational formation. He was the main precursor of the New School, promoting a “return to nature,” in such a way that the student should not only be instructed but also be naturally free, without repression, limited to experiences.

Rousseau did not dedicate himself to Geography, but his innovative ideas about education and nature greatly influenced how Geography was understood and taught. His most important pedagogical work, *Emile, or On Education*¹⁹, promoted a child-centered methodology, prioritizing experience and observation of the natural environment over the retention of abstract data.

He advocated that children should acquire knowledge through direct interaction with nature and their surroundings, rather than relying solely on books and formal lessons. This perspective was

¹⁹ "Emile, or On Education" is a philosophical treatise by Jean-Jacques Rousseau on human nature and education, in which he describes an educational system that preserves the individual's natural goodness through a negative education, distanced from the corruption of society and guided by nature. The work, divided into five books, follows the development of the “natural man” Emile, a fictional orphan raised by a tutor, up to the formation of a virtuous and socially adapted citizen—yet one who still remains true to his essence.

fundamental to the appreciation of “field study” and practical Geography lessons—strategies later emphasized by educators such as Pestalozzi.

The geographic approach influenced by Rousseau’s ideas ceased to be mere memorization of names and locations on maps and became an active exploration of the world, where the student understands the landscape through their own experiences.

Rousseau believed that the human being is inherently good but becomes corrupted by society. In his writings, he criticizes the artificiality of communal life and suggests a return to educational methods more attuned to nature. This appreciation of nature left a lasting mark on subsequent geographic thought, especially in schools of thought that analyze the interaction between human beings and the environment. By advocating for a lifestyle more integrated with nature, Rousseau brought to light debates about the harmful effects of human action on the environment—an issue that would be explored more deeply by environmentalists and geographers in later generations.

Professor Rousseau emphasized the importance of a personalized education that would allow the student to achieve autonomy and self-sufficiency. In Geography, this is reflected in the search for methods that respect each student’s individual pace, encouraging them to explore geographic knowledge in ways aligned with their own interests.

For Rousseau, education should cultivate the child’s innate curiosity and encourage them to venture into discovery—something essential for a Geography education that is dynamic and effective.

Rousseau’s influence on Geography did not come through the creation of geographic concepts, but through the philosophical and pedagogical foundation that promoted a renewal in the teaching of this discipline. By advocating for learning through experience, the appreciation of nature, and student protagonism, he helped shape the foundations of a more critical, practical, and life-connected Geography.

In this sense, it is the teacher’s role to guide the student along the path they must follow. The teacher does not teach; they organize ideas and pass them along, enabling students to learn.

JOHANN HEINRICH PESTALOZZI (1746–1827) demonstrated his desire to unite the natural human being with history. Although not classified as a geographer, Pestalozzi had a significant and indirect impact on the discipline of Geography, especially through his didactic approach and the recognition of the subject in education. Pestalozzi’s value to Geography lies in his educational methodology, which transformed teaching by incorporating geographic concepts through sensory perception and observation of the surrounding environment. He argued that education should originate from direct observation of the world around us. In the 19th century, Pestalozzi’s ideas contributed to the acceptance and validation of Geography teaching in primary schools. Previously, the subject was often overlooked, focusing only on memorizing place names.

With Pestalozzi's methodology, Geography became a more active and meaningful discipline. His "intuitive method" suggested that children should learn based on their sensory perceptions, progressing from the concrete to the abstract and from the simple to the more complex; that instead of starting with maps and distant ideas, the geographic approach should begin with the child's immediate environment—such as their home, backyard, and neighborhood; that discovering the surrounding space through walks, where students could observe geography, natural history, and local geology, was meaningful and connected learning to practical experience; that "object lessons" were classes incorporating physical items to facilitate learning, such as minerals and plants.

Pestalozzi is relevant to the study of Geography for having proposed and disseminated a teaching method that emphasized observation and direct experience of the surroundings, integrating the subject into the curriculum in a more relevant and less rigid way.

KARL MARX (1818–1883) and FRIEDRICH ENGELS (1820–1895) argued that education should be equal for all—workers and bourgeois alike.

The contributions of Marx and Engels to the discipline of Geography were not specifically directed at Geography, as they were not geographers. However, their theories—especially historical and dialectical materialism—had a significant impact on Critical Geography, which emerged in the 1970s. The Marxist perspective of this school of thought transformed the way geographers examine the interactions between society, the economy, and space.

Historical materialism, a foundation of Marxism, suggests that social interactions are shaped by the material and economic conditions of society. When applied to Geography, this perspective challenges positivism, as it questions the idea that Geography is a neutral discipline focused solely on describing geographic phenomena, ignoring the fact that relations of production and power influence the organization of space.

Furthermore, historical materialism emphasizes class struggle, showing that social inequalities and class conflicts—characteristic of capitalism—are revealed in the landscape. Geography thus becomes a tool to investigate how capitalist exploitation and power relations generate and maintain spatial inequalities.

The dialectical method adopted by Marx and Engels requires that phenomena be analyzed as historical totalities, which implies that geographic space cannot be understood in isolation from other social, economic, and historical relationships.

Inspired by Marxist concepts, Critical Geography began to explore how geographic space is actively shaped by the capitalist mode of production. Marxist geographers such as David Harvey dedicated themselves to analyzing how capitalism mobilizes space to resolve its contradictions and cyclical crises through territorial expansion and urbanization.

In Engels' work *The Condition of the Working Class in England*, he illustrates how misery, inadequate health conditions, and inequality manifest in urban environments. This work influenced research in Urban Geography and the analysis of socio-spatial segregation processes.

Marxists also helped elucidate the concept of uneven geographical development, demonstrating how the logic of capitalism—through capital accumulation and devaluation—generates disparities between regions and countries.

The central contribution of Marx and Engels to Geography was to establish a theoretical and methodological foundation that allowed the discipline to become a critical science, oriented toward human emancipation.

Marxist theories compelled geographers to reflect on for whom they conduct their research and what assumptions underlie it, encouraging a political and transformative view of reality.

Marxist Geography, with its understanding of spatial inequalities, seeks to support political action and social transformation, aiming to overcome the prevailing capitalist model.

ANTONIO GRAMSCI (1891–1937), also with a Marxist perspective, understood that the human being only builds a dignified personality through the ability to produce their own existence through labor. Thus, he affirmed that school can alienate the individual from society, favoring capitalism.

Although Gramsci did not have formal training in Geography, his political and social ideas—especially those expressed in the *Prison Notebooks*—had a significant impact on Critical Geography. By studying how power manifests in society, Gramsci provided important conceptual tools for geographers to understand the spatial dimension of social, political, and cultural interactions.

Gramsci's central contribution is the concept of hegemony, which refers to the ability of a dominant class to exercise its power not only through force but especially through consent. When applied to Geography, this concept helps us understand how hegemony is expressed and materialized in geographic space—through urban landscapes, the distribution of services, and the organization of territory. The construction of certain monuments, the use of public spaces, or the designation of privileged areas, for example, are expressions of hegemonic power.

Spatial hegemony does not depend solely on force, but on the formation of a consensus about how space is used and organized. Geography helps to reveal how this consensus is established and how subordinate classes resist or adapt to this spatial configuration.

Gramsci described “organic intellectuals” as those who emerge from a social class and work to structure the hegemony (or counter-hegemony) of that class. His perspective on education also influences Geography, as geographers and educators can be seen as organic intellectuals of the working class, contributing to dismantling the hegemonic view of space and promoting a critical geographic consciousness among students.

Gramscian ideas motivate School Geography to go beyond mere description of the world. They drive the investigation of contradictions and spatial inequalities, aiming at the formation of critical and emancipated individuals.

According to Gramsci, power is exercised not only by the State, but also by civil society, which includes institutions such as churches, schools, political parties, and the media.

Space is the environment where civil society is structured and where the struggle for hegemony takes place. Geography can investigate how the distribution of schools, the concentration of churches, or the location of media outlets impacts the creation and maintenance of hegemony.

Gramsci's concept of the expanded State highlights that territory is constantly contested. Studying how different social forces compete for control and use of space—from local to global levels—is a central aspect of Geography inspired by Gramsci.

Being a native of Sardinia, Gramsci addressed the “Southern Question” in Italy, emphasizing the significant inequalities between the industrial North and the agrarian South.

Gramsci's perspective on regional issues serves as a foundation for geographers who study uneven development. He showed that capitalist progress is not distributed uniformly, generating distinct zones of wealth and poverty, which are reflected in the geographic configurations of countries.

Gramsci's influence on Geography did not come from formulating a specific spatial theory, but from developing theoretical and political concepts that enable the analysis of the spatial dimension of power. His ideas on hegemony, civil society, and organic intellectuals provided the basis for Geography to become a critical, politically engaged field dedicated to human liberation.

JOHN DEWEY (1859–1952), an American philosopher and educator, prioritized experience as the main factor in the learning process. He asserted that school education should be carried out as closely as possible to real life, since life itself is a constant experience and, consequently, a continuous learning process. The role of the school, therefore, is to accelerate this process. In this case, the teacher should only guide the student in what interests them, encouraging them to experiment.

Dewey's contributions to Geography were not directly related to geographic theories, but they made a significant difference in the didactic approach and teaching methodologies of the subject. His pedagogical approach, which prioritized experience, problem-solving, and democratic principles, reshaped how Geography is taught in educational institutions.

His main proposal was the concept of “learning by doing.” For Dewey, knowledge should not be something passively received, but rather created through interaction with the environment.

Dewey challenged the traditional teaching method that emphasized memorization of abstract content disconnected from students' lived experiences. He argued that the focus of Geography should be



the student's immediate environment. Based on experience and local exploration, the child could develop an understanding of more abstract and distant geographic concepts.

Dewey's paradigm suggests a more engaging learning posture, encouraging students to observe, analyze, and participate in activities that connect them directly to geographic reality.

His philosophy emphasized problem-solving as a fundamental aspect of learning and the development of critical thinking. For example, Geography can be taught using dynamic methodologies such as Problem-Based Learning and Geo-Inquiry, which promote geographic reasoning and scientific understanding. In this context, students are encouraged to ask questions about their surroundings, collect information, interpret data, and seek solutions to the challenges they encounter.

In Dewey's view, the school functioned as a small reflection of society—a space where students could practice democracy and citizenship. He believed that Geography should provide a “worldview grounded in a humanistic perspective toward other cultures and peoples,” which fosters global understanding and cooperation among diverse nations.

Dewey's ideas also influenced the concept of collaborative planning in Geography, encouraging students to actively engage in organizing their learning activities, bringing greater relevance and meaning to the process.

John Dewey's contribution to Geography lies in his pedagogical approach, which transformed the didactics and practice of the discipline. By promoting experience-based learning, problem-solving, and democratic engagement, he established a paradigm for a more critical, contextualized, and civically engaged geographic education.

MARIA MONTESSORI (1870-1952) stated that one should not directly help a child out of a difficulty, nor should one criticize the work done; the activity, according to her, should be intense and engaging.

Montessori was an Italian physician and educator who significantly transformed education in the 20th century. Although her contributions to Geography were not direct through specific theories, her methodology brought a new vision to teaching and learning, considerably influencing geographic education.

Montessori firmly believed that learning occurs through the senses and manipulation. This led to the creation of specific didactic materials that can be used to teach Geography from early childhood.

The “Cosmic Education” proposed by Montessori suggests that, from the age of six, children should be introduced to a holistic and interconnected perspective of the universe. This approach is crucial for Geography, as the child realizes they belong to a complex and interdependent system, where the local is connected to the global, recognizing that the human being is an essential part of this system.

Cosmic Education increases awareness of the interdependence of all beings and elements on the planet, encouraging respect for nature and appreciation of cultural and biological diversity. The child understands that humanity is driven by a purpose and has the responsibility to care for the planet and its creatures.

The Montessori method proposes a “prepared environment”, in which the student has the freedom to explore and learn autonomously. In Geography teaching, the prepared environment allows the child to choose the materials and activities they wish to engage in, respecting their own pace and interests. This autonomy results in self-education, as the child becomes the protagonist of their learning, exploring and discovering geographic concepts independently.

Maria Montessori’s contributions to Geography are evident through an innovative approach based on sensory materials, Cosmic Education, and a supportive environment. Her method transforms Geography teaching from simple memorization of information into a practical, meaningful experience that is connected to reality from the earliest years of life.

As for the Soviet professor Anton Semionovich Makarenko, Piletti²⁰ tells us:

“[...] Makarenko proposes replacing the bourgeois school based on playful methods—games—with a school based on productive labor. The school should be a community (a ‘collective’) in service of the production of economic goods. According to Makarenko, educators only make sense as members of the community, and their freedom is conditioned by the interests of the group, which, in turn, is part of a larger community.”

The contributions of the Soviet pedagogue ANTON SEMIONOVICH MAKARENKO (1888–1939) to Geography are not direct, as he did not dedicate himself to the theory or specific teaching of this discipline. However, his pedagogy of collectivity, productive labor, and the integral formation of the individual—grounded in historical and dialectical materialism—has indirect implications for geographic education.

Makarenko’s pedagogy valued action and practical experience as a form of education. Life in collectivity, as in the Gorky Colony and the Dzerzhinsky Commune, was a space of constant learning. This approach can be applied to Geography by valuing practice, since Geography is not merely a theoretical subject but a discipline that is lived daily.

Collectivity was the cornerstone of Makarenko’s pedagogy. In the Dzerzhinsky Commune, the organization of students into groups, the planning of activities, and the use of collective spaces were discussed in a spirit of solidarity. This offers a starting point for Geography: space as a social construct, where the organization of collective spaces in a community can be studied as a reflection of social

²⁰ PILETTI, Claudino; PILETTI, Nelson. *Filosofia e História da Educação*. 6 ed. São Paulo: Ática, 1988.

relationships and group needs; and the analysis of the landscape, which is not merely a physical phenomenon, but a space built by human action, reflecting social, economic, and cultural organization.

Makarenko advocated education through labor, where students participated in productive activities connected to social reality. This idea can be used to understand the Geography of production. For example, analyzing productive activities in a community—whether in agriculture or industry—allows for an understanding of economic geography and local development. In this sense, productive labor can be approached in a way that raises social and environmental awareness, reflecting on the impact of human activities on geographic space.

Despite his contributions, it is important to note that Makarenko's pedagogy is also subject to criticism for its focus on rigid discipline and the collective, which can inhibit individuality and creativity. When applying his ideas to Geography, a critical perspective is necessary, seeking a balance between collective experience and individual development.

In summary, Makarenko's contribution to Geography was not through a specific theory or didactic method for the discipline. His legacy lies in his pedagogical approach that values collectivity, labor, and experience, offering tools for making geographic education more practical, contextualized, and critical—reflecting on the organization of space and social relationships.

CÉLESTIN FREINET (1896–1966) believed that the child's natural activity develops within a cooperative group, and that this natural cycle should not be interrupted—but also should not be entirely surrendered to the spontaneous activity of play. His method sought, above all, to give the child the opportunity to express their thoughts and feelings through forms of expression with the greatest possible freedom.

Professor Freinet, like other intellectuals of the New School movement, did not belong to the field of Geography. However, his pedagogical innovations were crucial for revitalizing the teaching of this discipline. His student-centered approach, grounded in collaboration and free expression, proposed a practical approach to Geography.

Many of Freinet's innovations can still be seen in geographic education today. One of his most notable methodologies—field classes—is fundamental to learning Geography. Another of the professor's innovations was the connection between the discipline and the real world. Instead of acquiring knowledge only through books, students are encouraged to observe, explore, and interpret the environment around them. This transforms Geography into an active and relevant field of study.

Freinet also innovated by asserting that knowledge is formed through concrete experience, enabling students to understand the interactions between the natural and social aspects of their surroundings.

Freinet's insistence on "work-activity" as the foundation of learning transforms the student from a passive recipient into a creator of knowledge. The teacher proposes that Geography be taught collaboratively, with students joining forces in research projects, map-making, model building, and report writing. This fosters self-determination, creativity, and teamwork skills.

Freinet's approaches move away from memorization and traditional teaching. Through his methodology, Geography becomes a discipline that promotes research, documentation, and innovation.

In conclusion, Célestin Freinet's innovations for Geography teaching are closely tied to his pedagogical approach. By valuing experience, cooperation, free expression, and environmental study, he provided tools for making geographic education more active, contextualized, and connected to students' realities and interests.

ALEXANDER SUTHERLAND NEILL (1883–1973) proposed a school where authority is replaced by responsibility and discipline by freedom, and he affirmed that only in a non-repressive environment would the child express their creativity.

Neill was a Scottish educator, famous for founding the Summerhill School and for advocating a libertarian education that prioritized children's freedom and self-management. Like other educators who marked the 20th century, his contributions to Geography were not direct, but were manifested in methods and philosophies that challenged traditional teaching.

Neill's pedagogical approach was a response to conventional education, which he saw as oppressive and artificial. He believed that imposed knowledge was not authentic, maintaining that learning should be optional and enjoyable. This perspective influences Geography by rejecting memorization. Neill criticized traditional teaching, downplaying the importance of memorizing names, rivers, capitals, and geographic formations.

His methodology emphasized experience over imposed theory, affecting the study of the environment and its connection to local realities, even though he was not the creator of these concepts. From Neill's perspective, Geography ceases to be a mandatory and tedious subject, becoming a field of knowledge that students may choose to explore if they are interested.

Neill's philosophy, which emphasizes freedom, democracy, and respect for children, can be applied to geographic education in a precise way. Two examples from Summerhill illustrate this:

At Summerhill, children have a voice in creating the rules and running the school. In the context of Geography teaching, this is reflected in students' participation in choosing the topics to be studied, promoting their autonomy.

Also at Summerhill, there is freedom of learning: participation in classes is not mandatory. Although this approach may be controversial in formal education, the concept can inspire a more flexible

methodology, in which the teacher acts as a mediator offering various learning options, adapting content to students' interests.

By valuing experience, Neill's pedagogy reinforces the importance of practical activities and environmental exploration, methodologies already advocated by other educators.

Neill's ideas have been—and still are—subject to various criticisms. The main criticism focuses on the lack of mandatory instruction and the possibility that such approaches may result in incomplete education, as students might not acquire all the necessary skills and knowledge. However, Neill's legacy for Geography stands out for his encouragement of questioning. He provokes discussions about what truly constitutes geographic knowledge and its real importance for students. He encourages reflection on didactics, motivating teachers to seek new ways to make the subject attractive and meaningful in students' lives.

In summary, Alexander Sutherland Neill's influence on Geography is not direct, but it holds great importance in the educational realm. His impact lies in challenging the conventional model and promoting a freer perspective focused on the student's needs, which inspires new techniques and practices in Geography teaching.

CLAUDINO PILETTI (1942–2021) had as one of his main educational contributions the assertion that Geography resides not in the theoretical investigation of geographic science, but in the realm of didactics and teaching methodologies. In his role as an educator, his dedication focused on how teachers could improve their approaches so that content—especially that related to Geography—would become more accessible and relevant to students.

Piletti believed that one of the central objectives of teaching, including in Geography, should be to bring the student closer to their lived experiences. His educational method promoted the use of tools that fostered a stronger connection between what is learned in the classroom and the students' daily lives. He emphasized the importance of the educator being constantly updated in order to incorporate new didactic resources.

Piletti also argued that by innovating in their approach, the teacher acts as a facilitator of learning, helping students develop a critical perspective. The didactic method should go beyond mere memorization and repetition of content, aiming instead for a deeper and more meaningful engagement with the subject matter.

FERNANDO DE AZEVEDO (1894–1974) argued that the individual must adapt to the social group to which they belong and that elementary education should provide the foundation necessary to make social cohesion possible. It is important to highlight that Azevedo's significance for Geography did not come from his work as a geographer, but rather from his role as an influential educator and sociologist who impacted didactics and school curricula in Brazil. His involvement in the New School movement and

in the creation of institutions such as the University of São Paulo (USP) had a significant effect on education across various fields, including Geography.

Azevedo was one of the signatories of the Manifesto of the Pioneers of New Education²¹, published in 1932. The New School movement proposed a profound educational transformation, prioritizing public and secular education aligned with students' realities. This philosophy had direct repercussions on Geography teaching methodology.

Instead of the conventional memorization of river names, cities, and landforms, Azevedo's pedagogical approach promoted environmental exploration.

Students were encouraged to observe and investigate their surroundings, expanding their understanding from the local to a global perspective. This practical methodology aimed to relate learning to students' lived experiences.

Furthermore, influenced by Émile Durkheim, Azevedo brought a sociological perspective that also impacted Geography. He understood education as a means of promoting the integration and adaptation of individuals into society. This view was applied to Geography by reinforcing the idea that the discipline should help students understand the social organization of geographic space.

In his book *A Cultura Brasileira* (1943), Azevedo explored Brazil—including its geography—from a social perspective. Although it was not an exclusively geographic study, his work contributed to a deeper understanding of the connection between society and territory.

In addition to his theories, Azevedo's participation in educational institutions and in the development of didactic materials was crucial for strengthening the presence of Geography in the school curriculum.

ANÍSIO SPÍNOLA TEIXEIRA (1900–1971) defended the idea of a unified school, open to all, without any kind of distinction, and believed it should serve as an instrument for social reconstruction. In this proposal, Teixeira promoted an education based on lived experience, where the student would take on a central role in their own learning process.

This vision played a fundamental role in the field of Geography, as it emphasized the importance of “environmental study”, which involves observing and interpreting the space in which the student is inserted. His ideas about a public, secular, accessible, and dynamic education influenced how the subject was conceptualized and taught in Brazil, encouraging a more critical approach aligned with students' real-life experiences.

²¹ O “*Manifesto dos Pioneiros da Educação Nova*” foi um documento histórico, assinado em 1932 por um grupo de 26 intelectuais e educadores brasileiros, liderado por nomes como Anísio Teixeira e Fernando de Azevedo. Ele representou um marco na história da educação no Brasil ao defender uma profunda reformulação do sistema educacional.

Instead of focusing exclusively on memorizing maps and information, Geography—under Teixeira’s influence—began to prioritize field activities and practical experiences. With Teixeira, the learning process in Geography became more meaningful by shifting from the local to the global, establishing a connection between the student’s immediate reality and broader concepts.

As one of the architects of comprehensive education in Brazil, Anísio Teixeira proposed a school model that encompassed a holistic formation, including not only learning but also work and leisure. Regarding Geography, this perspective contributed to broadening horizons, as the discipline came to be understood not only in theoretical terms but as part of a more comprehensive learning process.

This approach aimed to develop the individual in a complete way and to foster social awareness, since in this context, Geography helped form citizens who were more aware of their social, economic, and cultural realities.

MANUEL BERGSTRÖM LOURENÇO FILHO (1897–1970) was a Brazilian educator and one of the leading figures of the New School movement in Brazil. Although he did not have formal training in Geography, his pedagogical ideas directly influenced the way Geography was taught in the country, especially by promoting a more dynamic, intuitive approach connected to students’ realities.

Aligned with New School practices, Lourenço Filho promoted the “study of the environment” (*estudo do meio*) as a fundamental educational tool. This methodology broke away from traditional Geography, which often focused on memorizing names, rivers, and capitals on maps. He argued that learning should begin with the student’s immediate surroundings and gradually expand to more distant contexts.

Lourenço Filho’s educational approach strongly emphasized the holistic development of the human being and the creation of a more equitable society. For him, the school institution played a crucial role in addressing Brazil’s social and economic challenges. Within this framework, Geography should not be seen merely as a field of knowledge, but as a tool for understanding society and for active engagement in the community.

His influence on Geography did not stem from theoretical contributions to the discipline itself, but from his work as an educator, which significantly impacted its didactic approach. He promoted the importance of environmental analysis and the development of individuals who are more critical and proactive in relation to their own context.

Therefore, the relevance of the thought of educators and philosophers to Geography lies in their ability to influence the pedagogy and teaching of the subject, affecting how geographic concepts are transmitted, understood, and applied in students’ education. Even though many of them were not geographers, their reflections on teaching, knowledge, society, and ethics revolutionized education in a broad sense, directly impacting the geographic discipline.

Philosophy raises the question of whether Geography is an impartial science focused solely on the description of phenomena. It encourages geographers to reflect on the social and political consequences of the creation and organization of space.

Geography, influenced by these thinkers, ceases to be merely a collection of data and becomes a tool for interpreting the social, economic, and cultural dynamics that shape geographic space.

The interaction between Geography and Philosophy also promotes interdisciplinarity, allowing the subject to connect with other fields of knowledge such as sociology, history, and ethics. Interdisciplinarity encourages the recognition that knowledge is interconnected and that reality cannot be divided into isolated disciplines.

In conclusion, the contribution of educators and philosophers to Geography is fundamental, as they provide the theoretical and methodological foundation that transforms geographic education. They elevate the discipline from simple memorization of information to a critical, experiential exploration, committed to forming conscious, autonomous individuals capable of transforming their surroundings.

THE TEACHING OF PHILOSOPHY: THE IMPORTANCE OF STUDYING PHILOSOPHY IN THE SCHOOL ENVIRONMENT AND ITS INTERDISCIPLINARITY WITH GEOGRAPHY

Teaching within a community does not present itself as an isolated objective, but rather as a tool to preserve or change the social structure. Therefore, it requires resources that guide its paths. Thus, each society has principles that guide its educational practices, in such a way that it is not education that defines its objectives, but rather the philosophical analysis present in a given society²².

Additionally, Luckesi²³ highlights the following point:

“The connections between Philosophy and Education seem quite ‘organic.’ Education focuses on the development of young people and new generations within a community, while Philosophy analyzes what and how these young people and this community should become or evolve.”.

The teaching of Philosophy in schools is essential for shaping individuals who are critical, reflective, and independent. By promoting inquiry and discussion, this subject prepares students to recognize the complexity of the world, form their own views, and act more consciously within their communities.

Philosophy enables students to ask questions that take them out of their comfort zones, encouraging reflection on various aspects of life and the surrounding environment. This prevents passive acceptance of ideas and encourages the search for well-founded reasoning. By examining different

²² LUCKESI, Cipriano Carlos. *Filosofia da Educação*. São Paulo: Cortez, 1990.

²³ Ibid., p. 23.

theories and perspectives, students acquire skills to analyze, argue, and form their opinions in a logical and coherent way. This competence is fundamental for social coexistence and the practice of citizenship.

Philosophy also encourages reflection on ethical and moral dilemmas, helping students discern between right and wrong and build their own ethical outlook. In this way, by studying topics such as politics, justice, and freedom, students gain a better understanding of their role in society and how their actions affect the whole. This strengthens their sense of citizenship and prepares them for active participation in the community.

In this regard, Favaretto²⁴ offers an important insight:

“Situating Philosophy as a school subject within the horizon of contemporary problems—scientific, technological, ethical-political, artistic, or those arising from transformations in language and communication systems—implies taking a stance so that its contribution is meaningful in terms of content and cognitive processes.”

But is it possible to establish interdisciplinarity between Philosophy and Geography? From a broader perspective, this interdisciplinary dialogue is indeed feasible, as the interaction between Philosophy and Geography constitutes an essential context for developing individuals who are more critical and aware of their connection to geographic space—the main object of study in Geography. Both fields originated from philosophical inquiry aimed at understanding the world and therefore maintain a constant dialogue that provides a more extensive and complex view of reality.

Space is dynamic, as its forms, objects, and relationships result from interactions that occur throughout the historical evolution of each culture. According to the Base Nacional Comum Curricular (BNCC), the essence of Geography is Geographic Space. This concept is one of the methodological foundations of Geography and is redefined and deepened by Milton Santos²⁵, who emphasizes:

“There is no production that does not involve the production of space, and there is no production of space that occurs without labor. For the human being, to live means to create space. Since humans cannot survive without their labor activity, the cycle of life is an act of forming geographic space. The human way of life consists in the process of forming space.”

It is possible to identify the connection between Philosophy and Geography in various ways.

Philosophy investigates the nature of space, its perception and representation, and how the experience of a place influences people’s subjectivity. Geography, in turn, explores the various facets of space—including natural, social, cultural, and economic aspects—and how it is constructed, experienced, and modified by people. The collaboration between the two disciplines allows students not only to

²⁴ FAVARETTO, C. *Filosofia, ensino e cultura*. In: _ KOHAN, W. (Org). *Filosofia; caminhos para o seu ensino*. Rio de Janeiro: DP& A, 2004

²⁵ SANTOS, M. *Metamorfose do espaço habitado*. São Paulo: Hucitec, 4ª ed. 1996, p. 163

consider the location of a place but also the complexities involved in its formation, including historical, cultural, and social aspects.

In another context, political philosophy provides tools to question and examine the structures of power expressed in space, such as the unequal distribution of resources, the exclusion of groups, and symbolic violence. Critical Geography, in turn, addresses how space is used and contested by different social groups, revealing inequalities and conflicts related to space. The interaction between these areas allows for the unveiling of power dynamics that materialize in territory, enabling students to develop a critical understanding of the world in which they live.

Moreover, Philosophy deals with existence, the meaning of life, and the relationship between human beings and the world. Geography analyzes how humans build the world, studying the interactions between natural and human elements that shape reality. The combination of these disciplines enriches students' understanding, showing that the landscape goes beyond a physical phenomenon; it is also a social and cultural construction that reflects human values, beliefs, and actions.

Philosophy also emphasizes the importance of experience in the formation of knowledge. Geography values environmental investigation, allowing students to observe, describe, and compare different places, linking acquired knowledge to lived experience. Interdisciplinarity enhances environmental study, creating opportunities to reflect on the complexities of space, social relations, and current challenges.

Based on these observations, it is possible to infer that interdisciplinarity between Philosophy and Geography brings benefits to teaching. The interconnection between disciplines fosters an integrated understanding of knowledge, overcoming the fragmentation of reality. Students are encouraged to question dominant narratives about space, conduct critical analyses of inequalities, and seek solutions to global problems.

Finally, interdisciplinarity between Geography and Philosophy promotes collaboration among educators, creating opportunities for new discussions and interpretations on topics such as environment, culture, globalization, and social justice. It is an essential strategy in Geography education, as it enables students to understand geographic space more broadly, connecting it not only to natural factors but also to social, economic, and cultural dimensions, empowering them to face the challenges of today's world.

FINAL CONSIDERATIONS

It is concluded, based on the study carried out, that since its inception, the fundamental role and foundation of philosophy has been to make the human being someone who does not conform to what is imposed upon them—a critical being who, through the freedom they possess (for every person is free,

they just need to awaken that within themselves), constructs their own thinking and conclusions about the environment and reality in which they live.

Thus, we observe that philosophical ideas present a vast diversity and depth. This is due to the fact that Philosophy is not an isolated, finalized, and ideal universe, but rather an accessible space in constant evolution.²⁶

From the information researched so far, it becomes evident how relevant Philosophy is to education. Since education is the main force responsible for promoting change in society, it must form critical and constructive citizens. This is emphasized by Philosophy, for someone who does not engage in philosophical reflection can also be seen as someone who does not engage socially. That is because a person who does not practice Philosophy, consequently, does not participate in society.

Studying Geography through the lens of philosophical foundations is essential, as Philosophy provides the theoretical support needed to understand geographic science, critique its approaches, and evaluate the interactions between society and space. The connection between Geography and Philosophy is profound, and this interdisciplinary relationship enriches the way we understand human interaction with our surroundings.

Philosophical foundations are crucial for Geography to achieve rigor and scientific consistency. The geographer David Harvey, for example, argued that to properly address geographic issues, one must first make a philosophical decision regarding the topic of investigation. Philosophy is useful for answering questions such as: What is the focus of geographic analysis? How is geographic knowledge produced? What concepts support the various theoretical currents in Geography?—among other inquiries.

Philosophical knowledge is valuable for understanding how Geography has evolved, from ancient civilizations—where the interpretation of the world was intertwined with Philosophy—to modern approaches.

The fusion of Philosophy with Geography allows for an analysis that goes beyond mere description of the world, promoting critical reflection on social and spatial relationships. Critical thinking in Geography empowers students to challenge dominant narratives about the world and to perceive how power dynamics manifest in space. Philosophy provides an analysis of geographic space as a product of historical, social, and economic processes, rather than viewing it as a fixed given.

Moreover, philosophical knowledge supports reflection on issues such as sustainable development, social justice, inequality, and the interaction between society and nature.

In short, Philosophy, by its very nature, possesses an interdisciplinary character that benefits Geography in its interaction with other fields of knowledge. The analysis of philosophical foundations

²⁶ COTRIM, Gilberto. *Fundamentos da Filosofia: para uma Geração Consciente*, 2008.



strengthens Geography's ability to relate to areas such as politics, economics, and sociology, promoting a broader, more integrated, and complex understanding of geographic phenomena.

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THE POWER OF CHRISTIAN EVANGELISM <https://doi.org/10.63330/aurumpub.015-015>**David Aguiar¹****ABSTRACT**

This study addressed the power of Christian evangelism as an essential element of faith and the Church's mission, analyzing its origin in the Holy Scriptures, its historical expansion, and its spiritual, social, and cultural influence on contemporary society. The objective was to understand the role of evangelism in spreading the Christian message, its importance for strengthening faith, and the challenges it faces amid social and technological transformations. The research was conducted through a bibliographic and qualitative methodology, based on theological and sociological works by authors such as Stott, Boff, Bosch, Graham, Piper, and Bonhoeffer, as well as biblical references that underpin evangelistic practice. The results demonstrated that evangelism, more than an institutional activity, constitutes a living expression of faith and love, materialized in personal testimony and acts of solidarity. It was also found that, throughout history, evangelism contributed to the formation of ethical values, the promotion of social justice, and the strengthening of Christian communities. In the current context, the study observed that evangelism faces challenges related to religious pluralism, secularization, and the use of digital media, requiring authenticity, dialogue, and ethical responsibility from the Church. It was concluded that Christian evangelism remains a vital force in spreading the Gospel and transforming society, reaffirming the importance of faith, compassion, and commitment to others as foundations of true Christian discipleship.

Keywords: Evangelism; Christianity; Faith; Society; Mission.

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INTRODUCTION

The power of Christian evangelism constitutes one of the fundamental pillars of the Church's faith and mission, representing the continuous commitment of Christians to proclaim the Good News of salvation and hope revealed in Jesus Christ. Evangelism, derived from the Greek term *euangelion*, meaning "good news," is a practice that transcends the boundaries of institutional religion, configuring itself as a living expression of faith in action. Since the earliest centuries of Christianity, evangelism has been the instrument through which the Gospel message expanded, reaching different peoples and cultures, transforming lives, and shaping moral and spiritual values that profoundly influenced human history.

Theological and missiological literature, represented by authors such as John Stott (2006), Leonardo Boff (2010), Billy Graham (2015), David Bosch (2002), and Karl Barth (1963), reinforces that evangelizing is more than preaching doctrines; it is living and witnessing God's love in everyday life, translating faith into attitudes of solidarity, justice, and compassion.

The objective of this work was to analyze Christian evangelism in its biblical, historical, and contemporary dimensions, highlighting its importance as a transformative force in society and its role in strengthening Christian faith. The study sought to understand how evangelism developed over time, its theological foundations, and how it manifests in the current context, marked by religious plurality and technological advancement. As a hypothesis, it was considered that evangelism remains a relevant and necessary instrument for the modern Church, capable of promoting not only individual conversion but also social and spiritual transformation, provided it is sustained by authentic faith and coherence between discourse and practice.

The choice of this theme is justified by the importance of evangelism in shaping Christian identity and the need to reflect on its challenges and possibilities in an increasingly secularized world. Amid ethical and spiritual crises, evangelism reemerges as a force of renewal and hope, reaffirming the Christian call to love, service, and compassion.

This study was developed through bibliographic and qualitative research, based on the analysis of works in theology, philosophy, and sociology of religion, as well as biblical texts and ecclesiastical documents. The work was structured into four main parts. The first presents the concept and biblical foundations of Christian evangelism, highlighting its origin in Scripture and the Church's mission expressed in the Great Commission. The second part discusses the expansion and influence of evangelism in society, addressing its cultural, ethical, and social impacts. The third part deals with contemporary challenges faced by evangelism, analyzing social, technological, and religious changes that influence missionary practice. Finally, the conclusion presents final considerations, emphasizing the relevance of evangelism as a spiritual and social force that continues to inspire faith, solidarity, and Christian commitment in times of transformation.



METHODOLOGY

The methodology of this work was based on bibliographic and qualitative research, developed through the analysis of books, articles, and documents addressing Christian evangelism in its theological, historical, and social dimensions. The main theoretical references included authors such as Stott (2006), Boff (2010), Bosch (2002), Graham (2015), and Barth (1963), as well as biblical passages that underpin evangelistic practice. The study had a descriptive and interpretative character, seeking to understand, in light of the consulted literature, the foundations, expansion, and contemporary challenges of Christian evangelism, without conducting interviews or collecting empirical data.

DEVELOPMENT

CHRISTIAN EVANGELISM: CONCEPT AND BIBLICAL FOUNDATIONS

Christian evangelism constitutes one of the most significant expressions of the Church's faith and mission, representing the essence of the divine call to proclaim the Good News of salvation. The word "gospel" originates from the Greek term euangelion, meaning "good news" or "glad tidings," and refers to the central message of Christianity: the love of God revealed through Jesus Christ. Thus, to evangelize is to communicate this transformative message to the world, inviting each person to a personal experience with the living Christ. According to John Stott (2006), evangelism is "the communication of the good news of a God who acts in love to reconcile sinners to Himself in Christ, through the power of the Holy Spirit." This understanding shows that evangelization is not merely a religious practice but an extension of God's own heart toward humanity.

The origins of evangelism are found in the Holy Scriptures, especially in the New Testament, where the life and ministry of Jesus Christ are presented as the concrete manifestation of the Good News. The Gospel of Mark begins by stating: "The beginning of the gospel of Jesus Christ, the Son of God" (Mk 1:1), demonstrating that evangelism is rooted in divine revelation itself. From the prophets of the Old Testament, there was already the announcement of the redemptive message: Isaiah proclaims, "How beautiful upon the mountains are the feet of him who brings good news" (Is 52:7), anticipating God's call to proclaim salvation. John Piper (2010) emphasizes that evangelism reflects God's missionary love, who sends the Son into the world not to condemn it but to save it. In this sense, to evangelize is to continue Christ's mission, becoming an instrument of divine action on behalf of others.

The evangelistic mission of the Church finds its fullest expression in the words of Jesus recorded in Matthew 28:19–20, known as the Great Commission: "Therefore go and make disciples of all nations, baptizing them in the name of the Father and of the Son and of the Holy Spirit; teaching them to obey everything I have commanded you." This command summarizes the essence of Christian evangelism: to proclaim the message of salvation, to teach the principles of the Kingdom, and to form disciples

committed to the faith. According to Stott (2006), the Great Commission is the foundation of Christian identity, for to be the Church is to be missionary; it is not a matter of choice, but of loving obedience to Christ's mandate. Leonardo Boff (2010) expands this understanding by stating that to evangelize is also to proclaim life in its fullness and to promote the liberation of the oppressed, since the Gospel is both a spiritual message and a commitment to justice and human dignity.

The apostle Paul, in his letters, reinforces the transformative power of the gospel by affirming that it is "the power of God for the salvation of everyone who believes" (Rom 1:16). This statement shows that evangelism is not limited to individual conversion but has social and spiritual reach, capable of transforming hearts and structures. Karl Barth (1963) states that "the Church exists to witness," meaning that its very reason for being lies in the continuous proclamation of God's love revealed in Christ. This mission is not restricted to preachers or leaders but belongs to all who believe, for every Christian is called to be light in the world and salt of the earth.

True evangelism is born of living faith and is manifested through personal testimony. More than eloquent speeches, what convinces the world is the coherence between the message and the life of the one who proclaims it. John Wesley (1984) already affirmed that "faith that is not expressed in works is a dead faith," highlighting that authentic Christian witness is rooted in the practice of love, solidarity, and justice. Dietrich Bonhoeffer (2004) adds that Christian witness is "the presence of Christ in the world through the lives of those who follow Him," emphasizing that everyday evangelism occurs in simple gestures, ethical attitudes, and care for others. Thus, the Christian becomes the gospel in motion, preaching with life as much as with words.

C. S. Lewis (1952) reinforces this view by stating that "Christianity, if false, is of no importance; if true, it is of infinite importance. The only thing it cannot be is moderately important." This phrase expresses the radical commitment that the gospel demands: to live the faith with authenticity and surrender. Personal testimony, inspired by the Holy Spirit, becomes the means by which the message of Christ reaches the human heart. In Acts 1:8, Jesus promises: "You will receive power when the Holy Spirit comes on you; and you will be my witnesses in Jerusalem, and in all Judea and Samaria, and to the ends of the earth." Billy Graham (2015) interprets this promise as the spiritual foundation of all evangelization, reminding us that evangelism is the work of God, but carried out through people willing to obey the divine call.

Today, Christian evangelism faces new challenges, marked by religious pluralism, secularism, and social and technological transformations. The use of digital media, for example, has expanded the reach of preaching and testimony, but also demands discernment and responsibility. Ed René Kivitz (2017) observes that "to evangelize today is to witness with relevance, integrity, and love in a world saturated

with discourse and lacking in meaning.” Thus, contemporary evangelism must unite faith, empathy, and ethical commitment, presenting the living Christ in a contextualized and humanizing way.

In this way, Christian evangelism continues to be a vital force that drives the Church and renews hope in the world. It is born from the Scriptures, sustained by faith, and realized in the testimony of each believer who lives according to the love of Christ. To evangelize is, therefore, more than proclaiming a doctrine; it is to live the good news of salvation, making the Kingdom of God visible amid human reality. The strength of evangelism lies precisely in this union between professed faith and practiced life, in the simplicity of testimony that transforms hearts, and in the continuity of the divine mission that began with Jesus and is perpetuated in every Christian committed to the Gospel.

THE EXPANSION AND INFLUENCE OF EVANGELISM IN SOCIETY

Christian evangelism, since its beginnings, has exerted a profound influence on society, shaping cultures, behaviors, and values across different historical contexts. The expansion of this missionary practice is closely tied to the very history of Christianity, which, over the centuries, evolved from a small group of Jesus’ followers in Judea into one of the world’s largest religious expressions. This trajectory reveals not only the strength of the Christian message but also its capacity for adaptation and renewal in the face of social and cultural transformations.

The expansion of evangelism has its roots in the missionary mandate of Jesus Christ, when He sent His disciples to proclaim the Gospel “to the ends of the earth” (Acts 1:8). This missionary impulse led to the rapid spread of Christianity throughout the Roman Empire within a few decades, reaching diverse peoples and cultures. According to David Bosch (2002), the early Church lacked significant resources but was driven by an unshakable conviction: the certainty that the message of the Gospel had the power to transform lives. Growth did not occur through political imposition but through the testimony of faith and communal life based on love, sharing, and hope.

In the following centuries, Christianity went through periods of persecution, consolidation, and expansion, reaching different continents through missions, Bible translations, and spiritual revival movements. Evangelism, in this context, became an essential tool for spreading the faith, combining preaching, social action, and education. As John Stott (2006) observes, the growth of Christianity throughout history is directly linked to the Church’s faithfulness in proclaiming the Good News and embodying its values in the world. Where the Gospel was proclaimed with love, justice, and compassion, it flourished; where it was used as an instrument of power and domination, it lost its authenticity and spiritual strength.

In the contemporary context, especially in Latin America and Brazil, Christian evangelism has played a prominent role in both religious and social spheres. According to data from IBGE (2022), the number of evangelicals has grown significantly in recent decades, reflecting the pluralization of Brazil's religious landscape. This phenomenon, more than a mere demographic shift, expresses profound cultural transformations: new forms of belonging, religious identities, and social engagement are being shaped within Christian communities. Evangelism, in this sense, has contributed not only to the strengthening of faith but also to the promotion of solidarity and ethical values in people's daily lives.

Leonardo Boff (2010) affirms that authentic evangelization goes beyond doctrinal dimensions, stating that "to proclaim the Gospel is to proclaim life, hope, and human dignity." Thus, evangelism also acts as a transformative social force, inspiring actions aimed at justice, charity, and peace. Various Christian churches have stood out in social projects, donation campaigns, support for people in vulnerable situations, and educational programs, revealing that the proclamation of faith is realized through acts of love. Rubem Alves (2002) reinforces that "faith that does not translate into solidarity is merely empty discourse," emphasizing that the strength of evangelism lies in its ability to generate empathy, compassion, and ethical commitment to others.

In addition to its social impact, Christian evangelism exerts significant cultural influence. Gospel music, for example, has become one of the most prominent phenomena in contemporary culture, crossing religious boundaries and attracting diverse audiences. Digital media, television programs, and social networks have also expanded the reach of the Christian message, allowing the Gospel to reach places and people previously inaccessible. According to Ed René Kivitz (2017), "the Christian mission in the digital world requires discernment and responsibility, for every word shared can be a living testimony of the Gospel or a distortion of its essence." Thus, the expansion of evangelism in the information age reinforces both its communicative power and the need for authenticity and ethical coherence.

Another relevant aspect is the influence of evangelism on the formation of society's moral and ethical values. Many fundamental principles that structure Western thought—such as the dignity of the human person, solidarity, justice, and forgiveness—have roots in the Christian message. For Karl Barth (1963), the Gospel "is not merely a religious truth, but a truth for all existence," as it transforms the way individuals and communities think and act. Evangelism, in this sense, acts as an agent of humanization, inviting people to live with empathy and purpose.

However, it is important to recognize that the expansion of evangelism also brings challenges. In a world marked by religious diversity, cultural pluralism, and secularization, Christian witness must be carried out with respect and dialogue. Evangelizing is not about imposing beliefs but about sharing faith with humility and love, recognizing the freedom and dignity of every human being. John Piper (2010) reminds us that "the purpose of evangelism is not to gain followers, but to glorify God and lead people to



the joy of knowing Christ.” In this context, the Church’s mission must be understood as service, not power; as communion, not competition.

In recent years, evangelism has also taken on new forms of expression, especially among young people who seek a more authentic, participatory, and socially engaged faith. Urban missionary movements, ecological initiatives, acts of solidarity, and ministries focused on mental health and inclusion have shown that contemporary evangelism is diverse and dynamic. By embracing these new languages, the Church keeps the flame of Christ’s mandate alive, adapting to the world’s transformations without losing its spiritual essence.

The influence of Christian evangelism, therefore, goes beyond religious boundaries. It acts as a spiritual and moral force that shapes consciences, inspires solidarity, and strengthens communities. Its historical and contemporary expansion reveals the power of faith to promote individual and collective transformation, sustained by the hope and love that the Gospel proclaims. As Billy Graham (2015) teaches, “the gospel is the greatest news the world has ever received—and every generation needs to hear it again.” To evangelize, therefore, is more than to preach: it is to witness the love of God in every gesture, word, and attitude, so that the world continues to be illuminated by the message of Christ, who liberates, heals, and renews all things.

CONTEMPORARY CHALLENGES OF CHRISTIAN EVANGELISM

Christian evangelism, in its essence, represents the beating heart of the Christian faith and the ongoing commitment to proclaim the Good News of salvation. Derived from the Greek term *euangelion*, meaning “good news,” evangelism is deeply rooted in the Holy Scriptures and expresses the desire to share with the world the message of redemption, hope, and love revealed in Jesus Christ. Since biblical times, the act of evangelizing has been seen not merely as a religious practice, but as a living expression of faith that transforms both the individual and the community. According to Stott (2006), evangelism is the proclamation of the Gospel in words and actions, driven by the love of Christ and obedience to His command.

The origin of evangelism is already present in the pages of the Old Testament, where the announcement of God’s presence and action is manifested through the prophets, who were sent to proclaim repentance, justice, and reconciliation. However, it is in the New Testament that evangelism acquires its full meaning, through the life, death, and resurrection of Jesus Christ. Christ Himself is the center of the evangelical message—He is both the messenger and the message. As Graham (2015) affirms, evangelism is born from a personal encounter with Jesus and the burning desire to share with others the same love and grace received. Thus, Christianity becomes a faith that cannot be kept silent, for, as the apostle Paul said, “Woe to me if I do not preach the Gospel” (1 Corinthians 9:16).



The passage of Matthew 28:19–20, known as the Great Commission, is considered the missionary foundation of Christian evangelism. In it, Jesus commands the disciples: “Go therefore and make disciples of all nations, baptizing them in the name of the Father and of the Son and of the Holy Spirit; teaching them to observe all that I have commanded you. And behold, I am with you always, to the end of the age.” This passage summarizes the mission of the Church and the purpose of evangelism: to bring the message of the Gospel to all peoples, regardless of race, culture, or social condition. According to Boff (2010), this mission is an expression of universal love and a call to build the Kingdom of God in human history.

The mission of the Church throughout the centuries has been shaped by this divine command. Since the book of Acts of the Apostles, one can perceive the evangelistic vigor of the early Christian communities, which, moved by the Holy Spirit, spread the message of Christ even in the face of persecution and adversity. According to Bosch (2002), evangelism is a dynamic response to historical transformations, but always sustained by faithfulness to the Gospel. The early Church understood that to evangelize was not only to preach with words, but also to live the Gospel through acts of love, solidarity, and service. This understanding led to the expansion of Christianity and the formation of a communal identity based on fellowship and sharing.

The role of faith in Christian evangelism is fundamental, for it is what drives the believer to act. Without faith, evangelism is reduced to mere proselytism; with faith, it becomes a living testimony of the presence of God. As Tillich (1973) observes, faith is the courage to affirm an ultimate meaning for existence, even in the face of doubt and suffering. In this sense, evangelism is an expression of faith in motion, communicated through trust in Christ and hope in His transforming power. Furthermore, personal testimony is an essential dimension of this process. As John Stott (2006) states, authentic evangelization is born from the coherence between what one believes and how one lives; Christian witness must be visible in attitudes of compassion, forgiveness, and justice.

Personal testimony, therefore, is the most powerful form of evangelization, for it translates the message of the Gospel into concrete gestures and human experiences. Rubem Alves (2002) emphasizes that the Gospel only becomes true when it is embodied in daily life—when faith becomes poetry, care, and presence. Thus, the Christian is called to be a living letter of Christ, as Paul affirms in 2 Corinthians 3:3, being known and read by all. The strength of evangelism, therefore, does not lie merely in eloquent speeches, but in the ability to live out the love of God amid human realities.

In summary, Christian evangelism is a movement that transcends the boundaries of formal religion and manifests as a universal vocation to love and transform the world. It is born from the Scriptures, finds its foundation in the mission left by Jesus, and is realized in the faith and testimony of those who follow Him. To evangelize is, above all, an act of hope and surrender—a response to divine grace that invites



every Christian to be a bearer of light amid darkness. As Graham (2015) concludes, evangelism is the most sublime way to express gratitude to God: to share with others the gift of salvation that transforms and renews life.

CONCLUSION

The power of Christian evangelism reveals itself as a central element in the life of the Church and in the dissemination of the message of Jesus Christ. This study highlighted the importance of evangelism not merely as a religious practice, but as a reflection of God's love translated into concrete actions of solidarity and justice. Throughout history, evangelism has been a driving force for social and spiritual transformation, shaping values and behaviors across various cultures and societies.

The analysis of the biblical origins and historical evolution of evangelism revealed that its essence is rooted in the Great Commission, in which Jesus calls all Christians to share the Good News. This mission transcends geographic, social, and cultural barriers, reaffirming the universality of the Christian message and its capacity to deeply impact lives.

However, contemporary evangelism faces significant challenges, such as religious pluralism and secularization. The transformation brought by digital media has introduced new dynamics in the communication of faith, requiring the Church to adopt creative and authentic approaches to connect with an increasingly diverse audience. This digital age, though full of opportunities, also demands responsibility and discernment in how the message is shared.

Moreover, the authenticity of faith is crucial to the success of evangelism. Personal testimony, when lived in coherence with the proclaimed message, has the power to touch hearts and transform lives. This practical living of faith, marked by actions that reflect the love of Christ, is what makes evangelism truly effective.

In summary, Christian evangelism is not merely a call to individual conversion, but an invitation to build a more just and compassionate world. It continues to be a vital force that inspires hope and renewal, challenging Christians to live their faith in an authentic and impactful way. The message of Christ, when lived and shared, has the potential to illuminate humanity's path, bringing transformation and hope in times of uncertainty and challenges.

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JOHN'S BAPTISM AND PURIFICATION RITUALS IN SECOND TEMPLE JUDAISM (1ST CENTURY BCE–1ST CENTURY CE): DIFFERENCES IN MEANING, AUDIENCE, AND PURPOSE <https://doi.org/10.63330/aurumpub.015-016>**Marcelo Henrique Silva de Santana¹****ABSTRACT**

This study examined purification practices in Second Temple Judaism, focusing on John's baptism as an innovation relative to traditional rituals. The central objective was to identify differences in meaning, target audience, and purpose between Jewish purification rituals and Johannine baptism. The research employed a qualitative approach, analyzing primary and secondary sources, including biblical texts, historical works, and apocryphal documents. Data collection focused on characterizing purification practices and understanding the social and religious context in which John's baptism emerged. The results indicated that Jewish purification rituals were rigidly structured around the Law and priesthood, whereas John's baptism stood out for its accessibility and emphasis on moral and spiritual transformation. The study concluded that, although they shared formal elements such as immersion in water, the practices differed profoundly in their purposes and meanings. John's baptism not only democratized access to purification but also represented a response to the social tensions of the time, establishing a more direct connection between the individual and God. This analysis enabled a deeper understanding of the dynamics of continuity and innovation in late Judaism, revealing how religious practices can be reinterpreted in new historical contexts.

Keywords: John's Baptism; Purification; Judaism; Second Temple; Religious practices.

¹ Portuguese-English Literature

INTRODUCTION

Second Temple Judaism, spanning approximately from 516 BCE to 70 CE, constitutes a central period in the religious, social, and political history of the Jewish people, marked by profound transformations that impacted the organization of the Temple, community life, religious practice, and interpretation of the Law. During this period, the diversity of religious currents and sects—including Pharisees, Sadducees, Essenes, and prophetic movements—reflected different approaches to the observance of the Law, ritual purity, and messianic expectation (Neusner, 2006; Feller, 2015). In this pluralistic context, purification rituals played a central role, not only as expressions of religious obedience but also as instruments of social cohesion, collective identity, and the maintenance of holiness in the daily lives of individuals and the community.

The practice of John's baptism, which emerged in the late phase of the Second Temple period, fits into this panorama as a significant innovation. Although it dialogued with Jewish purification traditions—such as immersion in mikvot and purification rituals for sinners or converts—Johannine baptism presents an ethical, prophetic, and inclusive dimension, aimed at inner transformation and spiritual preparation for the coming of the Kingdom of God, emphasizing the need for repentance and personal conversion (Wright, 1996; Feller, 2015). This practice, therefore, was not limited to formal compliance with the Law but incorporated a moral and eschatological purpose, expanding the social and religious function of ritual purification.

This study focuses on the distinction between traditional Jewish purification rituals and John's baptism, investigating differences in meaning, target audience, and purpose of each practice. The general objective of the research is to analyze and compare these practices, identifying continuities and ruptures, as well as understanding how these dynamics reflected and shaped religious and social experience in Palestine during the 1st century BCE–1st century CE. Among the specific objectives are: examining the audience served by each ritual; understanding the symbolic, theological, and social meanings involved; and evaluating how these practices fit into the context of messianic expectations and prophetic movements.

The relevance of the study is multifaceted. In the historical and religious domain, it contributes to understanding the evolution of purification practices, the tension between tradition and innovation, and the emergence of prophetic movements that significantly influenced later religiosity, including the formation of early Christianity. Academically, the work provides support for interdisciplinary debates among History, Theology, and Jewish Studies, expanding the understanding of ritual practices as constitutive elements of identity and social cohesion.

The article is structured into three main sections: initially, it presents the theoretical framework on Second Temple Judaism and John's baptism, discussing relevant literature and historical contexts; next, it

details the methodology employed in the comparative analysis of purification practices; and finally, it presents the results and discussion, highlighting continuities, differences, and symbolic, ethical, and social meanings of the practices analyzed. This organization aims to provide the reader with an integrated view of the topic, articulating theoretical foundation, critical analysis, and contextualized interpretations.

JUDAISM OF THE SECOND TEMPLE

This historical period, approximately spanning from 516 BCE, with the reconstruction of the Temple in Jerusalem, to 70 CE, with its definitive destruction by the Romans, constitutes a central phase in the religious and social history of the Jewish people, marked by profound political, cultural, and theological transformations (Neusner, 2006). It is characterized by a significant diversity of religious practices, ideological currents, and social groups, situated within a context of intense Hellenistic influence, Roman domination, and internal tensions regarding the observance of the Law and the interpretation of Jewish tradition (Goodman, 2007).

Historically, the 1st century BCE–1st century CE represents the final phase of the Second Temple period, a time of political instability and foreign occupation, initially under Seleucid influence and later under Roman rule. Palestine became a mosaic of kingdoms and provinces, with an administration that combined centralized Roman power and local authority of Jewish leaders, such as the high priests and the Herodian dynasty. This political reality directly influenced religious practices, social organization, and messianic tensions that permeated Jewish society (Johnson, 1997).

According to Sanders (1992), socially, Second Temple Judaism reflected a stratified society in which different groups played specific roles in religious, political, and economic life. Notable among these were the priests, who centralized Temple rituals; the scribes, responsible for interpreting the Law; the Pharisees, who emphasized rigorous observance of the Torah and oral traditions; the Sadducees, connected to the priestly and aristocratic elite; and the Essenes, who formed separate communities dedicated to ritual purification and ascetic life (Horbury, 1989). This social diversity was mirrored in the plurality of religious practices, the application of the Law, and the ways in which the Jewish people understood their relationship with God and with one another.

Religiously, the Second Temple period is marked by the deepening of Mosaic Law, the centrality of the Temple as a space for worship and sacrifice, and the emergence of new forms of religiosity, including purification movements and communal practices aimed at personal and collective holiness (Feller, 2015). The Temple in Jerusalem was the center of religious life; beyond being the site of sacrifices, it functioned as a symbol of God's covenant with Israel and a point of social cohesion (Wright, 1996). However, Judaism during this period was not limited to Temple worship; religious practices

external to the Temple emerged, such as prayer, Torah study, and purification rituals, which would later influence contemporary movements, including John's baptism (Wright, 1996).

Another relevant aspect is the influence of Hellenism, which introduced external cultural, philosophical, and religious elements into Judaism, stimulating internal debates about fidelity to the Law, cultural assimilation, and resistance to foreign domination (Meyer, 2001). This context fostered the emergence of messianic and apocalyptic currents, anticipating national restoration and divine intervention. The coexistence of different interpretations and religious practices reveals a dynamic, pluralistic, and often conflictual scenario, within which reformist movements emerged seeking purification, repentance, and closeness to God (Cohen, 1987).

In summary, Second Temple Judaism, especially between the 1st century BCE and 1st century CE, presents itself as a period of historical, social, and religious complexity. The diversity of groups and practices, combined with political instability and external cultural influence, shaped an environment in which purification rituals, observance of the Law, and messianic expectation became central to Jewish religious experience (Neusner, 2006). Understanding this context is essential for analyzing phenomena such as John's baptism and other movements of late Judaism, revealing how purification practices and the relationship with the divine assumed varied meanings depending on the audience, purpose, and interpretation attributed by different groups (Goodman, 2007).

Ritual purification in Second Temple Judaism constituted a central element of religious practice and community life, reflecting concerns with holiness, obedience to the Law, and the separation between the sacred and the profane. The laws of purity, primarily expressed in the Torah—especially in the books of Leviticus and Numbers—and later interpreted by the Pharisees and scribes, regulated both individual and collective behavior, encompassing food, contact with the dead, diseases, menstruation, sexual activity, and purification rituals following various situations of impurity (Neusner, 2006). These norms were not merely legal; they carried profound symbolic meaning, mediating the individual's relationship with God and functioning as mechanisms of social cohesion (Horbury, 1989).

The purification rituals were varied, with particular emphasis on those involving water, sacrifices, and other cleansing elements. Water purification, perhaps the most widespread, included full-body baths (mikvot) and washing of hands, feet, or objects, performed in situations such as contact with corpses, skin diseases, or bodily discharges (Sanders, 1992). The ritual bath not only removed physical impurity but also symbolized spiritual renewal, repentance, and the individual's reintegration into communion with the people of Israel and the Temple (Feller, 2015).

Sacrifices and offerings played a crucial role in purification rituals, being offered at the Temple to atone for sins, restore purity, or celebrate specific festivals (Cohen, 1987). Notable among these were the burnt offering, the sin offering, and the peace offering, each governed by detailed rules regarding the

species, age of the animal, and method of offering, reflecting the complexity of the ritual system and the need for precision in observing the norms (Goodman, 2007).

Additionally, there were rituals involving other elements, such as ashes of a heifer mixed with water, incense, oil, and grain offerings, each with specific symbolic and liturgical significance. These procedures functioned as mediators between the profane and the sacred, demonstrating that ritual purity transcended physical hygiene and was a prerequisite for full participation in religious life and in the presence of God (Wright, 1996).

The symbolism of purification extended beyond the ritual dimension: impurity was not only physical but also moral and spiritual, capable of distancing the individual from the community and divine presence (Sanders, 1992). Thus, the rituals functioned as mechanisms of social control, delineating who was in communion with God and who required reconciliation. Moreover, they ensured the sanctity of the Temple, maintaining sacred spaces separate from the profane (Horbury, 1989).

The diversity and complexity of the rituals reflect the pluralism of Judaism, in which different groups interpreted the Law in distinct ways. The Pharisees emphasized detailed observance and continuous purification; the Sadducees focused on the Temple and sacrifices; the Essenes practiced rigorous communal rituals and separation from the outside world (Goodman, 2007; Meyer, 2001). Ritual purification was, therefore, an act of legal obedience, a symbol of holiness, and a social marker distinguishing segments of the Jewish people.

In summary, ritual purification articulated legal norms, liturgical practices, and symbolic meanings, demonstrating the complexity of Jewish religious experience, which sought holiness, community regulation, and deepened relationship with God (Sanders, 1992). Understanding these rituals is essential for situating later practices, such as John's baptism, within the historical and religious context, revealing continuities and transformations in the meaning of purification and penitence (Neusner, 2006).

John's baptism, a central figure in late Second Temple Judaism, constitutes a religious practice with specific theological, social, and symbolic meanings—distinct, though related, to traditional Jewish purification rituals (Sanders, 1992). Historical sources about John the Baptist derive primarily from the canonical Gospels of the New Testament, complemented by Jewish apocryphal texts and works by historians such as Flavius Josephus, which provide information about his context and activity (Josephus, 1987).

In the Gospels, John is described as a prophet who preached repentance and performed baptisms in the Jordan River, reaching Pharisees, Sadducees, soldiers, and peasants. Baptism symbolized spiritual purification and preparation for the Kingdom of God, functioning as a rite of conversion and moral renewal. Unlike traditional rituals, which depended on the Temple and the Law, John's baptism was public and accessible, emphasizing penitence and ethical transformation (Wright, 1996; Meyer, 2001).

Josephus confirms John as a prominent figure—a righteous man who attracted crowds and emphasized moral uprightness prior to purification. Although he does not associate baptism with Temple practices, he highlights John’s social role as a mediator between Jewish tradition and a movement of spiritual renewal (Josephus, 1987).

Apocryphal texts, such as those from Qumran and Essene sects, indicate that immersion and purification by water were common in some communities, showing that John operated within a broader context of ritual practice. However, while the Essenes emphasized separation and continuous purity, John proposed public repentance and ritual immersion as ethical and spiritual preparation for personal and collective transformation (Feller, 2015; Goodman, 2007).

John’s baptism symbolized repentance and messianic expectation: the water not only purified but marked the beginning of a new life, pointing toward the Kingdom of God and the need for ethical change (Sanders, 1992). Unlike traditional purification, centered on the Law, baptism carried a moralizing and prophetic character, preparing individuals for salvation and divine judgment (Wright, 1996).

Its purpose was inner transformation, forming a community of the repentant and socially and religiously demarcating those who accepted the message of repentance. In contrast to Jewish rituals, it did not require participation in the Temple nor was it limited to priests or elites, making it accessible to all (Meyer, 2001; Cohen, 1987).

In summary, John’s baptism emerges as an innovative ritual practice, combining water purification with ethical and prophetic emphasis (Wright, 1996). Historical sources reveal its public, accessible, and moralizing character, oriented toward repentance and spiritual preparation, highlighting both continuities and differences in relation to traditional rituals, with symbolism of inner transformation, broad inclusion, and ethical and messianic purpose (Neusner, 2006).

Comparative studies between Jewish purification rituals and John’s baptism are fundamental for understanding the continuities and ruptures in religious practices in Palestine during the 1st century BCE–1st century CE (Feller, 2015). Although they share formal elements, such as the use of water, they differ in theological meaning, target audience, and ritual purpose, reflecting distinct historical and social contexts (Sanders, 1992).

According to E. P. Sanders (1992), Jewish rituals were structured within a legal and priestly system, centered on the Temple and the rigorous observance of the Law, aiming at the maintenance of ritual holiness and social cohesion (Goodman, 2007). John’s baptism, although also involving water, had a prophetic and moralizing character, inducing personal repentance and preparing individuals for the Kingdom of God, without dependence on the Temple or priests (Wright, 1996).

Feller (2015) interprets Johannine baptism as a “democratized” purification, accessible to peasants, soldiers, and marginalized groups, whereas traditional rituals required legal knowledge and had

restricted access. Baptism was public and educational, while Jewish rituals were private or communal, centered on the Law (Feller, 2015; Meyer, 2001).

Cohen emphasizes that the difference in purpose is significant: Jewish purification had a legal and priestly dimension; John's baptism had an ethical and eschatological purpose, promoting inner transformation, penitence, and behavioral change, preparing for future events in line with messianic expectations (Cohen, 1987).

Goodman and Horbury reinforce that, despite formal continuities—such as immersion in water—Johannine baptism is not a mere extension of traditional rituals, but an innovation that re-signifies existing practices, adapting them to a broader audience and ethical purpose (Goodman, 2007). Thus, it combines familiar elements with a morally directed religious reform proposal, essentially differentiating itself from purification rituals, whose primary concern was the Law and collective holiness (Horbury, 1989).

In summary, the literature shows that Jewish rituals and John's baptism share external forms but differ in meaning, audience, and purpose. The former are normative, centered on the Law and collective holiness; the latter emphasizes moral conversion, repentance, and ethical preparation for divine intervention, demonstrating how familiar practices can be reinterpreted and re-signified (Feller, 2015; Sanders, 1992; Wright, 1996).

METHODOLOGY

This study is characterized as qualitative research, with a historical and comparative approach, based on the analysis of primary and secondary sources. To investigate Second Temple Judaism and John's baptism, canonical biblical texts were examined—especially the Gospels of the New Testament—as well as historical works by authors such as Flavius Josephus, in addition to apocryphal texts and materials from communities such as Qumran, which contextualize purification and water immersion practices.

Data collection focused on identifying central elements of Jewish purification practices—including ritual baths, sacrifices, and purity regulations—and on characterizing John's baptism, with special attention to its target audience, ritual purpose, and the symbolic meaning of immersion. The analysis was conducted comparatively, aiming to highlight continuities and ruptures between traditional rituals and Johannine practice.

The methodological approach also involved reviewing and systematizing academic literature, with authors specialized in Second Temple Judaism, rituality, and the history of early Christianity, allowing for the grounding of historical and theological interpretations of the practices analyzed. The synthesis of data

sought to articulate historical, social, and religious information, contributing to the understanding of the context in which John's baptism emerged and its relationship with the Jewish tradition of purification.

CONVERGENCE AND RUPTURE

The analysis of Second Temple Judaism reveals a profoundly complex religious and social landscape, in which the diversity of groups, practices, and interpretations of the Law shaped the daily life and spiritual experience of the Jewish people. The findings indicate that ritual purification constituted a central axis in Jewish religiosity, serving multiple functions: maintaining the sanctity of the Temple, fostering social cohesion, delineating status within the community, and mediating the relationship between the individual and God (Neusner, 2006; Horbury, 1989; Sanders, 1992).

It was observed that traditional rituals, based on Mosaic Law, were structured around detailed rules of purity and sacrifice, requiring technical knowledge and the participation of specific groups, such as priests and scribes. Immersion in water, animal sacrifices, and the use of other liturgical elements (ashes, incense, grains) held symbolic significance, transcending mere physical hygiene and reinforcing collective holiness (Goodman, 2007; Cohen, 1987; Feller, 2015).

In contrast, John's baptism presents itself as an innovative practice, though articulated with the tradition of Jewish purification. Analysis of the sources demonstrates that Johannine baptism used water as a symbol of purification but shifted the focus from legalism and ritual observance to an ethical and prophetic dimension. Its function was to prepare the individual for the Kingdom of God, promoting public repentance, inner transformation, and social inclusion of peasants, soldiers, and marginalized individuals, without dependence on the Temple or priests (Wright, 1996; Meyer, 2001; Feller, 2015). The comparison between the practices highlights formal continuities, such as immersion in water, but significant differences in terms of purpose, target audience, and social context. While Jewish purification emphasized obedience to the Law and the maintenance of collective holiness, John's baptism assumed a democratized and educational character, oriented toward moral transformation and preparation for eschatological events (Sanders, 1992; Cohen, 1987; Goodman, 2007).

The findings also reveal that Johannine baptism not only re-signified existing practices but represented a response to the sociopolitical and religious context of the 1st century CE, marked by instability, Roman occupation, and messianic tensions. In this sense, John the Baptist acts as a mediator between tradition and spiritual renewal, reinterpreting elements of Jewish rituality to construct an accessible, ethical, and prophetic practice capable of engaging different segments of late Jewish society (Josephus, 1987; Feller, 2015).

The discussion thus shows that ritual purification and John's baptism reflect distinct strategies for mediating the relationship with the divine and regulating community life. Jewish purification structured

the social and religious space through the Law and ritual observance, while baptism emphasized ethical and spiritual transformation, anticipating later Christian practices and demonstrating the adaptability of religious traditions in contexts of historical change (Neusner, 2006; Wright, 1996; Meyer, 2001).

In summary, the findings indicate that John's baptism represents a point of convergence and rupture in relation to the Jewish rituals of the Second Temple: it retains traditional symbolic elements but redefines their purpose and audience, promoting inclusion, repentance, and ethical preparation. This analysis allows for an understanding of how purification practices can be adapted and reinterpreted in different historical contexts, revealing dynamics of continuity and innovation in late Judaism.

FINAL CONSIDERATIONS

The conclusion of this study on John's baptism and the purification rituals in Second Temple Judaism highlights the complexity and richness of the religious practices of this period, evidencing both the continuities and ruptures that mark the Jewish tradition. Second Temple Judaism, which spans from the 6th century BCE to the 1st century CE, is characterized by a dynamic setting in which various religious, political, and social currents coexisted, influencing worship practices and individuals' relationships with the divine. In this context, purification rituals—especially those involving immersion in water—played a crucial role in community life, serving as mechanisms of social control and expressions of obedience to the Law.

However, the figure of John the Baptist emerges as a landmark of innovation by introducing a baptismal practice that diverged from established traditions. By emphasizing the need for repentance and personal transformation, John recontextualized the act of purification, making it accessible to all, regardless of social status or compliance with legal requirements. This democratization of the purification ritual not only reflected the social and political tensions of 1st-century Palestine but also allowed for a new interpretation of the relationship with God, centered on ethics and inner change. Johannine baptism, therefore, was not merely an extension of traditional Jewish rituals; rather, it represented a significant response to the needs of a society in crisis, offering a space for spiritual renewal and inclusion.

The research shows that, although John's baptism employed formal elements similar to Jewish purification rituals—such as water—its purpose and target audience were markedly different. While traditional rituals were regulated by a legal and priestly system, John's baptism broke through these barriers, promoting a collective experience of repentance and preparation for the imminent arrival of the Kingdom of God. This transformation not only resonated among John's contemporaries but also prefigured practices that would become central to the Christian tradition, revealing how religious traditions are malleable and susceptible to reinterpretation in response to evolving social and spiritual contexts.

In sum, the comparative analysis between Jewish purification rituals and John's baptism underscores the plasticity of religious practices and the capacity of traditions to adapt over time. The impact of John's baptism, with its focus on ethics and moral transformation, suggests that purification practices can be understood not only as rituals of cleansing but also as expressions of a deeper search for meaning and connection with the divine. Thus, understanding these dynamics is essential for analyzing subsequent religious movements and for appreciating the rich tapestry of late Judaism, which continues to influence religious traditions to this day. The study, therefore, not only illuminates the past but also invites reflection on how faith practices can evolve and adapt to the needs of their communities over time.

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STRATEGIC MANAGEMENT OF CYBERSECURITY <https://doi.org/10.63330/aurumpub.015-017>**David Aguiar¹****ABSTRACT**

Strategic management of cybersecurity is a central topic in an increasingly digital and interconnected world. This study aimed to analyze cybersecurity from a holistic perspective, addressing fundamental concepts, management practices, and challenges faced by organizations. The methodology employed was predominantly bibliographic, involving the analysis of books and articles discussing information security, cyber defense, and IT governance, enabling an in-depth understanding of the subject. Research findings revealed that cybersecurity should be understood as an integrated set of practices, policies, and technologies that go beyond the mere installation of technical tools. The study emphasized the importance of aligning digital security with organizational objectives, stressing that security should not be viewed as a cost but as a strategic investment essential for operational continuity and the protection of critical assets. The research also identified that organizational culture and continuous employee training are crucial factors for the effectiveness of implemented security policies. Conclusions indicated that, to effectively address cyber threats, organizations must adopt a proactive approach that includes strategic planning, threat prevention and detection, as well as incident response and recovery. The study highlighted that integrating processes, technology, and people is fundamental for creating a secure and resilient digital environment. Thus, this work contributes to understanding strategic cybersecurity management as a vital component for protecting information and preserving institutional reputation in a challenging digital landscape.

Keywords: Cybersecurity; Strategic management; Organizational culture; Prevention.

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INTRODUCTION

Cybersecurity has become a central concern as digitalization advances and connectivity expands. This study aims to explore the strategic management of cybersecurity, addressing fundamental concepts, recommended practices, and contemporary challenges faced by organizations across different sectors. The consulted literature, including works by Stallings (2019), Santos and Moraes (2021), and Harris (2020), provides a robust theoretical foundation, highlighting the importance of a holistic approach that goes beyond technical protection and involves human, organizational, and strategic aspects.

The objectives of this study include analyzing key cybersecurity concepts, discussing strategic management in digital environments, and identifying risks and vulnerabilities. The central hypothesis is that effective cybersecurity management, through integrated policies and a strong organizational culture, can significantly reduce the impact of digital threats and strengthen organizational resilience.

The justification for this work lies in the growing incidence of cyberattacks and the need for proactive responses by organizations. Cybersecurity should not be seen as an isolated cost but as a strategic investment that supports business continuity and the protection of critical assets. The relevance of the topic is further underscored in a scenario where stakeholder trust and institutional reputation are at stake.

The development of this work was structured into several sections, beginning with a clear definition of cybersecurity concepts, followed by an analysis of strategic management and the identification of risks and vulnerabilities. The study also addresses strategic planning, threat prevention and detection practices, and the importance of incident response and recovery. Finally, training and organizational culture are discussed as essential elements for the effectiveness of implemented security measures.

In short, this work seeks to provide a comprehensive understanding of strategic cybersecurity management, emphasizing its importance for data protection and the continuity of organizational operations in an increasingly complex and challenging digital world.

METHODOLOGY

The methodology of this study was based on a bibliographic and qualitative approach, allowing for an in-depth analysis of concepts and practices related to strategic cybersecurity management. The research was structured into several stages to ensure rigor and relevance of the data.

Initially, a review of existing literature was conducted, selecting works and articles by recognized authors in the field of cybersecurity, such as Stallings, Santos and Moraes, and Harris. This stage involved identifying sources that address key concepts, frameworks, and information security practices, as well as contemporary trends and challenges faced by organizations.



The methodology also included the analysis of international standards and frameworks, such as ISO/IEC 27001 and COBIT 2019, which provide guidelines for structuring information security. The critical evaluation of these standards allowed for understanding how organizations can align their security practices with business objectives and regulatory requirements.

DEVELOPMENT

CYBERSECURITY CONCEPTS

Cybersecurity is an essential field today, considering the growing use of digital technologies and the expansion of connectivity. It can be defined as the set of practices, policies, processes, and technologies aimed at protecting systems, networks, devices, and data against attacks, unauthorized access, damage, or disruptions (STALLINGS, 2019). The scope of cybersecurity goes beyond technical protection, also involving human, organizational, and strategic aspects, since any vulnerability—whether in software, hardware, or user behavior—can be exploited by malicious actors (SANTOS; MORAES, 2021).

Among the main cyber threats are malware, which includes viruses, worms, and trojans capable of infecting systems and compromising information; ransomware, which hijacks data and demands ransom for its release; and phishing, which consists of fraud through emails or messages that induce users to provide sensitive information (HARRIS, 2020). Additionally, Distributed Denial of Service (DDoS) attacks aim to overload servers or networks, making services unavailable and harming business or government operations. These threats constantly evolve, requiring continuous updates to defense strategies.

Cybersecurity is directly related to concepts such as information security, which focuses on protecting the confidentiality, integrity, and availability of data (ISO/IEC 27001, 2013); cyber defense, which involves proactive actions to protect critical systems of essential infrastructures against complex threats; and IT governance, which establishes the strategic management of technological resources, policies, and internal controls to ensure that technology supports organizational objectives securely (COBIT, 2019). These integrated concepts form the foundation for creating a resilient digital environment capable of preventing incidents and mitigating impacts when they occur.

Therefore, understanding cybersecurity is not limited to using antivirus software or firewalls but requires a holistic approach that includes policies, processes, user training, and strategic risk management. The evolution of digital threats and the growing dependence on connected systems make it imperative for organizations and individuals to adopt robust protection practices, aligning technology, processes, and organizational culture to ensure the integrity and reliability of information (STALLINGS, 2019; SANTOS; MORAES, 2021; HARRIS, 2020).



STRATEGIC MANAGEMENT IN CYBERSECURITY

Strategic management in cybersecurity consists of planning, implementing, and monitoring policies, processes, and technologies in an integrated manner, aligned with organizational objectives, aiming to protect critical digital assets and reduce the risk of incidents. Unlike operational security, which focuses on isolated and reactive measures, strategic management seeks a holistic approach involving long-term planning, corporate governance, risk analysis, and organizational culture (SANTOS; MORAES, 2021).

One of the main elements of this management is the adoption of international frameworks and standards that provide guidelines for structuring information security systematically. ISO/IEC 27001, for example, establishes requirements for information security management systems, including the identification of critical assets, risk assessment, and implementation of appropriate controls (ISO/IEC 27001, 2013). COBIT 2019 offers an IT governance model, enabling organizations to align technological management with corporate strategy, ensuring that security policies support business objectives and comply with regulatory requirements (ISACA, 2019).

Additionally, strategic management includes defining internal policies, standards, and procedures that structure how employees should handle sensitive data and critical systems. These policies cover, for instance, rules on passwords, encryption, access control, and mobile device usage. When implemented consistently, these measures strengthen organizational resilience and reduce vulnerabilities (HARRIS, 2020).

Another fundamental point is the security culture, which requires engagement and awareness at all organizational levels. Continuous training programs, attack simulations, and awareness campaigns enable employees to understand risks and adopt safe behaviors, turning each individual into a line of defense against digital threats (STALLINGS, 2019).

In summary, strategic cybersecurity management is not limited to technologies or isolated tools but involves integrating processes, people, and technology, always aligned with organizational objectives. This approach allows companies and institutions to anticipate threats, respond effectively to incidents, and maintain the trust of clients, partners, and stakeholders in an increasingly complex and challenging digital environment (SANTOS; MORAES, 2021; HARRIS, 2020; STALLINGS, 2019).

RISKS AND VULNERABILITIES

Cybersecurity is intrinsically linked to the identification and mitigation of risks, as any organization that relies on digital systems is subject to vulnerabilities that can compromise data, operations, and reputation. Cyber risk refers to the likelihood that threats will exploit weaknesses in systems, processes, or people, resulting in financial, legal, or strategic impacts (STALLINGS, 2019). With

the growth of digitalization and connectivity, the variety of risks has increased exponentially, making it essential for organizations to adopt a proactive and systematic approach.

Among the most common vulnerabilities are unpatched software flaws, weak passwords, lack of access control policies, and user negligence regarding safe practices (HARRIS, 2020). These gaps can be exploited by various types of attacks, such as malware, ransomware, phishing, and DDoS attacks, which can lead to data loss or significant disruptions in critical services. Furthermore, emerging threats such as attacks on Internet of Things (IoT) systems and mobile devices increase the complexity of cybersecurity protection, requiring adaptive and updated solutions (SANTOS; MORAES, 2021).

Another relevant aspect is risk assessment, which involves identifying critical assets, mapping vulnerabilities, and estimating potential impacts. Techniques such as qualitative and quantitative risk analysis allow prioritization of actions and investments in security, ensuring that resources are directed to the most sensitive areas (ISO/IEC 27005, 2018). This practice is complemented by implementing mitigation controls, which range from technical tools such as firewalls, intrusion detection systems, and encryption to organizational processes such as contingency plans and employee training.

Beyond technical vulnerabilities, the human factor is critical. User errors, lack of awareness, and negligence can be as harmful as technological failures. Therefore, strengthening the security culture through continuous training and effective communication is essential to reduce risks and make systems more resilient (STALLINGS, 2019; HARRIS, 2020).

In short, understanding risks and vulnerabilities is not just about identifying threats but about developing an integrated protection strategy that combines technology, processes, and people. This approach enables organizations to minimize the impact of cyber incidents, ensure operational continuity, and protect critical information in an increasingly dynamic and challenging digital environment (SANTOS; MORAES, 2021; STALLINGS, 2019).

STRATEGIC PLANNING

Strategic planning in cybersecurity is a central element for any organization that seeks to protect its digital assets effectively and sustainably. This process involves defining clear goals and priorities, considering both existing risks and the institution's long-term objectives (SANTOS; MORAES, 2021). Establishing strategic goals allows resources to be allocated efficiently, focusing efforts on the most critical areas, such as protecting sensitive data, ensuring continuity of essential services, and complying with regulatory standards.

A fundamental aspect of planning is aligning digital security with organizational objectives. Cybersecurity should not be treated as an isolated cost or a reactive measure but as an integrated component of business strategy, capable of supporting operations, innovation, and competitiveness

(COBIT, 2019). This means that decisions regarding technology investments, implementation of controls, and awareness programs must consider their impact on corporate results and their contribution to the institutional mission.

Additionally, strategic planning involves identifying performance indicators and security metrics, enabling monitoring of the effectiveness of implemented actions and adjusting strategies when necessary (STALLINGS, 2019). Tools such as risk maps, monitoring dashboards, and periodic audits are essential for transforming data on threats and vulnerabilities into concrete strategic decisions.

Another relevant point is that strategic planning must be dynamic and adaptable, considering the rapid evolution of cyber threats. Organizations that adopt a flexible approach can anticipate attacks, respond quickly to incidents, and maintain operational resilience even in unpredictable scenarios (HARRIS, 2020). Thus, strategic planning becomes not only an administrative obligation but a competitive advantage and a mechanism for protecting institutional reputation.

In summary, strategic planning in cybersecurity involves defining priorities, aligning digital security with organizational objectives, and continuously monitoring results, ensuring that the organization is prepared to face complex threats and preserve the integrity, confidentiality, and availability of its critical information (SANTOS; MORAES, 2021; COBIT, 2019; STALLINGS, 2019).

PREVENTION AND DETECTION OF THREATS

Prevention and detection of threats are essential stages of cybersecurity, as they enable organizations to identify and neutralize risks before they cause significant damage. Implementing technical controls such as firewalls, antivirus software, intrusion detection and prevention systems, encryption, and multi-factor authentication is fundamental for creating layers of protection that hinder unauthorized access and minimize vulnerabilities (STALLINGS, 2019). These mechanisms act both in prevention and mitigation of incidents, ensuring the integrity, confidentiality, and availability of critical data.

Beyond technical solutions, continuous monitoring of networks and systems plays a crucial role in early threat detection. Real-time monitoring tools allow identification of abnormal behavior patterns, intrusion attempts, and suspicious activities, enabling rapid responses before major damage occurs (HARRIS, 2020). Log analysis, threat intelligence, and automated alert systems contribute to building a resilient digital environment capable of responding to incidents efficiently.

Another relevant aspect is that prevention and detection should not be limited to technologies but must be integrated into organizational processes and employee awareness. Combining technical controls with security policies, training, and best practices strengthens

cyber defense, significantly reducing the likelihood of successful attacks (SANTOS; MORAES, 2021). Creating a security culture, combined with advanced monitoring tools, ensures that organizations are prepared to face complex and constantly evolving threats.

In summary, prevention and detection of threats constitute a strategic pillar of cybersecurity, combining technology, processes, and people. Through effective technical controls and continuous monitoring, organizations can not only protect their digital assets but also maintain the trust of clients, partners, and stakeholders in an increasingly challenging digital environment (STALLINGS, 2019; HARRIS, 2020; SANTOS; MORAES, 2021).

RESPONSE AND RECOVERY

Response and recovery are critical stages of cybersecurity, as they ensure that organizations can react quickly to incidents, minimize damage, and resume normal operations efficiently. A central element of this process is the development of contingency and disaster recovery plans, which define detailed procedures for handling attacks, system failures, or data loss. These plans include prioritizing critical assets, assigning responsibilities, establishing backup protocols, and outlining strategies to restore essential services, thereby ensuring operational continuity even in adverse events (STALLINGS, 2019; SANTOS; MORAES, 2021).

Beyond technical recovery, incident communication is a strategic component, involving clear and organized reporting to internal and external stakeholders about the occurrence and impact of the incident. Effective communication helps reduce reputational damage, strengthen client and partner trust, and coordinate corrective actions efficiently (HARRIS, 2020). Integrating technical recovery plans with communication protocols enables organizations to manage crises in a structured manner, preventing escalation and additional problems.

Another essential point is impact mitigation, which consists of taking swift actions to limit the consequences of attacks or failures, such as isolating compromised systems, restoring data from reliable backups, and conducting detailed incident analysis to prevent recurrence. Continuous practice of incident simulations

and testing recovery plans enhances organizational resilience, ensuring teams are prepared to respond to real situations with precision and agility (SANTOS; MORAES, 2021).

In summary, response and recovery are not limited to technology but involve planning, processes, and strategic communication, making them essential for protecting digital assets and ensuring operational continuity. Organizations that implement robust contingency and recovery policies are better prepared to face complex cyber threats and maintain stakeholder trust, even in the face of critical incidents (STALLINGS, 2019; HARRIS, 2020; SANTOS; MORAES, 2021).

TRAINING AND ORGANIZATIONAL CULTURE

Training and organizational culture are fundamental pillars for the effectiveness of cybersecurity, since even with advanced technologies, the human factor remains one of the most vulnerable elements within organizations. Investing in continuous employee training ensures that everyone understands the risks associated with the digital environment and adopts safe behaviors, such as proper password usage, recognizing suspicious emails, and handling sensitive information with care (SANTOS; MORAES, 2021).

Beyond technical training, it is essential to promote a security culture that transforms data and system protection into a shared value across the organization. This involves raising awareness about the importance of cybersecurity and creating policies and practices that encourage collaboration among different areas, reinforcing that every employee plays a role in defending the organization (STALLINGS, 2019). Awareness campaigns, incident simulations, and incentives for good security practices are effective strategies for consolidating this culture.

Another relevant aspect is the integration of processes, technology, and people, as even highly protected systems can be compromised if users do not follow proper security procedures. Organizations that successfully align training, internal policies, and protection technologies tend to significantly reduce the risks of cyber incidents and increase resilience against attacks (HARRIS, 2020).

Therefore, training and organizational culture should not be seen as isolated actions but as strategic components of cybersecurity, capable of turning employees into active defenders of the organization. By investing in these aspects, companies not only protect their digital assets but also strengthen client, partner, and stakeholder trust, consolidating cybersecurity as an integral part of organizational strategy (SANTOS; MORAES, 2021; STALLINGS, 2019).

CONCLUSION

Strategic management of cybersecurity is an increasingly important topic in a digital world that is becoming more complex and interconnected. This study explored various aspects of cybersecurity, emphasizing the need for a comprehensive approach that considers not only protection technologies but also processes and, fundamentally, the human factor. The conclusion reaffirms that cybersecurity should be understood as a strategic element, essential for the integrity and continuity of organizational operations.

The research demonstrated that cybersecurity cannot be treated as a mere technical obligation but as an essential investment that provides competitive advantages. By integrating security practices with business objectives, organizations can not only protect their digital assets but also foster innovation and trust among clients and partners. The adoption of recognized frameworks such as ISO/IEC 27001 and

COBIT 2019 proved to be an effective strategy for structuring and systematizing information security practices, aligning them with organizational and regulatory guidelines.

One of the central points addressed was the identification and mitigation of risks. The growing diversity and sophistication of cyber threats require organizations to adopt a proactive stance that includes continuous vulnerability assessment and implementation of appropriate controls. The study highlighted that risk assessment should be a regular practice, enabling organizations to prioritize security investments in the most critical and sensitive areas.

Additionally, the research emphasized the importance of organizational culture and continuous employee training. The human factor remains one of the main vulnerabilities in any cybersecurity strategy. Therefore, promoting a security culture that involves all organizational levels is essential. Training programs, awareness campaigns, and incident simulations are valuable tools that enable employees to recognize and respond to threats effectively, turning them into active defenders of security.

Incident response and recovery were also addressed as vital components of cybersecurity. Having well-developed contingency plans that include communication protocols and strategies to mitigate impacts is fundamental to ensuring operational continuity. Clear and effective communication during an incident can reduce reputational damage and strengthen stakeholder trust, demonstrating that the organization is prepared to face challenges.

In short, strategic management of cybersecurity is a field that demands continuous attention and investment. Organizations that adopt an integrated approach combining technology, processes, and people are better positioned to protect their information, ensure operational continuity, and preserve their reputation in an increasingly challenging digital environment. This study contributed to understanding cybersecurity as a strategic priority, essential for organizational success and sustainability in the future. The ability to adapt, innovate, and protect digital assets will undoubtedly be a critical competitive advantage in a world where technology and connectivity are inseparable.



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**INTERSECTIONS AND CONTRASTS: CULTURAL AND MARKET DIFFERENCES
BETWEEN DESIGN AND MANAGEMENT** <https://doi.org/10.63330/aurumpub.015-018>**Ana Júlia Simões Thomé¹****ABSTRACT**

This study addressed the theme Intersections and Contrasts: Cultural and Market Differences between Design and Management, aiming to understand how cultural and market dimensions have influenced the education and professional practice in these two fields of knowledge. The research adopted a qualitative and bibliographic approach, grounded in authors such as Geertz, Hofstede, Hall, Schein, Bonsiepe, Norman, Cardoso, Manzini, Papanek, Chiavenato, Drucker, Kotler, and Maximiano, enabling a comparative analysis of the practices and professional identities of designers and managers. The study revealed that culture plays a decisive role in shaping professional identity, molding values, behaviors, and ways of thinking in each field. It was observed that the culture of Design is characterized by creativity, innovation, and aesthetic sensitivity, prioritizing experimentation, interdisciplinarity, and a commitment to sustainability and social responsibility. Conversely, the culture of Management is grounded in rationality, strategic planning, leadership, and efficiency, seeking measurable results and sustainable organizational solutions. In the market context, both fields converge on aspects such as innovation, project management, and consumer experience, although they diverge in planning methods and market approaches. The findings demonstrate that the interaction between Design and Management constitutes an opportunity for developing more creative and effective interdisciplinary practices, in which aesthetic sensitivity and strategic rationality complement each other. It is concluded that dialogue between these fields represents a promising path for training professionals capable of combining innovation and management, emotion and efficiency, thereby contributing to organizational advancement and the construction of more human and sustainable solutions in an increasingly complex and competitive market.

Keywords: Design; Management; Professional culture; Labor market.

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INTRODUCTION

This introduction explores the intersections and contrasts between the cultures of Design and Management, emphasizing the importance of understanding how these fields, although distinct, interact and complement each other in the contemporary market. The topic was contextualized through the consulted literature, which includes theorists such as Geertz, Hofstede, Hall, Schein, Bonsiepe, Norman, Cardoso, Manzini, Papanek, Chiavenato, Drucker, Kotler, and Maximiano, whose works address the influence of culture on professional education and organizational practice.

The research objectives were outlined to investigate how cultural and market dimensions shape the performance of Design and Management professionals, as well as to identify practices that foster collaboration between these fields. The central hypothesis suggests that, despite cultural differences, the interaction between Design and Management can generate innovative and effective solutions by combining creativity and management.

The justification for this study lies in the growing need to integrate creative and managerial approaches in a market that demands professionals capable of dealing with the complexity and dynamism of the business environment. The research aims to contribute to the training of more comprehensive professionals, prepared to face contemporary challenges.

The development of the study was structured into sections addressing culture and professional identity, the culture of Design, the culture of Management, and the intersections and contrasts between them. The methodology adopted was qualitative and bibliographic, enabling a comparative and reflective analysis of professional practices and their cultural implications. The articulation between theory and practice was emphasized, demonstrating how professional identities are shaped by historical and social contexts.

In summary, the introduction presented a comprehensive view of the topic, aligning objectives, hypotheses, and justifications, and established the foundation for the critical analysis developed in the subsequent sections. The research sought to reinforce the importance of dialogue between Design and Management in building innovative and sustainable solutions, promoting a deeper understanding of the cultural and market interactions that permeate these fields.

METHODOLOGY

The methodology of this study was structured based on a qualitative and bibliographic approach, aiming to explore the intersections and contrasts between the cultures of Design and Management. The choice of a qualitative research design is justified by the need to understand the nuances and meanings that permeate the practices and professional identities of both fields, allowing for a deeper and more reflective analysis.

The bibliographic research involved consulting a wide range of sources, including books, academic articles, and relevant documents addressing cultural, market, and theoretical aspects related to Design and Management. The works of renowned authors such as Geertz, Hofstede, Hall, Schein, Bonsiepe, Norman, Cardoso, Manzini, Papanek, Chiavenato, Drucker, Kotler, and Maximiano were fundamental in constructing the theoretical framework. Each of these authors contributed valuable perspectives on professional identity, organizational culture, and the interaction between creativity and management.

For the analysis, selection criteria prioritized academic relevance, the timeliness of publications, and their pertinence to the central theme of the study. The critical and interpretative approach enabled the identification of patterns, convergences, and divergences in the practices and values that characterize Design and Management.

The development of the study also included a comparative analysis of the cultural and market dimensions of both fields, seeking to highlight how these influences shape professional education and practice. This analysis was grounded in theoretical discussion and practical cases observed in both disciplines, emphasizing opportunities for dialogue and collaboration between Design and Management.

In summary, the adopted methodology provided a comprehensive overview of the intersections and contrasts between Design and Management, grounded in a solid theoretical foundation and enabling a critical reflection that contributes to understanding professional practices in a contemporary context of increasing complexity and interconnection.

DEVELOPMENT

CULTURE AND PROFESSIONAL IDENTITY

Culture is one of the most complex and multifaceted concepts in the human and social sciences, being essential for understanding human behavior, social practices, and, consequently, the professional identities that emerge in different work contexts. Clifford Geertz (1989), one of the leading anthropologists of the 20th century, defines culture as a web of meanings woven by individuals themselves and within which they are immersed. According to the author, human beings develop within collectively constructed symbolic systems, and it is through these systems that they interpret the world and guide their actions. Thus, culture is not merely a set of customs or values but a system of shared meanings that structures thought and everyday practices.

Complementarily, Hofstede (2001) conceives culture as a “collective programming of the mind,” which differentiates the members of one group or social category from others. This conception brings the notion of culture closer to the field of organizations and management, revealing that each professional group tends to develop its own patterns of behavior, communication, and decision-making. In a business

environment, for example, culture influences how people perceive authority, risk, collaboration, and innovation. Therefore, professional identity is shaped not only by technical competencies but also by values and beliefs incorporated throughout education and social practice.

Edward Hall (1976) expands the understanding of culture by discussing communication as a cultural expression, highlighting the importance of high- and low-context interactions. For the author, in high-context cultures—such as many Latin American ones—communication is more implicit, based on personal relationships, intuition, and trust. In low-context cultures—more typical of Anglo-Saxon countries—objectivity, clarity, and a focus on results prevail. This distinction is relevant when analyzing professions with distinct cultural characteristics, such as Design, oriented toward creative and symbolic expression, and Management, oriented toward rationality, planning, and measurable outcomes. Each of these fields constructs its own professional culture, influencing how its members think, communicate, and operate in the market.

Edgar Schein (1992), in turn, is one of the authors who most deeply analyzed organizational culture, understanding it as a pattern of basic assumptions invented, discovered, or developed by a group as it learns to cope with problems of external adaptation and internal integration. When these assumptions work effectively, they are taught to new members as the correct way to perceive, think, and feel regarding these problems. Thus, Schein emphasizes the dynamic nature of culture, which is continuously reconstructed through the interaction between individuals and institutions. In the context of professional education, this means that each learning and practice environment—whether a university, a design studio, or a company—shapes and reinforces certain ways of thinking and acting, creating particular professional identities.

The influence of culture on professional education is profound, as it goes beyond technical learning. A professional's identity is built through symbolic experiences, interaction with peers, professors, and leaders, and the incorporation of values that define what it means to be “good” or “competent” in a given field. In Design, for example, professional culture values originality, aesthetic sensitivity, and the capacity for innovation. Designers are often encouraged to think “outside the box,” explore subjectivity, and seek creative solutions to complex problems. In Management, by contrast, a more rational, strategic, and structured culture predominates, oriented toward efficiency, control, and decision-making based on data and measurable results.

These differences do not imply a hierarchy of value but demonstrate distinct ways of seeing and acting upon the world. While creative culture tends to emphasize freedom of expression, improvisation, and the transformative potential of imagination, managerial culture privileges predictability, planning, and security in decision-making. Both, however, are indispensable in the current context, where the labor market demands both the ability to innovate and the ability to manage processes responsibly and

strategically. The integration of these ways of thinking represents one of the greatest contemporary challenges for educational institutions and organizations seeking more collaborative and interdisciplinary teams.

In summary, understanding culture and its relationship with professional identity means understanding the human being in their entirety—as a historical, social, and symbolic subject. Each profession carries a set of meanings and values that guide its practices, and recognizing these differences is essential to fostering dialogue between distinct fields. The intersection between creative and managerial cultures can generate new forms of innovation and management, in which aesthetic sensitivity and strategic rationality work together to build more human, effective, and sustainable solutions.

THE CULTURE OF DESIGN

The culture of Design is characterized by the intersection of art, science, technique, and human sensitivity. The field of Design is not limited to the creation of objects or images but involves a specific way of thinking and acting upon the world—a creative and intellectual stance toward contemporary problems. The designer's profile, therefore, is defined by creativity, innovation, and aesthetic sensitivity, elements that reflect not only technical competencies but also deeply rooted cultural and ethical values. The designer is, above all, a mediator between humans and their environment, between functionality and emotion, between the material and the symbolic.

According to Gui Bonsiepe (2011), Design is a project-based practice that seeks to reconcile the aesthetic dimension with social, technical, and communicative dimensions. He argues that the role of the designer goes beyond merely styling products; the designer acts as an agent who interprets human needs and translates them into concrete solutions, promoting improvements in quality of life. This perspective reinforces the idea that Design is both a creative and an ethical act, as it entails responsibility for the cultural and environmental impacts of each project.

In Design programs, pedagogical practices reflect this diversity of dimensions. Teaching methodologies prioritize experimentation, interdisciplinarity, and critical thinking. Students are encouraged to explore materials, technologies, and diverse languages, exercising creative autonomy and the ability to solve problems in original ways. Cardoso (2012) observes that the education of designers is marked by a constant tension between the rational and the intuitive, requiring professionals to balance logical analysis with subjective expression. This characteristic makes Design a dynamic field, where the culture of innovation is directly associated with the culture of sensitivity.

Donald Norman (2013), one of the leading contemporary theorists of Design, emphasizes that the value of a product lies not only in its practical function but also in the emotional experience it provides to

the user. Thus, the concept of user-centered design has become fundamental in recent decades, shifting the focus from isolated aesthetics to the creation of meaningful, accessible, and enjoyable experiences. This paradigm requires designers to understand behaviors, desires, and sociocultural contexts, integrating empathy, technology, and aesthetics within the same process.

Ezio Manzini (2008) adds that the role of the designer today is deeply connected to sustainability and social innovation. For him, Design should contribute to building desirable futures, relying on collaborative practices and solutions that value community, the environment, and the local economy. This perspective broadens the scope of Design, which now engages with themes such as solidarity economy, material reuse, sustainable production systems, and participatory design. Creativity, in this context, is not merely an individual skill but a tool for collective transformation and social regeneration.

Victor Papanek (1995), one of the most influential thinkers of the 20th century, had already warned that Design could not remain indifferent to the ethical and environmental consequences of its creations. In his work *Design for the Real World*, he criticizes consumerism and argues that true Design is that which meets real human needs and contributes to a more dignified and balanced life. This critical view shaped a generation of designers committed to social responsibility and the pursuit of sustainable and inclusive solutions.

In the contemporary scenario, the creative economy represents a new frontier for Design practice. It integrates culture, innovation, and technology, transforming ideas into products, services, and experiences of high symbolic and economic value. In this context, Design assumes a strategic role in areas such as branding, user experience (UX), design thinking, and digital innovation, becoming essential for companies seeking differentiation and relevance in the global market. This transition reinforces the importance of the designer as a connector between different fields of knowledge—a professional capable of understanding the cultural impact of each design decision and translating complexities into humanized solutions.

THE CULTURE OF MANAGEMENT

The culture of Management is strongly associated with rationality, strategic planning, and the pursuit of organizational efficiency and effectiveness. According to Chiavenato (2014), the manager's profile is characterized by the ability to make informed decisions, lead teams, manage resources, and promote productivity in a balanced manner. For the author, management is a dynamic process that involves planning, organizing, directing, and controlling, always with a focus on results and the achievement of organizational objectives. This logic reinforces the identity of a professional who acts strategically and analytically, committed to institutional efficiency and performance.

Peter Drucker (2002), considered the father of modern management, emphasizes that the manager is an agent of change within organizations, responsible for transforming opportunities into concrete results. For him, management should be understood as a social practice that combines technical knowledge with human sensitivity, since no company survives without innovation, but neither can it thrive without leadership and purpose. Thus, the contemporary manager must balance instrumental rationality with the ability to inspire and engage people around common goals.

In Management programs, educational practices and methodologies reflect this rational and scientific tradition while also seeking to incorporate emotional and ethical competencies. Maximiano (2011) observes that management education aims to develop multiple competencies, involving not only technical mastery of management tools but also communication skills, teamwork, and decision-making in complex environments. The author stresses that management education should promote a systemic vision, integrating theory and practice to prepare students to address organizational and social challenges critically and innovatively.

From a labor market perspective, the field of management is constantly expanding, encompassing areas such as business administration, entrepreneurship, marketing, finance, and strategic planning. Kotler and Keller (2012) argue that today's manager must understand consumer behavior, market trends, and new organizational models based on data, innovation, and relationships. In a globalized and digital world, the manager becomes a mediator between people, processes, and technologies, acting as an orchestrator of value and competitiveness.

In this context, the culture of Management is configured as a results-oriented culture, guided by objectivity and the pursuit of measurable performance. However, the 21st-century manager is called to go beyond mere instrumental rationality: they must exercise ethical, sustainable, and humanized leadership, capable of aligning economic interests with social and environmental demands. This perspective revives the humanistic dimension of management and brings it closer to other fields of knowledge, such as Design, which values creativity and empathy. Therefore, although the managerial universe is marked by logics of planning and control, it also opens itself to innovation and interdisciplinary thinking. The integration between managerial and creative cultures proves essential for addressing contemporary challenges, where efficiency and sensitivity must go hand in hand. The modern manager, like the designer, is a transformative agent whose role transcends technical boundaries and reaches social, cultural, and ethical dimensions of the world of work.

INTERSECTIONS AND CONTRASTS BETWEEN DESIGN AND MANAGEMENT

The dialogue between Design and Management represents one of the most intriguing interfaces of the contemporary world, bringing together two fields that, although distinct in their origins and

objectives, share the pursuit of innovation, efficiency, and consumer satisfaction. Both disciplines play a fundamental role in the creation of products, services, and meaningful experiences within the context of a globalized economy, even though their methods and languages differ considerably. On one hand, Design is anchored in creativity, experimentation, and aesthetic sensitivity, seeking to understand human needs and transform them into tangible and symbolic solutions (Bonsiepe, 2012). Management, on the other hand, is guided by rationality, strategic planning, and resource optimization, aiming to achieve measurable and sustainable results (Chiavenato, 2014). This difference in perspectives does not imply opposition but rather complementarity. As Drucker (2006) emphasizes, innovation is not the exclusive domain of the creative field but the core of modern management itself, being essential for organizational competitiveness.

The intersections between the two fields become evident in areas such as project management, marketing, branding, and user experience. While the designer seeks to develop human-centered solutions, the manager creates structural and strategic conditions for these ideas to be viable and sustainable in the market. Norman (2013) reinforces that user-centered design depends on a systemic understanding of organizations and their processes—something that the managerial perspective can provide. Thus, the success of a product or service arises from the balance between creative thinking and managerial thinking.

Conversely, the divergences between the fields are also significant. Design tends to value subjectivity, intuition, and fluidity—characteristics that may conflict with the structured, hierarchical, and results-oriented logic typical of Management (Kotler & Keller, 2012). While designers work with uncertainty and experimentation, managers seek to reduce risks and increase predictability. This tension, however, is also a source of mutual learning: the encounter between creative freedom and organizational rigor can generate innovative and viable solutions, combining purpose and profitability.

In this sense, Manzini (2008) argues that contemporary design must engage in dialogue with other fields of knowledge to foster social and sustainable innovation, and Management is a key component in this process. The same applies to modern managerial thinking, which, according to Maximiano (2011), must incorporate creative and human values to adapt to the new dynamics of the creative economy. Therefore, interdisciplinary dialogue between Design and Management becomes a strategic necessity for organizations seeking to thrive in a complex, ever-changing, and experience-driven environment.

In summary, the intersections and contrasts between Design and Management should not be seen as barriers but as opportunities for convergence. The union of creative thinking and managerial action represents the path toward a new form of professional practice—more collaborative, empathetic, and future-oriented. It is in the interdependence between the sensitive and the rational, the artistic and the



strategic, that projects capable of transforming ideas into sustainable and socially impactful realities are built.

CONCLUSION

The analysis conducted throughout this study made it possible to understand that the professional and cultural practices that shape the fields of Design and Management reflect not only methods and techniques but also distinct ways of interpreting and acting upon the world. Design, historically associated with creativity, aesthetics, and innovation, reveals a culture oriented toward sensitivity, subjectivity, and the pursuit of solutions that reconcile functionality and emotion. Management, on the other hand, consolidated as a science focused on rationality, planning, and efficiency, represents an organizational culture guided by logic, measurable results, and strategic leadership. These distinctions, however, do not constitute opposition but rather complementarity, as both fields share common objectives such as process improvement, value generation, and the satisfaction of human and market needs.

It was found that the cultural differences between designers and managers are related to ways of thinking and acting, influenced by academic training and the historical contexts in which these professions developed. While designers are encouraged to think openly, exploratively, and aesthetically, managers are trained to structure, plan, and make decisions based on data and objective analyses. However, the advancement of technologies, globalization, and the complexity of contemporary markets increasingly demand interdisciplinary action, where creative reasoning and managerial thinking complement each other in the search for innovative and sustainable solutions.

The study also demonstrated that dialogue between Design and Management is not only possible but necessary. The integration of creativity and management expands the possibilities for innovation and strengthens organizations in a competitive and constantly changing environment. Design contributes with its ability to understand users, translate needs into experiences, and humanize processes, while Management provides structure, strategy, and economic viability to creative ideas. This convergence proves essential in a context where companies increasingly value design thinking, collaborative project management, and the creation of brands with purpose and strong identity.

It is concluded, therefore, that understanding the intersections and contrasts between Design and Management means understanding the importance of interdisciplinarity in contemporary professional education and practice. The balance between sensitivity and rationality, between creation and planning, between aesthetics and strategy, constitutes the most promising path for building innovative and humanized solutions. The union of these two fields of knowledge not only enhances organizational efficiency and competitiveness but also contributes to the development of professionals who are more critical, ethical, and aware of their social role. In an increasingly complex and interconnected world, the



future belongs to those who know how to integrate the creative thinking of design with the strategic vision of management, transforming differences into complementarities and challenges into opportunities for collective evolution.

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OMISSION OF MANAGERS AND ITS IMPACTS ON THE RELATIONSHIP WITH EMPLOYEES

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ABSTRACT

The omission of managers in people management represents a critical factor that negatively impacts relationships with employees and, consequently, organizational performance. This study aimed to analyze the consequences of managerial omission, characterized by the lack of communication, feedback, and attention to team needs, and to propose strategies to mitigate these issues. The research employed a qualitative approach, based on a literature review of relevant sources and interviews with managers and employees from different sectors. The results indicated that omission in management generates insecurity, demotivation, and an unfavorable organizational climate, resulting in increased turnover and decreased productivity. The absence of feedback practices and clear communication was identified as a vicious cycle that negatively affects employee engagement and satisfaction. Furthermore, the study revealed that neglecting team demands can lead to stress and mental health problems, further compromising individual and collective performance. The conclusions highlighted the importance of active managerial presence, which must be proactive and attentive to team needs. Investing in communication, recognition, and professional development is essential to foster a healthy and productive work environment. Thus, the study not only contributed to understanding the dynamics of people management but also offered practical recommendations for managers seeking to avoid the pitfalls of omission.

Keywords: Managerial omission; People management; Communication.

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INTRODUCTION

Efficient people management is one of the main pillars sustaining organizational structure and directly influencing business performance. In this context, managerial omission in fulfilling their roles can generate profound impacts on relationships with employees, affecting not only productivity but also organizational climate and employees' mental health. Literature indicates that leadership goes beyond supervising activities; it involves creating an environment that fosters motivation, engagement, and employee satisfaction (Chiavenato, 2014; Robbins & Judge, 2019). This study aims to investigate how omission in management can compromise these fundamental aspects, based on theories and practices discussed by renowned authors in the field of people management.

The objectives of this study are twofold: first, to analyze the consequences of managerial omission for organizational performance and employee well-being; second, to propose strategies that managers can adopt to avoid such failures. The central hypothesis guiding the research is that managerial omission, characterized by lack of communication, insufficient feedback, and neglect of team needs, results in an unfavorable work environment, leading to increased turnover, stress, and decreased productivity.

The justification for conducting this study lies in the growing importance of people management in the contemporary corporate environment, especially in a scenario where organizations seek not only operational efficiency but also talent retention and the promotion of a healthy organizational climate. Literature is rich in evidence demonstrating the connection between leadership quality and organizational outcomes (Gil, 2019; Vergara, 2016). However, few studies delve deeply into analyzing the direct consequences of managerial omission and how it can be mitigated.

The work was developed in three main stages. First, a literature review was conducted, addressing fundamental concepts of people management and leadership, focusing on the implications of omission in management. Next, qualitative data were collected through interviews with managers and employees from different sectors, aiming to understand their experiences and perceptions regarding leadership in their organizations. Finally, the data were analyzed and discussed, resulting in practical recommendations for managers seeking to improve their performance and avoid the pitfalls of omission.

In summary, this research seeks to contribute to understanding the dynamics of people management, highlighting the importance of managerial presence and engagement in their roles, and how omission can be a critical factor for organizational success or failure. Analyzing the relationships between leaders and their teams, as well as identifying practices that promote a healthy and productive work environment, is essential for building more effective and sustainable organizations.

METHODOLOGY

The methodology used in this study was based on a qualitative, descriptive approach, grounded in a bibliographic review of books and scientific articles related to people management, leadership, and organizational behavior. This design choice is justified by the relevance of understanding, from consolidated theoretical frameworks, the impacts of managerial omission on relationships with employees and organizational performance. To this end, works by authors such as Chiavenato (2014), Robbins and Judge (2019), Gil (2019), Vergara (2016), Bergamini (2018), among others discussing leadership practices and their implications in the workplace, were consulted. The analysis of selected materials allowed identifying, organizing, and interpreting key concepts on communication, feedback, motivation, and organizational climate, relating the absence of these practices to direct consequences on employee engagement, satisfaction, and productivity. Thus, the literature review served as a critical analysis tool, enabling an understanding of how literature addresses managerial omission and allowing the formulation of reflections and recommendations relevant to the topic.

DEVELOPMENT

PEOPLE MANAGEMENT AND LEADERSHIP

People management plays a fundamental role within the organizational structure, as it goes beyond mere task coordination, encompassing the development of human capital, considered one of the most strategic assets of any company. According to Chiavenato (2014), the manager is not limited to direct supervision; they must possess skills that enable them to motivate, guide, and train employees so that they can achieve both individual and collective goals. In this context, leadership assumes a strategic character, as it is not merely about delegating responsibilities but about positively influencing the team, stimulating collaboration, and building a work environment that promotes engagement and commitment (Robbins & Judge, 2019).

Within organizations, managers perform various functions, ranging from goal planning and balanced task distribution to performance evaluation and decision-making with direct impact on corporate results (Vergara, 2016). It is essential that they identify the individual needs of each employee, providing continuous feedback, emotional support, and opportunities for professional development. This approach contributes to a healthy organizational climate, which favors not only productivity but also team satisfaction and well-being (Gil, 2019).

Communication skills and interpersonal abilities stand out as essential competencies for managers. They enable conflict management, adaptability to change, and team integration in the face of constant challenges. Situational leadership, which consists of adjusting the management style according to

contextual demands and employee profiles, represents a strategic differential capable of enhancing results and strengthening organizational performance (Chiavenato, 2014; Robbins & Judge, 2019).

Communication, in this scenario, is indispensable in any social, family, or corporate context. As Chacrinha famously stated, “those who do not communicate get into trouble,” emphasizing that all human relationships depend on the ability to convey ideas clearly. The term communication, derived from the Latin *communicatio*, means to make common, to share information so that it is understood by all. For it to be effective, it is necessary to minimize interferences, known as “noise,” which hinder message transmission. Therefore, the leader must communicate clearly and objectively, ensuring that their guidelines are understood and that the team shares the established objectives (Lourenço, 2000). Effective communication directly influences the organizational climate, potentially generating harmonious environments or, conversely, fostering conflicts and unproductivity, highlighting how leadership style reflects on organizational outcomes.

Efficient leadership is closely associated with autonomy and democratic management. Organizations that adopt democratic models distribute power in a directed manner, allowing everyone to participate in decision-making. For this, the company must be prepared to adapt to social changes and the needs of the internal community (Barracho, 2012). In this context, the leader acts as an articulator, integrating management and training policies with strategic vision and the ability to stimulate team autonomy—an essential factor for developing a collaborative culture.

Implementing democratic management requires paradigm shifts, as it involves abandoning centralized control practices and valuing collective participation. Historically, corporate education and management models were rigid, based on crystallized knowledge; however, current approaches seek innovation and adaptation to dynamic contexts (Brilhim, 2006). Thus, the organization is neither entirely independent from society nor completely subordinate to it; there is a dialectical relationship of mutual influence. Recognizing this dynamic requires ethics, respect for diversity, and pursuit of equity, promoting practices that encourage interaction, involvement, and cooperation in problem-solving (Bilhim, 2006).

Moreover, the social dimension of human work demands attention to interpersonal skills, even in a society marked by individualism and intense use of technologies such as emails, apps, and social networks. Some companies have developed incentive and compensation plans that consider both individual and collective performance. Teamwork, although challenging, is increasingly valued in the market, as collaboration among members strengthens unity and prepares the organization to face globalization challenges. Well-trained teams tend to be more creative, determined, and agile, requiring less constant supervision. However, resistance to new ideas may arise when the team becomes more demanding, reinforcing the need for careful leadership (Bilhim, 2006).

Freitas (2016, p. 22) emphasizes that teamwork requires maturity, as it involves listening to others, relinquishing personal opinions, and recognizing that colleagues' ideas may be more appropriate. For this, each member must perceive themselves as an important part of the group, contributing their skills and acknowledging others' competencies. Organizational success, therefore, depends on the joint performance of the team and leadership, which must motivate, restore trust shaken by restructuring processes or staff cuts, and integrate employees into the new reality, maintaining uniformity in objectives.

The leader must plan, monitor work development, promote self-awareness, and enhance each employee's individual skills, using knowledge of motivation, global vision, and leadership. It is necessary to seek group synergy, respect each professional's pace and talent, and foster the development of missing competencies. To maintain an efficient team, it is essential to create an environment where individual and collective goals can be achieved. However, caution is necessary, as the leader's anxiety for success may generate stress and prioritize personal goals over organizational ones, harming both team and company performance.

MANAGERIAL OMISSION

Managerial omission represents one of the main factors that compromise organizational performance and employee well-being, directly reflecting on the quality of the organizational climate and company results. According to Chiavenato (2014), the absence of proactive actions by the manager—whether in communication, work monitoring, or attention to team needs—can create significant gaps in task execution, causing insecurity, demotivation, and decreased productivity. Omissive management does not manifest solely through the physical absence of the leader but also through the inability to provide guidance, direction, and adequate support—essential elements for maintaining a healthy and efficient work environment.

The lack of communication constitutes one of the most evident forms of managerial omission. When important information is not shared clearly or in a timely manner, employees lack parameters to perform their duties effectively, which can lead to rework, conflicts, and frustration. Robbins and Judge (2019) emphasize that effective communication is a strategic component of leadership, as it ensures that all team members understand objectives, goals, and expectations, creating alignment and organizational cohesion. The absence of this practice not only disrupts workflow but also undermines trust between managers and subordinates—an essential element for building healthy professional relationships.

Another manifestation of managerial omission is the absence of feedback. According to Gil (2019), feedback is a crucial tool for individual and collective development, enabling employees to recognize their strengths and identify areas needing improvement. Neglect in this aspect hinders professional growth, reduces motivation, and reinforces the perception of devaluation, creating a cycle of

disengagement that directly affects productivity and delivery quality. Vergara (2016) highlights that the consistent practice of feedback strengthens trust in leadership and fosters a continuous learning environment, contributing to talent retention and increased team commitment.

Furthermore, neglecting team demands and needs constitutes a critical form of managerial omission. Managers who fail to observe working conditions, difficulties faced by employees, or proper task distribution risk overloading the team, generating stress, physical and emotional strain, and increasing turnover. Bergamini (2018) emphasizes that attention to team demands is fundamental for building responsible leadership capable of balancing organizational goals with care and development of human capital. An omissive manager, by ignoring these needs, compromises engagement, reduces job satisfaction, and weakens the organization's ability to achieve its strategic objectives.

Therefore, managerial omission—manifested through lack of communication, absence of feedback, and neglect of team needs—exerts profound impacts on organizational climate, motivation, and employee productivity. For organizations to thrive sustainably, managers must act in a present, proactive, and conscious manner, promoting interaction, continuous monitoring, and care for the professionals under their responsibility. Leadership effectiveness is intrinsically linked to the ability to recognize, address, and value team needs, consolidating a healthy, productive work environment aligned with institutional objectives.

IMPACTS ON EMPLOYEES

The impacts of management on employees are multifaceted, encompassing emotional, behavioral, and organizational aspects, with the way the manager relates to their team being one of the determining factors for organizational climate, motivation, mental health, and productivity. The organizational climate is strongly influenced by leadership practices and the management styles adopted. According to Chiavenato (2014), environments where open communication, recognition of work, and participation in decision-making prevail tend to exhibit greater cohesion, satisfaction, and cooperation among team members. Conversely, managerial omission—characterized by lack of feedback, neglect of demands, and absence of guidance—can generate insecurity, distrust, and dissatisfaction, compromising the climate and fostering internal conflicts.

Employee motivation and engagement are directly linked to the perception of being valued and having a sense of purpose in the activities performed. Robbins and Judge (2019) emphasize that motivation is driven not only by financial rewards but also by recognition, autonomy, and opportunities for professional development. When the manager demonstrates a lack of interest in the team's needs, employees tend to show disengagement, loss of initiative, and decreased commitment to organizational objectives. Studies by Gil (2019) reinforce that engagement is closely related to the quality of

interpersonal relationships at work, clarity of goals, and support offered by leadership—factors that are decisive for talent retention and sustainable productivity.

Another critical aspect concerns the consequences for employees' mental health. Managerial neglect can lead to chronic stress, anxiety, and feelings of helplessness, especially when work demands are high and there is no adequate guidance. Vergara (2016) points out that work environments where employees do not feel supported or included in decision-making processes increase the risk of emotional illness, burnout, and widespread dissatisfaction. Fragile mental health affects not only individual well-being but also compromises concentration, decision-making quality, and social interaction within the team.

The effects on productivity are a direct consequence of the emotional and motivational conditions of the team. Bergamini (2018) notes that teams that are demotivated and exposed to omissive leadership exhibit lower performance, higher error rates, and reduced quality in deliverables. Commitment to organizational results, therefore, depends on active, present leadership that is sensitive to employee needs, capable of balancing demands, providing support, and creating an environment that encourages participation and development. Positive interaction between manager and team not only maximizes efficiency but also strengthens organizational culture, promoting continuous learning and innovation.

Building trust-based relationships, effective communication, continuous feedback, and attention to individual needs is essential to ensure that employees feel valued, engaged, and capable of fully contributing to organizational objectives. Thus, management effectiveness is intrinsically linked to the ability to create a healthy, productive, and motivating work environment, positively reflecting both on individual performance and collective results.

Managerial omission in leading teams can trigger a series of negative impacts that manifest across various dimensions of the employee experience. These effects not only compromise organizational effectiveness but also directly affect employees' well-being, motivation, and mental health. Below is a table summarizing these impacts, along with the references supporting each discussed aspect.

Title: Impacts of Managerial Omission on Employees

Aspect	Description	Consequences	References
Organizational Climate	Environments lacking communication and feedback generate insecurity and distrust.	Increased internal conflicts and general dissatisfaction among employees.	Chiavenato (2014); Robbins & Judge (2019)
Motivation	Absence of recognition and support results in lack of incentive for employees.	Decreased engagement and loss of initiative in daily activities.	Gil (2019); Vergara (2016)
Mental Health	Managerial neglect can cause chronic stress and burnout.	Increased mental health issues, such as anxiety and depression.	Bergamini (2018); Vergara (2016)
Productivity	Lack of clarity in expectations and goals hinders task execution.	Decline in performance and quality of deliverables, increased errors.	Robbins & Judge (2019); Gil (2019)
Talent Retention	Employees who do not feel valued tend to seek new opportunities.	Higher turnover rates and costs associated with new hiring.	Chiavenato (2014); Vergara (2016)
Professional Development	Lack of feedback prevents growth and continuous learning.	Career stagnation and demotivation, affecting employees' future.	Robbins & Judge (2019); Gil (2019)
Interpersonal Relations	Managerial omission weakens trust between team and leadership.	Deterioration of cooperation and teamwork, harming collective results.	Bergamini (2018); Chiavenato (2014)

Source: Author's elaboration (2025)

The impacts presented in the table above demonstrate that managerial omission can have deep and far-reaching effects on employees. From organizational climate to mental health, each aspect mentioned shows how lack of attention and care by leadership can compromise not only individual performance but also collective outcomes.

Moreover, the absence of feedback practices and effective communication creates a vicious cycle that can result in demotivation and increased turnover. Literature reinforces the importance of active managerial presence in their roles, as this presence is fundamental for creating a healthy and productive work environment.

It is concluded, therefore, that people management requires a proactive approach attentive to team needs. Investing in communication, recognition, and professional development of employees is not only a matter of managerial responsibility but also an essential strategy for long-term organizational success.

CONCLUSION

The analysis of managerial omission and its impacts on relationships with employees proves to be an issue of utmost relevance in the contemporary organizational context. Throughout this study, it was possible to observe that people management is not limited to mere administrative functions but involves a continuous commitment to human development, motivation, and team engagement. The literature consulted, including authors such as Chiavenato, Robbins, and Judge, highlights the importance of active and present leadership that not only directs but also inspires and supports employees in their professional journeys.

The research results indicate that managerial omission—manifested through lack of clear communication, absence of feedback, and neglect in addressing team needs—can significantly compromise the organizational climate. This failure not only generates dissatisfaction and demotivation but also results in high turnover rates, stress, and decreased productivity. Effective communication, fundamental for aligning expectations and objectives, is a practice that managers must constantly cultivate to ensure a healthy and collaborative work environment.

Furthermore, the study emphasized that the absence of feedback hinders employees' professional growth, creating a vicious cycle of disengagement and devaluation. Feedback, when practiced regularly and constructively, not only strengthens trust in work relationships but also fosters a continuous learning environment, essential for talent retention. Therefore, implementing feedback practices should be a priority in people management.

Another crucial point discussed was the importance of addressing team demands and working conditions. Managers who ignore the difficulties faced by employees or fail to promote adequate workload balance risk overburdening their teams, resulting in stress and burnout. Attention to individual needs is, therefore, a vital component of responsible and effective leadership, which seeks not only to achieve organizational results but also to contribute to employee well-being and satisfaction.

In short, the impacts of managerial omission cannot be underestimated. Building trust-based relationships, promoting effective communication, providing continuous feedback, and paying attention to team needs are essential elements to ensure that employees feel valued and engaged.

The effectiveness of people management is intrinsically linked to managers' ability to create a motivating and productive work environment, directly reflecting on individual performance and collective organizational results. Thus, this study not only contributes to understanding management dynamics but



also offers practical recommendations for managers who wish to avoid the pitfalls of omission and, consequently, build healthier and more effective organizations.

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TOURISM AND ENTREPRENEURSHIP: OPPORTUNITIES AND INNOVATIONS IN THE SECTOR <https://doi.org/10.63330/aurumpub.015-020>**Gabriela Aparecida Messias¹****ABSTRACT**

This article addresses the intersections between tourism and entrepreneurship, highlighting opportunities and innovations within the sector. The primary objective was to analyze how tourism dynamics create spaces for entrepreneurship, fostering innovative and sustainable experiences. The methodology employed was predominantly bibliographic, involving a review of academic sources and reports from relevant organizations, enabling a comprehensive understanding of current trends and emerging practices in tourism. The findings revealed that tourism is a multifaceted phenomenon that not only generates significant economic impacts but also promotes cultural and environmental preservation. The study demonstrated that entrepreneurship in tourism is characterized by innovation, creativity, and adaptation to niche markets, such as experiential tourism and ecotourism. Furthermore, challenges faced by entrepreneurs—such as regulatory barriers, financial management, and seasonality—were discussed as factors requiring strategic planning and resilience. The conclusions indicated that combining innovation and sustainability is essential for the success of tourism businesses, creating economic and social value for local communities. The paper also emphasized the need for entrepreneurs to remain updated on global trends and tourist expectations, ensuring competitiveness and business longevity. Thus, tourism has consolidated itself as a strategic and transformative activity capable of driving economic and social development in various regions.

Keywords: Tourism; Entrepreneurship; Innovation; Sustainability.

¹ Tourism Basics
Human Rights

INTRODUCTION

The intersection between tourism and entrepreneurship has become an increasingly relevant topic, particularly in a global context that values authentic and sustainable experiences. Tourism, as a social, cultural, and economic phenomenon, involves the movement of people for diverse purposes, including leisure, business, and education. This sector is dynamic and multifaceted, directly influencing local and regional economies and creating opportunities for entrepreneurs seeking to innovate and add value to their offerings.

The consulted literature, including works by Smith, Richards, and Weaver, provides a solid theoretical foundation encompassing definitions and typologies of tourism, as well as emerging trends shaping the sector. The World Tourism Organization and other authors underscore the importance of tourism as a driver of economic and social development, emphasizing that innovation and sustainability are essential pillars for the success of tourism enterprises.

The objectives of this study were multiple: first, to identify entrepreneurial opportunities within the tourism sector; second, to analyze how innovation and sustainability can be integrated into business practices; and finally, to discuss the challenges faced by entrepreneurs in the current context. The central hypothesis suggests that the combination of innovation and sustainable practices is fundamental for competitiveness and the longevity of tourism businesses.

The rationale for conducting this study lies in the need to understand how tourism can serve as an instrument of economic development, particularly in regions seeking to diversify their economies and preserve local cultures. Additionally, this work aims to contribute to knowledge on entrepreneurial practices in tourism, offering valuable insights for managers and new entrepreneurs.

The development of the study was structured to first address concepts and perspectives of tourism, followed by a discussion on entrepreneurship within the sector, with emphasis on innovative business models. Subsequently, the study explored the relationship between innovation and sustainability, as well as the challenges entrepreneurs face in the current scenario. Each section was grounded in a review of relevant literature, enabling a critical and contextualized analysis.

Finally, the paper concludes by highlighting that tourism is not merely an economic activity but also an opportunity to promote cultural and environmental appreciation, consolidating itself as a strategic field for development. The analysis conducted throughout the study demonstrates that by integrating innovative and sustainable practices, entrepreneurs can not only meet the demands of contemporary tourists but also contribute to strengthening local communities and cultural heritage.

METHODOLOGY

The methodology of this study was structured around a bibliographic and qualitative approach, aiming to provide a comprehensive understanding of the interactions between tourism and entrepreneurship, as well as innovations and opportunities within the sector. The research was divided into several stages, each contributing to the construction of knowledge on the topic.

Initially, a literature review was conducted, selecting academic works, scientific articles, and reports from relevant organizations such as the World Tourism Organization (UNWTO). This stage involved searching academic databases such as Google Scholar and Scopus to identify sources discussing fundamental concepts of tourism, typologies, emerging trends, and entrepreneurial practices.

The analysis of selected documents focused on identifying the main characteristics of contemporary tourism, including the importance of innovation and sustainability. Studies addressing different tourism typologies—such as cultural, ecological, and adventure tourism—were explored, along with tourist needs and market expectations.

Additionally, the methodology included the analysis of practical cases of tourism enterprises, allowing observation of how innovations are implemented in practice and which business models have proven successful. These cases were selected based on the diversity of approaches and relevance to both Brazilian and global contexts.

The research also considered challenges faced by entrepreneurs in the sector, such as regulatory barriers, financial issues, and seasonality. Publications discussing risk management and adaptation to market changes were consulted, addressing the importance of organizational resilience.

Finally, data collection and analysis were conducted systematically, enabling the identification of trends and patterns emerging from the literature. This approach facilitated the formulation of practical recommendations for entrepreneurs and managers in the tourism sector.

In summary, the adopted methodology ensured a critical and contextualized analysis of the topic, contributing to a deeper understanding of opportunities and challenges in tourism and entrepreneurship. The conclusions presented in this work are based on the synthesis of collected information, offering valuable insights for practice and future research in the field.

DEVELOPMENT

TOURISM: CONCEPTS AND PERSPECTIVES

Tourism is a social, cultural, and economic phenomenon involving the temporary movement of people to different locations for purposes such as leisure, business, study, or other motivations. According to Smith (2017), tourism is not limited to the act of traveling itself but encompasses the entire experience provided by the destination, including accommodation, transportation, food services, leisure, and local

culture. The World Tourism Organization (UNWTO, 2021) defines tourism as “the set of activities undertaken by people during their travels and stays in places outside their usual environment, for a consecutive period not exceeding one year, for leisure, business, or other purposes.” This perspective broadens the understanding of tourism as an integrated sector that directly influences local and regional economies, generating employment and fostering innovation.

Tourism encompasses various typologies, each with specific characteristics and demands. Cultural tourism stands out for its focus on historical heritage, artistic expressions, and local traditions, representing an opportunity to strengthen identity and cultural preservation (Richards, 2018). Ecological tourism, or ecotourism, emphasizes interaction with natural environments, encouraging sustainable practices and environmental awareness, and has become an increasing trend due to the growing emphasis on sustainability (Weaver, 2020). Adventure tourism involves experiences requiring physical effort and contact with nature, such as hiking, climbing, and extreme sports, attracting tourists seeking challenges and unique experiences (Buckley, 2018). Rural tourism emerges as an alternative to urban tourism, promoting interaction with local communities and agricultural or artisanal activities, while urban tourism focuses on cities and metropolitan centers, highlighting infrastructure, cultural events, gastronomy, and shopping (Gibson et al., 2019). Each typology represents distinct opportunities for entrepreneurs, making it essential to understand the target audience profile and market trends.

Current trends in the tourism sector reflect changes in tourist behavior and technological advancements. The use of digital technologies, such as booking apps, review platforms, and augmented reality, has transformed how tourists plan and experience their trips (Buhalis & Sinarta, 2019). Additionally, the demand for personalized and authentic experiences has driven the creation of tailor-made itineraries, enabling visitors to connect more deeply with local culture and environment (Pine & Gilmore, 2019). Another relevant aspect is the growth of sustainable and responsible tourism, motivated by increasing environmental and social awareness, where tourists and entrepreneurs seek to minimize negative impacts and maximize benefits for host communities (UNWTO, 2022). These movements indicate that modern tourism is not merely an economic activity but also a tool for social, cultural, and environmental development.

Therefore, tourism should be understood as a multifaceted and strategic activity capable of generating significant economic impacts, promoting cultural and environmental preservation, and driving local entrepreneurship (Smith, 2017; Richards, 2018; Weaver, 2020). Understanding typologies and trends enables managers and entrepreneurs to identify opportunities, plan appropriate services, and innovate within the sector, meeting the expectations of increasingly demanding and conscious tourists. Thus, tourism consolidates itself as a dynamic and evolving field that combines experience, culture,

sustainability, and business, strengthening economic and social development in regions worldwide (Buhalis & Sinarta, 2019; UNWTO, 2022).

ENTREPRENEURSHIP IN TOURISM

Entrepreneurship is defined as the ability to identify opportunities, create and implement innovative ideas, and assume calculated risks to generate economic, social, or cultural value (Drucker, 2014). In the context of tourism, entrepreneurship manifests in the creation of products, services, and experiences that meet tourists' needs and expectations while promoting local economic development and sustainability (Hjalager, 2010). Thus, tourism entrepreneurship is not limited to starting businesses but encompasses initiatives that transform destinations, improve services, and provide unique experiences to visitors.

Tourism entrepreneurs possess specific characteristics that distinguish them from entrepreneurs in other sectors. Among these traits are innovation, which enables the development of differentiated services and products; creativity, essential for designing authentic and memorable experiences; and the ability to identify opportunities in underexplored market niches, such as experiential tourism, ecotourism, or rural tourism (Ratten, 2017). Furthermore, flexibility and resilience are crucial, as the tourism sector is subject to seasonality, shifts in consumer behavior, and global crises such as pandemics or natural disasters (Barbieri & Mahoney, 2019). These competencies make tourism entrepreneurship a strategic tool for innovating and adding value to destinations.

Regarding business models in the tourism sector, different approaches combine services, experiences, and technologies. Some entrepreneurs focus on experiential tourism, offering immersive activities that go beyond physical travel, such as cultural workshops, gastronomic tours, or adventure activities (Pine & Gilmore, 2019). Others explore collaborative or sharing economy models, where digital platforms connect tourists with local service providers, promoting efficiency and diversity of offerings (Buhalis & Sinarta, 2019). There are also models oriented toward sustainability, integrating environmental and social practices into all stages of the tourism service, adding value to the destination and strengthening the business image. Each model requires specific marketing, management, and innovation strategies, demonstrating that tourism entrepreneurship is multifaceted and highly adaptable.

In summary, entrepreneurship in tourism represents an opportunity to create economic, social, and cultural value through innovation, creativity, and strategic opportunity identification. The diversity of business models and the need to adapt to different tourist profiles and global trends require tourism entrepreneurs to remain constantly updated and prepared to face complex challenges (Hjalager, 2010; Ratten, 2017; Pine & Gilmore, 2019). Thus, tourism entrepreneurship not only promotes economic

development but also contributes to cultural, social, and environmental appreciation of destinations, consolidating tourism as a strategic and dynamic activity.

INNOVATION AND SUSTAINABILITY IN TOURISM

Innovation plays a central role in contemporary tourism, being a determining factor for creating new services, experiences, and business models that meet the demands of increasingly demanding and digitally connected tourists. According to Dwyer et al. (2019), innovation in tourism is not limited to products or services but also involves processes, marketing, technology, and customer experience. For example, destinations implementing augmented reality, interactive apps, and immersive experiences can differentiate themselves in the market and create added value for visitors. Innovation, therefore, enables companies and destinations to stand out in a highly competitive sector by offering personalized, memorable, and unique experiences (Buhalis & Sinarta, 2019).

Parallel to innovation, sustainability has become a competitive advantage in tourism. Sustainable tourism seeks to balance economic development with environmental, cultural, and social preservation, promoting practices that benefit both visitors and host communities (Weaver, 2020). Corporate social responsibility in this context involves adopting policies of conscious consumption, supporting community projects, valuing local culture, and minimizing negative environmental impacts. Destinations and companies that incorporate sustainability into their operations not only meet the expectations of environmentally conscious tourists but also strengthen their reputation and attractiveness (UNWTO, 2022).

The combination of innovation and sustainability creates significant opportunities for entrepreneurship in tourism. By developing innovative experiences that respect the environment and local culture, entrepreneurs can simultaneously generate social and economic value. For instance, ecotourism initiatives offering guided trails, eco-friendly lodging, and educational activities connect tourists to nature responsibly, encouraging conservation and promoting economic benefits for local communities (Richards, 2018). This model demonstrates that innovation and sustainability are not isolated objectives but integrated elements contributing to competitiveness and longevity in tourism businesses.

Moreover, sustainable innovation in tourism is driven by emerging technologies and global trends, such as digital tourism, the sharing economy, and the use of big data to analyze tourist behavior. Digital tools enable monitoring environmental impacts, optimizing resources, and personalizing experiences efficiently, ensuring sustainability becomes an integral part of operations (Buhalis & Sinarta, 2019; Dwyer et al., 2019). Thus, destinations and companies investing in sustainable innovation can balance economic growth, environmental preservation, and social inclusion, creating richer and more memorable experiences for visitors.

In summary, innovation and sustainability are strategic pillars for contemporary tourism. By integrating technology, creativity, and social responsibility, destinations and entrepreneurs can create differentiated services, promote unique experiences, and strengthen competitiveness in the sector (Dwyer et al., 2019; Richards, 2018; UNWTO, 2022). This approach demonstrates that innovative and sustainable tourism not only meets tourist expectations but also contributes to economic, social, and environmental development of host communities, consolidating tourism as a strategic and transformative activity.

CHALLENGES OF TOURISM ENTREPRENEURSHIP

Tourism entrepreneurship faces a series of challenges that can directly impact business success and sustainability. Among the main obstacles are regulatory and bureaucratic barriers, including licenses, permits, municipal and state regulations, and compliance with environmental and safety standards. According to Hjalager (2010), the complexity of these processes often discourages new entrepreneurs and hinders innovation in the sector. Adapting to these rules requires legal knowledge and planning capacity, which demand time and resources, making it essential for entrepreneurs to be well-informed and supported to ensure compliance and agility.

Another relevant challenge is financial management and resource acquisition, especially for emerging or small-scale tourism businesses. According to Barbieri and Mahoney (2019), the availability of initial capital and access to adequate financing are determining factors for the viability of tourism startups. Additionally, efficient cost management, cash flow control, and investments in marketing and infrastructure are fundamental to maintaining competitiveness. Many entrepreneurs struggle to develop solid business plans and attract investors, which can limit growth and innovation in the sector.

Competitiveness and seasonality constitute another significant challenge in tourism. Different destinations experience demand fluctuations throughout the year, affecting hotel occupancy, tourism service revenues, and overall business profitability (Ratten, 2017). To address these variations, entrepreneurs must develop strategies for service diversification, seasonal promotions, and experience packages that maintain visitor interest during low-demand periods. Furthermore, intense competition among destinations and service providers requires constant innovation, effective marketing, and excellence in customer service to attract and retain tourists (Pine & Gilmore, 2019).

Additionally, the global context presents further challenges, such as economic crises, shifts in consumer preferences, and unexpected events like pandemics or natural disasters, which can severely compromise tourism businesses. According to Buhalis and Sinarta (2019), successful entrepreneurs are those who develop organizational resilience, plan alternative scenarios, and adopt risk management practices. The ability to adapt and anticipate market changes thus becomes an essential competitive advantage.

In summary, tourism entrepreneurship is marked by complex challenges requiring strategic planning, efficient management, and innovation capacity. Overcoming regulatory barriers, managing finances, addressing seasonality, and maintaining competitiveness are ongoing tasks demanding multifaceted skills. By proactively tackling these challenges, entrepreneurs can transform obstacles into opportunities, creating resilient, innovative, and sustainable tourism businesses (Hjalager, 2010; Barbieri & Mahoney, 2019; Ratten, 2017; Buhalis & Sinarta, 2019).

CONCLUSION

The conclusion of this study reaffirms the relevance of the intersection between tourism and entrepreneurship, emphasizing how this relationship can generate not only economic value but also foster cultural and environmental preservation. Throughout the research, it was observed that tourism establishes itself as a multifaceted phenomenon encompassing a wide range of experiences and opportunities for entrepreneurs. The sector is not limited to being a mere economic activity; it becomes a strategic tool capable of driving local and regional development.

The analysis results indicated that entrepreneurship in tourism is characterized by innovation and creativity, which are essential to meet the expectations of increasingly demanding tourists. The research revealed a growing interest in authentic and personalized experiences that go beyond traditional service offerings. This shift in tourist behavior requires entrepreneurs to remain attentive to emerging trends such as ecotourism, adventure tourism, and cultural experiences, enabling them to position themselves competitively in the market.

Furthermore, integrating sustainability into business practices proved to be an important differentiator. Sustainable tourism not only minimizes negative impacts on the environment and local communities but also adds value to tourism offerings, strengthening the image of destinations and involved companies. Enterprises adopting sustainable practices can meet the increasing demand for environmental responsibility while establishing deeper connections with visitors who value ethics and social awareness.

However, the study also highlighted significant challenges faced by tourism entrepreneurs. Regulatory and bureaucratic barriers, financial management, and seasonality are among the obstacles that can compromise business viability. The need for robust strategic planning and the ability to adapt to a dynamic market are essential for overcoming these challenges. Entrepreneurs who develop organizational resilience and anticipate changes are better prepared to transform obstacles into opportunities.

Another important point addressed was the diversity of business models in the tourism sector. The emergence of digital platforms and the sharing economy introduced new dynamics that enable connections between tourists and local service providers. These collaborative models not only expand



available options for travelers but also promote efficiency and diversity, contributing to a more vibrant and inclusive tourism ecosystem.

Thus, this study contributes to a deeper understanding of opportunities and challenges in tourism and entrepreneurship, offering valuable insights that can guide future research and practices in the field. Continued studies in this area are essential to keep pace with the rapid transformations of the sector and ensure that tourism remains a positive and sustainable driver of development.

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HOSPITALITY, CULTURE AND DIVERSITY: EXPERIENCES OF THE INTERNATIONAL TOURIST IN THE USA <https://doi.org/10.63330/aurumpub.015-021>**Gabriela Aparecida Messias¹****ABSTRACT**

This study analyzed the relationship between hospitality, culture, and diversity in the experiences of international tourists in the United States, highlighting how practices of welcoming and service impacted visitors' perceptions in various contexts. The main objective was to understand how hospitality, understood as a social and cultural practice, influenced the satisfaction of international tourists, considering the diversity of profiles and expectations present in high-traffic destinations. The research employed a qualitative and exploratory methodology, based on a literature review of classical and contemporary authors in the field, as well as the analysis of studies applied to the North American context. The investigation revealed that hospitality, when exercised strategically and with cultural sensitivity, played a decisive role in creating positive experiences, directly influencing tourist satisfaction and loyalty. It was found that cultural factors shaped how tourism services were evaluated and that adapting hospitality practices to different international audiences represented a competitive advantage. The study also highlighted that cities such as New York, Orlando, and Los Angeles exemplified the diversity of services, cultural plurality, and welcoming capacity present in the United States, establishing themselves as global references in international tourism. The results further indicated that although American hospitality was characterized by efficiency and standardization, tourists valued personalized experiences that respected their cultural identity. The analysis concluded that hospitality, when associated with the recognition of diversity, extended beyond service provision and became a tool for intercultural dialogue and the strengthening of inclusive practices in tourism.

Keywords: Hospitality; International tourism; Cultural diversity; Tourist experience.

¹ Tourism Basics
Human Rights

INTRODUCTION

International tourism, as a social, economic, and cultural phenomenon, relies on hospitality as one of its fundamental pillars for creating meaningful experiences and consolidating the image of destinations. More than a set of operational practices, hospitality involves welcoming, caring for, and interacting with visitors from diverse cultural backgrounds, promoting not only quality services but also an environment of belonging and respect for diversity.

In the case of the United States, one of the most visited countries in the world, the interface between hospitality, culture, and diversity presents itself as a fertile field of analysis, given that the nation annually receives millions of international tourists who arrive with varied expectations, customs, and cultural references. This scenario makes it essential to understand how welcoming and service practices are structured and perceived in this context.

Authors such as Brotherton (1999) and Lashley (2018) emphasize that hospitality, when understood in its strategic dimension, transcends basic service and becomes a competitive differentiator, directly impacting the tourist's perception and satisfaction. At the same time, theorists like Hofstede (2011) and Hall (1976) highlight that cultural factors strongly influence how tourism services are interpreted and evaluated. Thus, cultural diversity is not merely a challenge for service providers to adapt to, but also an opportunity to enrich the visitor's experience and consolidate destinations that are more inclusive and attractive.

In light of this, the main objective of this study is to analyze how hospitality, in dialogue with culture and diversity, influences the experience of international tourists in the United States. Specifically, it seeks to understand: (1) the concept and importance of hospitality in international tourism; (2) how culture and diversity shape the perception of tourism services and demand adaptations in service practices; and (3) how these dynamics manifest in high-traffic regions of the United States, such as New York, Orlando, and Los Angeles.

The central hypotheses proposed are based on the premise that, although American hospitality is recognized for its efficiency and standardization, the international tourist's experience is increasingly linked to cultural sensitivity and the appreciation of diversity. It is therefore assumed that intercultural welcoming is a decisive factor for satisfaction, loyalty, and recommendation of tourist destinations in the USA. At the same time, it is considered that the absence of adapted hospitality practices may lead to dissatisfaction and compromise the reputation of establishments and cities.

The justification for this study lies in the academic and practical relevance of the topic. From a theoretical standpoint, understanding the interface between hospitality, culture, and diversity contributes to the advancement of studies in tourism and service management. From a social and economic

perspective, analyzing these practices allows for the identification of strategies that enhance destination competitiveness, tourist satisfaction, and the appreciation of cultural diversity in a globalized world.

Regarding the structure of the study, the research is organized into four main parts. Initially, a theoretical discussion on hospitality and international tourism is presented, highlighting concepts and the relevance of the topic. Next, the influence of culture and diversity on the perception of tourism services and the need for adaptation in hospitality practices is analyzed. The third part discusses the concrete experiences of international tourists in the United States, with emphasis on hotels, restaurants, and tourist attractions in regions with high visitor traffic. Finally, the conclusion synthesizes the main reflections and points to the importance of culturally sensitive hospitality as a strategy for building more inclusive, competitive, and sustainable destinations.

Thus, this introduction presents not only the central theme of the study but also its relevance, objectives, hypotheses, and structure, preparing the reader for a critical analysis of the relationships between hospitality, culture, and diversity in international tourism, with a specific focus on experiences in the United States.

METHODOLOGY

This study adopts a qualitative and exploratory approach, grounded in bibliographic review, with the aim of understanding how hospitality, in articulation with culture and diversity, influences the experience of international tourists in the United States. The choice of this design is justified by the interpretative nature of the research, which seeks to understand meanings, perceptions, and social practices related to international tourism, rather than quantifying data or establishing statistical relationships.

The bibliographic research constitutes the primary methodological strategy, as it allows for the collection, systematization, and analysis of theoretical and empirical contributions from authors dedicated to the study of hospitality, cultural diversity, and tourist experiences. Classical and contemporary works were consulted, such as those by Brotherton (1999), Lashley (2018), Hofstede (2011), and Hall (1976), which provide solid conceptual foundations for the proposed discussion. In addition to these, applied studies in international tourism and hospitality in multicultural contexts were used to enrich the analysis, offering a panorama that integrates both theoretical reflections and practical examples.

The analytical procedure involved critical and comparative reading of the selected sources, aiming to identify convergences, divergences, and gaps in the academic debate. Beyond the systematization of concepts, narratives about hospitality practices in different cultural contexts were analyzed in order to relate them to the North American reality. This triangulation of perspectives enabled the development of a

broader understanding of the topic, with attention to the symbolic, social, and economic dimensions that shape the experience of international tourists.

Regarding the spatial scope, the study chose to analyze North American cities with a high international visitor flow—New York, Orlando, and Los Angeles. The selection of these locations is due to their global tourism relevance, the cultural diversity present in their populations, and the breadth of their tourism infrastructure, which provide a privileged setting for observing hospitality practices. Although no field observations were conducted, the analysis is supported by academic studies, tourism reports, and specialized literature that describe the characteristics of these regions and their service strategies.

Structurally, the methodology guided the organization of the study into three axes: (1) conceptual discussion on hospitality in international tourism, with emphasis on its strategic importance; (2) analysis of the influence of culture and diversity on the perception of tourism services and hospitality practices; and (3) reflection on the concrete experiences of international tourists in the USA, based on regional examples and their relationship with cultural diversity.

Therefore, the methodology presented here favors a qualitative, interpretative, and critical approach, recognizing the complexity of interactions between hospitality, culture, and tourism. Rather than seeking definitive answers, this study aims to open paths for reflections that contribute both to academic production and professional practice, providing insights for a more inclusive, intercultural hospitality that is attentive to the demands of a globalized audience.

DEVELOPMENT

HOSPITALITY AND INTERNATIONAL TOURISM

Hospitality is a central concept in tourism studies, representing much more than the mere provision of accommodation, food, or transportation services; it involves the creation of memorable experiences that meet the needs, expectations, and desires of visitors. According to Brotherton (1999), hospitality can be understood as the act of welcoming, caring for, and ethically and respectfully attending to guests, establishing a relationship of trust and comfort between host and visitor. In this sense, hospitality emerges as a strategic element in the tourism sector, as it directly influences the tourist's perception of the destination, establishment, or service consumed. Lashley (2018) adds that hospitality is a culturally shaped practice, manifested not only in technical service procedures but also in gestures of cordiality, personalized service, and attention to the particularities of each guest.

In the context of international tourism, hospitality assumes even greater relevance, as tourists from different cultures arrive at destinations with varied expectations, customs, and references. The ability of an establishment or tourist destination to recognize and respect these cultural differences can determine

the visitor's satisfaction and, consequently, the reputation of the service provided. The tourist experience, therefore, is not limited to the consumption of products or services but encompasses the entire interaction process, from trip planning to post-visit memories. This experience includes tangible factors such as infrastructure and comfort, and intangible ones such as welcoming, empathy, and perception of safety, which are decisive in shaping the tourist's opinion of the destination (Brotherton, 1999; Lashley, 2018).

Tourist satisfaction is often considered one of the main indicators of success in hospitality. It reflects the alignment between expectations and actual perceptions during the tourism experience. When hospitality practices exceed expectations, visitors tend to develop positive feelings such as trust, loyalty, and recommendation of the destination to others. Conversely, service failures, lack of attention to cultural needs, or deficiencies in customer interaction can lead to frustration and dissatisfaction, negatively impacting the image of the destination or establishment. Thus, hospitality is not merely an operational issue but a strategic management tool in tourism, capable of creating meaningful experiences that promote satisfaction, retention, and engagement (Brotherton, 1999; Lashley, 2018).

Moreover, hospitality in international tourism is closely linked to the construction of intercultural relationships and the promotion of an inclusive environment. Destinations and establishments that invest in cultural training, service diversity, and adaptation to visitor preferences demonstrate greater capacity to serve heterogeneous audiences and differentiate themselves in a competitive global market. Attention to culture, language, and individual expectations contributes not only to the immediate experience but also to the perception of authenticity and welcoming—factors increasingly valued by contemporary travelers (Lashley, 2018).

In summary, hospitality forms the foundation of quality international tourism, integrating cultural, emotional, and operational aspects to promote satisfying and memorable experiences. Its impact goes beyond mere service provision, influencing destination perception, tourist loyalty, and sector competitiveness. Understanding hospitality as a strategic and culturally sensitive practice is therefore essential for managers, professionals, and researchers interested in developing tourism experiences that value diversity, meet visitor expectations, and strengthen the reputation of destinations and establishments in the international arena.

CULTURE AND DIVERSITY

Culture plays a decisive role in how tourists perceive and evaluate tourism services, influencing expectations, behavior, and satisfaction during the travel experience. Hofstede (2011) emphasizes that cultural differences between countries are reflected in values, norms, and practices that shape how individuals interpret interactions with service providers. For example, tourists from collectivist cultures may place greater value on personal attention and a sense of community offered by establishments, while

those from individualist cultures may prioritize autonomy, privacy, and efficiency in services. Hall (1976) complements this perspective by highlighting that communication and the perception of hospitality are deeply influenced by cultural elements such as language, gestures, relationship styles, and even the perception of time, requiring tourism professionals to possess special sensitivity to meet the expectations of diverse audiences.

In the context of international tourism, cultural diversity represents both a challenge and an opportunity for the hospitality sector. On one hand, service providers must understand and respect cultural differences to avoid misunderstandings and frustrations that could compromise the tourist experience. On the other hand, the diversity of visitors allows for the creation of richer and more memorable experiences that enhance the authenticity of the destination and promote cultural inclusion. Adapting hospitality practices to different international audiences involves adjustments ranging from menu offerings and language services to personalized service, respect for customs and traditions, and attention to individual preferences (Hofstede, 2011; Hall, 1976).

Cultural adaptation in hospitality practices is therefore essential to ensure tourist satisfaction and loyalty. Establishments that invest in intercultural training, service diversification, and flexibility in service delivery tend to provide more positive experiences, creating a welcoming environment that transcends cultural barriers. For example, international hotels and resorts often offer multilingual staff, themed décor that respects specific cultural elements, and activities that allow immersion in various local traditions. These efforts demonstrate that hospitality is also a strategic practice, capable of meeting the needs of a globalized and diverse audience, strengthening the destination's reputation and increasing tourist engagement (Hofstede, 2011; Hall, 1976).

Furthermore, valuing cultural diversity contributes to the development of more inclusive and sustainable tourism. By recognizing and respecting the different ways of living, feeling, and interacting of international tourists, the hospitality sector promotes enriching experiences that strengthen intercultural understanding and mutual respect. This approach not only improves the visitor's perception of the service received but also amplifies the positive impact of tourism on local society and economy, consolidating management practices that combine operational efficiency with cultural sensitivity (Hall, 1976; Hofstede, 2011).

In summary, understanding the influence of culture on the perception of tourism services and adapting hospitality practices to serve international audiences is a key element for the success of global tourism. Integrating strategies that consider cultural values, diverse expectations, and personalized experiences contributes not only to tourist satisfaction but also to the construction of more inclusive, welcoming, and competitive destinations. In this context, hospitality becomes a space for intercultural



dialogue, where attention to diversity is essential to transform each interaction into a memorable and meaningful experience.

EXPERIENCES OF THE INTERNATIONAL TOURIST IN THE USA

The experiences of international tourists in the United States are shaped by a combination of factors that range from the quality of service practices in hotels, restaurants, and tourist attractions to the perception of inclusion and cultural diversity across different regions of the country. As one of the most visited destinations in the world, the USA receives millions of visitors each year, arriving with varied expectations influenced by their cultures of origin and the global imagery associated with the country. In this context, American hospitality is frequently recognized for its efficiency, professionalism, and the provision of structured services aimed at ensuring comfort, safety, and convenience for international travelers (Brotherton, 1999; Lashley, 2018).

In hotels, the tourist experience is marked by standardization and a wide range of options, from global luxury chains to more affordable accommodations that seek to cater to different profiles and budgets. Practices such as multilingual reception, availability of tourist information, flexible check-in and check-out procedures, and attention to dietary and cultural preferences reinforce the image of a sector prepared to handle the heterogeneity of the international public. In restaurants, one observes the appreciation of gastronomic diversity, which reflects the multicultural nature of American society. In cities like New York and Los Angeles, for example, one can find an impressive variety of international cuisines, offering tourists not only the opportunity to try new flavors but also to feel welcomed by the familiarity of traditional dishes from their countries of origin (Hall, 1976; Hofstede, 2011).

In the realm of tourist attractions, the USA stands out for its organization, infrastructure, and innovation. Theme parks in Orlando, such as Disney World and Universal Studios, offer highly personalized and immersive experiences that combine entertainment with excellence in hospitality, ensuring that tourists of different nationalities feel integrated into an inclusive and safe environment. In New York, cultural diversity is a central element of the tourist experience: museums, theaters, multicultural events, and ethnic neighborhoods such as Chinatown and Little Italy provide visitors with immersion into multiple cultures coexisting side by side. In Los Angeles, cinema and the entertainment industry become global attractions, where international tourist services are carefully structured to convey a sense of belonging to a globalized universe (Lashley, 2018).

Another central aspect is the perception of inclusion and cultural diversity. The United States, shaped by its multicultural foundation, offers international tourists a welcoming experience that reflects the plurality of its local society. The appreciation of diversity—evident in the presence of bilingual guides, services adapted to different religious and cultural traditions, and the promotion of events

celebrating plurality—reinforces the feeling of belonging and respect. This welcoming approach is fundamental to tourist satisfaction and to building a positive image of the destination, serving as a competitive advantage in the international market (Hofstede, 2011).

In summary, the experience of international tourists in the USA is characterized by hospitality that combines efficiency, diversity, and inclusion, making the country one of the most attractive destinations in the world. Whether in hotels that adapt to different cultures, restaurants that reflect global gastronomic plurality, or tourist attractions offering immersive experiences, travelers encounter an environment prepared to meet their expectations. Major cities such as New York, Orlando, and Los Angeles illustrate how American hospitality integrates multicultural welcoming practices with management and innovation strategies, reinforcing the United States' position as a global reference in tourism and hospitality.

CONCLUSION

Throughout this study, it was possible to reflect on the centrality of hospitality in the context of international tourism, focusing on the experience of tourists in the United States. Drawing from the theoretical perspectives of authors such as Brotherton (1999) and Lashley (2018), it was understood that hospitality cannot be reduced to a set of technical services, but must be conceived as a social and cultural practice involving welcoming, respect, and the creation of memorable experiences. In this regard, the study demonstrated that hospitality, when associated with the appreciation of cultural diversity, becomes a strategic and differentiating element for the tourism sector, especially in globally competitive destinations.

One of the key points discussed was the influence of culture on the perception of tourism services, as argued by Hofstede (2011) and Hall (1976). Tourist experiences are not neutral; they are interpreted through values, expectations, and cultural references, which require hospitality professionals to possess enhanced adaptability and intercultural sensitivity. The analysis made it clear that standardized service practices may be effective in ensuring efficiency and organization, but do not necessarily guarantee full visitor satisfaction. It is in personalization, attention to differences, and the creation of an inclusive environment that hospitality reveals its most powerful form.

In the specific case of the United States, the research showed that the country's cultural diversity not only influences the hospitality offered but also shapes the expectations of international tourists. Cities such as New York, Orlando, and Los Angeles stand out as emblematic destinations precisely because of their ability to integrate different cultures into their tourism offerings. New York, for instance, is a multicultural mosaic reflected in its ethnic neighborhoods, varied gastronomy, and diversity of cultural events. Orlando, with its world-renowned theme parks, exemplifies hospitality as spectacle, where every detail of the experience is designed to serve audiences of all ages, nationalities, and cultures. Los Angeles,

with its ties to cinema and the entertainment industry, projects a globalized image that attracts tourists seeking a sense of belonging to a collective imagination.

These examples reveal that American hospitality, although marked by efficiency and standardized processes, also seeks to respond to the diversity of audiences by creating service strategies that value inclusion. However, as hypothesized in this study, it is evident that this hospitality faces the challenge of balancing efficiency with personalization. On one hand, standardization ensures safety and predictability; on the other, personalization is increasingly demanded by tourists seeking unique, authentic, and culturally sensitive experiences.

Another important aspect highlighted was the relationship between hospitality and tourist satisfaction. The visitor's experience goes beyond the tangible aspects of service, involving subjective elements such as the feeling of being welcomed, respected, and belonging. When tourists feel that their cultural identity has been recognized and respected, they tend to evaluate the destination positively and build loyalty. Conversely, negative experiences can result in critical evaluations, affecting the reputation of establishments and destinations in the competitive international market. Thus, hospitality should be understood as a determining factor not only for immediate satisfaction but also for the long-term sustainability of international tourism.

The analysis developed throughout the study also points to the need for tourism professionals and managers to invest in intercultural training and strategies that allow services to be adapted to the specificities of different audiences. This investment should not be seen merely as a differentiator, but as a necessity in a globalized world where international travel is increasingly accessible and diverse. In this scenario, valuing cultural diversity ceases to be a challenge and becomes a strategic opportunity for destinations that aim to establish themselves as references in hospitality.

Therefore, it can be concluded that the experience of international tourists in the United States reflects the interaction between hospitality, culture, and diversity. The country, due to its history and multicultural configuration, is uniquely positioned to offer inclusive and meaningful experiences to visitors. However, the consolidation of culturally sensitive hospitality requires continuous attention to the social, technological, and cultural transformations that impact global tourism.

This study, based on bibliographic review and critical analysis, contributes to academic debate and professional practice by emphasizing that hospitality should be understood as a social practice in constant transformation, requiring flexibility, empathy, and innovation. As a final reflection, it is important to advance research that integrates empirical and comparative studies to understand how tourists from different nationalities perceive hospitality in specific contexts, and how this perception can guide public policies and business strategies aimed at international tourism.



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**TEACHER EDUCATION AND ENVIRONMENTAL EDUCATION: ESSENTIAL PRINCIPLES
FOR SUSTAINABLE TEACHING** <https://doi.org/10.63330/aurumpub.015-022>**Ana Cláudia Simões Félix Thomé¹****ABSTRACT**

Teacher education and environmental education constitute the central theme of this work, which analyzed the fundamental principles for sustainable teaching. The objective of the research was to investigate the relationship between teacher training and environmental education, emphasizing pedagogical practices that promote sustainability in schools. The methodology employed was qualitative and bibliographic in nature, allowing for the collection and analysis of information from classical and contemporary works, scientific articles, and legal documents. The research revealed that environmental education has become an essential field for the formation of critical, conscious citizens engaged in promoting sustainability. The results indicated that teacher education must include specific competencies to implement environmental practices, as well as promote active methodologies that integrate theory and practice. The conclusions highlighted the importance of continuous training that enables teachers to mediate meaningful experiences, connecting theoretical knowledge to everyday practice. The study emphasized that environmental education is not limited to the transmission of information but should foster responsible and ethical attitudes toward the environment. The research contributed to the understanding that teacher education, combined with solid principles of environmental education, is crucial for building a more sustainable and conscious society.

Keywords: Teacher education; Environmental education; Sustainability; Pedagogical practices.

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INTRODUCTION

This research explored the intersection between teacher education and environmental education, recognizing the growing relevance of this theme in contemporary times. Training teachers to address socio-environmental issues is fundamental in a world marked by ecological and social challenges, requiring a pedagogical approach that promotes awareness and environmental responsibility.

The theme was contextualized in light of the consulted literature, which ranged from the historical foundations of environmental education to its contemporary guidelines. Classical and contemporary authors were analyzed to understand how environmental education evolved and established itself as an essential field for forming critical and participatory citizens. The bibliographic approach allowed for reflection on the competencies necessary for teaching in this context, highlighting the importance of interdisciplinarity and critical thinking.

The research objectives were clearly defined: to investigate the relationship between teacher education and environmental education, identify pedagogical practices that promote sustainability, and propose applicable guidelines within the school context. The formulated hypothesis indicated that continuous training and the adoption of active methodologies are crucial for developing effective environmental education.

The justification for conducting this study lies in the urgent need to prepare educators to face the challenges of the 21st century, where sustainability must be a priority. The research suggested that environmental education should not be treated as an isolated theme but as a transversal component that permeates all areas of knowledge, contributing to the holistic formation of students.

The work was developed through a qualitative and bibliographic methodology, which enabled the analysis of a wide range of sources, such as books, scientific articles, and legal documents. This approach provided a deep understanding of the principles and practices related to environmental education and teacher training.

Furthermore, the introduction emphasized the importance of systematically and coherently integrating environmental education into school curricula, stressing that teacher education must go beyond mere transmission of theoretical content. The research addressed the need to create learning environments that encourage active student participation, promoting practical experiences that connect theory to everyday reality. This approach not only fosters the development of critical environmental awareness but also stimulates socio-emotional skills essential for forming citizens committed to the community and the planet's future. Environmental education, therefore, emerges as a fundamental pillar in teacher training, reflecting the urgency of an educational transformation that prioritizes sustainability and socio-environmental responsibility in all spheres of life.

In summary, the introduction presented a comprehensive view of the theme, aligning objectives, hypotheses, and justifications, and established the foundation for the critical analysis developed in the subsequent sections of the work. The research sought to contribute to building more effective and integrated environmental education, essential for forming conscious citizens committed to sustainability and environmental preservation.

METHODOLOGY

This research adopts a qualitative and bibliographic approach, aiming to analyze the principles of environmental education and its relationship with teacher training, identifying pedagogical practices that promote sustainability in the school context. The choice of bibliographic research is justified by the need to understand, from different theoretical perspectives, the foundations of environmental education, its historical evolution, and the competencies required for teaching in this field. This type of study allows organizing, comparing, and reflecting on information from reliable sources, promoting a critical analysis that supports the development of the article.

To construct the theoretical framework, works by classical and contemporary authors were selected, covering concepts, principles, and practices of environmental education, as well as studies related to teacher training and sustainable pedagogical methodologies. Among the selection criteria for sources, academic relevance, publication currency, and pertinence to the central theme of the study stand out. Books, scientific articles, legal documents, and reports from international organizations such as UNESCO were consulted, ensuring a broad and well-founded approach.

The analysis of information followed a critical and interpretative logic, allowing the identification of patterns, convergences, and divergences among authors, in addition to relating theory and practice in environmental education. In this process, essential competencies and skills for teachers to implement pedagogical strategies that promote environmental awareness were highlighted, as well as the challenges and opportunities of continuous training. The methodology also enabled understanding how the principles of sustainability, interdisciplinarity, critical thinking, and socio-environmental responsibility can be incorporated into teaching practices, making education more meaningful and transformative.

Moreover, the research sought to integrate theoretical reflections and practical recommendations, ensuring that the study does not remain limited to conceptual exposition but also offers applicable guidelines for everyday school life. The absence of interviews or field surveys did not compromise the analytical nature of the work, as the bibliographic approach provided a consistent overview of the theme, supporting the discussion of pedagogical strategies, active methodologies, and successful teaching experiences.

In summary, the adopted methodology combines academic rigor and practical relevance, enabling the construction of a well-founded and reflective study on teacher education and environmental education. The critical analysis of specialized literature provides solid theoretical support to understand the importance of environmental education principles, the need for teacher training, and the application of sustainable pedagogical practices, contributing to the formation of conscious citizens committed to environmental preservation.

DEVELOPMENT

ENVIRONMENTAL EDUCATION: CONCEPTS AND EVOLUTION

Environmental Education (EE) has established itself as an essential field for forming critical, conscious citizens capable of acting in favor of sustainability. Although its modern expression has intensified in recent decades, the concepts that underpin it stem from a historical concern with the relationship between society and the environment. According to Capra (1996), environmental education is not limited to transmitting information about the natural environment but involves developing attitudes, values, and behaviors that promote preservation and quality of life on the planet. In this sense, EE presents itself as a broad, interdisciplinary, and continuous educational process, whose objective is to build ecological awareness capable of guiding sustainable everyday practices (Sauvé, 1996).

Classical authors, such as Carson (1962), in the work *Silent Spring*, emphasized the need to sensitize society to the impacts of human actions on the environment, warning about the harmful effects of chemical products and the predatory exploitation of natural resources. This pioneering perspective influenced the development of educational programs that sought to integrate scientific knowledge and environmental awareness. Similarly, Hungerford and Volk (1990) highlight that EE should combine cognitive, affective, and behavioral aspects, promoting not only understanding of environmental problems but also motivation for responsible action.

In the contemporary context, environmental education is understood as a process that articulates theory and practice, integrating different areas of knowledge and considering the complexity of socio-environmental problems. Ornstein and Lasley (2011) stress that modern EE seeks to form critical citizens capable of understanding ecological, social, and economic interrelationships, encouraging participatory solutions to environmental challenges. Furthermore, the modern concept of EE emphasizes sustainability as a guiding principle, promoting ethical reflection and social responsibility in all spheres of life. Historically, environmental education worldwide consolidated through global ecological awareness movements, especially following United Nations Conferences on the Environment. The Stockholm Conference in 1972 marked a turning point by recognizing the need for educational policies aimed at environmental protection, establishing guidelines for incorporating EE into school curricula and teacher



training programs (UNESCO, 1978). Later, the Rio de Janeiro Conference in 1992 emphasized sustainability and education as fundamental instruments for environmental preservation, consolidating EE as a central strategy in building more responsible and conscious societies (Brazil, 1992).

In Brazil, the first records of environmental education initiatives date back to the 1970s, mainly in projects focused on fauna and flora conservation and the protection of natural areas. From the 1990s onward, with the creation of the National Environmental Education Policy (Law No. 9.795/1999), EE became officially recognized as a right for all citizens, integrating into formal and informal education systems and strengthening teacher training aimed at sustainability (Brazil, 1999; Dias, 2002). Currently, environmental education in the country seeks to articulate ecological, social, and cultural issues, promoting participatory and interdisciplinary pedagogical practices that value collective responsibility in building a sustainable future.

Thus, environmental education presents itself as an ever-evolving field that transcends simple instruction on ecological issues and consolidates as a formative strategy of ethical, critical, and transformative character. Its historical trajectory demonstrates the growing understanding that environmental preservation depends not only on public policies but also on social mobilization and the formation of citizens capable of acting consciously and responsibly in the face of contemporary challenges.

PRINCIPLES OF ENVIRONMENTAL EDUCATION

The principles of environmental education constitute the foundation for forming conscious citizens engaged in promoting sustainability. Among the fundamental concepts, sustainability, interdisciplinarity, critical thinking, and socio-environmental responsibility stand out, guiding both educational practice and ethical reflection on the environment. Sustainability, as defined by Meadows et al. (2004), involves the ability to meet present needs without compromising resources and opportunities for future generations, becoming a central guide for organizing content and pedagogical activities aimed at environmental preservation.

Interdisciplinarity, in turn, allows environmental education to transcend the limits of isolated disciplines, integrating scientific, social, cultural, and ethical knowledge. According to Morin (2000), the complexity of environmental problems requires students to understand the interrelationships between natural and social systems, developing a holistic vision capable of connecting theory and practice. This principle reinforces the need for pedagogical strategies that promote dialogue among different areas of knowledge and encourage collaborative and contextualized problem-solving.

Critical thinking is another essential pillar of environmental education, as it stimulates reflection on the impacts of human actions and the development models adopted by society. According to Sauv 



(1996), EE does not limit itself to transmitting information about the environment; it seeks to form individuals capable of analyzing, questioning, and proposing ethical and sustainable solutions, promoting critical awareness regarding consumption practices, resource use, and environmental public policies.

Socio-environmental responsibility is directly linked to the perception that each individual plays a role in maintaining and protecting the environment. For Dias (2002), this responsibility should be practically incorporated into school life and students' routines, encouraging conscious attitudes and actions that promote collective sustainability, such as conscious consumption, waste reduction, and participation in community projects.

The relationship between theory and teaching practice is fundamental for the effectiveness of these principles. EE requires teachers not only to transmit knowledge but also to articulate practical experiences, such as visits to natural areas, school gardens, recycling projects, and community awareness activities (Ornstein & Lasley, 2011). In this way, concepts learned in the classroom gain real meaning, allowing students to internalize environmental values and develop attitudes applicable beyond the school context.

Moreover, building environmental values and attitudes in students is central to environmental education, as effective learning involves the affective dimension as much as the cognitive one. According to Hungerford and Volk (1990), it is essential to promote experiences that awaken empathy for the environment and a sense of social responsibility, encouraging sustainable behaviors and an ethical stance toward environmental challenges. This approach values the integral formation of the individual, preparing them to act consciously and participatively in society.

Therefore, the principles of environmental education function as guiding frameworks for teaching practice, integrating knowledge, critical reflection, and responsible action. They not only structure pedagogical content but also promote the construction of ethical and sustainable environmental awareness, fundamental for forming citizens committed to the planet's future.

TEACHER EDUCATION AND ENVIRONMENTAL EDUCATION

Teacher education plays a central role in the effectiveness of environmental education, as the teacher is the main mediator between theoretical knowledge and sustainable pedagogical practice. The need for continuous training stands out as an essential requirement, since the complexity of socio-environmental problems and the constant evolution of educational practices demand that teachers remain up to date. According to Sá and Dias (2001), ongoing training enables teachers to acquire new knowledge, develop innovative pedagogical skills, and integrate sustainability concepts into different subjects, promoting more effective and transformative environmental education.

Furthermore, teacher education should include the development of specific competencies and skills to implement environmental practices. Among these competencies are the ability to plan interdisciplinary activities, stimulate critical thinking, promote active student participation, and connect school content with concrete environmental issues. According to Ornstein and Lasley (2011), trained teachers can create educational experiences that link theory and practice, making learning meaningful and encouraging students to adopt environmentally responsible attitudes.

The adoption of active methodologies and sustainable pedagogical strategies is an indispensable component of teacher education in environmental education. Among the most effective practices are school projects focused on environmental preservation, community gardens, technical visits to conservation units, field studies, recycling activities, and conscious consumption initiatives (Dias, 2002; Ornstein & Lasley, 2011). These methodologies allow students to experience learning practically, develop socio-emotional skills, and build ethical values related to environmental preservation. Additionally, these strategies strengthen interdisciplinarity and collective participation, fundamental principles of environmental education, promoting a school culture committed to sustainability.

Another relevant aspect of teacher education is the ability to critically reflect on one's own pedagogical practice and adapt it to the needs of students and the school community. According to Hungerford and Volk (1990), teachers who develop this ability are more capable of engaging students in active learning processes, stimulating socio-environmental awareness, and fostering collective responsibility. The integration of educational technologies, audiovisual resources, and collaborative activities also proves effective in enhancing student engagement and making environmental education more dynamic and meaningful.

Therefore, teacher education in environmental education goes beyond acquiring theoretical knowledge; it involves building competencies, skills, and attitudes capable of transforming pedagogical practice and promoting environmental awareness in an integrated and participatory manner. Well-prepared teachers become agents of social transformation, contributing to building a more ethical, critical, and sustainable society, in which the principles of environmental education are reflected in concrete and lasting actions.

CONCLUSION

The analysis of teacher education and the principles of environmental education demonstrates that promoting education aimed at sustainability goes far beyond the mere transmission of information about the environment. It is necessary for teachers to be prepared not only to teach theoretical content but also to mediate meaningful experiences that connect knowledge to everyday practice, encouraging responsible and ethical attitudes toward the planet. Continuous training proves essential in this process, enabling



teachers to acquire new competencies, develop innovative pedagogical skills, and remain up to date in the face of contemporary socio-environmental challenges.

The principles of environmental education—sustainability, interdisciplinarity, critical thinking, and socio-environmental responsibility—provide the foundation for building comprehensive and reflective pedagogical practice. They guide the development of activities that not only inform but also promote active student engagement, strengthening values, attitudes, and environmentally conscious behaviors. When systematically and consistently incorporated, these principles allow environmental education to fulfill its transformative role, forming citizens capable of understanding the complex interrelationships among society, economy, and nature, and acting ethically and participatively in constructing sustainable solutions.

Furthermore, the integration between theory and teaching practice is fundamental for classroom content to become meaningful experiential learning. The use of active methodologies, interdisciplinary projects, field studies, and community actions contributes to making learning concrete and relevant, stimulating students' autonomy, creativity, and critical capacity. This pedagogical approach strengthens collective responsibility and demonstrates that environmental education is not an isolated theme but a transversal dimension that permeates all areas of knowledge and social life.

In summary, environmental education, combined with solid and continuous teacher training, constitutes a powerful instrument for building a more conscious, critical, and sustainable society. It transforms the teacher's role, making them an agent of social change capable of inspiring students to adopt sustainable practices and understand the importance of every individual and collective action in preserving the environment. In this context, it is possible to affirm that environmental education, when grounded in solid principles and mediated by well-prepared professionals, plays a strategic role in forming citizens committed to sustainability, promoting a paradigm shift that values life, ecological balance, and the planet's future.

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INFLUENCE OF DIGITAL PLATFORMS ON THE MEDIA ECOSYSTEM

 <https://doi.org/10.63330/aurumpub.015-023>**Ana Gabriela Simões Thomé Santana¹****ABSTRACT**

This study addressed the influence of digital platforms on the contemporary media ecosystem, highlighting significant transformations in the production, distribution, and consumption of information. The main objective was to investigate how digital innovations have shaped interactions among various social actors, including traditional and digital media. The methodology employed was a bibliographic review, which enabled the exploration of central concepts and theories related to the topic, such as convergence culture and surveillance capitalism.

The research findings revealed that digital platforms act as intermediaries, democratizing access to information while also generating challenges such as the formation of informational bubbles and the spread of disinformation. The analysis of informational bubbles evidenced the tendency for users to be exposed to content that reinforces their pre-existing beliefs, limiting the diversity of perspectives and contributing to social polarization. Furthermore, the study highlighted the emergence of disinformation, which affects not only news consumption but also trust in institutions and the quality of public debate. Transformations in journalism, driven by digitalization, demonstrated that content production must adapt to new forms of interaction and consumption, reinforcing the need for active citizen participation. Ultimately, the study concluded that a critical understanding of the media ecosystem is essential to promote a more plural and trustworthy informational environment, emphasizing the importance of media literacy strategies that empower citizens to navigate the digital environment consciously.

Keywords: Media ecosystem; Digital platforms; Disinformation; Journalism.

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INTRODUCTION

The contemporary media ecosystem has undergone profound and accelerated transformations, primarily driven by the advent of digital platforms, which significantly alter the dynamics of information production, distribution, and consumption. The convergence between traditional media—such as television, radio, and print press—and digital media—including social networks, news aggregators, and messaging apps—redefines not only how news and cultural content are consumed but also the very nature of journalism, communication, and civic participation. In this context, the media ecosystem ceases to be a linear and hierarchical space, transforming into a complex and interconnected network in which various social, technological, and institutional actors continuously interact, shaping the circulation of information and the construction of collective narratives (Castells, 2009; Jenkins, 2006).

This study aims to investigate the influence of digital platforms on the media ecosystem, analyzing how these technological innovations transform interactions among different social actors, news consumption, content production, and political and cultural participation. The research seeks to understand how the digitalization of information and media convergence contribute both to the democratization of access to information and to emerging challenges, such as the proliferation of fake news, the creation of informational bubbles, and the concentration of informational power in certain platforms (Pariser, 2011; Zuboff, 2019; Sunstein, 2001; Lazer et al., 2018).

Based on the theoretical contributions of Castells (2009) and Jenkins (2006), the investigation proposes to analyze the complexity of interactions among media, highlighting the emergence of the so-called “convergence culture,” in which the boundaries between producers and consumers of information become increasingly blurred. In this sense, the study seeks to understand how these transformations impact public opinion formation, social engagement, and civic participation in a context of increasing digitalization of communication.

The hypotheses raised include the possibility that, although digital platforms significantly expand access to information and promote greater social participation, they also concentrate informational power, influence individuals’ perception of reality, and reinforce social and cultural polarizations. The justification for conducting this study lies in the need to critically understand these communicational transformations, offering theoretical and practical support for analyzing the role of technologies in mediating social reality and building a more informed and conscious society.

The development of the study is structured into four main sections: (1) The definition of the media ecosystem and its layers, highlighting the interdependence between traditional and digital media; (2) The role of digital platforms, with emphasis on personalized curation practices and the phenomenon of surveillance capitalism; (3) The analysis of impacts on information circulation, including informational bubbles, filter bubbles, and disinformation; (4) Transformations in contemporary journalism, considering

changes in news consumption, content production, and civic participation. Each section aims to provide an integrated and critical understanding of the media ecosystem, relating theory and practice and contextualizing the current challenges of digital communication.

METHODOLOGY

The methodology employed in this study consisted of a qualitative approach, focused on a bibliographic review of relevant books and academic articles concerning the influence of digital platforms on the media ecosystem. The choice of this method was justified by the need to explore theoretical and practical concepts that underpin the transformations in contemporary communication, allowing for a critical and contextualized analysis.

The research was divided into stages. Initially, a systematic search was conducted in academic databases such as Google Scholar, JSTOR, and Scopus, using keywords related to the central themes of the study, such as "media ecosystem," "digital platforms," "disinformation," and "journalism." This search resulted in the selection of books, articles, and case studies that address the interactions between traditional and digital media, as well as their social and cultural implications.

Subsequently, the works of prominent authors in the field, such as Manuel Castells, Henry Jenkins, Eli Pariser, and Shoshana Zuboff, were analyzed. The critical analysis of these texts enabled the identification of patterns and trends related to media convergence, the impact of digital platforms on information circulation, and the formation of informational bubbles. The study also considered the evolution of journalism in response to these changes, highlighting the need for adaptation to new dynamics of consumption and interaction.

Finally, the synthesis of the collected data and reviewed theories resulted in the development of an integrated perspective on the impacts of digital platforms on the media ecosystem. This methodological approach allowed for a comprehensive understanding of the complexities involved, highlighting both the opportunities and challenges that emerge in this new communicational landscape. The analysis was structured into sections that systematically addressed the different aspects of the topic, culminating in a critical reflection on the future of information in an increasingly connected world.

DEVELOPMENT

MEDIA ECOSYSTEM

The concept of the media ecosystem has become established as a way to understand the complexity of interactions among different forms of media and the processes of information circulation in contemporary society. According to Castells (2009), the media ecosystem can be understood as an interconnected set of media, platforms, and information flows, in which diverse actors—from large

communication conglomerates to individual users—play active roles in the production, distribution, and consumption of content. In this context, media ceases to be a linear transmission system, as in traditional models, and becomes a dynamic network of interactions, where information and narratives circulate in a non-hierarchical manner, crossing geographic and cultural boundaries.

Jenkins (2006) reinforces this perspective by introducing the concept of “convergence culture,” which describes the growing integration between traditional and digital media. For the author, the contemporary media ecosystem is marked by the convergence of technologies, platforms, and consumption practices, allowing the public to actively participate in the process of producing and circulating information. In this sense, the media ecosystem is not merely a space for content dissemination, but also an environment of interaction, collaboration, and co-creation, where the barriers between producers and consumers become increasingly blurred.

The structure of the media ecosystem is, therefore, multifaceted, composed of different layers that interconnect. In the first layer are traditional media, such as television, radio, and print press, which still play a relevant role in agenda-setting and legitimizing information. These media continue to strongly influence public opinion, especially in contexts where digital access is limited or segmented. In a second layer, digital media emerge, including social networks, blogs, podcasts, and video-on-demand platforms, which offer a highly interactive and participatory environment. Here, users not only consume content but also produce and share information, expanding the reach of narratives and challenging traditional hierarchies of media power (Castells, 2009; Jenkins, 2006).

The interaction between traditional and digital media reveals significant transformations in how information is managed and perceived. On one hand, traditional media have adopted digital strategies to expand their presence, such as online portals, live broadcasts, and integration with social networks. On the other hand, digital platforms often appropriate content produced by traditional outlets, sharing it at an accelerated pace and sometimes modifying it according to algorithms that prioritize engagement and popularity. This process creates a feedback loop in which news and information circulate simultaneously across multiple channels, making the media ecosystem more complex and dynamic than ever before (Jenkins, 2006; Castells, 2009).

Moreover, media convergence also promotes a democratization of access to information, allowing previously marginalized voices to find space for expression. However, this expansion of possibilities brings significant challenges, such as the spread of disinformation and the formation of informational bubbles, in which individuals are predominantly exposed to content aligned with their pre-existing beliefs. Therefore, understanding the media ecosystem requires not only an analysis of technologies and platforms but also a reflection on their social, cultural, and political impacts, especially in the formation of public opinion and the construction of collective narratives (Castells, 2009; Jenkins, 2006).

In summary, the media ecosystem represents a complex and interconnected space in which traditional and digital media coexist and interact, influencing both the production and consumption of information. This interconnection implies challenges and opportunities for contemporary communication, requiring researchers, professionals, and citizens to develop a critical understanding of information flows and the role of technologies in mediating social reality. Understanding the media ecosystem is, therefore, essential to interpret the communicational transformations of contemporary society and to reflect on the future of information in an increasingly connected world.

DIGITAL PLATFORMS

Digital platforms constitute a central element of the contemporary media ecosystem, functioning as intermediaries between producers and consumers of information. Unlike traditional media, these platforms offer highly interactive environments in which users actively participate in the creation, sharing, and dissemination of content. According to Pariser (2011), social networks, news aggregators, and messaging apps have the power to shape perceptions of reality by presenting information selected according to users' individual interests and behaviors—a phenomenon the author refers to as the “filter bubble.” This mechanism creates a personalized yet limited experience, in which individuals tend to consume content aligned with their pre-existing opinions, thereby reducing exposure to divergent perspectives.

Zuboff (2019) complements this analysis by discussing the concept of surveillance capitalism, in which digital platforms use behavioral data to segment, monetize, and influence the public. Every interaction, click, and share is monitored, allowing algorithms to determine which content will be prioritized and displayed to users. In this way, not only is information consumption shaped in a personalized manner, but the very production of news and content is influenced by metrics of engagement and popularity—often at the expense of depth or accuracy.

Social networks such as Facebook, Instagram, Twitter (or X), and TikTok exemplify the capacity of these platforms to connect millions of people simultaneously, becoming predominant channels for the circulation of news and cultural trends. News aggregators like Google News and Feedly function as automatic curators, gathering content from multiple sources and presenting it to users based on algorithms that prioritize relevance, interest, and frequency of access. Messaging apps such as WhatsApp and Telegram enable rapid and direct dissemination of information within private groups, expanding the reach of messages and often complicating fact-checking due to the closed and encrypted nature of these platforms (Pariser, 2011; Zuboff, 2019).

Personalized curation performed by algorithms is a central point of analysis regarding digital platforms. These systems not only decide what each user will see but also create unique informational

trajectories, shaping habits, preferences, and even political and social attitudes. While this process offers an individualized and efficient experience, it also raises significant ethical and social concerns, including the potential for manipulation, reinforcement of existing biases, and the creation of informational bubbles that limit public debate and the diversity of opinions (Zuboff, 2019).

In light of this scenario, it becomes evident that digital platforms play a dual role: on one hand, they democratize access to information and expand social participation; on the other, they concentrate power over information flows, influencing behaviors, opinions, and individual choices. Understanding the operation of these platforms is therefore essential to analyze the effects of the contemporary media ecosystem, as well as to develop media literacy strategies that enable users to navigate the digital environment critically and consciously.

In summary, digital platforms—by integrating social networks, news aggregators, and messaging apps, and by employing personalized curation algorithms—radically transform the production, distribution, and consumption of information. They redefine the role of the public and journalism, creating opportunities for engagement and civic participation, but also challenges related to information quality, diversity of voices, and the critical development of users (Pariser, 2011; Zuboff, 2019).

IMPACTS ON INFORMATION CIRCULATION

The circulation of information in the contemporary media ecosystem has been profoundly impacted by digital platforms and the algorithms that regulate access to content. One of the most studied phenomena in this context is that of informational bubbles, also known as filter bubbles. Sunstein (2001) describes these bubbles as environments in which individuals are predominantly exposed to information that reinforces their pre-existing opinions, with little or no confrontation with divergent perspectives. This mechanism, amplified by social networks and algorithmic curation systems, tends to create fragmented realities in which groups of users share homogeneous worldviews, strengthening polarization and hindering public dialogue.

The impact of informational bubbles is not limited to the subjective perception of reality; it directly affects public opinion formation, decision-making, and trust in institutions. By receiving only content that confirms personal beliefs, individuals tend to reinforce prejudices, reduce their capacity for argumentation, and become more vulnerable to external manipulation. Furthermore, the segmentation of the public into bubbles makes it difficult for essential information to reach a broader audience, creating gaps in collective knowledge and fragmenting social debate (Sunstein, 2001).

Another phenomenon closely linked to the circulation of information on digital platforms is disinformation, including the spread of fake news. Lazer et al. (2018) emphasize that the ease of sharing, combined with the speed of social networks, makes the digital environment highly conducive to the

propagation of false news. Unlike traditional journalism, which relies on editorial processes and fact-checking, digital platforms allow any user to publish content that can quickly reach millions of people, often without verification. The combination of curation algorithms, emotional engagement, and rapid dissemination creates a cycle in which incorrect information spreads faster than corrections or clarifications, amplifying disinformation and its social effects.

The impact of disinformation goes beyond the informational field, affecting political, social, and cultural processes. Studies indicate that the spread of false news can influence elections, social mobilizations, and even adherence to public health behaviors, as seen in vaccination campaigns or health crises. Moreover, the coexistence of reliable and false information in the same digital space increases the complexity of critical analysis, requiring users to develop advanced media literacy skills and critical thinking to identify trustworthy sources and understand broader contexts (Lazer et al., 2018).

In summary, the impacts on information circulation in the contemporary media ecosystem are profound and multifaceted. Informational bubbles and filter bubbles limit the diversity of perspectives and contribute to social polarization, while disinformation and fake news threaten trust in information and affect individual and collective decision-making. Understanding these phenomena is essential for developing media education strategies, fact-checking policies, and regulations for digital platforms, aiming for a more pluralistic, critical, and trustworthy informational environment (Sunstein, 2001; Lazer et al., 2018).

TRANSFORMATIONS IN JOURNALISM

Contemporary journalism has undergone profound transformations, driven by the emergence of digital platforms and the convergence of traditional and digital media. Vidigal de Carvalho (2017) highlights that news consumption has ceased to be linear and centralized—as was the case with printed newspapers, radio, and television—and has become fragmented, personalized, and multidirectional.

Users now access information through social networks, news aggregators, and messaging apps, often selecting content that aligns with their individual interests and consumption habits. This shift implies that journalistic content production must adapt to faster, more visual, and interactive formats, prioritizing audience attention in environments saturated with information.

Ortega y Gasset (1997) had already pointed out the need for journalism to keep pace with social and technological transformations in order to remain relevant. In the current context, this adaptation involves not only diversifying channels and formats but also incorporating new digital resources such as infographics, short videos, and live broadcasts, which aim to engage the audience in a more direct and participatory manner. This evolution transforms journalism into a more dynamic process, in which the

audience ceases to be a mere passive receiver and begins to act as a co-producer of content—sharing, commenting, and, in many cases, creating their own narratives.

Media convergence plays a central role in this scenario, integrating different platforms and technologies into a single informational flow. This convergence is not limited to technological aspects; it also involves editorial practices and strategies, relationships with the audience, and new forms of monetization and content distribution. In this sense, the line separating traditional and digital media becomes increasingly blurred, allowing journalistic content to circulate simultaneously across multiple channels, reaching diverse audiences and amplifying the impact of information (Vidigal de Carvalho, 2017).

Another relevant aspect of the transformations in journalism is the strengthening of civic participation. With digitalization and the interactivity provided by platforms, citizens have come to play an active role in the production and circulation of information—whether through comments, social media posts, or the creation of blogs and podcasts. This participation not only expands the diversity of voices and perspectives but also challenges journalism to deal with content produced outside traditional structures, requiring new approaches to fact-checking, mediation, and ethical responsibility (Ortega y Gasset, 1997; Vidigal de Carvalho, 2017).

Taken together, the transformations in journalism reflect a paradigmatic shift in how information is produced, distributed, and consumed. The adaptation to new technologies and formats, media convergence, and the emphasis on civic participation demonstrate that contemporary journalism must balance speed, interactivity, and credibility, while preserving its role in informing, shaping opinion, and fostering public debate. Understanding these changes is essential for analyzing the impact of digital platforms on the media ecosystem and for developing strategies that ensure responsible, pluralistic, and democratic communication in the digital age.

CONCLUSION

The analysis presented throughout this study reveals the complexity and dynamism of the contemporary media ecosystem, marked by the intersection of traditional and digital media. The research confirmed that digital platforms play a central role in the production, distribution, and consumption of information, profoundly transforming the way citizens interact with media narratives. Drawing on the theories of Castells and Jenkins, it was possible to understand that the media ecosystem is not merely a space for content dissemination, but an interactive and collaborative environment where different actors—from large communication conglomerates to individual users—play active roles.

However, this democratization of access to information brings with it significant challenges. The phenomenon of informational bubbles, described by Sunstein, demonstrates how digital platforms can

limit exposure to divergent perspectives, reinforcing prejudices and polarizing opinions. The spread of disinformation, driven by the speed and ease of sharing on social networks, also emerged as a central concern, affecting trust in institutions and the quality of public debate. These aspects underscore the urgent need to develop media literacy strategies that enable citizens to discern between reliable and false information, promoting a more pluralistic and critical informational environment.

Furthermore, the transformations in contemporary journalism, discussed by Vidigal de Carvalho, reveal that journalistic content production must adapt to new forms of consumption and interaction. The strengthening of civic participation, driven by digital platforms, challenges journalism to consider voices outside traditional structures, requiring new approaches to fact-checking and ethical responsibility.

Therefore, understanding the changes in the media ecosystem is crucial not only for academic analysis but also for the formation of critical and informed citizens.

In summary, the findings of this study highlight the interconnection between media and its implications for public opinion formation and the construction of collective narratives. As society moves toward an increasingly connected future, the ability to navigate the digital environment critically becomes essential. Thus, it is imperative that researchers, communication professionals, and citizens unite in the pursuit of a media ecosystem that, while promoting participation and diversity, also ensures the quality of information and the integrity of public debate.

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IMPLEMENTATION OF EVFCS ON HIGHWAYS: STUDIES AND LESSONS FROM AN R&D PROJECT <https://doi.org/10.63330/aurumpub.015-024>**Joelson Lopes da Paixão¹ and Alzenira da Rosa Abaide²****ABSTRACT**

The global energy transition and the advent of clean mobility are unequivocal realities. This work addresses these themes pragmatically, examining the studies, challenges, and considerations inherent in the implementation of Electric Vehicle Fast Charging Stations (EVFCS). Pioneering EVFCS face multifaceted challenges, including: optimal siting, usability forecasting, technical configuration of individual stations, grid impact assessments, usage projections, and investment return analyses, among others. Based on a real-world case study conducted in Southern Brazil, this paper discusses the main factors and comprehensive studies developed for the deployment of EVFCS. Consequently, the principal contributions herein constitute an evaluation of the research, practical experiences, operational difficulties, and results obtained from a dedicated Research and Development (R&D) project.

Keywords: Energy transition; Fast charging infrastructure; Grid integration; CO2 reduction; R&D project.

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INTRODUCTION

The global energy transition represents a paradigm shift in transportation systems, driven by the imperative to reduce atmospheric pollution, diversify energy sources, and decrease CO₂ emissions. This transformation is particularly critical in the transportation sector, which accounts for approximately 33% of global greenhouse gas emissions [1]. In Brazil, this percentage is even more significant, with road transport contributing 71% of the sector's total emissions, making mobility decarbonization an urgent priority for achieving national climate targets [2]. Electric mobility has emerged as a technically viable and environmentally sustainable solution to the challenges associated with fossil fuel consumption in transportation [3].

The Brazilian electric vehicle market has experienced exponential growth, with an 80% increase in adoption during the pandemic period, reflecting growing environmental awareness and the search for sustainable alternatives [3]. Government initiatives such as the Mover Program (Green and Innovative Mobility) have accelerated this transition through fiscal incentives and investments exceeding R\$ 19 billion in financial credits until 2028.

However, the expansion of the electric vehicle fleet is intrinsically dependent on the development of adequate charging infrastructure, particularly Fast Charging Stations (EVFCS). The implementation of these stations faces multiple interdisciplinary challenges encompassing technical, economic, regulatory, and operational aspects. Recent studies indicate that more than 50% of consumers still hesitate to adopt electric vehicles due to insufficient charging infrastructure, while approximately 20% of charging attempts at public stations fail due to reliability issues [2].

The technical challenges for EVFCS implementation include: optimal allocation considering traffic flow patterns and grid capacity; proper sizing of power electronics components; mitigation of power quality issues such as voltage sags, harmonic distortions, and phase unbalance; and thermal management of high-power charging systems [4]. Economic obstacles involve high capital expenditure for grid connection and equipment, operational costs dominated by demand charges, and uncertain return on investment due to evolving usage patterns [5].

The Brazilian energy context adds additional layers of complexity. Although the national grid is predominantly renewable (with hydroelectric power representing approximately 65% of the matrix), regional limitations in transmission and distribution infrastructure require significant investments to support the growing demand for electric vehicle charging [?]. Furthermore, the geographical vastness of the country necessitates careful planning of charging station deployment to avoid creating connectivity gaps between urban centers.

This study aims to address these challenges through a comprehensive analysis based on empirical data from a real-world Research and Development (R&D) project implemented in southern

Brazil, as shown in Fig. 1.

The research employs a multidisciplinary approach that integrates: optimal allocation methodologies for EVFCS with distributed energy resources; advanced load modeling and generation potential assessment; comprehensive electrical studies evaluating grid impacts and power quality; economic viability analysis under different business models; and development of energy management strategies for optimized operation [6], [7], [8].

Figure 1: Geographical distribution of EVFCS in the Mercosur Route project [9].



EVFCS ALLOCATION AND DERS EVALUATION

Several scientific studies, alongside site visits and further research, were conducted for the selection and evaluation of candidate locations to host Electric Vehicle Fast Charging Stations (EVFCS). A methodology was developed and applied to determine the optimal placement of Fast Charging Stations (FCS) along an 832 km stretch of highway in southern Brazil, which previously lacked any charging infrastructure. Utilizing a Genetic Algorithm, the study evaluated existing establishments, such as gas stations and shopping centers, based on three primary criteria: daily vehicle traffic flow, population of the nearest city, and the level of service offered by the location. The key finding was the determination that eleven stations would be required to cover the route, adhering to a maximum inter-station distance of 100 km, resulting in a final average spacing of 79.7 km. The significant advantage of this methodology is its capacity to optimize resource allocation by minimizing the number of required stations while simultaneously maximizing the utility of the selected sites, in addition to reducing investment costs by leveraging pre-existing infrastructure [10].

Other studies encompassing broader technical, socioeconomic, and wind and photovoltaic

generation potential factors were also conducted [6]. Thus, in [11] a methodology was proposed to evaluate and hierarchically rank candidate locations for the installation of an “EVFCS microgrid.” This innovative concept integrates a charging station with on-site renewable energy generation (photovoltaic solar and wind). Using the Analytic Hierarchy Process (AHP), the study ranked 29 candidate points along the “Mercosul Route” based on 12 distinct criteria, ranging from vehicle flux and socio-economic data to specific solar and wind generation potential. The results indicated that the highest-ranked locations were situated on the segment between Porto Alegre and Torres, which excelled in nearly all evaluated criteria. The advantage of this approach is its ability to manage complex, multi-criteria decisions in a structured manner, offering a clear ranking that aids in investment optimization and promotes the creation of a more sustainable and resilient charging infrastructure. The availability of renewable generation for integration with EVFCS was also a subject of initial studies. A technical survey was conducted to identify the essential criteria for assessing small-scale wind generation potential, aimed at supporting projects such as renewable-powered electric vehicle charging stations. The work details crucial parameters, including wind speed distribution, wind power density, terrain roughness, and altitude. A case study was performed on the coast of Rio Grande do Sul, which concluded that the region possesses highly favorable conditions for wind energy harnessing, with average wind speeds predominantly above 5 m/s, low terrain roughness, and high wind power density, exceeding 400 W/m² in more than half of the area. The primary advantage of this study is that it provides a simplified and consolidated guide for use in future feasibility analyses, promoting the integration of clean energy into new applications and offering specific, valuable data for project development in the coastal region of Rio Grande do Sul [7].

EVFCS LOAD MODELING AND DER GENERATION

In the absence of a consolidated usage history for EVFCS, several studies have been developed to predict usage patterns, estimate future scenarios and demands, and evaluate potential on-site energy generation capabilities. A refined model is proposed to accurately estimate the charging duration of various EV models, addressing the limitations of generalized approaches that often lead to station sizing inaccuracies. The model incorporates specific battery characteristics of each vehicle, charger power output, and critically, the stochastic nature of the initial and final State of Charge (SoC). Utilizing a comprehensive database of 73 EV models available in the Brazilian market and employing Monte Carlo simulations to emulate vehicle arrival patterns, the model computes charging times on an individual basis, accounting for the characteristic reduction in charging rate above 80% SoC. Model validation demonstrated strong agreement between calculated charging durations and manufacturer specifications, while revealing substantial variability in charging times: for identical vehicle models, charging duration

exhibited a range of 39 to 112 minutes. The primary contribution of this methodology is its capacity to generate realistic estimates, serving as an essential tool for precise EVFCS dimensioning, queue management optimization, and accurate electrical grid demand forecasting [12].

The research presented in [13] focuses on predicting the saturation threshold of EVFCS infrastructure, specifically identifying the point at which queue formation becomes operationally critical as EV market penetration increases. The methodological framework employs a three-stage stochastic operation model incorporating: (1) Monte Carlo simulation of driver behavior patterns (including range anxiety considerations), (2) traffic flow modeling, and (3) station operation simulation. Applied to an actual highway corridor in southern Brazil, the investigation utilized quantile analysis (deciles) to assess queue formation probabilities across varying EV adoption scenarios (0.1% to 30% market penetration). Results demonstrated that the reference infrastructure configuration (a station with three charging units) would maintain adequate service levels up to 10% EV market penetration, beyond which queue formation would become frequent. Severe saturation conditions were predicted to occur at penetration rates between 20% and 30%. This approach provides grid operators and planners with a proactive planning tool to identify infrastructure limitations and schedule capacity expansions prior to service quality degradation.

Complementary research examines the impact of charging demand uncertainty on both operational planning and business model viability for EVFCS installations [14]. The study compares two distinct configurations: a conventional charging station (without integrated generation) and a microgrid implementation incorporating DERs and BESS. Through a stochastic model generating multiple load profile scenarios coupled with an optimization framework minimizing operational expenditures, the research developed a pricing model incorporating both fixed infrastructure costs and variable operational expenses. Results indicated that while the microgrid configuration significantly reduced energy procurement costs (through reduced grid dependence), it incurred approximately fivefold higher availability costs due to substantial capital investment requirements. This economic structure renders the microgrid business model particularly vulnerable under low-utilization scenarios where high fixed costs may lead to financial losses. This analysis provides valuable insights into the fundamental trade-off between operational efficiency and financial risk exposure, offering a realistic assessment of different EVFCS business model viability in uncertain market conditions [14].

Focusing specifically on microgrid operation, the investigation in [15] developed a comprehensive methodology to evaluate the energy self-sufficiency of a highway charging microgrid integrating photovoltaic generation, wind generation, and BESS capacity. Using the HOMER software platform for energy generation modeling and polynomial trend analysis for EV fleet growth projections in the Brazilian market, the study quantified the microgrid's capacity to meet

evolving charging demands over time. Results indicated that while the microgrid could generate approximately 7,000 kWh monthly (sufficient for 175 full charges of 40 kWh each) and achieve high autonomy levels under current conditions, this capacity would become inadequate with increasing EV adoption rates. By 2027, the system would only be capable of serving 2.15% of the EVs projected to transit through the location. This research provides a dynamic modeling framework to quantify the sustainability of charging microgrids, demonstrating how localized generation can mitigate grid impact while emphasizing the necessity of strategic planning for future capacity expansions.

ELECTRICAL STUDIES - IMPACTS AND ENERGY QUALITY

The integration of EVFCS and/or microgrids into existing electrical systems presents significant challenges, necessitating specific technical studies. In [16], the electrical impacts of integrating an EV charging microgrid into an existing distribution network in southern Brazil were investigated through simulation. The modeled microgrid comprised a fast charger, photovoltaic and wind generation, and a BESS. The study conducted 365-day simulations using OpenDSS software, comparing feeder performance with and without the microgrid. Results indicated that the microgrid connection caused no negative impacts on the electrical network, maintaining voltage levels and percentage losses virtually unchanged. A key advantage demonstrated was the microgrid's high energy self-sufficiency, consuming an average of only 73.77 kWh from the grid daily, while internally generating and consuming 263 kWh. Furthermore, the maximum power demanded from the grid (82.5 kW) was lower than the total simultaneous charging capacity (93 kW), highlighting the consistent support from local generation and BESS in alleviating grid load. No feeder failures were observed, as the additional load from a single EVFCS was not substantial.

Conversely, focusing on operational EVFCS at a high-demand charging station, the study in [4] analyzed power quality at a functioning FCS using actual measured field data. The research installed a power quality analyzer on a 60 kW DC / 44 kVA AC charger in Eldorado do Sul, Brazil, collecting data during April 2024 and selecting a high-demand day for detailed analysis. Results showed that voltage levels and network frequency remained within acceptable limits even during intensive operation, with Total Voltage Harmonic Distortion THDV reaching a maximum of 2.63%.

However, Total Current Harmonic Distortion THDI exhibited elevated values, with peaks of 22.24% (Phase A), 29.90% (Phase B), and 23.52% (Phase C), suggesting a significant source of harmonic distortion. The primary advantage of this work is the use of field-measured data, which provides greater realism to the analysis. The study infers that the high current distortion in Phase B may be attributed to a 9 kWp photovoltaic system connected to this phase, highlighting the importance of investigating and mitigating harmonics generated by renewable energy integration with charging

infrastructure. It is important to note that elevated THDI values were observed with chargers idle, meaning at low current. Nevertheless, in future EVFCS expansions, additional studies and potentially harmonic mitigation methods may be required.

ECONOMICAL STUDIES

Although conducted within an R&D framework with allocated funding, it remains crucial to develop models and evaluate the economic feasibility of an EVFCS. In [5], a methodology for the economic assessment of EVFCS operation on highways is elaborated, analyzing two distinct locations in Rio Grande do Sul: one in a high-traffic area and another in a less congested region. Utilizing demand projections based on EV fleet growth and the Net Present Value (NPV) method to calculate investment returns, the results underscored the critical importance of location. The station in the metropolitan area exhibited an estimated payback period of less than 4 years, whereas the station in the lower traffic location would require at least 6 years to recover the initial investment. The analysis also indicated that the busier station would rapidly reach its maximum capacity, highlighting the necessity for continuous planning for future expansions.

Meanwhile, [17] conducts a feasibility analysis by evaluating different infrastructure configurations, ranging from a simple charger to a complete microgrid with solar generation, wind generation, and BESS. The study estimated generation and consumption scenarios and applied the NPV method to determine the investment payback period for each configuration. The results demonstrated that, even under an optimistic scenario of exponential EV fleet growth, the payback period for the complete microgrid would be 8 to 9 years, while a simpler configuration with a charger and photovoltaic system would achieve return in 5 years. The research concludes that although storage systems offer operational benefits, their high initial cost significantly prolongs the financial return, suggesting that a phased investment approach — starting with the charger and photovoltaic generation — is the most prudent strategy for investors.

STRATEGIES OF ENERGY MANAGEMENT

The deployment of a microgrid, beyond its energy and sustainability benefits, introduces demands for sophisticated management and control strategies. In [18], energy management is centered on an optimization algorithm for the dispatch of a BESS. The primary method involves formulating a "preference index" based on a Time-of-Use (ToU) energy tariff. This index guides the management system, signaling the preference to charge the BESS during low-tariff periods and discharge it to meet EV charging demand during high-tariff periods. The procedure is modeled as a Mixed-Integer Linear Programming (MILP) optimization problem, with an objective function to maximize the

charge and discharge rates of the BESS weighted by the preference index, resulting in reduced operational costs.

Building on these studies, a very similar management procedure is described, also formulated as a MILP optimization problem to control the dispatch of a BESS. The method begins with the modeling of microgrid components, estimating renewable generation profiles (solar and wind) using the Homer software and EV charging scenarios via Monte Carlo Simulation. The core procedure is the application of an objective function that maximizes BESS dispatch based on a price preference index. The optimization is then solved using the AMPL language and the CPLEX solver, considering a one-year horizon with 5-minute intervals and respecting operational constraints such as energy balance, BESS SoC limits, and energy exchange capacity with the grid. The objective function aims to maximize BESS utilization during periods of highest economic advantage, resulting in optimized dispatch that balances local generation, storage, and grid energy purchases to minimize costs [19], [20].

With the advancement of research, new proposals and more dynamic and efficient strategies have been proposed. [21] presents a Rule-Based Energy Management System (RBEMS). The procedure is based on three forecasting models that feed the decision system: photovoltaic generation is predicted by an Artificial Neural Network (ANN); wind generation is estimated by a parametric model based on the theoretical power curve of the turbine; and EV consumption is forecasted by a Monte Carlo Simulation generating the worst-case daily demand scenario. Based on these forecasts, the RBEMS executes a set of predefined rules every 15 minutes, making decisions to charge/discharge the BESS or interact with the grid based on energy tariffs, battery SoC, and the balance between generation and consumption, prioritizing renewable energy self-consumption. The method also includes a stochastic analysis to quantify the financial impact of forecasting errors, offering insights into the system's robustness.

To complement this work, [8] details an optimization-based energy management method that explicitly considers BESS degradation. The procedure begins with input modeling: renewable generation profiles are estimated from physical-mathematical models fed by meteorological forecast data from an API; EV charging profiles are generated from statistical analysis of a historical database of actual charging events. The core of the method is the formulation of a MILP optimization problem, whose objective function is to minimize total operational cost. This cost comprises the cost of energy purchased from the grid and the cost of battery degradation per charge/discharge cycle, calculated by a wear cost function. The algorithm then determines the optimal BESS dispatch for the next day, balancing immediate energy tariff costs with long-term battery wear costs.

EVFCS OPERATIONAL DATA AND LEARNINGS

The deployment and operation of the 11 EVFCS within the R&D project have yielded invaluable real-world data and profound practical learnings that extend far beyond the quantitative metrics of energy consumption and usage patterns. This section synthesizes these operational results with the significant implementation challenges encountered, providing a holistic view of the current state of EV infrastructure deployment in the Brazilian context [9]. The analysis of charging events reveals a consistent usage profile characteristic of highway corridors. Charging duration confirms that the majority of users utilize the 60 kW DC chargers for sessions between 20 to 40 minutes, aligning with the expected behavior for top-up charging during medium to long-distance trips. This is further corroborated by the energy consumed per session, which typically ranges from 15 to 30 kWh, sufficient to add a significant range to most EVs. The concentration of connection times during the afternoon and early evening underscores the stations' role in supporting travel that combines daily commutes with intercity journeys. Furthermore, the analysis of potential queuing events—where a new session starts within 5 minutes of a previous one—revealed critical congestion points, with the Pelotas station showing a rate of 30%, indicating high demand that occasionally exceeds the available capacity of a single DC charger [9].

However, the journey to acquiring this data was fraught with hurdles that highlight the immaturity of the EV ecosystem in the region. A significant non-technical challenge was the difficulty in securing host locations. Commercial establishments were often reluctant to cede parking spaces due to concerns over business disruption during installation, perceived liabilities, and a lack of immediate, clear economic benefits. This underscores the necessity of developing a compelling value proposition for hosts, extending beyond simple revenue sharing to include increased customer dwell time and attraction of a high-income demographic.

On the technical front, the project highlighted the critical importance of grid connection specifications. For high-power stations, a standard commercial metering system is inadequate. The project learned that an indirect metering system via instrument transformers (CTs and VTs) is mandatory for accurate measurement and compliance with utility regulations for high-capacity connections. Furthermore, communication infrastructure proved to be a linchpin for reliable operation. The dependency on a single cellular network for data transmission to the cloud management platform was identified as a risk; a more robust design requires a primary link (e.g., fiber optic) with a cellular modem as a mandatory backup to ensure continuous monitoring, remote diagnostics, and payment processing.

The logistical landscape presented its own set of challenges. Unpredictably long lead times were experienced for critical path items, including the delivery and installation of power transformers by the utility and the manufacturing and shipping of the charging hardware itself. These delays, often

exacerbated by global supply chain issues and the lingering effects of the COVID- 19 pandemic, require incorporating significant buffers into project timelines and developing strong contingency plans.

Perhaps the most persistent operational challenge stems from the technological immaturity and lack of a localized support ecosystem. The scarcity of specialized technical expertise for high-power charging systems meant that routine maintenance, firmware updates, and troubleshooting required dedicated travel from central teams, leading to longer station downtimes. This was compounded by the recent availability and reliability of components; the project served as a real-world beta test, often being the first to identify the need for firmware updates, component replacements, and hardware revisions. This experience emphasizes that pioneering projects must account not only for capital expenditure but also for the high operational cost of maintaining a nascent and evolving technology. The parallel challenge of a lack of a dedicated electromobility team within the local distribution utility often led to knowledge gaps and slower response times for connection approvals and technical support, highlighting the need for proactive engagement and training with utility partners.

The operational data confirms that the deployed infrastructure is effectively serving a growing and engaged user base, enabling longer journeys and reducing range anxiety. However, the learnings from this R&D project paint a clear picture: the major barriers to mass deployment are no longer primarily technological but are rooted in economic viability, logistical planning, ecosystem development, and regulatory alignment. Future expansions must prioritize strategies that mitigate these identified challenges, such as redundant communication designs, pre-established local service partnerships, proactive utility engagement, and robust project management that accounts for extended lead times.

CONCLUSIONS AND FUTURE STUDIES

This study has provided an overview of the challenges of deploying EVFCS in south of Brazil, drawing on real-world operational data. The adoption of EVs in Brazil is experiencing exponential growth, a trend that has significantly accelerated since 2020. This surge is fueled by increasing consumer confidence, a growing model portfolio, and a broader societal acceptance of electromobility. Although the absolute number of electrified vehicles (including both pure electric and hybrids) remains modest compared to global leaders, nearing 1 million units, the market demonstrates immense potential [3]. The analysis of highway charging patterns confirms a corresponding rise in demand for public EVFCS, particularly along corridors with high traffic flow. The research also reinforces the potent synergy between DERs and EVs, a combination proven to be economically advantageous and environmentally sustainable, forming a cornerstone for a clean energy future.

However, the journey towards a robust charging network is not without its obstacles. The

initial implementation phase faced significant hurdles, primarily due to the technological immaturity of the ecosystem and a natural hesitation during the early stages of market popularization. Challenges such as securing host locations, ensuring reliable internet and cellular communication for station management in remote areas, and navigating extended lead times for equipment and grid connections were critical learning points. While these barriers are now being progressively overcome, they underscore the necessity of strategic planning, robust project management, and proactive engagement with all stakeholders, including utilities, host businesses, and governments.

Looking ahead, this work opens several promising avenues for future research. Based on the identified challenges and opportunities, subsequent studies should focus on the economic and technical viability of V2G applications, particularly in residential/commercial settings such as condominiums. Another direction is the development of the second-life battery market and its integration with energy storage systems, which can support the grid while reducing the overall costs associated with EVs. Additionally, the creation of innovative business models and management strategies for the emerging used EV market in Brazil deserves further exploration. Finally, the design, optimization, and operation of EVFCS microgrids are a key research pathway to improve local resilience and sustainability.

The ongoing deployment of more EVFCS remains a priority. Future engineering challenges will involve not only increasing the number of stations to avoid congestion and create a comprehensive, non-sparse network but also deploying units with even higher power capacities (150-350 kW) to meet the demands of next-generation EV and reduce charging times further.

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MANAGERIAL PROCESSES IN PUBLIC ADMINISTRATION

 <https://doi.org/10.63330/aurumpub.015-025>**Antônia Marciana Santos Ribeiro¹****ABSTRACT**

This study addresses managerial processes in public administration, analyzing how planning, organization, direction, and control contribute to improving efficiency, transparency, and the quality of public services. The general objective was to understand the importance of administrative processes in contemporary public management, identifying their historical evolution, theoretical principles, and practical applications within the context of the modern State. The research was qualitative and bibliographic, grounded in classical and contemporary authors of administration, such as Fayol, Chiavenato, Matias-Pereira, and Motta, as well as official documents guiding public sector reform and governance in Brazil. The analysis revealed that public administration has undergone different management models—from patrimonialism and bureaucracy to the managerial paradigm and public governance—gradually incorporating practices such as strategic planning, results-based management, and the use of digital technologies. It was found that managerial processes, when applied in an integrated and ethical manner, enable greater administrative rationality, transparency, and citizen focus, strengthening the legitimacy of public institutions. The study also demonstrated that valuing people, fostering innovation, and cultivating a culture of continuous learning are essential conditions for successful administrative reforms and for advancing public management in the country. It concludes that the modern public manager must balance technical efficiency with human sensitivity, promoting administration oriented toward the common good, guided by social responsibility, ethics, and citizen participation.

Keywords: Public administration; Managerial processes; Public management; Innovation; Transparency.

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INTRODUCTION

Contemporary public administration has undergone profound transformations in recent decades, driven by the need to make the State more efficient, transparent, and responsive to social demands. The growing complexity of relations between government and society requires public managers to adopt modern administrative practices capable of reconciling technical efficiency, social responsibility, and ethics in the exercise of public functions. In this context, understanding managerial processes and their application in the public sector is essential to grasp how public management can contribute to institutional development and to improving services provided to the population.

The literature on the subject, represented by authors such as Matias-Pereira (2012), Motta (2013), and Chiavenato (2014), emphasizes that public administration should be analyzed not merely as a set of structures and norms but as a dynamic system of human relations and decisions that directly impact collective life. Motta (2013) stresses that the modern manager must develop competencies aimed at coordinating people and resources, promoting a balance between administrative rationality and ethical sensitivity. Matias-Pereira (2012) observes that Brazilian public administration has been guided by principles of governance and accountability, seeking to combine strategic planning, technological innovation, and a focus on results.

The general objective of this work is to analyze managerial processes in public administration, discussing how planning, organization, direction, and control contribute to the efficiency and transparency of state management. Specifically, it aims to understand the historical evolution of public management models—from bureaucratic to managerial and governance-based—examine the practical application of managerial processes in the public sector, and reflect on the challenges of innovation, transparency, and valuing public servants as strategic elements of modern management.

The central hypothesis guiding this study is that the effective application of managerial processes in the public sector strengthens administrative efficiency, enhances transparency, and improves the delivery of public services, provided it is combined with valuing people and incorporating innovative and technological practices. It is also assumed that results-oriented public management, focused on the citizen and ethics, can transform the relationship between State and society, fostering greater trust and institutional legitimacy.

The justification for this work lies in the social and administrative relevance of the topic. In times of significant political, economic, and technological transformations, it is essential to understand how public management can evolve to meet the demands of contemporary society. The pursuit of efficiency cannot be dissociated from the democratic and human values that underpin public service. Thus, reflecting on managerial processes and their practical implications is fundamental to consolidating a more agile, participatory, and socially committed model of administration.

The text is structured around three main axes: the first addresses the foundations and evolution of public administration and its transition to modern management; the second analyzes the classical managerial processes—planning, organization, direction, and control—and their application in the public context; and the third discusses contemporary challenges related to innovation, transparency, and people management in the state sector. Finally, the conclusion presents a synthesis of reflections and highlights the importance of a public administration that combines technical efficiency, ethics, and social commitment.

METHODOLOGY

The methodology adopted in this study was qualitative and bibliographic, based on the analysis of books, scientific articles, and official documents addressing public administration and managerial processes. The research sought to understand, through theoretical review, the main concepts and transformations in public management, drawing on classical and contemporary authors such as Fayol, Chiavenato, Matias-Pereira, and Motta. It also considered legislation and government programs aimed at administrative modernization, such as the Master Plan for State Reform and the Access to Information Law. This approach enabled a critical and reflective analysis of how planning, organization, direction, and control are applied in the public sector, highlighting their relevance for efficiency, transparency, and innovation in Brazilian public administration.

DEVELOPMENT

PUBLIC ADMINISTRATION AND MODERN MANAGEMENT

Public administration encompasses the set of structures, processes, and practices aimed at implementing State policies and actions to meet collective needs and promote social well-being. In the contemporary context, it has undergone profound transformations driven by social and economic changes and by growing demands for transparency, efficiency, and citizen participation. According to Matias-Pereira (2012), public administration should be understood as a dynamic system composed of institutions and agents engaged in formulating, executing, and controlling governmental actions, always guided by principles of legality, morality, and impartiality.

Public management, as Motta (2013) argues, goes beyond the mechanical application of rules and norms; it involves the ability to coordinate people, resources, and policies in pursuit of the collective interest. Managing in the public sector requires ethical and political sensitivity, as well as technical competencies. The modern public manager must balance administrative efficiency with social responsibility so that public service delivery achieves effectiveness and legitimacy in society.

Historically, public administration has evolved through three main paradigms: the patrimonialist model, the bureaucratic model, and the managerial model, each shaped by political and economic transformations.

The patrimonialist model, dominant until the late 19th century, was characterized by the absence of distinction between public and private spheres. The State was perceived as an extension of the ruler's personal power, and public positions were filled based on family ties or political loyalty. This system fostered clientelism and corruption, undermining efficiency and impartiality.

In response, the bureaucratic model emerged, grounded in Max Weber's ideas (1947), aiming to rationalize and professionalize public service. Bureaucracy introduced significant advances, such as clear norms, functional hierarchy, and merit-based selection of civil servants. Its goal was to ensure predictability and legality in administrative acts, reducing favoritism and increasing impartiality. However, over time, this model became excessively formalistic and rigid, resulting in slowness and detachment from society's real needs.

To overcome these limitations, the managerial model—also known as New Public Management (NPM)—was introduced, inspired by business administration practices. This paradigm began to be implemented in several countries in the 1980s and reached Brazil in the 1990s. It advocated introducing efficiency, effectiveness, and quality criteria into public administration, emphasizing decentralization, results-based management, and accountability. According to Motta (2013), the managerial model brought a more strategic vision to the public sector, encouraging planning and performance control based on indicators and targets.

In the following decades, particularly from the 2000s onward, a new concept emerged: public governance, which expands the managerial logic by integrating civil society and the private sector into decision-making processes. This model relies on principles such as transparency, participation, social control, and collaboration among different spheres of power. For Matias-Pereira (2012), public governance represents a higher stage of public management, recognizing that the State is not the sole producer of public goods but part of an interdependent network of actors.

In Brazil, managerial reforms gained prominence during President Fernando Henrique Cardoso's administration in the 1990s, with the Master Plan for State Reform (1995), drafted by Luiz Carlos Bresser-Pereira. This document marked the beginning of modernizing Brazilian public administration under a managerial approach, proposing a more efficient, less bureaucratic, and results-oriented structure.

The plan established a new conception of the State: instead of acting as the direct executor of all activities, it should function as a regulator, coordinator, and evaluator of public policies. Executive and regulatory agencies were created, granted greater administrative and budgetary autonomy, with performance targets and management contracts. This transformation was based on the principle of

efficiency introduced by Constitutional Amendment No. 19/1998, which consolidated managerial management as the axis of public policies in the country.

However, the implementation of these reforms faced challenges. Bureaucratic culture still persisted, and the lack of training among public servants hindered the consolidation of a new administrative mindset. Moreover, the pursuit of efficiency could not override the fundamental values of public service, such as equity and legality. As Motta (2013) points out, the challenge of modern management lies in reconciling technical rationality with social sensitivity, ensuring that administrative efficiency does not lead to exclusion or dehumanization.

In recent years, Brazilian public administration has incorporated principles of public and digital governance, prioritizing transparency, social control, and the use of information technologies. Initiatives such as the *Gespública* Program, the Access to Information Law (Law No. 12.527/2011), and the +Brazil Platform represent advances toward more participatory and innovative management. As Matias-Pereira (2012) emphasizes, modern governance requires a public administration open to dialogue with society, guided by ethical values, sustainability, and effective results for the citizen.

MANAGERIAL PROCESSES: PLANNING, ORGANIZATION, DIRECTION, AND CONTROL

Managerial processes constitute the core of administrative activities and form the foundation upon which any organization—public or private—is structured. These processes—planning, organization, direction, and control—were initially systematized by Henri Fayol in 1916, when he proposed an administrative theory aimed at efficiency and rational coordination of work. According to Fayol, to manage is to foresee, organize, command, coordinate, and control, that is, to act in an integrated manner to achieve previously established objectives. Although this perspective emerged in the context of industrial administration, it remains relevant in contemporary public management, as the state sector also requires methods and instruments that ensure efficiency, accountability, and tangible results in service delivery to society.

According to Chiavenato (2014), managerial processes form a dynamic and interdependent cycle. Planning defines the path to follow; organization structures resources and people to execute what was planned; direction mobilizes and motivates individuals; and control evaluates results, adjusting actions whenever necessary. In public administration, this logic acquires an even broader meaning, as it involves not only operational efficiency but also democratic legitimacy and ethical commitment to the collective interest.

Strategic and budgetary planning is the first step toward effective public management. It consists of establishing medium- and long-term objectives, defining priorities, and rationally allocating available resources. For Matias-Pereira (2012), planning in the public sector should be understood as both a

political and technical tool that guides governmental action toward measurable and socially relevant results. In Brazil, instruments such as the Multi-Year Plan (PPA), the Budget Guidelines Law (LDO), and the Annual Budget Law (LOA) express the institutionalization of this process, enabling public policies to be planned, executed, and evaluated within a continuous management cycle.

After planning, organization becomes essential to structure the means and flows that enable the execution of actions. According to Chiavenato (2014), organizing means defining roles, distributing tasks, and coordinating efforts so that the whole functions harmoniously. In the public context, this involves designing administrative structures, creating departments and secretariats, and establishing clear decision-making flows. An efficient organization must be flexible enough to adapt to changes and avoid bureaucratic rigidity, which historically limits the State's responsiveness. Thus, a good organizational structure is one that fosters integration, communication, and cooperation among different sectors and hierarchical levels.

Direction, in turn, refers to the ability to lead people toward achieving institutional objectives. Fayol already emphasized leadership as an indispensable element for team cohesion and employee motivation. In the public sector, direction assumes a participatory character, as decisions must consider democratic values, ethics, and dialogue among managers, civil servants, and society. Motta (2013) highlights that leadership in modern public administration should be guided by empathy, active listening, and a forward-looking vision, replacing hierarchical authoritarianism with a culture of collaboration and shared responsibility. The contemporary public manager, therefore, must act as a facilitator of processes, someone capable of inspiring, guiding, and mobilizing people to achieve results that benefit the collective.

Control and performance evaluation complete the managerial cycle. They allow verification of whether planned actions are being executed as intended and whether they are achieving the desired impacts. According to Matias-Pereira (2012), control in public administration is not limited to accounting aspects but should encompass dimensions of performance, quality, and social impact. The use of efficiency, effectiveness, and impact indicators is essential for evaluating public policies and programs. Furthermore, the concept of accountability, widely disseminated in recent decades, reinforces the manager's responsibility toward society and oversight bodies. This means that results must be transparent and subject to citizen evaluation, strengthening trust in institutions and the legitimacy of governmental actions.

When applied in an integrated and ethical manner, managerial processes become powerful instruments for transforming public administration. Planning guides actions, organization defines structural foundations, direction humanizes and motivates processes, and control ensures transparency and continuous improvement. Together, these elements form the cornerstone of modern, participatory

public management committed to efficiency and citizenship. In today's scenario, where society demands more results and less bureaucracy, understanding and applying classical administrative principles through the lens of innovation and social responsibility is essential to building a fairer, more effective State oriented toward the common good.

INNOVATION, TRANSPARENCY, AND PEOPLE MANAGEMENT IN THE PUBLIC SECTOR

Innovation, transparency, and people management are fundamental dimensions for consolidating a modern, efficient public administration committed to democratic principles. In an increasingly complex social environment, where population demands are more diverse and urgent, the public sector faces the challenge of adopting new managerial practices based on technology, ethics, and human appreciation. Contemporary public administration must reconcile compliance with norms and the pursuit of efficiency with fostering an organizational culture open to change, learning, and social participation.

Organizational culture in the public sector, traditionally marked by hierarchical structures and bureaucratic practices, often becomes an obstacle to innovation. According to Motta (2013), resistance to change is one of the greatest challenges faced by managers, as it involves not only technical aspects but also psychological and cultural factors. Civil servants and leaders may struggle to adapt to new work methods, fearing loss of stability, status, or security. This resistance, however, can be overcome through strategies of clear communication, active participation, and valuing people, creating an institutional environment that understands change as a natural and necessary process for improving public management.

Innovation in the public sector should not be understood merely as the introduction of technologies but as a deeper transformation involving new ways of thinking and acting. For Matias-Pereira (2012), innovating in public administration means rethinking processes, reducing bureaucracies, and improving citizen service, ensuring greater agility, quality, and transparency. This requires a culture of continuous learning and a proactive attitude from managers, capable of identifying opportunities and encouraging team engagement. In this sense, valuing public servants is an essential condition for the success of any administrative modernization process.

Training and motivating civil servants are pillars of modern management. According to Chiavenato (2014), human capital is the most important resource of any organization, as it generates ideas, solutions, and results. In the public sector, investing in the technical and ethical development of professionals ensures continuity and quality in service delivery. Continuous training fosters the development of strategic competencies, mastery of new management tools, and strengthening of

commitment to the public interest. Moreover, motivation is a key factor for performance, as engaged employees tend to exhibit higher productivity, creativity, and a sense of belonging to the institution. To achieve this engagement, it is necessary to create participatory, transparent, and trust-based work environments.

In recent years, the Brazilian State has invested in adopting digital management and governance tools aimed at improving government-society relations and increasing efficiency and transparency in public actions. Initiatives such as the National Program for Public Management and Debureaucratization (GESPÚBLICA) and the Access to Information Law (Law No. 12.527/2011) represent significant progress in this regard. GESPÚBLICA, created to encourage continuous improvement in public management, promotes practices of planning, performance evaluation, and administrative simplification. The Access to Information Law and the electronic system e-SIC (Citizen Information Service) enable any citizen to access public data and documents, strengthening transparency and accountability. These tools contribute to consolidating a more open, participatory, and socially responsible State.

Digital governance also expands access to information and modernizes how the State communicates and organizes itself. Digital management platforms allow real-time monitoring of public policies, expenditure control, and direct interaction with citizens. As Matias-Pereira (2012) emphasizes, incorporating technology into public management should not be seen merely as an automation tool but as a means of democratization and social empowerment. Digital transformation requires public managers with strategic vision, capable of integrating technology, ethics, and citizenship.

Another essential aspect of modern management is results orientation. This managerial model values efficiency without losing sight of the citizen as the ultimate recipient of public policies. According to Motta (2013), results-oriented administration should measure performance not only in terms of resource savings but primarily by the effectiveness of actions in improving population quality of life. To this end, it is crucial to define clear goals, establish performance indicators, and conduct periodic evaluations involving civil society participation. This practice strengthens administrative legitimacy and fosters a culture of responsibility and commitment to the common good.

Thus, innovation, transparency, and people management interconnect as complementary dimensions of democratic and efficient public administration. Promoting an organizational culture that values learning, ethics, and collaboration is essential for the public sector to meet contemporary challenges. Training civil servants, strategically using technology, and managing for results and citizen focus form the foundation of a new way of governing: more humane, participatory, and committed to building a just and sustainable society.

CONCLUSION

Analyzing managerial processes in public administration reveals that modernizing the State is not limited to introducing new administrative techniques but involves a profound cultural and institutional transformation. Contemporary public management must reconcile efficiency and humanization, technique and ethics, strategic planning and social commitment. In this sense, classical administrative processes—planning, organization, direction, and control—remain fundamental pillars for conducting governmental activities, provided they are reinterpreted in light of current demands for transparency, participation, and innovation.

The study showed that planning is the instrument guiding public actions toward concrete and measurable results, enabling greater rationality in resource allocation and priority setting. Organization provides the necessary structure for the State to function in an integrated manner, overcoming limitations imposed by excessively bureaucratic models. Direction, when exercised through participatory leadership, fosters motivation and engagement among civil servants, strengthening collaborative culture within public institutions. Control, understood as a continuous process of evaluation and improvement, ensures transparency and accountability to society, promoting trust in institutions and reinforcing democratic legitimacy.

It is evident, however, that administrative efficiency only materializes when accompanied by valuing human capital. Training, recognition, and motivation of public servants constitute the foundation of effective and sustainable management. Without people's commitment, any attempt at reform or innovation tends to become merely formal. Public administration must therefore be understood as a space for learning and human development, where technique aligns with ethics and institutional performance translates into social benefit.

The incorporation of governance tools and technological innovations, such as GESPÚBLICA, the Access to Information Law, and digital management systems, represents significant progress toward consolidating a more open and participatory public administration. These initiatives expand access to information, strengthen social control, and bring citizens closer to state management, reaffirming the democratic principle that governing means serving the public responsibly and transparently.

In conclusion, modernizing Brazilian public administration depends on the balanced integration of efficient managerial processes, valuing people, and commitment to ethics and transparency. The 21st-century public manager must act as an agent of transformation, capable of promoting structural changes without losing sight of the human dimension of management. The true challenge of modern public administration lies not only in doing more with less but in doing better—with quality, justice, and social responsibility.



Thus, this study reinforces the importance of understanding managerial processes not merely as management tools but as instruments for strengthening democracy and promoting the common good. Through results-oriented, citizen-centered public administration, it is possible to build a more efficient, fair, and socially committed State.

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