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THE CIRCULAR ECONOMY AS A STRATEGIC DRIVER FOR SUSTAINABLE COMPETITIVE ADVANTAGE IN HOSPITALITY AND FOOD SERVICE

Kristina SHOPOVA*[1]
Dimcho SHOPOV*[2]

Abstract: *The relevance of sustainability across all sectors of life is a defining feature of the 21st century, particularly in tourism, where environmental pressures and socio-economic challenges demand urgent transformation. In this context, the hospitality and restaurant industries must undergo a strategic transition toward sustainable management practices. The purpose of this study is to substantiate the necessity of implementing modern managerial approaches grounded in ecological responsibility and circular economy principles. The object of the research is the process of transitioning to sustainable hospitality and restaurant management, while the subject comprises the specific techniques and models that facilitate this transition. The central thesis posits that the successful adoption of sustainability-oriented practices in hotel and restaurant enterprises is a key driver of long-term economic viability, environmental stewardship, and socially responsible tourism development. The methodology is qualitative and conceptually descriptive, employing general scientific methods such as analysis, synthesis, comparison, and analogy. It is further enriched by an AI-assisted systematic review of academic literature and official documents from institutions such as the EU and UN Tourism, enabling the classification of transition techniques and formulation of actionable management recommendations. This process includes the analysis of leading industry benchmarks and official Best Environmental Management Practices (BEMPs), which serve as applied examples for defining operational optimization. The scientific novelty of the study lies in its integrative approach, combining macroeconomic frameworks (e.g., ESG and Triple Bottom Line) with micro-operational strategies (e.g., circular economy principles and Fourth Industrial Revolution technologies). This dual-level integration redefines sustainability not merely as a moral imperative but as a strategic economic model that enhances competitiveness, operational efficiency, and investment attractiveness. The main conclusion is that sustainable development should be embraced as a core mission of the tourism business. Enterprises that align their operations with sustainability principles demonstrate measurable success, validating the strategic and economic value of responsible hospitality and restaurant management.*

Keywords: *sustainability, hospitality management, restaurant management, circular economy, waste management*

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Introduction

The issue of sustainability is widely discussed these days not only in scientific circles but also among the general public. Undoubtedly, this is one of the most significant problems facing our entire society, regardless of which area of public life it is. The implementation of sustainable practices in individual spheres of the economy limits the

* [1] *Kristina Shopova, PhD, Head Assistant Professor, D. A. Tsenov Academy of Economics, k.georgieva@uni-svishtov.bg, ORCID: 0000-0002-5872-0081*
* [2] *Dimcho Shopov, PhD, Assistant Professor, D. A. Tsenov Academy of Economics, d.shopov@uni-svishtov.bg, ORCID: 0000-0002-6499-568X*

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adverse human impact on the environment and also contributes to economic stability and social justice in society. From the point of view of the tourism sector, sustainability in its three leading manifestations (environmental, economic and social) should find a more significant place in the management of hotel and restaurant enterprises. A significant number of scientific publications are devoted to the problems facing the sustainable development of the hospitality industry. The interest in them is not only scientific but also practical. One of the largest platforms for booking accommodation and other tourist services, Booking.com, has been conducting a survey among more than 30,000 of its users for nearly 10 years about their attitudes towards sustainable travel. According to their data for 2024, 75% of respondents want their travels to be more sustainable, while 28% admit that traveling more sustainably is important to them, but is not their main consideration when planning or booking a trip (Booking.com, 2024).

Today, more and more hotels and restaurants are trying to respond to public preferences for sustainable experiences during vacations or travel, which are likely to persist and even intensify in the coming years as Generation Z members age. For this reason, more and more companies in this sector are implementing technologies and approaches that would contribute to a balance between their economic development, social justice and environmental protection.

The purpose of the study is to substantiate the necessity of implementing modern managerial approaches grounded in ecological responsibility and circular economy principles. The selected object includes the process of transitioning to sustainable hospitality and restaurant (HORECA) management. The subject of the study consists of the specific techniques and models that facilitate this transition. The leading thesis states that the successful transition of hotel and restaurant enterprises towards sustainability is a crucial driver for the long-term viability and responsible development of the tourism sector. The working hypotheses adopted by the authors are the following:

- **H1:** The long-term economic viability and investment attractiveness of hotel and restaurant enterprises are contingent upon the integrated adoption of macro-level sustainability frameworks (Environmental, Social and Governance (ESG), and Triple Bottom Line (TBL)) and micro-operational principles of the circular economy (CE).
- **H2:** The official strategic communication and public representation of sustainable practices in the HORECA sector clearly position Fourth Industrial Revolution (4IR) technologies and Artificial Intelligence (AI) as strategic enablers for the implementation of CE principles.
- **H3:** Existing academic literature and official documents (e.g., BEMPs, European Union (EU)/United Nations (UN) Reports) demonstrate a strong conceptual consensus regarding the role of AI-assisted operational tools in fundamentally facilitating and optimizing key CE processes, specifically waste reduction and resource management.

The methodology is qualitative and conceptually descriptive, employing general scientific methods such as analysis, synthesis, comparison, and analogy. It is further enriched by an AI-assisted systematic review of academic literature and official documents, which enables the systematic classification of transition techniques. The main conclusion of the study is that the tourism business today, and in particular the hotel and restaurant industry, should adopt sustainable development as its mission and align as much of its activities with it as possible. The authors conclude that there are a significant number of hotels and restaurants that are developing successfully today, thanks in part to the fact that their management has adopted a sustainable approach to work.

Literature Review

Human development and the rise in people's living standards over the centuries have inevitably led to negative environmental consequences. The growth of the world's population from just under 2 billion people in 1923 to over 8 billion people today has had a significant impact on the environment (United Nations, 2023). Advancements in technology and digitalization increase the demand for a wider variety of resources to support the production of both common and specialized items used by people.

Under these circumstances, in order to protect the environment and ensure normal living conditions for future generations, it is necessary to take measures on a global scale. A fundamental concept in modern science is the idea of “sustainability”. Sustainability is a social goal for the long-term coexistence of people on Earth. The specific definitions of this term are controversial and vary depending on the literature, context and time (Ramsey, 2015). Experts often describe sustainability as a structure based on three pillars: economy, environment and social sphere, with much of the research in recent years emphasizing the environmental dimension (Purvis, Mao, & Robinson, 2019).

In common usage, sustainability typically addresses major environmental issues such as climate change, biodiversity loss, land degradation, and air and water pollution. Another closely related idea is “sustainable development”, and in global practice, these terms are often used interchangeably. Environmental protection specialists from UNESCO distinguish between the two concepts as follows: “Sustainability is often seen as a long-term goal, while sustainable development refers to the processes and methods used to achieve that goal” (UNESCO, 2023).

In 2015, the United Nations (UN) General Assembly created the Sustainable Development Goals (SDGs), which are part of the 2030 Agenda, the main idea of which is to strengthen the interconnection between the environmental, social and economic aspects of sustainable development (UN Department of Economic and Social Affairs, 2016). Figure 1 displays the abbreviated names of the 17 SDGs.

The 17 main goals are divided into a total of 169 specific targets, some of which have a direct link to waste management: target 11.6 aims to reduce the adverse environmental impact of cities per capita, including by paying special attention to air

quality and issues related to the management of municipal and other waste; targets aimed at the environmentally sound management of all waste through prevention, reduction, recycling and reuse (targets 12.4 and 12.5) and the reduction of food waste (target 12.3).

Figure 1. Sustainable Development Goals

Source: United Nations (United Nations, 2023), *https://www.un.org/sustainabledevelopment/wp-content/uploads/2023/09/E_SDG_Guidelines_Sep20238.pdf*

Waste management is not a new concept, but with the improvement of technologies for processing and utilizing waste streams, the possibilities for their utilization as an alternative source of raw materials and energy and the reduction of quantities destined for landfills are increasing. Within the EU, this issue is increasingly being put on the agenda.

Perhaps the most significant step towards implementing a modern and workable waste management system at the national and European level is the development of a New Waste Management Framework. By highlighting the importance of proper waste management and recovery and recycling methods, it is possible to reduce the impact on resources and improve their use (The European Parliament and the Council of the European Union, 2008).

The New Waste Framework establishes the so-called "waste hierarchy", which has two main objectives: 1) to minimize the negative impact of waste generation in the EU, and 2) to improve resource efficiency. Graphically, the hierarchy is represented as an inverted pyramid with the most preferred options at the top and disposal at the bottom as the last waste management option (Figure 2). Based on this hierarchy, the most preferred option is waste prevention, which includes measures taken before a substance, material, or product becomes waste.

The European Union (EU) 8th Environment Action Programme (EAP) (European Commission, 2022), which is still relevant today, sets the goal of achieving "a climate-neutral, resource-efficient and regenerative economy, which gives back to the planet more

than it takes" (European Union, 2023). To achieve this goal, improving coordination between sectoral policies is recognized as crucial. Furthermore, environmental and climate considerations must underpin the majority of future policy-making efforts in Europe. In line with the European Green Deal, a New Circular Economy Action Plan was adopted in March 2020, serving as a tool for achieving sustainable development in Europe (Duquennoi & Martinez, 2022).

Figure 2. Waste hierarchy according to Directive 2008/98/EC

Source: (European Commission, 2023), *https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en*

Over the past fifty years, the EU has enacted policies focused on environmental protection and improving the well-being of its member states' populations (Shopov, 2023). These policies leverage tools related to sustainable development and the circular economy. They address the challenges of modern waste management, providing both the public and businesses with opportunities to live and work in a cleaner, more eco-friendly environment.

Current discussions and negotiations are evaluating the implementation of programs to advance a circular economy, the European Green Deal, and the UN Sustainable Development Agenda. These efforts aim to propel Europe towards a low-carbon economy and achieve climate neutrality by 2050. At the same time, some slow progress has been made in developing effective waste management strategies and measures for their proper treatment and disposal (Zorpas, 2020).

The European Union is leading the global effort to achieve economic, environmental and social sustainable development, in particular in the fight against climate change. On December 11, 2019, the European Commission presented the European Green Deal, which serves as a comprehensive plan to transition the EU economy towards

sustainability, turning environmental and climate challenges into opportunities across all policy areas, while ensuring fairness and inclusion for all.

If one analyses the essential similarities between sustainable development and the circular economy, it can be concluded that both principles emphasize intra- and intergenerational responsibilities motivated by environmental risks. They also underscore the importance of fostering dialogue and public discussion on various development pathways.

Business development depends on the integration of sustainable practices into business activities. Enterprises should focus on innovation, environmental responsibility, and social equity to achieve long-term success (Parashkevova, Ivanov, & Stoyanova, 2024). The managers of the business organizations should realize that commitment to the global sustainable development goals is indispensable and key to increasing competitiveness and the successful implementation of strategic goals (Chipriyanov & Lazarova-Krysteva, 2020). By adopting sustainable strategies, companies can enhance their competitiveness, meet regulatory requirements, and contribute positively to the community and environment. This approach not only ensures compliance with global sustainability standards but also fosters a resilient and adaptable business model that can thrive in a rapidly changing market.

The concept of sustainable development has its widespread application in tourism. Sustainable tourism is a term that focuses on limiting negative impacts on the environment, society and economy while providing positive economic and social benefits for local communities and the tourism industry (Pandzherova, 2024). The guiding principle is to achieve a balance between the needs of tourists, the environment and the local population.

The World Tourism Organization defines sustainable tourism as “tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities” (UNWTO, 2018). Its three dimensions generally represent:

- Environmental sustainability: Reducing negative impacts on nature through sustainable practices and conserving natural resources;
- Social sustainability: Supporting the cultural heritage and traditions of local communities, as well as ensuring fair working conditions;
- Economic Sustainability: Promoting economic benefits for local communities and sustainable development of the tourism industry.

Sustainable tourism seeks to take into account all impacts of tourism, both positive and negative, to minimize the negative and maximize the positive (Global Sustainable Tourism Council, 2022). Negative impacts include economic drain, environmental damage and overcrowding. Positive impacts include job creation, cultural heritage conservation, wildlife conservation and landscape restoration. In this regard, risk management in a tourism context (Ivanova, 2024a; Ivanova, 2024b) refers to the planning and implementation of processes aimed at preventing and reducing risk and managing the adverse consequences of crises, disasters and catastrophes.

The increased scientific interest in the concept of sustainable tourism is considered "one of the great success stories of tourism research and knowledge transfer" (Hall, 2011). There has been a significant evolution in research on sustainable tourism development. A significant part of this research focuses on sustainable tourism policies, including in the context of crises. The main objective of most public policy analyses is to support managers in making strategic decisions (Ivanova, 2024c). In this context, sustainable tourism indicators function as measurement tools that are widely used in planning and decision-making processes. The data collected through these indicators can serve as an objective analysis of the opportunities and threats faced by tourism enterprises, such as hotels and restaurants.

Building on the importance of strategic planning and indicators, it becomes evident that the successful implementation of sustainable practices also relies heavily on the people behind them. The shift toward sustainable and circular practices in hospitality depends not only on technology and resources, but critically on the quality of human capital. In the "new economy," knowledge is a key driver of added value and long-term viability. Hotels and restaurants must base their innovations on the generation and application of knowledge. Implementing advanced sustainability tools requires staff with specialized skills. Turning data into actionable decisions demands understanding and practical application – making investment in training essential. As Viorelia Lungu (Knowledge-based society - a condition to ensure sustainable development, 2019, p. 96) states: "The success in the new economy depends on a knowledge-based society which imposes a new inter-relational system, different from the current, built on openness, flexibility, permanent education and specialized entrepreneurial motivation". In conclusion, sustainable transformation in hospitality and food service is inseparable from the transformation of human capital – without investments in knowledge and skills for applying sustainable practices, even the best technologies and strategies are destined to fail. While human capital is essential for operational sustainability, long-term viability also depends on how organizations strategically position themselves in an increasingly dynamic and digital business environment.

The central thesis of this study postulates that the transition to sustainable management is a "critical driver for the long-term viability" of hospitality and food service enterprises. Strategically, this has traditionally been associated with achieving Sustainable Competitive Advantage (SCA), a position that is difficult for competitors to imitate and ensures long-term success. However, modern strategic theories, especially in the context of the Fourth Industrial Revolution (4IR) and accelerated digitalization, question the possibility of achieving true, lasting SCA. In a hyper-competitive business environment, every advantage is transient, as innovations are quickly replicated and markets are highly transparent. Therefore, sustainability (in its environmental and social dimensions) should not be viewed as a final destination for achieving an inimitable advantage, but rather as a core mechanism for continuous adaptation. The shift toward a circular economy, resource optimization, and waste management in hospitality and food service is a constant source of new, albeit short-lived, advantages. These practices make the organization more flexible, adaptive, and capable of rapidly transitioning from one advantage to the next. As Vera

Kriel and Geoff A. Goldman emphasize, instead of seeking sustainable competitive advantage, organizations should focus on agility, complexity management and the ability to generate new advantages in a series of short cycles (Is Sustainable Competitive Advantage Antediluvian?, 2024, p. 73). Thus, efforts toward sustainable management ensure long-term viability not by creating a permanent monopoly, but by building the organizational agility necessary to survive in an ever-changing economic environment.

Sustainable tourism should provide a high level of satisfaction to tourists and ensure memorable experiences while raising their awareness of sustainability issues and promoting the implementation of sustainable tourism practices. Achieving this is a continuous process, based on constant monitoring of impacts, resulting in the introduction of corrective or preventive measures where necessary (Ilieva, et al., 2024). The tourism industry recognizes the importance of adopting sustainable practices to adapt to both current and future environmental conditions. This requires economically viable investments in technological innovations that result in energy, natural resource, and human resource savings (Ilieva & Todorova, Role of technological innovation for sustainable management of tourism organizations, 2023). Implementing these principles in the hospitality and restaurant industry is key to balancing economic development, social well-being and environmental protection, requiring commitment and cooperation at all levels.

Recent research on sustainability and its relationship to business has increasingly emphasized the "Triple Bottom Line" (TBL) concept. This is a business concept that encourages companies to measure their social and environmental impact alongside their financial performance (Nica, Chiriță, & Georgescu , 2025). It is based on the "three Ps": profit, people and the planet. Companies that implement sustainable practices can achieve positive social and environmental impacts while making a profit. A crucial aspect of applying the TBL concept (Stoddard, Pollard, & Evans, 2012) is that corporate performance should benefit not only shareholders but also all stakeholders, including groups like the local community where business activities take place. For this reason, the concept is particularly applicable to sustainable hotel and restaurant management.

The principle of the TBL finds its modern financial projection in the ESG factors (Environmental, Social and Governance). These factors have become a key tool for assessing corporate sustainability and risk by investors and financial institutions. The three groups of factors have the following significance:

- Environmental: Directly encompasses issues such as waste management, energy efficiency and CE – topics central to the transition in hospitality and food service sectors.
- Social: Includes aspects such as labor practices, employee health and safety, and relations with local communities, corresponding to the "People" dimension in TBL.
- Governance: Refers to the effectiveness of management structures, transparency and corporate accountability.

The importance of integrating these factors is evidenced by financial resilience. During major market disruptions, such as the COVID-19 pandemic, ESG-oriented investments demonstrated financial durability, often achieving higher returns and lower volatility compared to traditional investments. This reinforces the core thesis that a sustainable management approach is not merely a matter of corporate responsibility but a key factor for long-term viability and financial stability in hospitality and food service enterprises.

In this context, the efforts of managers in the tourism sector to implement optimization technologies and CE practices (from reducing environmental footprint to improving working conditions) directly lead to higher ESG ratings.

As Serghei Petighin (Shifting Focus: The Role of Environmental, Social, and Governance Factors in Investment Policy During a Pandemic, 2024, p. 86) notes, "companies with strong social performance... were better prepared to manage the health and safety of their employees and customers and to maintain operational continuity during the pandemic". Therefore, the transition to sustainable management in hospitality and food service is not only an ecological and social necessity but also a strategic imperative for attracting capital and ensuring long-term success in the modern global economy.

Successfully transitioning to sustainable management and applying circular economy principles in the HORECA (Hotel/Restaurant/Café) sector requires a shift in managerial thinking and the adoption of advanced technologies and processes. While internal motivation is essential, many small and medium-sized enterprises (SMEs) need external expertise to navigate this transformation. Management consulting plays a pivotal role as a catalyst for change. Consultants act as agents of transformation by introducing specialized knowledge, improving operational efficiency, and guiding strategic sustainability planning. Their support helps businesses reduce environmental impact, optimize resource use, and align with ESG standards. Far from being a cost, consulting services represent a strategic investment that bridges knowledge gaps and accelerates innovation. They provide the tools to turn sustainability concepts into standardized, effective operations. As Mariana Radov notes, through the exchange of experience and transfer of best practices, consultants provide clients with new managerial knowledge and tools that enable them to improve process efficiency and define optimal development strategies (Radov, 2022, p. 31). Ultimately, the success of sustainability efforts in hospitality depends on the synergy between internal leadership and external expertise.

The transition to sustainable management is not solely a matter of environmental or social responsibility – it is a strategic imperative for strengthening market positioning and ensuring long-term financial viability. In the HORECA sector, this imperative is closely tied to the ability to effectively serve high-value segments such as business tourism. Empirical research (Mabeba & Xu, 2023) in tourism economics consistently shows that business travel contributes more significantly to the sector's economic performance than leisure travel. As a result, businesses that successfully attract and retain this segment tend to demonstrate greater financial stability. Achieving high sustainability standards – through circular economy practices, optimization of energy and water resources, and the

implementation of corporate social responsibility initiatives – directly influences brand perception and alignment with the expectations of corporate clients. Sustainable management not only enhances operational efficiency but also improves service quality and investment appeal, particularly in terms of ESG performance, which is crucial for attracting international business clients and corporate event organizers. Therefore, sustainability investments should be viewed as strategic tools for creating a reliable and competitive environment, positioning hotels and restaurants as preferred partners in serving economically valuable market segments.

A deeper exploration of sustainability in tourism requires a clarification of the essence of sustainable hospitality. It involves utilizing resources for economic activities in a manner that satisfies present demands while ensuring their availability for future use (Pavlov, 2020). Its main manifestations include the use of energy-saving technologies (including renewable energy sources), reducing water consumption and reducing waste generation.

Sustainability in the restaurant industry is less well-studied in the scientific literature than sustainability in the hospitality industry or tourism in general. Furthermore, a significant portion of the existing literature on this topic focuses on restaurants that are part of chains and implement comprehensive sustainability certification programs. Waste management is perhaps the most characteristic feature of sustainable restaurants.

Sustainability concerns are central to EU policies, encompassing sectors like tourism. The Strategic Vision for European Tourism: 2024-2029 (European Commission, 2024) and The Sustainable Tourism Draft Action Plan (European Commission, 2024), developed by the European Commission, aim to promote sustainable development in the tourism industry. They emphasize green transformation, environmental practices and reduction of energy consumption, waste, water consumption and pollution (European Union, 2024). The circular economy is bolstered by resource reuse and recycling, while digital transformation is achieved through the adoption of digital tools to enhance tourism services. Sustainability efforts focus on enhancing resilience to future crises and supporting small and medium-sized enterprises. Additionally, education and skills development emphasize high-quality training and professional growth within the sector.

The schedule adopted with these policies aims to ensure the competitiveness, resilience and preparedness of the EU tourism industry after the COVID-19 shocks. Several researchers (Ivanova, 2023) highlight that the 2020 health crisis provides an opportunity to reorient tourism activities toward the principles of sustainability, authenticity, social justice and security. Innovation is key to economic growth and well-being, especially in the context of sustainable development (Ivanova, 2013). Their application in the tourism sector (Ilieva, Todorova, Marinov, & Ismailov, 2024) plays an important role in competitiveness, improving the customer experience and sustainability of destinations. Sustainable innovations address environmental, social and economic challenges, strengthening the long-term viability of the industry and contributing to a positive impact on the environment and society.

The circular economy is a model of production and consumption that seeks to extend the life cycle of products by reusing, repairing, recycling and restoring them for as long as possible. This concept contrasts with the traditional linear model of the economy, which is based on the principle of "take, make, throw away". Despite the challenges associated with its implementation, its benefits are significant and diverse. The circular economy is often associated with sustainable tourism as an approach that goes beyond optimizing the actions and added value of individual tourism actors. It represents an effective way of managing the destination, giving it an innovative and modern vision, in line with contemporary consumer trends (Mancheva-Ali, 2023). In the context of the hospitality and restaurant industry, the circular economy includes various strategies and practices that can help minimize waste and increase resource efficiency (Pandzherova, 2024).

The circular economy aims to create a virtuous cycle in which goods and services are produced without wasting the planet's limited resources, such as raw materials, water and energy. Similarly, circular tourism offers a model in which all participants (tourists, hosts, tour operators and suppliers) follow an environmentally sustainable approach. The future of the tourism industry is likely to be shaped by the principles of complex adaptive systems and will result from the reorganization of the sector based on the circular development model. Research (Pazieva, 2022) indicates that not all waste from tourism can be recovered and reused; instead, it must be substituted with materials or products that comply with contemporary environmental standards.

Applying the principles of the circular economy in the restaurant industry often focuses on waste and resource management (water, energy) within the enterprise itself. However, to achieve true long-term viability, this understanding must be expanded to include the entire food supply chain. Restaurants and hotels are highly dependent on the agri-food sector, which is under significant pressure from the European Union to transition toward more ecological and decarbonized practices (European Commission, 2024). Global and European environmental policies, such as those reflected in the Common Agricultural Policy (CAP) (European Commission, 2025), encourage farmers to reduce greenhouse gas (GHG) emissions, increase soil carbon sequestration, and expand organic production. This macroeconomic framework creates a strategic imperative for restaurateurs to rethink their sourcing by prioritizing products from sustainable and environmentally certified agriculture. Choosing suppliers who have adapted their processes in line with the EU's environmental goals enables hotels and restaurants to (Velaoras, Menegaki, Polyzos, & Gotzamani, 2025):

- reduce their indirect carbon footprint;
- improve the quality of raw materials (for example, through reduced pesticide use);
- position themselves as part of a holistic and sustainable agri-food system.

As Adela Sorinela Safta and Lavinia Popescu (Sustainability From Concept to Paradigm of Environmental Policies, 2024, p. 181) emphasize, "A key tool for guaranteeing that agriculture can make a workable transition to a sustainable future – one that includes

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achieving the objective of lowering carbon emissions has been identified as the Common Agricultural Policy's (CAP) views." Taken together, sustainable restaurant management in the context of the circular economy must include an active role in transforming the food supply chain, becoming a driver of environmentally responsible agriculture.

Sustainable practices in the restaurant industry extend beyond internal operations and waste management. They require responsible supply chain management. Partnering with suppliers under European quality schemes (such as Protected Designation of Origin – PDO, Protected Geographical Indication – PGI, or Traditional Speciality Guaranteed – TSG), strengthens a restaurant's sustainable positioning while supporting local producers and preserving culinary heritage (Glogoveţan, Dabija, Fiore, & Pocol, 2022). Certified products offer market differentiation and justify premium pricing by enhancing perceived value and customer loyalty. As highlighted by Agostino and Trivieri, quoted in Ţimiraş (Protection and Promotion of Agricultural and Food Products at European Union level through European Quality Schemes, 2019, p. 81), geographical indications protect producers from unfair competition and assure consumers of product quality, making them more willing to pay higher prices. This reduces vulnerability to price competition and enables higher profits through quality and uniqueness. Thus, integrating products from European quality schemes is a strategic approach that aligns environmental and social responsibility with long-term financial success.

Measuring sustainability, particularly in the tourism sector, is a complex process because it involves qualitative rather than quantitative indicators. Consequently, there is a shortage of meaningful statistical data on this phenomenon. It wasn't until early 2024 that the United Nations Statistical Commission (UNSC) officially endorsed the Statistical Framework for Measuring the Sustainability of Tourism (MST) at its 55th session (UNWTO, 2024). It aims to assess the economic, social, and environmental impacts of tourism. The Framework helps countries produce reliable, comparable data on tourism sustainability, ensuring that tourism activities contribute positively to people's lives. Developed by UN Tourism with support from various international organizations, MST is intended to provide robust data for better decision-making in the tourism sector.

Regarding global challenges, sustainability is becoming increasingly important, providing opportunities to realign the tourism industry towards the principles of social justice, economic equity and environmental responsibility. Investment in innovation and the implementation of concepts such as the circular economy are key to the long-term viability of the tourism sector and in particular, the hospitality and restaurant industry, while ensuring competitiveness and sustainable development. All stakeholders in the tourism industry must commit to sustainable practices that will not only improve the customer experience but also contribute to environmental protection and social well-being. Combining economic, social and environmental aspects in tourism management is essential for building sustainable destinations and achieving long-term success in the sector.

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Methodology and Limitations of the Study

1. Methodological Approach and Justification

The research adopts a qualitative and conceptually descriptive approach. The primary objective is not to test empirical hypotheses using statistical data, but to substantiate and systematically classify the theoretical and managerial connections necessary for the transition to sustainability. The choice of an exclusively qualitative methodology is justified by the following limitations:

- *Conceptual Nature of the Study:* The focus is on building a theoretical and managerial framework (Conceptual Model), which inherently requires analysis and synthesis rather than statistical testing.
- *Data Scarcity and Non-Standardization:* A lack of standardized and continuous quantitative data regarding sustainability performance metrics (for example waste per guest, specific water use) across the broad hospitality and restaurant sector renders large-scale quantitative analysis statistically unreliable.

2. Methods and Procedures

The study employs the following methods in a phased approach:

- *General Scientific Methods:* Analysis, synthesis, comparison, analogy, and induction are used to connect macro-level frameworks (ESG, TBL) with micro-operational techniques (Circular Economy, 4IR).
- *Systematic Review and AI-Assisted Classification:* A comprehensive literature review is performed on scientific publications and official documents (EU, UN Tourism). This review is enriched by an AI-assisted classification process to rapidly identify, categorize, and synthesize core concepts and systematically classify transition techniques (as defined in hypothesis H3).
- *Content and Qualitative Textual Analysis:* A desktop survey of established hospitality operations and a qualitative textual analysis of existing sustainability certification systems and official Best Environmental Management Practices (BEMPs) is performed. These serve as applied industry benchmarks to extract the most relevant sustainable management practices.

3. Methodological Limitations

The primary limitation stems from the study's conceptual and theoretical focus. The research does not include primary data collection (surveys or interviews) or statistical testing. Consequently, the findings provide a structurally sound set of managerial recommendations and a conceptual model, but these require subsequent empirical validation through sector-specific quantitative studies to confirm their statistical significance and generalizability across diverse markets.

Results and Discussion

1. Certification programs for sustainability in tourism

The growing interest in sustainable travel is leading to the emergence of sustainability certificates. Certification is among the most effective mechanisms that can register to what extent tourism enterprises have implemented the sustainable development code of conduct in their everyday activities and how sustainable their products and services are.

Environmentally and socially conscious travelers seek out businesses and destinations that hold recognized sustainability certifications. These certifications demonstrate a business's commitment to a sustainable future, giving travelers confidence that their choices align with their personal values. To obtain such certification, enterprises must meet established standards and criteria encompassing environmental, social, and economic sustainability. This process is carried out by a reputable organization that is recognized for its trust in assessing and certifying sustainable practices in the tourism industry. The most popular sustainability certification programs relevant to the hospitality and restaurant industry are presented in Table 1.

The table presents the most commonly used sustainability certificates applicable to hotels and restaurants. The use of such international certification programs makes their recipients more recognizable. They also guarantee the care of tourism enterprises for the environment and society, their commitment to green initiatives and their efforts to increase sustainability in daily operations. Most certificates are awarded for one year, and the main disadvantage that could discourage hotel and restaurant management is the relatively high fee paid for certification. In most cases, it varies depending on the type of certified facility and the country in which it is located. Another downside of this sustainable management approach is the necessity for ongoing business improvements, which carry financial implications. However, these improvements are also linked to adopting a long-term, consistent strategy for enterprise development.

There is no official data on the exact number of all hotel and restaurant businesses that have been certified under these programs to date. Some of the websites of the certification bodies only provide information for 2024. For example, Green Key is used by over 7500 hotels and other establishments in more than 80 countries. Approximately 799 tourist accommodation services hold the EU Ecolabel. Around 550 hotels, resorts, and villas are certified by EarthCheck.

Once certified for sustainability, businesses or destinations traditionally undertake numerous marketing initiatives to promote their organization's success and inform as many tourists as possible about their compliance with sustainability criteria. It is believed that this will attract responsible travelers and potential new partners, as well as contribute to improving the reputation of the company or destination.

As defined in the scientific novelty, our research adopts an integrative approach that requires alignment between macro- and micro-strategies. To illustrate the

classification of transition techniques, we present the Conceptual Model of Integrative Transition (Figure 3).

Table 1. Sustainable Certification Programs for Hotels and Restaurants

Certificate	Validity Period	Advantages	Disadvantages	Objects Certified
Green Key	1 year	Enhances environmental management, reduces costs, attracts eco-conscious guests	Can be costly for smaller businesses, requires continuous improvement	Hotels, hostels, small accommodations, campsites, holiday parks, conference centres, restaurants, attraction
Green Globe	1 year	Comprehensive sustainability criteria, marketing benefits, operational efficiency	High certification costs, perceived as complex	Hotels, resorts, conference centres, attractions
ISO 14001	3 years	Enhances environmental performance, compliance with regulations, operational efficiency	Resource-intensive, complex documentation, requires top management commitment	Environmental management systems for various industries
EU Ecolabel	2 years	Recognized across Europe, promotes sustainable practices, reduces environmental impact	Potential greenwashing, high certification costs, consumer disinterest	Cleaning products, clothing, textiles, coverings, electronic equipment, furniture, mattresses, gardening products, tourist accommodations, lubricants, paper, personal care products
GSTC	1 year	Internationally recognized standards, enhances sustainability practices, marketing benefits	Can be costly, requires continuous improvement	Hotels, tour operators, destinations
EarthCheck	1 year	Science-backed sustainability criteria, enhances tourism experiences, attracts eco-conscious customers	High costs, requires continuous improvement	Tourism businesses
Biosphere Tourism	1 year	Aligns with UN SDGs, enhances sustainability practices, marketing benefits	Can be costly, requires continuous improvement	Tourism businesses
TourCert	1 year	Promotes responsible tourism, enhances sustainability practices, marketing benefits	Can be costly, requires continuous improvement	Tourism businesses
SDG Actions Platform	Varies	Supports UN SDGs, promotes sustainability initiatives, enhances global collaboration	Can be complex, requires continuous improvement	Various stakeholders

Source: Compiled by the authors. Data collected from official certification programs' websites.

This model visualizes not merely the existence of separate frameworks but the cascading relationship between them:

- *Macro Framework* (Level 1) establishes the overarching objective – achieving

comprehensive sustainability.

- *Circular Economy* (Level 2) acts as the operational mechanism, translating these broad goals into actionable strategies such as waste reduction and resource optimization.
- *4IR/AI Technologies* (Level 3) serve as the essential enabler, ensuring efficiency, measurability, and rapid adaptability of this mechanism.

Only through the active interaction of these three levels can the Circular Economy operate as a dynamic strategic engine for generating transient competitive advantages and sensuring long-term viability.

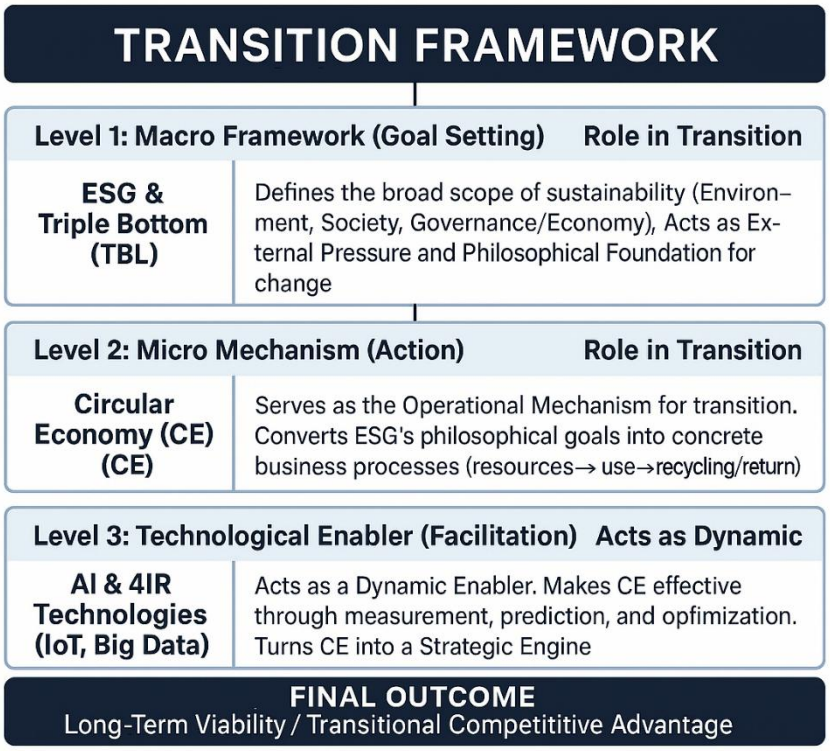

Figure 3. Conceptual Model of the Integrative Transition to Sustainable Management

Source: Compiled by the authors.

In the context of the Fourth Industrial Revolution (4IR) and an increasingly hyper-competitive business environment, the traditional pursuit of a permanent Sustainable Competitive Advantage (SCA) proves theoretically unrealistic. Our findings and systematic review indicate that the Circular Economy (CE) should not be perceived as a final destination or a permanent monopoly. Instead, CE functions as a dynamic mechanism for continuous adaptation. Through resource optimization and innovation, it enables the hospitality and food service sectors to generate a series of short-lived competitive advantages that build upon one another. This organizational agility – amplified by technological tools – becomes the cumulative factor ensuring long-term viability and positions the CE as the primary strategic driver in achieving the macro-level goal of sustainability.

2. Good practices in the hospitality industry

Management around the world has practically come up with a significant number of techniques that improve the sustainability of hotels, especially from an environmental and circular economy perspective. For example, Hotel Verde in Cape Town, South Africa, is known for its comprehensive sustainability policy. Many of these are embedded in the sustainability policies adopted by the companies. In most cases, the actions taken concern one of the subsequent three options – water conservation, waste management and recycling, and energy efficiency. The techniques used not only have a positive environmental imprint but also contribute to more efficient use of resources and higher competitiveness of enterprises. Modern technologies play a significant role in the transition to sustainable business practices, as they allow for the optimization of regular activities in enterprises. Some successful examples outlined through the desktop survey of various information sources (including accommodation websites) are listed.

Water Conservation:

- Reducing the amount of water used in consumption and cleaning processes – The Ritz-Carlton in Charlotte employs low-flow fixtures and has initiated a linen reuse program to decrease water consumption. Similarly, The Green House Hotel in Bournemouth, UK, has implemented various water-saving strategies, including rainwater harvesting and greywater recycling systems.
- Using dual-flush toilets that meet eco-standards to reduce the amount of water used – The Proximity Hotel in Greensboro, North Carolina, utilizes dual-flush toilets to effectively minimize water usage. The Hilton at San Francisco Union Square also features dual-flush toilets in both guest rooms and public restrooms to further reduce water consumption.
- Using water-saving showers and faucets – The Park Hyatt in Hyderabad, India, has installed water-efficient showers and faucets throughout its facilities. The Kimpton Hotel Monaco in Portland employs low-flow showerheads and faucets to conserve water while ensuring guest comfort.
- Developed procedures for regular inspection of dripping faucets – The Savoy Hotel in London conducts routine inspections to prevent dripping faucets, while The Fairmont Waterfront in Vancouver has established maintenance checks to ensure all plumbing fixtures are functioning properly and not wasting water.
- Linen and towel reuse procedures – The Hilton London Bankside encourages guests to reuse towels and linens to minimize laundry cycles. Many Accor hotels have adopted a similar policy, allowing guests to opt out of daily linen and towel changes, thereby reducing water usage.
- Eco-friendly cleaning processes – The Westin Hamburg has transitioned to using environmentally friendly cleaning products and eliminated aerosols. The Hyatt Regency in Denver has also updated its cleaning protocols to incorporate eco-friendly products and remove aerosol usage.
- Full capacity operations for dishwashers and washing machines – The

Radisson Blu Hotel in Berlin ensures that dishwashers and washing machines are only operated when fully loaded. The Four Seasons in Toronto follows the same practice to maximize water efficiency.

Waste and Recycling:

- Waste separation – The Marriott Marquis in San Francisco implements a thorough waste separation program, while The InterContinental in Berlin has a comprehensive waste management system that categorizes waste into recyclables, compost, and general waste.
- Glass bottle recycling machines – The Andaz Amsterdam Prinsengracht provides glass bottle recycling machines accessible to guests, promoting recycling during their stay.
- Individually packaged products are not offered at the buffet table – The InterContinental New York Barclay avoids offering individually packaged products at its buffet, opting instead for bulk options. The 1 Hotel in Brooklyn Bridge follows a similar approach to minimize waste.
- The hotel does not use single-use plastic products. They have been replaced with glass bottles, wooden stirrers, cardboard cups, paper bags, etc. – The Alila Villas Uluwatu in Bali has replaced single-use plastics with sustainable alternatives. Many Marriott hotels have also eliminated single-use plastics, opting for glass bottles and cardboard packaging.
- Digitalization of work processes and services to reduce paper use – The Peninsula Tokyo utilizes digital panels and electronic surveys to minimize paper consumption. CitizenM Hotels employs digital check-in and provides information through in-room tablets, further reducing the need for printed materials.
- Minimizing the amount of printed materials – The Hyatt Regency Amsterdam has implemented virtual concierge services to cut down on printed materials. The Radisson Blu in Amsterdam also uses a virtual concierge to enhance guest experience while minimizing paper use.
- Bulk purchasing – The Fairmont Waterfront in Vancouver focuses on purchasing products in bulk to reduce packaging waste. The Hilton Garden Inn in New York similarly emphasizes bulk purchasing to minimize waste.
- Recycling coffee capsules – The Four Seasons Hotel George V in Paris has a program for recycling coffee capsules used in guest rooms. The Hotel Indigo in London also recycles coffee capsules from in-room coffee machines.

Energy Efficiency:

- LED lighting – The Crowne Plaza Copenhagen Towers has implemented LED lighting throughout the hotel, significantly reducing energy consumption. The Marriott Marquis in Washington D.C. has also transitioned to LED lighting across its property.
- Energy-efficient appliances – The Sheraton Grand Hotel in Dubai ensures that all newly purchased appliances are energy efficient. The Westin in

Seattle is committed to using energy-efficient appliances in all guest rooms and common areas.

- Renewable energy sources – The Hotel Solar de las Animas in Mexico utilizes solar panels for electricity generation. The Hilton in San Francisco sources a portion of its energy from renewable sources, including solar and wind power.
- Electric vehicle charging stations – The Kimpton Hotel Van Zandt in Austin, Texas, provides charging stations for electric vehicles. The Hyatt Place in San Jose also offers electric vehicle charging, encouraging guests to adopt sustainable transportation options.

These examples show that various hotels around the world are adopting sustainable practices across different areas of hotel management to minimize their environmental impact, contributing to environmental conservation and responsible tourism. Many of them are part of chains that take advantage of the global recognition of the respective brand and the opportunities that franchising offers, including in relation to sustainability. However, this does not mean that smaller hotels in smaller countries cannot implement the mentioned practices. All of the above approaches are practically applicable at Katarino Spa Hotel in Razlog, Bulgaria (Katarino SPA Hotel, n.d.). This hospitality entity has also received the Green Key certification, demonstrating its commitment to sustainable management and high-quality tourism.

3. Good practices in the restaurant industry

In the context of good practices in the restaurant industry, waste management plays a key role. Reducing waste not only limits the growth of landfills but also has a positive impact on financial results through cost optimization. Food and packaging waste represents a significant challenge for restaurants, which can be overcome by implementing methods such as composting organic waste, recycling materials and portion control.

To minimize food waste, portion sizes can be reduced. Conducting a food audit will help categorize waste into spoiled food, kitchen waste, and customer waste. This data can be used to develop strategies to reduce spoilage and redirect leftovers, such as using animal bones for stock or stale bread for croutons. Additionally, a menu management system can help identify and eliminate unpopular dishes, and providing take-out containers will allow guests to take leftovers with them. Some of the successful examples of sustainable practices in the restaurant industry recorded during the study are as follows:

- Food with eco or organic certificates – Chipotle incorporates organic beans and responsibly sourced meats into its menu, ensuring high sustainability standards. Similarly, Blue Hill in New York emphasizes farm-to-table dining by sourcing ingredients from its own farm and other certified organic farms.
- Collaboration with suppliers implementing green practices – Sweetgreen, New York City partners with farmers who prioritize organic and sustainable farming practices. The Fat Duck in Bray, UK, collaborates with suppliers who adhere to sustainable practices.

- Sourcing from local producers – Blue Hill at Stone Barns in Tarrytown, NY, sources ingredients from its own farm and local producers for fresh, sustainable food. Farmers' Table in Delray Beach, Florida, focuses on sourcing from local farmers to support the economy and reduce carbon footprints.
- Partnerships with ethically aligned suppliers – Nectar Farm Kitchen in Bluffton, SC, collaborates with suppliers who share their commitment to sustainability. Noma in Copenhagen, Denmark, also partners with suppliers that prioritize ethical practices, ensuring alignment with their values.
- Seasonal menu offerings – The Barn at Blackberry Farm in Walland, TN, features a menu that changes with the seasons, utilizing ingredients grown on their own farm. Chez Panisse in Berkeley, California, is known for its seasonal menu that adapts based on the freshest local produce available.
- Own gardens and/or farms – Primo Restaurant in Rockland, ME, grows a significant portion of its ingredients on its own farm, ensuring fresh produce. The Edible Schoolyard in Berkeley, California, includes a restaurant that cultivates its own produce, promoting sustainability and healthy eating.
- Smaller portion sizes – Tapas restaurants in New York City serve smaller, artfully plated dishes, which help reduce food waste and encourage healthier eating habits. Osteria Francescana in Modena, Italy, offers tasting menus with smaller portions, allowing guests to sample a variety of dishes while minimizing waste.
- Limiting meat in dishes – Apricity Restaurant in Mayfair, London, focuses on reducing meat usage. Dirt Candy in New York is a vegetarian restaurant that highlights plant-based dishes, showcasing vegetables as the main attraction.
- Concise menu offerings – Noshway emphasizes the advantages of restaurants with smaller menus that can concentrate on quality and sustainability. Saison in San Francisco, California, provides a focused menu that prioritizes quality over quantity, facilitating better sourcing and less waste.
- Food waste reduction – Orderable offers strategies for restaurants to minimize food waste, such as conducting food audits and enhancing inventory management. WastED in New York is dedicated to utilizing ingredients that would otherwise go to waste, creating dishes from overlooked or surplus food.
- Bulk purchasing of products and materials – Sweetgreen in New York City buys products in bulk to minimize packaging waste and support sustainability. The Greenhouse Tavern in Cleveland, Ohio, also purchases in bulk to ensure a steady supply of sustainable ingredients.
- Eco-friendly packaging – Alila Villas Uluwatu in Bali, Indonesia, uses sustainable alternatives to single-use plastics, such as glass bottles and paper bags. Sweetgreen employs compostable and recyclable packaging for its takeout and delivery orders.
- Energy efficiency – Crowne Plaza Copenhagen Towers in Copenhagen, Denmark, utilizes LED lighting and energy-efficient appliances to lower

energy consumption. The River Café in London has implemented energy-efficient practices and appliances to reduce its overall energy use.

These examples illustrate how various restaurants are effectively implementing sustainable practices in their operations. Sustainable practices are not limited to restaurants of global chains or establishments in large cities. The Bulgarian boutique restaurant "Dieci" (Boutique restaurant "Dieci", n.d.), for example, is located in the village of Devino and applies a number of the listed sustainability techniques. The restaurant is housed in a former school, which has been restored with improved energy efficiency, and has its own vegetable and fruit garden. For its greenhouse for seedlings, the boutique restaurant has a seed bank for various types of plants, among which there are Bulgarian tomato varieties that are over a century old. During the entire food preparation operation, any material from paper, plastic, metal or glass is collected separately for future processing in their recycling center. All food scraps are placed in an electronic food composter, which in 10 hours turns all organic food waste into useful organic compost, resembling earth's soil.

These exemplary sustainable practices in hotel and restaurant management can serve as practical guidelines for other businesses in the sector. By adopting similar approaches, businesses can enhance their environmental responsibility, improve operational efficiency, and align with modern sustainability standards. This not only benefits the environment but also attracts eco-conscious customers and partners, ultimately contributing to a more sustainable and resilient industry.

4. Policies and Strategies for the Sustainable Application of AI and 4IR Technologies in the HORECA Sector

To demonstrate the full potential of AI and 4IR technologies as a strategic driver, it is necessary to examine their integrated impact across the three pillars of sustainability: Environmental, Social, and Governance. This transforms the technologies into a universal tool for achieving the goals of the ESG and TBL frameworks:

Environmental Pillar (Circular Economy - CE)

Within the CE framework, AI primarily functions as a preventive tool. Instead of merely managing waste, AI is used for Food Waste Prediction. By analyzing historical sales data, weather patterns, and guest numbers, AI systems can optimize menu planning and raw material orders with extreme accuracy. This leads to a significant reduction in excesses before they are created, representing the highest form of efficiency in the waste hierarchy and is in direct alignment with the requirements of the EU's Waste Framework Directive (2008/98/EC) (European Commission, 2023), which emphasizes prevention as the highest priority. Additionally, IoT sensors connected to AI regulate energy and water consumption in guest rooms based on occupancy, leading to direct resource optimization.

Social Pillar (TBL/ESG)

4IR technologies significantly improve health and safety conditions in the HORECA sector, which is a key element of social responsibility. The application of automated cleaning with robotic systems reduces physical strain and the risk of injury to staff. Air quality sensors

(IoT), integrated into building management systems, ensure optimal ventilation and control of pollutants, guaranteeing a healthier working environment. This focus on prevention and improving the work environment is consistent with European Occupational Safety and Health (OSH) frameworks (European Parliament and Council, 2025), aimed at systematically reducing professional risks and improving employee retention.

Governance Pillar (ESG - Governance)

In the realm of governance, AI provides tools for transparency and accountability that are vital for attracting investors and meeting ESG standards. AI is used for the automated collection, validation, and reporting of ESG data (e.g., carbon emissions, water consumption, social responsibility metrics). This process eliminates manual data entry errors and provides real-time data with a high degree of reliability. This facilitates auditing and the preparation of ESG reports, which are increasingly mandatory under regional regulations (e.g., the EU Corporate Sustainability Reporting Directive (European Parliament and Council, 2021)) and support global accountability under the 2030 Agenda.

Analyzing the context of sustainable practices in the hospitality and food service (HORECA) sector reveals that topics related to the Fourth Industrial Revolution (4IR) and the use of Artificial Intelligence (AI) are becoming increasingly relevant. Research and official documents indicate that AI and 4IR technologies are not only innovations but also strategic factors for implementing the principles of the circular economy (CE).

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The official strategic communication within the HORECA sector emphasizes the importance of innovations like AI and 4IR technologies in achieving sustainability. Integrating these technologies allows for resource optimization, waste minimization, and an overall increase in operational efficiency, aligning with the principles outlined in the EU's Directive 2008/98/EC (European Commission, 2023) on waste and the 2030 Agenda for Sustainable Development (United Nations, 2023). Organizations actively adopting these solutions not only adapt to consumer demands for sustainability but also gain a competitive edge in the market.

There is a consensus in academic literature and official documents regarding the impact of AI-assisted operational tools on key processes in the CE, particularly concerning resource management and waste reduction. A review of various sources, including guidance from the UN Tourism Statistical Framework for Measuring the Sustainability of Tourism (UNWTO, 2024), shows that AI can optimize resource flows, predict customer needs, and manage inventory more effectively.

Through content analysis of publications from official bodies and reports from the EU and UN (One Planet Network, 2020), we observe the significant impact of these tools

on practical aspects of the circular economy. Furthermore, official frameworks, such as those developed to facilitate innovation in circular tourism, provide specific strategic guidance that further substantiates the necessity of adopting CE as a key framework for the sector's development (One Planet Network, 2017). Reports provide specific examples of organizations that have achieved substantial waste reductions and enhanced resource efficiency through AI integration in their operations.

Successful AI integration examples include optimizing menus by using AI to analyze customer preferences and adapt offerings in real time, and automating processes where AI systems manage inventory to prevent excesses and reduce costs. These examples illustrate that the implementation of AI tools is not merely an innovation; it is a crucial step toward applying CE principles.

The presented evidence and analyses support hypotheses H2 and H3, highlighting that strategic communication and innovations in the HORECA sector are foundational for successfully integrating sustainable practices. AI and 4IR technologies not only offer resource optimization solutions but also play a vital role in building strategic competitive advantages within the context of the circular economy.

5. Discussion on Capital Expenditures and Financial Barriers

The analysis convincingly demonstrates that the strategic integration of the Circular Economy (CE), bolstered by advancements in Fourth Industrial Revolution (4IR) technologies and Artificial Intelligence (AI), leads to long-term economic viability and enhanced investment attractiveness. However, it is essential not to overlook the pressing concern of high initial capital expenditures (CAPEX). Transitioning from a linear to a circular model necessitates significant upfront investments. These investments include specialized equipment, such as smart waste management systems and energy-efficient installations, as well as the acquisition and implementation of AI-based software and hardware.

Moreover, the expenses associated with obtaining certification under international green standards, as shown in Table 1, can be particularly daunting for small and medium-sized enterprises (SMEs). This considerable financial burden often serves as a barrier to entry, limiting the capacity of SMEs to participate in and benefit from the shift toward sustainable practices. The lack of resources may stifle innovation, as smaller firms might find themselves unable to compete with larger entities equipped with the necessary capital to invest in green technologies.

This high initial financial barrier represents a significant constraint on the widespread adoption of sustainable practices across the sector, potentially slowing the overall transition to the Circular Economy (Rizos, Behrens, Kafyeke, Hirschnitz-Garbers, & Ioannou, 2015). Without addressing these barriers, the vision of a seamless integration of CE practices may remain out of reach for many organizations. Therefore, to ensure that CE becomes a universally applicable strategic driver, it is paramount for regulatory bodies and financial institutions to enact targeted financial mechanisms. These may include

subsidies, low-interest loans, or tax incentives designed specifically to alleviate the financial pressures faced by SMEs.

Additionally, promoting a phased approach to technological adaptation can greatly enhance the feasibility of transitioning toward CE (Geissdoerfer, Savaget, Bocken, & Hultink, 2017). By allowing businesses to gradually integrate circular practices, the financial burden can be spread over time, making it more manageable. Such an approach not only reduces immediate capital requirements but also enables firms to adapt at a pace that aligns with their operational capabilities and market demands.

In conclusion, while the integration of the Circular Economy presents substantial opportunities for long-term economic benefits, the challenges posed by high initial CAPEX must be adequately addressed. Without strategic financial frameworks and supportive policies, the potential benefits of CE may remain untapped, inhibiting both environmental sustainability and economic growth.

Conclusions

This study substantiates the critical necessity of a strategic management shift toward sustainability and circular economy principles within the hospitality and food service sectors. The research confirmed that environmental and socio-economic pressures require operational models that move beyond traditional linear consumption patterns. By employing a qualitative and conceptually descriptive methodology, we successfully identified and classified a comprehensive set of transition techniques and managerial models that facilitate this fundamental change.

The findings emphasize that sustainability in this context is not merely a moral obligation but a robust strategic and economic imperative. The integration of circular economy practices directly addresses key industry challenges, such as waste management, resource efficiency, and high operational costs. Furthermore, the analysis highlighted the significant impact of European regulatory frameworks in steering this transition, validating the practical relevance of the proposed approaches. The study thus offers a foundational roadmap for practitioners and managers seeking to implement ecologically responsible and economically viable operations.

1. Limitations and Future Research

A key limitation of this study stems from the lack of standardized, continuous quantitative data (e.g., uniform metrics for waste per guest, or standardized ecological footprint measures) across the hospitality and food service sector. This necessitated a reliance on qualitative textual analysis rather than empirical quantitative validation.

Future research should focus on developing standardized performance indicators to allow for cross-organizational quantitative comparisons. Furthermore, empirical studies utilizing the classified transition techniques are warranted to measure the precise economic and environmental impacts, thus transforming the conceptual framework developed here into a data-driven model for optimization and policy development.

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2. Synthesis of Research Hypotheses

To ensure the coherence and completeness of the scientific argument, the findings are directly synthesized against the initial research hypotheses:

- **H-1 (Strategic Necessity):** The necessity of a strategic transition toward sustainable management practices, grounded in ecological responsibility, is **confirmed**. The study's findings demonstrate that sustainable management is a prerequisite for competitiveness and resilience in the 21st century tourism market.
- **H-2 (Circular Economy & Competitiveness):** The integration of circular economy practices serves as a strategic driver for competitive advantage in the hospitality and food service sectors. This hypothesis is **confirmed**, as the classified transition models clearly illustrate how circularity leads to optimized resource use, cost reduction, and enhanced brand reputation.
- **H-3 (Economic Viability):** The successful adoption of sustainability-oriented practices is a key driver of long-term economic viability. This hypothesis is **validated**. The discussion on financial barriers and capital expenditures in Section 4.5 confirms that while initial investment may be required, the resulting operational efficiencies and improved market positioning constitute a significant long-term return on investment, thereby strengthening economic viability.

The successful validation of all three hypotheses reinforces the central thesis of the study: a dual-level approach integrating sustainability into both managerial strategy and operational practice is essential for industry transformation.

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