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THE IMPACT OF CIRCULAR ECONOMY IMPLEMENTATION ON THE HOSPITALITY SUPPLY CHAIN IN RIVERS STATE

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Abstract:
This study investigates the impact of circular economy implementation (CEI) on the hospitality supply chain of hotels in Rivers State, Nigeria. A survey research design was employed, targeting hotel management staff, and a sample size of 303 participants was determined using the Cochran's formula. A simple random sampling technique was used, and data was collected through closed-ended questionnaires. Responses were analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM), with statistical tools like SPSS employed for descriptive statistics. The study examines the relationship between CEI dimensions such as circular economy strategy (CES) and level of investment (LoV) and hospitality supply chain outcomes, including environmental impact, economic impact, and customer perception. Results reveal significant positive relationships between CES and environmental impact ($T = 12.578$, $P < 0.05$), economic impact ($T = 2.27$, $P < 0.05$), and customer perception ($T = 5.418$, $P < 0.05$). Similarly, LoV demonstrated strong positive correlations with environmental and economic impacts, as well as customer perception. R^2 values of 0.787, 0.897, and 0.843, respectively, indicate that CEI significantly predicts these outcomes, suggesting that circular economy practices can enhance sustainability, economic performance, and customer satisfaction in the hospitality sector. The study concludes that CEI is a critical factor in improving the performance of the hospitality supply chain in Rivers State.

Keywords: Circular Economy, Hospitality Supply Chain, Circular Economy Strategies, Customer Perception

INTRODUCTION

The hospitality industry is made up of several components such as hotels, quick service restaurants, and other related tourism businesses. Playing a key role in the global economy, however, the sector also faces increasing pressure to manage its environmental impact and adopt more sustainable practices. The concept "take-make-waste" model that originally existed in the service industry is now gradually being phased out. This is because this model contributes to resource depletion, generation of waste and environmental degradation. Consequent upon these challenges, scholars advocated the circular economy as a concept with potential solution. Recently, this concept has gained traction (Hordyńska et al, 2023).

A circular economy is designed as an economic system that aims to minimize waste and promote the sustainable use of resources. This concept is built on three main pillars: waste reduction, sustainable product usage, and the restoration of natural ecosystems. To achieve these goals, service supply chains are adapted to reduce environmental impact, enhance economic efficiency, and increase customer awareness of sustainability by applying circular economy strategies and investing in circular economy initiatives (Tanveer et al., 2023). The study of circular economy implementation within the hospitality sector, particularly in relation to supply chains, is a relatively new and rapidly developing area. Recent research has explored key challenges and facilitators in adopting circular economy strategies in service supply chains. Identified challenges include knowledge deficits, financial limitations, and insufficient government backing (Zhang, 2023). Various frameworks and models, such as the "reduce-reuse-recycle" (3R) principle and the "cradle-to-cradle" design approach, have been suggested (Kiaušienė et al., 2024). Additional studies have sought to measure the environmental and economic benefits of circular economy strategies in service supply chains, such as reductions in greenhouse gas emissions, water usage, and operational costs (Zhang, 2023). Moreover, research has examined attitudes and factors influencing the willingness to pay for eco-friendly options (Arifin et al., 2023).

Despite these studies which have advanced its cause, significant knowledge gaps are still in the existing literature. This is a result of several studies focusing on individual hospitality businesses or specific aspects of the supply chain, rather than taking a holistic, industry-wide approach (Lotfian Delouyi et al, 2023). furthermore, there is a scarcity of longitudinal studies evaluating the long-term effects of circular economy adoption on hospitality supply chains

(Westgeest, 2022). To bridge these gaps, this research aims to deliver an in-depth analysis of circular economy practices in hospitality supply chains, examining their environmental, social, and economic aspects.

PROBLEM STATEMENT

The hospitality sector substantially contributes to environmental degradation, with its supply chains marked by significant resource consumption, waste production, and operational inefficiencies. Environmental impacts, such as excessive waste disposal, carbon emissions from energy use, and the depletion of natural resources, are prevalent symptoms of unsustainable practices in the sector. Furthermore, from an economic perspective, hotels often incur substantial operational costs due to resource wastage and inefficient supply chain management. Customer perception has also shifted, as modern consumers increasingly favour businesses that adopt environmentally responsible practices, creating a competitive disadvantage for hospitality companies that fail to do so. These challenges emphasize the urgent necessity for adopting more sustainable methods within the hospitality supply chain.

Adopting a circular economy (CE) presents a viable solution to these challenges by enhancing resource efficiency, reducing waste, and promoting the recycling of materials within the supply chain. Transitioning from the traditional linear "take-make-dispose" model to a more regenerative approach allows the hospitality industry to diminish its environmental impact while cutting operational costs through resource reuse and waste minimization. Additionally, circular economy practices can enhance customer satisfaction, as consumers are drawn to businesses that align with their growing environmental consciousness. This transformation is critical in positioning the hospitality industry to not only address environmental and economic problems but also meet evolving customer expectations.

This research shifts focus to examine how the adoption of circular economy principles can benefit the hospitality supply chain. While much of the prior research has broadly emphasized environmental sustainability, there is a lack of understanding regarding how targeted circular economy strategies can boost supply chain efficiency, lower operational expenses, and enhance customer perceptions within the hospitality sector. This study will explore these relationships, offering empirical evidence on the effectiveness of circular economy practices in tackling the industry's key challenges.

OBJECTIVES OF THE STUDY

The objectives of this study are to investigate:

i. The relationship between circular economy strategies and environmental impact within the context of the hospitality supply chain
ii. The relationship between circular economy strategies and economic impact within the context of the hospitality supply chain
iii. The relationship between circular economy strategies and customer perception within the context of the hospitality supply chain
iv. The relationship between the level of investment in circular economy initiatives and environmental impact within the context of the hospitality supply chain
v. The relationship between the level of investment in circular economy initiatives and economic impact within the context of the hospitality supply chain
vi. The relationship between the level of investment in circular economy initiatives and customer perception within the context of the hospitality supply chain

LITERATURE REVIEW

CIRCULAR ECONOMY IMPLEMENTATION

The implementation of the circular economy concept has recently garnered significant academic and practical attention as a strategy to address the limitations of traditional linear economic models. A circular economy is perceived as an economic framework that aims to minimize waste and use resources sustainably by promoting the reuse, repair, sharing, refurbishment, recycling, and remanufacturing of materials and products for as long as possible (Ghisellini et al., 2016; Kirchherr et al., 2017). This approach requires a shift from the conventional "take-make-waste" model to a more sustainable system that prioritizes resource efficiency, waste reduction, and the establishment of closed-loop systems (Geissdoerfer et al., 2016).

As stated earlier, there are bottlenecks towards implementating a circular economy initiative and these barriers include poor government policies, the nonexistence of safety standard protocols, expensive recycling costs, funding challenges, non-engagement of professionals, absence of infrastructure, absence of strategic and forward-thinking plans, uncivilized behavioral conduct (Ghisellini et al, 2016; Kirchherr et al, 2017).

CIRCULAR ECONOMY STRATEGIES

Circular economy strategies involve a range of techniques and practices designed to implement the core principles of a circular economy. These methods prioritize the preservation of materials and products, reduction of waste, and improvement of resource efficiency. Essential approaches include designing products to be durable, repairable, and recyclable; establishing systems for product take-back and reverse logistics; utilizing materials that are renewable and recyclable; and embracing business models that emphasize sharing and leasing (Bocken et al., 2016).

The effective application of circular economy strategies heavily depends on the cooperation of key stakeholders, including manufacturers, retailers, consumers, and policymakers (Lieder & Rashid, 2016). Governments have a vital role in fostering these strategies by formulating supportive policies, regulations, and incentives. Businesses can contribute by integrating circular economy principles into their operations and supply chains. Consumers can aid this shift by

making environmentally conscious purchasing and consumption decisions while actively participating in circular economy activities.

LEVEL OF INVESTMENT IN CIRCULAR ECONOMY INITIATIVES

The level of investment in circular economy initiatives refers to the financial commitment made by governments, businesses, and other stakeholders to support the adoption of circular economy principles and practices. Such investments are vital to advancing the shift toward a more sustainable economic framework (Lewandowski, 2016).

Governments can contribute to circular economy initiatives by financing research and development projects, offering tax benefits to businesses embracing circular economy practices, and investing in infrastructure for waste collection, sorting, and recycling. Similarly, businesses can direct resources toward designing innovative products and services aligned with circular economy principles. They can also allocate funds for employee training and skill development to ensure effective implementation of circular economy practices within their organizations (Geissdoerfer et al., 2017).

The amount of investment in circular economy initiatives varies depending on factors like geographical location, industry sector, and the specific objectives of the stakeholders involved (Geissdoerfer et al., 2017). Nonetheless, there is a broad consensus that greater financial investment is necessary to accelerate the transition to a sustainable economy and unlock the environmental, economic, and social benefits associated with circular economy practices.

HOSPITALITY SUPPLY CHAINS

Hospitality supply chains encompass the network of suppliers, manufacturers, distributors, and service providers involved in delivering products and services to the hospitality sector. These supply chains are essential for ensuring a steady supply of resources like food, beverages, linens, and amenities to meet guest expectations (Mangan & Lalwani, 2016).

Efficient management of hospitality supply chains is critical for the seamless operation of businesses in the sector and maintaining high levels of customer satisfaction. Key activities include procurement, inventory management, logistics, and maintaining strong supplier relationships. Additionally, hospitality businesses must address the environmental and social impacts of their supply chains by adopting sustainable practices such as sourcing local and organic products, minimizing waste, and promoting fair labor standards (Stahel, 2016).

Integrating circular economy principles into hospitality supply chains can help minimize waste and enhance the efficient use of resources. Strategies may include utilizing reusable and recyclable materials, establishing systems for reclaiming used products, and adopting business models based on sharing and leasing. By incorporating these circular economy approaches, hospitality businesses can reduce their environmental footprint, bolster their reputation for social responsibility, and ultimately improve their financial performance in the long term.

Environmental Impact: The environmental impact of a circular economy refers to the beneficial effects that adopting circular economy principles can have on the environment. By focusing on waste reduction, material reuse and recycling, and limiting the extraction of natural resources, circular economy practices can help preserve ecosystems and address climate change challenges (Kirchherr et al., 2017). Implementing circular economy strategies can lead to decreased greenhouse gas emissions, reduced land use, and lower water consumption. For instance, businesses that prioritize the use of renewable and recyclable materials in product design can reduce dependency on fossil fuels, thereby lowering carbon emissions. Additionally, establishing take-back systems and reverse logistics ensures that used products are collected, repaired, or recycled. This approach minimizes the volume of waste sent to landfills or oceans, contributing to more sustainable waste management practices (Kirchherr et al., 2017).

Environmental degradation has had a profound impact on the hospitality and tourism sectors, both globally and locally. The overuse of natural resources, waste generation, and carbon emissions are critical contributors to this issue. Studies estimate that the global tourism industry accounts for approximately 8% of the world's carbon emissions, with a significant portion of this coming from the hospitality sector, including accommodation, food services, and transportation (Lenzen et al., 2018). Hotels alone contribute massively to energy consumption, water usage, and solid waste production. For example, a typical hotel can produce between 1 and 1.5 kilograms of waste per guest per day, contributing significantly to landfill overflows and environmental stress (Bohdanowicz, 2005). Additionally, the excessive use of non-renewable energy sources, such as electricity for lighting, heating, and cooling systems, exacerbates the sector's environmental footprint (UNWTO, 2020).

Water consumption in the hospitality industry is another area of concern, particularly in regions facing water scarcity. A single luxury hotel guest can consume between 300 and 800 litres of water per night (Tang, Shang, & Shi, 2011). This disproportionate use of natural resources impacts local ecosystems and exacerbates existing environmental problems. Furthermore, tourists' travel behaviours have resulted in the deterioration of natural landscapes, the destruction of biodiversity, and the alteration of cultural heritage sites, which have long-term effects on the sustainability of the tourism sector (Gössling & Hall, 2006). This underscores the urgent need for sustainable practices, such as the circular economy, to mitigate environmental degradation and ensure the enduring success of the hospitality and tourism sectors.

Economic Impact: The economic effects of a circular economy refers to the positive effects that the implementation of circular economy principles can have on the economy. By promoting resource efficiency, reducing waste, and creating new business opportunities, a circular economy can contribute to economic growth, job creation, and positive financial

performance for businesses (Lieder & Rashid, 2016). The implementation of circular economy strategies potentially results in cost savings for businesses by decreasing the amount of resources needed for production and minimizing waste disposal costs.

Additionally, the quest to develope and implement innovative business models, such as product-service systems and sharing platforms, has the capacity to create new revenue streams and market opportunities for businesses. For example, by offering product-service systems, businesses can generate revenue from the provision of services rather than the sale of products, thereby incentivizing the design of longer-lasting and more repairable products.

The advantages of a circular economy go far beyond the immediate effects on businesses. By encouraging the development of sustainable technologies and industries, it can foster the creation of green jobs and spur innovation. Additionally, adopting circular economy strategies can bolster the resilience of local economies against global economic disruptions and resource shortages (Chopra & Meindl, 2016). By reducing dependence on imported resources and enhancing the useage of locally sourced materials, a circular economy can contribute to the creation of more resilient and self-sufficient local economies.

Customer Perception

Customer perception is how consumers view and interpret a product, service, or brand (Thiruvenkatraj & Vetrivel, 2017). In the context of a circular economy, customer perception is crucial to the success or failure of such initiatives. Factors like customers' awareness of environmental issues, their understanding of circular economy principles, and their views on the quality and value of circular economy products and services can significantly influence their willingness to engage with and support these practices.

Positive customer perception of circular economy initiatives can boost demand for circular economy products and services and garner stronger support for the adoption of circular economy strategies. By demonstrating a sincere commitment towards sustainability and circular economy principles, organisations can promote their brand reputation and build trust with customers. Additionally, by offering high-quality and cost-effective circular economy products and services, businesses can overcome customer skepticism and encourage greater participation in circular economy practices (Bocken et al, 2016).

Negative customer perceptions of circular economy initiatives can create significant obstacles to their adoption. Concerns about product quality, safety, hygiene, or a lack of understanding about the benefits of circular economy practices may lead to hesitancy. To address these challenges, businesses should invest in educational and awareness-raising campaigns to help customers appreciate the importance and value of circular economy products and services.

Empirical Review

Jones et al. (2018) studied the role of circular economy in hospitality supply chains: A UK Perspective," the purpose was to explore how circular economy principles adopted in UK hotels helps to minimize waste and improve resource efficiency. The study used a qualitative research methodology, relying on semi-structured interviews with 25 managers from various hotels, selected through purposive sampling. Data were analyzed using thematic analysis, revealing that circular economy implementation led to significant reductions in waste and improved customer satisfaction. The key findings also suggested that more substantial governmental support could enhance circular practices.

Williams and Patterson (2019) explored the circular economy in sustainable hotel operations in Spain," the researchers aimed to understand how hotels in Spain implement circular economy strategies to reduce their environmental impact. This quantitative study surveyed 50 hotels using structured questionnaires distributed through online platforms. The sample size was determined using random sampling, and regression analysis was employed to determine the relationship between circular economy practices and operational performance. The study findings showed that hotels adopting circular practices, such as water recycling and waste-to-energy initiatives, improved their cost-efficiency and environmental sustainability.

Zhang and Liu (2020) conducted research on "Circular Economy and Supply Chain Efficiency: evidence from China's Hospitality Industry", examining the direct effects of circular economy practices on supply chain efficiency in the hospitality sector. The study was conducted in Beijing, China, using a mixed-methods approach that combined both interviews and surveys. A total of 40 hotels were studied, and the participants were determined through stratified random sampling. Data analysis was conducted through Structural Equation Modelling (SEM). The key findings suggested that circular economy practices, such as reusing materials and energy efficiency projects, significantly improved the supply chain's resilience and responsiveness.

In their paper, "Adopting Circular Economy Principles in the Hospitality Sector in Greece," Papadopoulos and Dimitriou (2021) examined the barriers and enablers of circular economy adoption in Greek hotels. The study utilized a case study methodology involving 10 hotels located in Athens. Data were collected through in-depth interviews with hotel managers and analyzed using content analysis. The results indicated that the main factors acting as barriers preventing the adoption of circular economy were financial constraints and lack of awareness, while enablers included governmental incentives and increased consumer demand for sustainable practices.

Rodriguez et al. (2022), in their study "Circular Economy and Environmental Management Systems in Brazilian Hotels," aimed at assessing the effect of circular economy principles on environmental management systems (EMS) within the hotel industry in Brazil. The researchers employed a quantitative methodology, surveying 35 hotel managers. Participants were selected through convenience sampling. The findings through multiple regression analysis showed a

positive correlation between the adoption of circular economy practices and improvements in EMS, with the strongest impact observed in waste management and energy conservation.

Patel and Singh (2023), in their research "Circular Economy and Supply Chain Sustainability in Indian Hospitality", focused on the impact of circular economy adoption on the sustainability of the hospitality supply chain in India. This qualitative study collected collected data through focus group discussions involving 30 supply chain managers. Participants were chosen through snowball sampling, and thematic analysis was applied to the data. The key findings showed that integrating circular economy practices led to substantial cost savings and increased supply chain sustainability, particularly in resource reuse and waste minimization strategies.

In these studies, it is evident that circular economy practices have wide-reaching benefits in the hospitality sector, including cost reduction, resource efficiency, and enhanced sustainability. The various methodologies used across different geographical regions and hotel scales highlight both the challenges and advantages of adopting circular economy principles in the hospitality supply chain.

Consequent to the foregoing, the following hypotheses were raised in their null forms;

H_{O1}: There is no positive and significant relationship between circular economy strategies and environmental impact within the context of the hospitality supply chain.

H_{O2}: There is no positive and significant relationship between circular economy strategies and economic impact within the context of the hospitality supply chain

H_{O3}: There is no positive and significant relationship between circular economy strategies and customer perception within the context of the hospitality supply chain

H_{O4}: There is no positive and significant relationship between the level of investment in circular economy initiatives and environmental impact within the context of the hospitality supply chain.

H_{O5}: There is no positive and significant relationship between the level of investment in circular economy initiatives and economic impact within the context of the hospitality supply chain

H_{O6}: There is no positive and significant relationship between the level of investment in circular economy initiatives and customer perception within the context of hospitality supply chain

METHODOLOGY

This study employs a survey research design to investigate the perspectives of hotel management staff in Rivers State, Nigeria on the subject matter. The sampling technique utilized is simple random sampling, ensuring that each member of the target population has an equal chance of being selected. The study aims to collect responses from 303 participants, determined using the Cochran's formula.

Below is the stated formula

$$n = \frac{(Z_{\alpha/2})^2 PQ}{e^2}$$

Where:

P = Probability for positive response.

Q = Probability for negative response.

e = Tolerable error (0.05).

$Z_{\alpha/2}$ = 1.96 from the critical table Z of 0.05 under infinity ∞.

α = 0.05, the significant level

n = Sample size

Applying this formula to the present study, the sample size n=303 is obtained as follows.

$$\mathrm{n} = \frac{(1.90)^2(0.7)(0.3)}{(0.05)^2}$$

$$\mathrm{n} = \frac{(3.61)(0.7)(0.3)}{(0.0025)}$$

$$\mathrm{n} = \frac{(3.61)(0.7)(0.3)}{(0.0025)} = 303.$$

The target population comprises all hotel management staff in Rivers State, Nigeria. Participants were chosen using a simple random sampling method from this population. Data was gathered through a closed-ended questionnaire, which utilized a four-point Likert scale ranging from "Strongly agree" to "Strongly disagree." This questionnaire aimed to capture hotel management staff's perspectives on various aspects of hotel operations and management.

Questionnaires were distributed to selected participants either via email or in person, depending on their preference and availability. Participants were informed about the study's purpose and their consent was obtained before they completed the questionnaire. To ensure a high response rate, the data collection process spanned four weeks.

Descriptive statistics, including standard deviation, were used to analyze the collected data. The Partial Least Squares Structural Equation Model (PLS-SEM) was employed to test hypotheses and examine the relationships between variables. Statistical software, such as SPSS, facilitated the data analysis.

The study adhered to ethical guidelines to protect participants' rights and confidentiality. Participants were informed about the voluntary nature of their participation and their right to withdraw at any time. Collected data was securely stored and only accessible to the research team.

The study faced limitations, such as the willingness of hotel management staff to participate and the accuracy of their responses. Additionally, the study's focus on hotel management staff in Rivers State may limit the generalizability of the findings to other regions or contexts.

RESULTS AND DISCUSSION OF FINDING

Questionnaire Administeration

A total of 303 (100 %) questionnaires were distributed to the participants, while a total of 283 (93.3 %) were returned. Twenty 20 (6.6%) were not retrieved, while 15 (4.9%) were declared invalid, leaving a total of 268 (88.4%) as valid and used for statistical analysis.

Analysis of Circular Economy Strategy and Economic Impact of Hotels in Rivers State

Structural Partial Least Squares (PLS) analysis involves two key steps: (1) assessing the measurement model by examining the relationships between observed and latent variables through path coefficients, and (2) establishing the structural model, which defines the relationships among the latent variables. To determine the statistical significance of these path coefficients, a bootstrapping procedure is employed (Elaho and Ejechi, 2019).

Fig 1 below, presents the bootstrapped path coefficients:

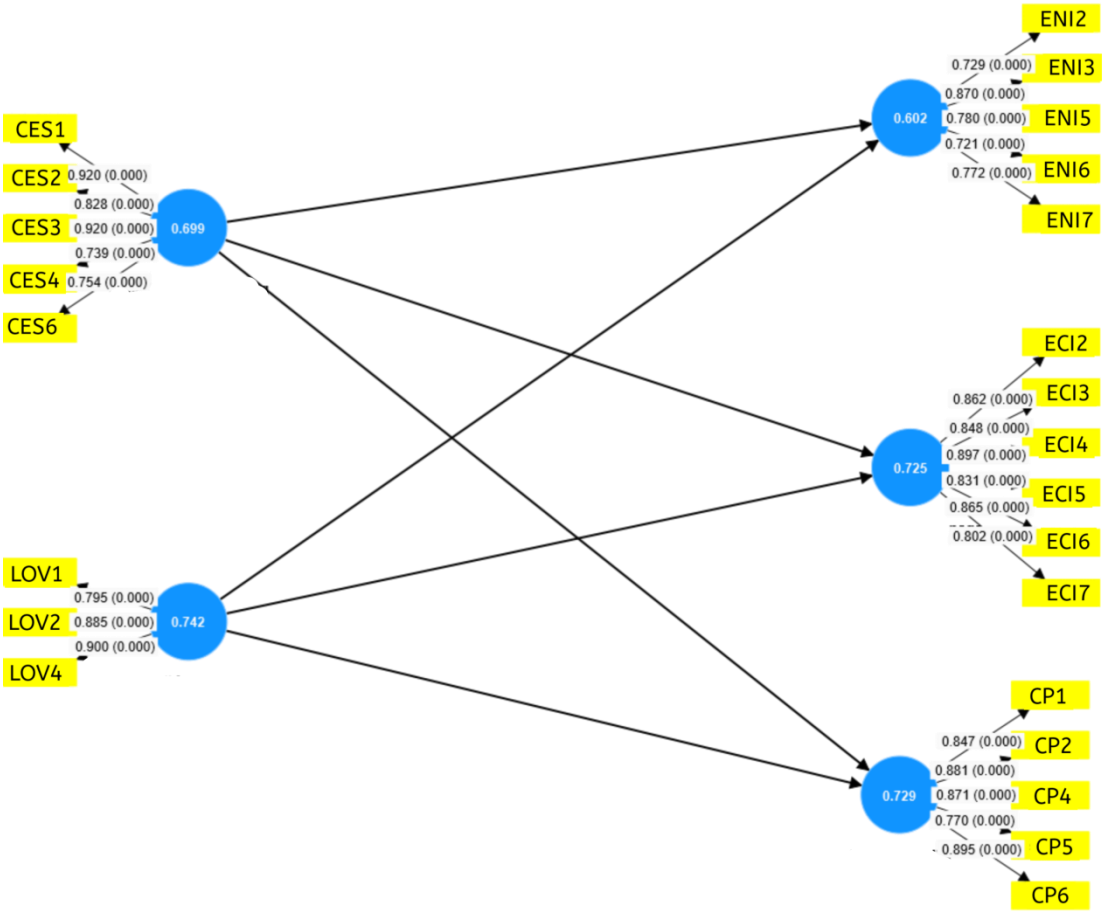

Fig 1: Bootstrap Path Diagram

Table 1: Discriminant Validity Latent Variables Constructs

Constructs	CES	LoV	ENV IM	ECO IM	CP
Circular Economy Strategy	**0.836**				
Level of Investment	0.669	**0.861**			
Environmental Impact	0.665	0.707	**0.777**		
Economic Impact	0.592	0.624	0.652	**0.852**	
Customer Perception	0.557	0.589	0.597	0.824	**0.854**

Source: The Researcher's Computation (2024)

Table 2: Path Analysis Result of The Direct Hypothesis Testing of Circular Economy Implementation and Hospitality Supply Chain

S/n	Hypothesized Path	P-Value	Standard	T T. Value	Decisions	f-Squared	Effect size
1.	CIS -> ENV IM	0.000	0.056	12.578	Not Supported	3.032	Large
2.	CIS -> ECO IM	0.023	0.052	2.27	Not Supported	2.164	Large
3.	CIS -> CP	0.000	0.051	5.418	Not Supported	0.346	Large
4	LoI -> ENV IM	0.000	0.059	3.532	Not Supported	4.002	Large
5	LoV -> ECO IM	0.000	0.048	17.614	Not Supported	1.901	Large
6	LoV -> CP	0.000	0.048	14.000	Not Supported	2.876	Large

Source: The Researcher's Computation (2024)

Table 2 shows the result of the path analysis for the relationship between circular economy implementation dimensions and measures of hospitality supply chains of hotels in Rivers State, Nigeria. Specifically, the result showed that there is a positive relationship between the dimensions of CEI and measures of HSP as follows; circular economy strategy (CES) and environmental impact (ENI IM) have a positive link, according to the first structural path, with P0.00 < 0.05 and T-Value 12.578 > 1.96. The null hypothesis was therefore disproved. With a T-value of 2.27 > 1.96 and a P-value of 0.023 < 0.05.

The second structural path indicated a positive correlation between circular economy strategy (CES) and economic impact (ECO IM). The null hypothesis was therefore disproved. There is a favorable correlation between circular economy strategy (CES) and customer perception (CP) with P 0.00 <0.05 and T-Value 5.418 > 1.96. Thus the null hypothesis was rejected.

The fourth structural path showed that there is a positive relationship between the level of investment (LoV) and environmental impact (ENV IM) with P0.00 < 0.05 and T-Value 3.532 > 1.96. Thus the null hypothesis was rejected.

The fifth structural path showed that there is a positive relationship between the level of investment (LoV) and economic impact (ECO IM) with a P-value of 0.00 < 0.05 and a T-value of 17.614 > 1.96. Thus the null hypothesis was rejected.

The sixth structural path showed that there is a positive relationship between the level of investment (LoV) and customer perception (CP) with a P-value of 0.00 < 0.05 and a T-value of 14.000 > 1.96. Thus the null hypothesis was rejected.

Furthermore, the high-value R^2 of 0.787, 0.897 and 0.843 recorded for environmental impact, economic impact and customer perception, respectively showed that circular economy implementation is a strong predictor of hospitality supply chain and in fact could predict environmental impact, economic impact and customer perception, to the magnitude of 78.7%, 89.7% and 84.3 respectively.

CONCLUSION

The analysis of the structural paths between circular economy implementation (CEI) and hospitality supply chain (HSC) measures reveals significant positive relationships across several dimensions. Specifically, the study demonstrates that circular economy strategy (CES) is positively linked to environmental impact (ENV IM), economic impact (ECO IM), and customer perception (CP). These relationships are supported by T-values that surpass the critical value of 1.96 and P-values below 0.05, thereby rejecting the null hypotheses for all paths. The results affirm that CES significantly influences key aspects of the hospitality supply chain.

Moreover, the level of investment (LoV) was found to have a strong positive impact on environmental impact, economic impact, and customer perception, further reinforcing the importance of financial commitment in driving sustainable

practices within the hospitality sector. Each of these relationships yielded high T-values and P-values below the 0.05 threshold, resulting in the rejection of null hypotheses and confirming the substantial role of investment in the effectiveness of CEI on the supply chain's performance.

Finally, the R2 values for environmental impact, economic impact, and customer perception—0.787, 0.897, and 0.843 respectively—indicate that CEI is a powerful predictor of these outcomes within the hospitality supply chain. The high percentages of explained variance suggest that implementing circular economy practices can lead to significant improvements in sustainability metrics, economic outcomes, and customer satisfaction. Consequently, this study highlights the strategic importance of integrating circular economy principles and investment in enhancing the overall performance of hotels' supply chains in Rivers State.

Implication of the Study

Practice Implications: The findings from this study highlight that implementing circular economy strategies in the hospitality supply chain positively impacts the environmental, economic, and customer-related performance of hotels. Specifically, the strong positive correlations between circular economy strategies and outcomes like environmental impact, economic impact, and customer perception suggest that adopting sustainable practices can enhance a hotel's reputation, profitability, and guest satisfaction. Hotels that invest in eco-friendly processes and resource optimization not only contribute to environmental preservation but also achieve significant cost savings and improved customer loyalty.

Recommendations for Hotel Managers in the Hospitality Industry

i. Hotel managers should prioritize the implementation of circular economy strategies, such as recycling, resource efficiency, and waste minimization, to reduce environmental impact while improving economic performance. By embracing these principles, hotels can lower operating costs and attract environmentally conscious customers.

ii. Increase investment in sustainable technologies and infrastructure, such as energy-efficient appliances, water-saving systems, and waste-reduction programs. This investment will not only contribute to environmental preservation but also improve operational efficiency and profitability.

iii. Equip employees with appropriate skills and knowledge to implement and sustain circular economy strategies. Regular training on resource management, waste reduction, and customer service that promotes sustainability can improve overall service delivery and enhance customer perceptions.

iv. Encourage guest participation in sustainability initiatives, such as recycling programs, reducing water and energy consumption, or supporting eco-friendly products and services. Promoting sustainability as part of the guest experience can strengthen customer loyalty and perception.

v. Establish systems for continuously monitoring and evaluating the environmental and economic effects of circular economy initiatives. Regular assessment of the identified effects could signal critical areas that requires improvement and ensure the long-term acheivement of sustainability efforts in hotels.

REFERENCES

1. Arifin, Y., Putra, W., Maslikhah, M., Tongli, B., & Sholeh, M. (2023). The impact of green supply chain management on the economic performance of SMEs, considering environmental conditions. *Economic Annals-XXI.*
2. Bocken, N. M., de Pauw, I., Bakker, C., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, 33(5), 308-320.
3. Bozarth, C. C., & Handfield, R. B. (2019). *Introduction to operations and supply chain management*. Pearson.
4. Chopra, S., & Meindl, P. (2016). *Supply chain management: Strategy, planning, and operation*. Pearson.
5. Elaho, O., & Ejechi, J. (2019). Production Planning and Customer Satisfaction in Table Water Companies in Edo State. *European Journal of Business and Management, 11(17), 71-82.*
6. Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy–A new sustainability paradigm?. *Journal of Cleaner Production*, 143, 757-768.
7. Geng, Y., Sarkis, J., & Ulgiati, S. (2016). Sustainability, well-being, and the circular economy in China and worldwide. *Science*, 6278, 73-76.
8. Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11-32.
9. Gössling, S., & Hall, C. M. (2006). *Tourism and global environmental change: Ecological, social, economic and political interrelationships*. Routledge.
10. Hordyńska, M., Kuczyńska-Chałada, M., & Lis, T. (2023). Analysis of the implementation of changes in supply chains towards a circular economy. Scientific Papers of Silesian University of Technology. Organization and Management Series.
11. Jones, M., Smith, T., & Wilson, K. (2018). The role of circular economy in hospitality supply chains: A UK perspective. *Journal of Sustainable Tourism*, 26(5), 746-760.
12. Kiaušienė, I., Hladkova, V., & Makūnaitė, G. (2024). Application of Circular Economy Principles in the Tourism Sector. *Management Theory and Studies for Rural Business and Infrastructure Development*, 46, 31 - 44.
13. Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221-232.
14. Lenzen, M., Sun, Y.-Y., Faturay, F., Ting, Y.-P., Geschke, A., & Malik, A. (2018). The carbon footprint of global tourism. *Nature Climate Change*, *8*(6), 522–528.
15. Lewandowski, M. (2016). Designing the business models for circular economy—Towards the conceptual framework. *Journal of Sustainability Studies*, 8(1), 43.
16. Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: a comprehensive review in context of manufacturing industry. *Journal of Cleaner Production*, 115, 36-51.
17. Lotfian Delouyi, F., Ranjbari, M., & Shams Esfandabadi, Z. (2023). A Hybrid Multi-Criteria Decision Analysis to Explore Barriers to the Circular Economy Implementation in the Food Supply Chain. Pearson.
18. Mangan, J., & Lalwani, C. (2016). Global logistics and supply chain management. John Wiley & Sons.
19. Papadopoulos, G., & Dimitriou, A. (2021). Adopting circular economy principles in the hospitality sector in Greece. *Tourism Management Perspectives*, 38, 100814.
20. Patel, A., & Singh, P. (2023). Circular economy and supply chain sustainability in Indian hospitality. *Sustainable Production and Consumption*, 37, 87-98.
21. Rodriguez, C., Mendes, D., & Silva, R. (2022). Circular economy and environmental management systems in Brazilian hotels. *Sustainability*, 14(6), 3461.
22. Stahel, W. R. (2016). The circular economy. *Nature*, 531(7595), 435-438.
23. Tang, Y., Shang, J., & Shi, Y. (2011). Study on water consumption of star hotels in China. *Procedia Environmental Sciences*, *10*, 2026-2031.
24. Tanveer, M.I., Yusliza, M.Y., & Fawehinmi, O. (2023). Green HRM and hospitality industry: challenges and barriers in adopting environmentally friendly practices. *Journal of Hospitality and Tourism Insights*.
25. Thiruvenkatraj, T.R., & Vetrivel S. (2017) A study on customer perception. International Journal For Research Trends and Innovation, 2(5),126-130, URL :https://ijrti.org/papers/IJRTI1705020.pdf
26. UNWTO. (2020). *Tourism and climate change*. United Nations World Tourism Organization. https://www.unwto.org
27. Westgeest, L. (2022). A circular economy approach to plastics in hospitality: a Frisian case study. *Research in Hospitality Management*, 12, 299 - 308.
28. Williams, R., & Patterson, L. (2019). Exploring the circular economy in sustainable hotel operations in Spain. *International Journal of Hospitality Management*, 81, 156-163.
29. Zhang, D. (2023). Environmental Sustainability and Global Value Chains: Challenges and Opportunities for Green Supply Chain Management. *Frontiers in Business, Economics and Management*.
30. Zhang, H., & Liu, Y. (2020). Circular economy and supply chain efficiency: Evidence from China's hospitality industry. *Journal of Cleaner Production*, 276, 123414. Bohdanowicz, P. (2005). European hoteliers' environmental attitudes: Greening the business. *Cornell Hotel and Restaurant Administration Quarterly*, *46*(2), 188–204.