

RIAT

Revista Interamericana de Ambiente y Turismo
Interamerican Journal of Environment and Tourism

Research paper

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Incidencia de la oferta de experiencias gastronómicas en el turismo creativo y el desarrollo sustentable en Mazatlán Sinaloa

Literature Review

Greenwashing in the tourism and hospitality sector: A systematic analysis of the literature

Tourism territories: Challenges for decarbonisation

Scientific production on tourism experience in Scopus: a bibliometric study

Economic impact of sustainable tourism: a bibliometric analysis.

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Research paper

The systemic crisis of tourism in Cuba: challenges for the development of tourism in Cuba

La crisis sistémica del Turismo en Cuba: retos para el desarrollo del Turismo en Cuba

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ABSTRACT

The systemic crisis in tourism represents a significant challenge for the sector worldwide, including in Cuba. This research seeks to generate knowledge to contribute to the recovery of the tourism sector in Cuba. The methodology used was the case study, which focuses on intensive analysis through qualitative research, combining the analysis of qualitative and quantitative data for a descriptive and contextual approach, which allowed for a more in-depth investigation than that offered by statistical studies. Case study research provides a valuable perspective, allowing a detailed and contextual analysis of the factors affecting tourism. The findings and conclusions can be instrumental in formulating effective strategies to address the underlying causes of the crisis and promote sustainable tourism recovery in the region. Comparison with other destinations in the insular Caribbean also provides an opportunity to learn from the experiences of others and adapt best practices to the Cuban context.

Keywords: systemic tourism crisis, case study, development challenges, Cuba

RESUMEN

La crisis sistémica del turismo representa un desafío significativo para el sector a nivel mundial, incluyendo a Cuba. Esta investigación procura generar conocimiento para contribuir a la recuperación de sector turístico en Cuba. Como metodología se utilizó el estudio de caso, que se enfoca en el análisis intensivo a través de la investigación cualitativa, combinando el análisis de datos cualitativos y cuantitativos para un enfoque descriptivo y contextual, que permitió una pesquisa más profunda que la que ofrecen los estudios estadísticos. La investigación mediante el estudio de caso proporciona una perspectiva valiosa, permitiendo un análisis detallado y contextual de los factores que afectan al turismo. Los hallazgos y conclusiones pueden ser fundamentales para formular estrategias efectivas que aborden las causas subyacentes de la crisis y promuevan la recuperación sostenible del turismo en la región. La comparación con otros destinos del Caribe insular también ofrece una oportunidad para asimilar de las experiencias de otros y adaptar las mejores prácticas al contexto cubano.

Palabras clave: crisis sistémica del turismo, estudio de casos, desafíos para el desarrollo, Cuba

INTRODUCTION

A systemic crisis in a country's economy refers to a significant collapse or deterioration in the economic structure that affects multiple sectors and manifests itself through a series of negative indicators. This type of crisis is not just limited to a temporary recession, but implies a profound failure in the functioning of the economic system as a whole. The structural crisis in tourism, which has been dragging on for years, has been aggravated by the Covid-19 pandemic, which has caused an unprecedented drop in tourism demand and supply (Aburumman, A. A. (2020). Haryanto, T. (2020). Mulder, N. (2020). Kumar, P., & Ekka, P. (2024)).

The systemic crisis in the economy has had a significant impact on the global impact on the tourism sector globally, and specific cases such as Cuba illustrate this such as that of Cuba illustrate this situation well. The following is an analysis of the main the main consequences that tourism has faced as a result of this crisis.

This situation has seriously affected the economy, employment, the environment and the economy of the countries and regions that depend on the sector. Tourism is a cross-cutting activity that requires coordination between various public and private actors, as well as constant adaptation to new trends and travellers' needs.

The current crisis represents a huge challenge, but also an opportunity to rethink the tourism model and orient it towards greater sustainability, quality and inclusion. The current tourism model faces major challenges and opportunities to adapt to new traveller demands and expectations, as well as to the impacts of the health crisis, climate change and digital transformation (Saner, R., Yiu, L., & Filadoro, M., 2019; Higgins-Desbiolles, F., 2020; Peralta, L., 2021).

The future of tourism will depend on its ability to innovate, diversify and deliver quality, sustainable and inclusive experiences that generate social, environmental and economic benefits for destinations and local communities. This requires a strategic vision, collaborative governance and responsible investment to drive the competitiveness, resilience and recovery of the sector. To build a sustainable future connected to technological and digital realities, it is necessary to rebuild the traditional models of tourism that generate inequalities and exclusion. Qiao, G., Hou, S., Huang, X., & Jia, Q. (2024).

However, there is one aspect that is insufficiently addressed: the training of tourism professionals who will have to handle these technologies, as well as that of their trainers who will have to be updated with new teaching methods. Moreover, it is essential to encourage critical thinking and creativity in this sector. For this reason, greater cooperation between public and private actors is required in order to achieve quality training adapted to the present and future needs of the tourism market.

METODOLOGY

The objective of this study is to document the differences in the tourism recovery process achieved by the end of 2023 among the main tourist destinations of the insular Caribbean. The article mainly analyses data from different official public and private institutional sources to try to answer the research questions in order to understand and analyse the data from different perspectives, to identify patterns, trends or relationships between variables.

The case study is a scientific research methodology that consists of an in-depth analysis of a phenomenon, a context, a situation or a specific problem, using various sources of information and data collection and analysis techniques Guetterman, T. C., & Fetters, M. D. (2018); Khoa, B. T., Hung, B. P., & Hejsalem-Brahmi, M. (2023).

The case study as an empirical research tool has proven to be particularly valuable in the analysis of complex phenomena within their real contexts, as is the case of tourism development in Cuba. This methodology allows for an in-depth understanding of systemic dynamics and crises, facilitating the identification of interactions and key variables that influence the sector.

The combination of qualitative and quantitative data through triangulation strengthens the validity of the findings and provides a holistic perspective. In addition, the case study draws on diverse sources of evidence, which enriches the research and contributes to the construction of robust theories applicable to business management and administration. The relevance of this methodology lies in its ability to generate meaningful and applicable knowledge, which makes it an indispensable methodological strategy in the social sciences and, by extension, in tourism research.

A qualitative approach seeks an in-depth understanding of a complex and unique phenomenon in its natural

context, based on multiple sources of evidence and through a holistic and interpretative analysis of a research context that has developed very strongly and has expanded to other fields of science and is no longer the preserve of the social sciences as in its origins. Moriarty, D., De Villavicencio, P., Black, L Bustos, M., Cai, H., Mehlenbacher, B., y Mehlenbacher, A. (2019).

RESULTS AND DISCUSION

According to the World Tourism Organization (UNWTO), the number of international tourists will double in 2022, reaching 965 million, compared to 485 million in 2021. However, this figure represents only 63% of pre-pandemic travel, when 1.5 billion trips were recorded in 2019. UNWTO estimates that the 2019 level of international tourist arrivals will not recover until 2024. Table 1

Table 1. Annual international tourist arrivals in the World: 2019-2023

Indicators	2019	2020	2021	2022	2023
Arrivals (overnight visitors)	1.5 billions	400 million	485 millones	965 millones	1.36 billions
Contribution of the tourism sector to world GDP	9.3 billions	4.78 billions	5.82 billions	7.7 billions	9. billions
Contribution of tourism to employment worldwide	334 million	271 million	289 millones	295 million	317 million

Source: Own elaboration based on data from UNWTO Barometer Vol. 21, Year 2023; Economic Impact of the World Travel & Tourism Council 2023 (WTTTC).

The tourism sector is a major driver of economic growth and job creation globally. In 2019, travel and tourism directly or indirectly generated 334 million jobs worldwide. The Covid-19 pandemic has had a significant impact in terms of global tourism employment in 2022, which stood at around 295 million workers worldwide.

The global situation indicates that, according to UNWTO forecasts for this year 2023, international tourist arrivals according to the UNWTO World Tourism Barometer September 2023, could be between 80% and 95% of pre-pandemic levels, finally achieving an upswing in the sector's recovery indicators, and a new opportunity to improve its future (UNWTO, 2023). At the end of July, international tourist arrivals reached 84% of pre-pandemic levels, 700 million tourists travelled internationally between January and July 2023. The outlook for September-December 2023 suggests a continued recovery, according to the latest UNWTO Confidence Index.

Analysis of tourism dynamics and its impact on the economy in Cuba.

Cuba is going through a deep economic crisis that di-

rectly affects the tourism sector. The shortage of basic commodities and the deterioration of services have had a negative impact on the tourist experience. Castellanos, L. P (2024). Despite the difficulties, the Cuban government continues to invest in the tourism sector. According to the National Office of Statistics and Information (ONEIC), it is estimated that in 2024, 34.5% of investments will go to tourism-related areas, including hotels and restaurants. Although the current situation shows a slow recovery, with the number of visitors still not reaching 60% of the activity levels of previous years.

Main attributes of Cuba's physical-geographical environment

The Republic of Cuba is made up of the island of Cuba (the largest of the Antilles), the Isle of Youth and more than 2,000 small islands that surround the main island to the north and south, which is why it has a wide variety of natural and historical-cultural resources of great value for the development of tourism. It covers an area of 110 922 km2 and has a population of 11.3 million inhabitants (ONEI, 2019). Its geographical position close to the Tropic of Cancer, its insularity and the particular geological-geo-

morphological evolution, condition a great diversity and complexity of the archipelago's landscapes. Its privileged location in the Insular Caribbean and Central America has led to it being known since the Spanish colonial period as the Key to the Gulf. **Figure 1**

Among the most outstanding tourist attractions are its beautiful and wide beaches covering more than 400 km, with soft white sands contrasting with coastal areas of erosive (cliffs) and biological (mangroves) origin. It also has a vast 70 000 km² marine shelf, with clear, warm waters and amazing coral reefs and seabed. Among other natural elements such as water and mud springs with therapeutic properties, numerous caves of great size and beauty, and a system of well-preserved protected areas with a high endemism in its

flora and fauna, which cover 17 % of the national territory (Salinas, E., Mundet, L. and Salinas, E., 2018).

To this natural heritage are added the rich and varied manifestations of Cuban culture, its rich historical heritage, its cities and historical heritage centres from the colonial era, but, above all, the intrinsic values of the Cuban people stand out: cheerful, sociable, supportive and hospitable. The innovation of tourism products is a necessity in the current tourism context; however, these have been little addressed.

Within the theoretical structure on tourism innovation, tourism product innovation and consumer experience are considered emerging issues (Leyva, B. S., Velázquez, F. F., and Pompa, F. D., 20).



Figure 1. Cuba's geographic location in the insular Caribbean

Source: Elaborated from <https://www.researchgate.net/profile/Map-of-the-Caribbean-Islands.png>

Growth of Cuba's Hotel Infrastructure

The growth of hotel infrastructure and the contribution of tourism to the economy are interdependent. While a robust hotel infrastructure facilitates an increase in the number of visitors and their spending, tourism growth drives significant investments in such infrastructure. This virtuous cycle not only benefits the sectors directly involved, but also has a wider positive impact on the economy.

Cuba's hotel infrastructure has experienced remarkable growth in recent years, driven by the increase in tourist demand and the opening of new air routes. According to official data, the country has more than 84,000 rooms distributed in some 337 hotels, most of them located in sun and beach destinations. Table 2

Table 2. Accommodation establishments in Cuba's tourism system: 2015-2023

	2015	2019	2021	2022	2023
Hotels	301	326	326	337	340
5 Stars	35	66	72	78	82
4 Stars	75	126	122	122	122
3 Stars	102	75	73	73	73
2 Stars	63	43	43	43	43
1 Stars	7	16	16	21	20
Aparthotel	38	7	5	5	5
Motel	12	3	3	3	3
Hostels	31	10	5	5	4
Other	45	128	140	178	192

Source: Own elaboration based on data from the National Office of Statistics and Information (ONEI); ANUARIO ESTADÍSTICO DE CUBA 2023 Turismo Edición 2023.

According to the Economic and Trade Report (ICEX, 2022), the Cuban government has announced plans to expand and modernise the hotel offer, with the aim of reaching 100,000 rooms by 2030. This project includes the construction of new hotels and the renovation of existing ones, focusing on raising the standard of facilities to attract more international visitors. Table 3

Table 3. Accommodation (beds) in Cuba's tourism system: 2015-2023

	2015	2019	2021	2023
Total, beds	66 389	128 885	129 483	135 996
Hotels	53 396	100 659	102 861	109 717
5 Stars	19 930	36 250	42 275	48 644
4 Stars	20 199	43 150	40 651	40 716
3 Stars	9 070	13 120	13 244	13 249
2 Stars	3 551	7 123	5 596	5 589
1 Stars	646	1 016	1 095	1 519
Aparthotel	1 666	3 138	3 102	3 102
Motel	442	960	807	807
Hostels	136	205	120	120
Other	10 134	23 923	22 594	22 250

Source: Own elaboration based on data from the National Office of Statistics and Information (ONEI); ANUARIO ESTADÍSTICO DE CUBA 2023 Turismo Edición 2023.

Tourist attractions in Cuba

Cuba, with its climate, history and culture, offers tourist experiences that attract visitors from all over the world. Sun and Beach Tourism is the best known, with its white sandy beaches and crystal clear waters that invite rest and relaxation. Urban tourism allows you to explore historic cities such as Havana, Trinidad where colonial architecture blends with modern life. For nature lovers, the Nature Tourism offers the opportunity to appreciate the island's unique biodiversity, from lavish valleys to underground cave systems. Health and Wellness Tourism takes advantage of Cuba's high quality medical facilities, while Adventure Tourism allows you to traditions and spiritual practices that make up the fabric of Cuban. These modalities not only enrich the visitor experience, but also promote responsible and sustainable tourism that benefits both tourists and the local community.



Tourist attractions in Cuba

Priority regions for tourism development in Cuba

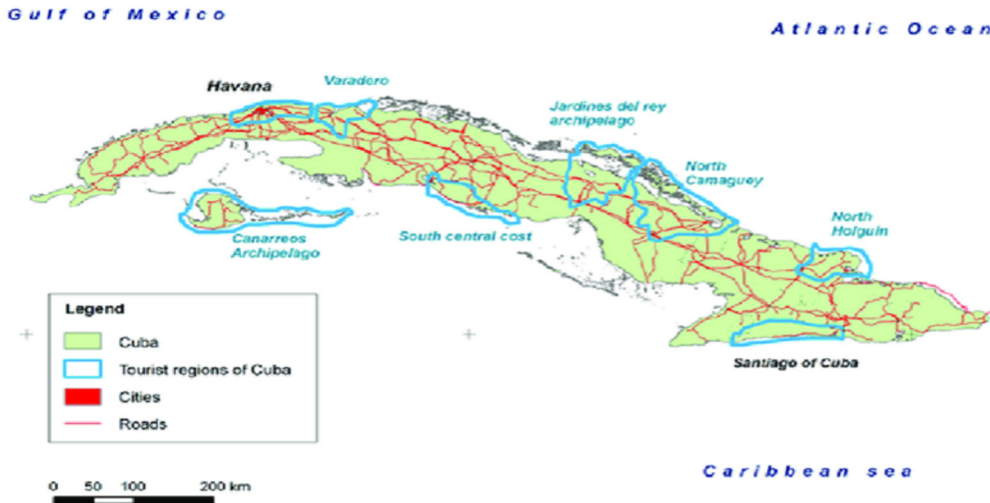
Cuba has identified eight key regions for tourism development, focusing on areas with high potential to attract both domestic and international visitors. These regions are Havana, Varadero, Jardines del Rey, North Camagüey, North Holguín, Santiago de Cuba, South Central Coast and Los Canarreos, with the recent inclusion of the northern region of Villa Clara. Figure 2.

Cuba's tourism development strategy has historically been influenced by its relationship with the United States, but in recent years, it has sought to diversify its tourism market, attracting visitors from Canada, Russia, Europe and Latin America. In addition, it has ha promoting sustainable local tourism as a way of contributing to territorial

development, enabling local businesses to manage tourism services that respect natural and cultural values and use tourism resources This orientation towards a more

integrated and sustainable tourism seeks not only to increase tourism revenues but also to improve the quality of life of the local population

Figure 2. Regions prioritised for tourism development in Cuba.



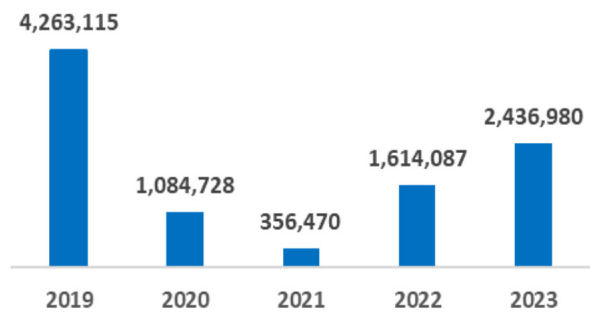
Source: Own elaboration based on https://www.researchgate.net/figure/Tourist-regions-of-Cuba_fig1_273222981

Behaviour of international tourist arrivals in Cuba: 2018-2023

According to data from the National Office of Statistics and Information (ONEI), international tourist arrivals to

Cuba fell from 4.7 million in 2018 to 4.3 million in 2019, representing a drop of 8.5%. In 2020, the situation worsened further, with only 1.1 million visitors arriving, down 80 per cent from the previous year. In 2022 and 2023, a recovery of international tourism in the country begins, thanks to the gradual resumption of air operations and the implementation of sanitary protocols to ensure the safety of travellers and workers in the sector requires year-round tourism diversification and promotion strategies to ensure a sustainable and resilient tourism industry in Cuba. Figure 3

Figure 3 International visitors to Cuba by month in 2019-2023

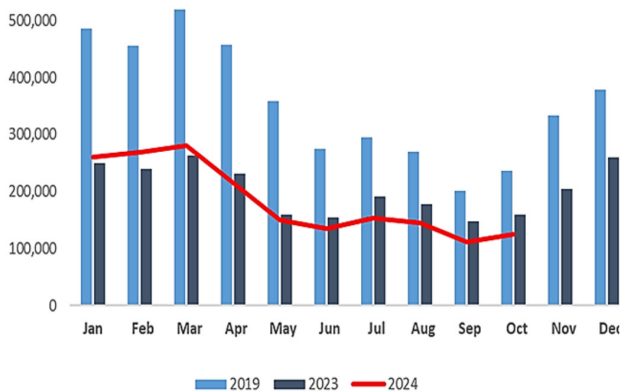


Source: Own elaboration based on data from the National Statistics and Information Office (ONEI).

Seasonality of tourism in Cuba: 2019-202

The seasonality of tourism in Cuba is a crucial aspect in understanding the dynamics of tourism flows to Cuba. The high season runs from December to March, coinciding with the most favourable weather and the largest influx of tourists, Figure 4. However, this concentration of tourism implies the need for infrastructure and services to respond to increased demand. Also, dependence on the high season can lead to periods of economic inactivity during the low season

Figure 4 International visitors to Cuba by month in 2019-2024



Source: Own elaboration based on data from the National Statistics and Information Office (ONEI).

Seasonal and geographical diversification is fundamental for sustainable tourism growth. It not only helps to mitigate the negative effects of seasonality, but also promotes more balanced development between different regions. By adapting to new tourist trends and preferences, the sector can maximise its economic potential and contribute to the overall well-being of local communities.

Economic impact of the reduction in the flow of international tourists to Cuba

The substantial decline in international tourism to Cuba in 2022, which experienced a 62.3 per cent drop compared to 2018, has indeed had profound economic implications. The tourism sector, a vital component of Cuba's GDP, faced multiple challenges, including strict US travel restrictions and the global health crisis caused by Covid-19.

These factors, coupled with a lack of market diversification and service quality, exacerbated the economic crisis.

The multifaceted crisis that Cuba has suffered in recent years has caused structural problems in the Cuban economy and the slow reform process has hampered recovery efforts. The situation requires strategic reforms and diversified economic resilience to mitigate these vulnerabilities in the future. The impact of these challenges on Cuba's socio-economic fabric provides a critical case study of the importance of tourism in the Cuban economies. Table 4

Table 4 Economic impact of international tourism to Cuba 2019-2023 (Millions of USD)

	2019	2021	2023
Total	2 645,1	416,9	1 308,3
International tourism receipts	2 596,2	404,1	1 269,1
Of which: Private Sector	373,1	38,2	284,7
International transport receipts	48,9	12,9	39,2

Source: Own elaboration based on data from the National Statistics and Information Office (ONEI)

Factors that have contributed to the decline of tourism in Cuba.

Tourism in Cuba has suffered a serious deterioration in recent years due to several factors that have affected both supply and demand. (Ginsburg, M., 2022; Rodríguez, R., 2023; Castellanos, L. P., 2023) Among these factors are:

- The US economic embargo, which limits foreign investment and access to technologies and markets.
- The energy crisis, which hinders the functioning of basic services and tourism infrastructure.
- The lack of maintenance and renovation of hotel and recreational facilities, which reduces the quality and competitiveness of the tourism product.
- The shortage of qualified, motivated and well-paid human resources, which affects the level of customer service and satisfaction.

The health crisis caused by Covid-19 severely affected the Cuban economy, which relies heavily on tourism and re-

mittances as sources of income. The pandemic forced the closure of borders and reduction of flights, resulting in a loss of income and foreign exchange. On the other hand, the energy crisis in Cuba has had a significant impact on basic services and infrastructure. tourism in the country. The situation has led to a reduction in the gastronomic and entertainment offer, affecting the tourist experience and decreasing the competitiveness of the tourism offer. In addition, the crisis has exacerbated existing challenges, such as travel restrictions and shortages of basic supplies, leaving tourism in a fragile position at a time when the sector worldwide is seeking to recover. the Cuban economy has had structural problems for years, such as low productivity, little productive diversification and a lack of incentives for the private sector.

The Cuban government has taken measures to boost domestic production, diversify sources of foreign exchange and protect the most vulnerable, but the medium- and long-term outlook is uncertain and challenging. Greater economic openness, regional integration and international cooperation are needed to overcome the obstacles and ensure the well-being of the population (Rodríguez, J. L., & Salinas, E., 2021; Hidalgo, V., & Triana, J.,

Despite achieving health success in containing the pandemic and developing its own vaccines, the country has not been able to take full advantage of the opportunities for revival. With mass vaccination of its population and the gradual reopening of its borders, the year 2022 looked to be a year of hope. It was predicted that the flow of tourists and remittances would increase, alleviating the shortage of foreign exchange. However, the reality has been more complex, as the tourism sector continues to grow at a slower rate than the main Caribbean destinations. (Table)

Table 5. International tourist arrivals (thousands) to the main Caribbean tourist destinations

	2019	2023	% (19 /23)
Caribe Mexicano	7,924	10,041	26.7
República Dominicana	6,446	8,058	25
Cuba	4,263	2,437	-42.8
Puerto Rico	3,180	4,091	28.6

Rooms, international tourist arrivals and receipts in Cuba (2013 -2023)

Tourism in Cuba has experienced growth in hotel infrastructure and an increase in international tourist arrivals. This growth is driven by the government's strategy of opening opportunities to international hotel chains and strengthening relationships with tour operators and airlines, which has helped to expand the tourism market. However, despite the increase in the number of rooms and tourist arrivals, tourism revenues have faced challenges.

The COVID-19 pandemic had a significant impact, drastically reducing the number of tourists in 2020 and affecting the sector's revenues. Although the numbers have shown a recovery in 2023, with an increase in sector revenues, the relationship between hotel infrastructure growth and tourism revenues remains complex, influenced by external factors such as international relations and global health and economic crises. **Table 6**

Table 6 Rooms, international tourist arrivals and receipts in Cuba (2013 -2023)

	2015	2019	2023	CAGR*
Economic impact (millions of USD)	2607	2645	1308	-7.38%
International Arrivals (thousands)	3525	4263	2436	-4.02%
Rooms	54651	62630	75434	3.65%

*CAGR (Compound Annual Growth Rate)

Source: Own elaboration based on data from the National Statistics and Information Office (ONEI)

The country has not been able to take full advantage of the opportunities for revival. With the mass vaccination of its population and the reopening of the gradual of its borders. The year 2022 was seen as a year of hope. It was predicted that the flow of Statistics and Information of the Republic of Cuba (ONEI) reported that as of October 2024, the nation received approximately 2.49 million visitors, representing a 96.1% increase compared to the same period last year.

Although there are signs of recovery in Cuban tourism, these are insufficient to compete with other Caribbean destinations that are experiencing strong growth. The situation requires attention to economic policies and a re-evaluation of tourism strategies to improve Cuba's

competitiveness in the global market

Forecast of international tourist arrivals to major Caribbean tourist destinations by 2024

Foresight and forecasting are useful tools to anticipate and prepare for the future; they allow us to identify trends, scenarios and challenges that may affect society, the economy and the environment (Mc Loughlin, E., & Hanrahan, J., 2023). (Dunn, M., 2020; Oncioiu, I., & Priescu, I., 2022) These tools are not a way to predict the future, but to explore possible alternatives and their implications.

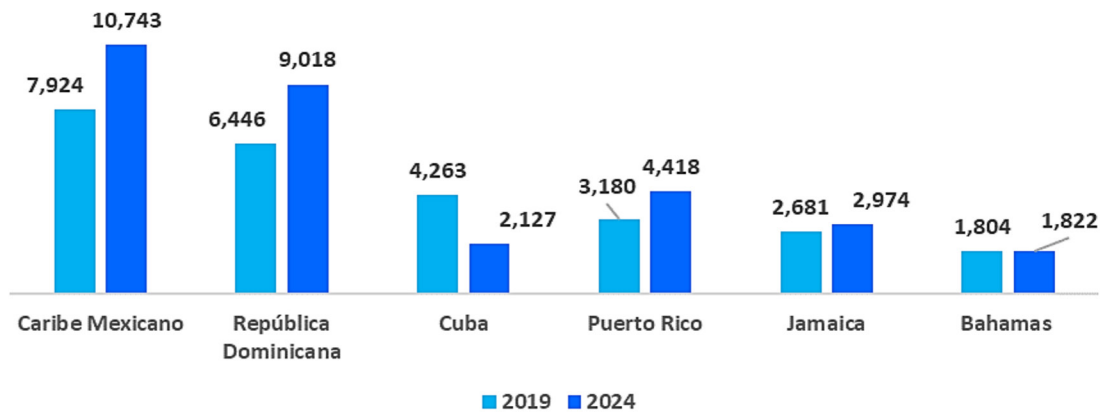
Tourism in the Caribbean has shown a positive trend for the year 2024, with an encouraging forecast suggesting a solid and sustained recovery. According to data from the World Tourism Organisation (UNWTO), international tourist arrivals are expected to reach or even exceed pre-pandemic levels by the end of 2024. Figure

The tourism industry in Cuba has experienced significant fluctuations in recent years. Between 2015 and 2019, the compound annual growth rate (CAGR) of the tourism sector's contribution to the economy was -7.38%, marking a notable change in the growth trend observed in previous years. However, despite this decline in the overall economic growth of tourism, the number of hotel rooms on the island experienced an absolute increase of 38%. This growth in hotel infrastructure indicates continued investment in the sector, possibly in anticipation of future recovery and increased tourism demand.

In fact, studies suggest that international tourism in Cuba maintained stable growth rates in recent years, despite the difficulties faced by the sector. In addition, the construction of new luxury hotel rooms continued, reflecting a focus on attracting high-end tourism.

These efforts to improve and expand tourism facilities are critical to Cuba's economic development and its ability to attract international visitors in the future. **Figure 5**

Figure 5 Forecast of international tourist arrivals to the main Caribbean tourist destinations by 2024



Source: Based on data from UNWTO Barometer Vol. 21, 2023, Central Bank of the Dominican Republic and Ministry of Tourism. Quintana Roo Datatur. Oficina Nacional de Estadística e Información (ONE) de Cuba 2024, Jamaica Tourist Board, 2024, bahamas.gov.bs, public/Statistics 2024

CONCLUSIONS

The systemic crisis of tourism is a phenomenon affecting the tourism sector globally, characterised by loss of competitiveness, declining demand, environmental and social deterioration, and lack of adaptation to technological and market changes. This crisis has multiple causes and consequences, and requires comprehensive and sustainable solutions involving all actors in the sector.

The current systemic tourism crisis, which has been aggravated by the Covid-19 pandemic, has had a negative impact on the island Caribbean region. The island Caribbean region. This has meant a loss of income, jobs and development opportunities for the countries and territories that rely heavily on this economic activity.

Moreover, the crisis has highlighted the structural vulnerabilities of the Caribbean tourism model, based on overcrowding, seasonality, dependence on external source markets and poor integration with the local productive fabric. Given this scenario, there is a need to promote a transformation of the sector towards a more sustainable, resilient, diversified and inclusive tourism that contributes to the well-being of local populations and the conservation of the region's natural and cultural resources.

Tourism in Cuba faces important challenges for its development in the face of the current systemic crisis affecting the sector globally. at the global level. To achieve environmental, social and economic sustainability, as well as innovation and competitiveness, the tourism sector needs a strategic vision, integrated management and constant adaptation to the changing environment. Moreover, it is necessary to diversify and differentiate tourism products in order to offer unique and quality experiences to visitors.

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Assessing the effects of covid-19 pandemic and lockdown measures on air quality in the city of Talca, Chile

Evaluación de los efectos de la pandemia de covid-19 y las medidas de confinamiento sobre la calidad del aire en la ciudad de Talca, Chile

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ABSTRACT

The COVID-19 pandemic led to the implementation of several quarantines in Chile, which meant a decrease in transportation flow and lower production levels in some companies. It also led to more people using wood burning at home for heating. This study aimed to determine the effect of the pandemic on air quality in Chile. The methodology consists of a regression analysis using ordinary least squares, where the effects of temperature, quarantine, and pandemic periods on daily emissions of PM2.5, PM10, CO2, and O3 were analyzed. The results show that for the dependent variables PM10, CO2, and O3, the variables minimum, average temperature, and pandemic were significant and inversely related to said pollutants. For PM2.5, the above is not true for the case of the pandemic, which positively affects PM2.5. The variable quarantine was not significant in all models. Finally, it was concluded that the COVID-19 pandemic has resulted in a change in air quality in the city of Talca, mainly due to the greater use of wood burning for heating; there was a high impact of the pandemic on these emissions, producing an increase in critical episodes of MP2.5 and MP10. Also, impacts were observed in O3 and CO2.

KEYWORDS / COVID-19 / Quarantine / Energy Uses / Wood Burning / Pollution / Air Quality

RESUMEN

La pandemia de COVID-19 llevó a la implementación de varias cuarentenas en Chile, lo que significó una disminución en el flujo de transporte y menores niveles de producción en algunas empresas. También llevó a que más personas usaran leña quemada en casa para calentarse. Este estudio tuvo como objetivo determinar el efecto de la pandemia en la calidad del aire en Chile. La metodología consiste en un análisis de regresión utilizando mínimos cuadrados ordinarios, donde se analizaron los efectos de los periodos de temperatura, cuarentena y pandemia sobre las emisiones diarias de PM2.5, PM10, CO2 y O3. Los resultados muestran que para las variables dependientes PM10, CO2 y O3, las variables mínimo, temperatura promedio y pandemia fueron significativas e inversamente relacionadas con dichos contaminantes. En el caso de las PM2.5, lo anterior no es cierto para el caso de la pandemia, que afecta positivamente a las PM2.5. La variable cuarentena no fue significativa en todos los modelos. Finalmente, se concluyó que la pandemia del COVID-19 ha provocado un cambio en la calidad del aire en la ciudad de Talca, principalmente por el mayor uso de la leña para calefacción; hubo un alto impacto de la pandemia en estas emisiones, produciendo un aumento en los episodios críticos de MP2.5 y MP10. Además, se observaron impactos en O3 y CO2.

PALABRAS CLAVE / COVID-19 / Cuarentena / Usos de energía / Quema de leña / Contaminación / Calidad del aire

INTRODUCTION

A study of global mortality and pollution levels estimated that about 9 million people die from the pollution of different sources each year (Burkart et al., 2022), with economic losses of over US\$4 trillion (Fuller et al., 2022), the deaths are greater than those provoked by COVID-19, which are about 6.7 million globally (World Health Organization, 2023; Wu et al., 2022). According to the UN Environmental Programme (2017), In Chile, air pollution is a major issue, and it costs the health sector at least 670 million dollars, resulting in 127,000 emergency health consultations and over 4,000 deaths (UN Environmental Programme, 2017). The COVID-19 pandemic had a significant impact on air quality not only in Chile but across the world.

The global lockdowns and travel restrictions implemented to reduce the spread of COVID-19 resulted in a significant reduction in emissions from transportation and industry, leading to a significant improvement in air quality in many cities worldwide (Wang et al., 2022). For instance, in India, the lockdown resulted in an average reduction of 33% of particulate matter 2.5 (PM2.5) levels in major cities like Delhi, Mumbai, and Kolkata. Similarly, in China, the lockdown resulted in an average reduction of 40% in NO2 levels in February 2020 compared to the same period in 2019 (Niu et al., 2022). Studies have also reported significant reductions in nitrogen dioxide (NO2) levels in major cities in Europe (Ramacher et al., 2022), the United States (Dahu et al., 2023), and the Asia-Pacific region (M. Jakovljevic et al., 2020). A multi-city study in Spain found that the lockdown reduced the atmospheric levels of NO2 in all cities analyzed except for the city of Santander (Briz-Redón et al., 2021). Air quality in the metropolitan area of Santiago, Chile, showed that population quarantine and confinement reduced some air pollutants; PM2.5 decreased by 11% and particulate matter 10 (PM10) by 5.2% (F. et al., 2020). In general, studies show that meteorological changes, together with periods of quarantine have impacted the level and concentration of NO2 and PM between 60% and 31% in 34 countries (Kaied et al., 2021). The improvements in air quality were not uniform across the globe (Soriano et al., 2020). In some regions, air quality worsened during the pandemic (Kganyago & Shikwambana, 2020; Mbandi, 2020; Ranabhat et al., 2021). In addition, in some regions, the reopening of industries and transportation as the pandemic receded led to a rebound in air pollution levels (Chattu et al., 2021).

The sources of pollution may vary according to transportation and industrial emissions (Martinez-Soto et al., 2021). The main atmospheric pollutants that are hazardous to human health in Chile are inhalable particulate matter (PM10, PM2.5, and PM1) and gaseous chemical compounds, such as nitrogen dioxide, ozone, sulfur dioxide, and carbon monoxide. Factors such as industrial development, the number of automobiles, the use of fossil fuels, and the use of firewood for heating all contribute to the concentration of pollutants (Frostad et al., 2022). A study has shown that firewood for heating and cooking food accounted for 94% of PM2.5 emissions in central and south of Chile (Huneus et al., 2020).

Several environmental-related studies in the region examined the perception and environmental behavior of users of firewood for heating. People consider the main air pollutant in the Maule is coming from wood-burning (65.4 %), and they are willing to pay to reduce pollution (Adams et al., 1993; A. Cerda et al., 2007; A.A. Cerda & Garcia, 2010; A.A Cerda & García, 2010; A. A. Cerda et al., 2010; L. Y. García & A. A. Cerda, 2021; García et al., 2021). The use of firewood to heat homes during the winter is a crucial factor in determining the air quality of a region, as it inevitably leads to an increase in respiratory health problems due to the smoke emitted from chimneys when people use wet firewood increasing pollution by particular matters, like PM2.5, and PM10 (MB Jakovljevic et al., 2013).

In March 2020, the arrival of COVID-19 in Chile, as in several countries worldwide, caused important changes in people's way of life, including energy use. The routines of individuals and families, as well as existing companies in the country, suffered modifications due to the restrictions associated with the COVID-19 pandemic. This situation modifies the energy demand and carbon dioxide (CO2) emissions, among other pollutants (Le Quéré et al., 2020). Additionally, government policies associated with controlling the COVID-19 pandemic, especially forced confinement, keep many people at home, during work, and leisure hours, which, in many cases, increases the use of energy for heating, electricity, oil, and wood burning (Leidy Y García & Arcadio A Cerda, 2021; García et al., 2021; Langille, 2021). Some policies implemented by the governments have generated impacts on the level of emissions of CO2 and particular materials, such as PM2.5, and PM10,

changing the air quality and level of respiratory problems in the population (Martínez-Soto et al., 2021; Morales-Solís et al., 2021; Sánchez-López et al., 2022). For instance, in Chile, part of the population of the country stayed in their homes; therefore, this generated a reduction in transport use because of businesses and school closures, which decreased the concentration of MP10 and MP2.5 (Morales-Solís et al., 2021). By May 2020, a study by the National Chamber of Commerce (CNC) mentioned that 59% of the companies were working under 30% of their capacity, whereas 30% was at 0% (National Confederation of Commerce and Goods, 2020). Finally, the Chilean economy experienced a 6% decrease in the gross domestic product by 2020.

The research problem is derived from the need to determine how the pandemic has affected air quality indicators. The hypothesis is that there is a negative relationship between the COVID-19 pandemic and air quality in the city of Talca, where the greater moving restrictions generate higher pollution levels. This study aimed to determine the effect of the pandemic on air quality in Chile by a regression analysis using ordinary least squares, where the effects of temperature, quarantine, and pandemic periods on daily emissions of PM10, PM2.5, CO2, and O3

Material and methods

Location

This research concentrates on the city of Talca, the capital of the Maule Region, Chile, which is in the depression intermedia, a valley that extends through much of the continental territory of Chile and is in the space that develops between the Coastal and Andes Mountains. Talca has a Mediterranean climate and typically has four seasons, but two very defined seasons: a dry and a rainy/cold season. The average annual temperature is 13°C, with cold winters and frequent rain, fog, and frost. Summers are dry and hot, with maximum temperatures exceeding 32°C. The methodology for measuring contaminants is called Beta attenuation, which consists of determining how opaque the contaminated filter becomes to a standardized pollution so that the

greater the environmental contamination, the greater the presence of these in the filter and consequently the less "transparency" of said filter before said pollution.

Data

The data used were the daily emissions of particulate matter PM2.5 and PM10, along with the daily temperature between January 2018 and August 2022. The data were obtained from the National Air Quality Information System (SINCA) from the air monitoring stations at La Florida. Continuous monitoring of PM10, PM2.5, CO2, and O3 ambient concentrations is conducted to estimate 24-hour moving averages. The data is updated every hour. The calculation of the 24-hour moving average is based on a minimum of 75% of the available data, which equates to a minimum of 18 hourly average.

Data pertinent to the quarantine periods were obtained from the COVID-19 Data Table led by the Ministry of Science, Technology, Knowledge, and Innovation, where epidemiological data from the Ministry of Health and other sources were obtained from the provisions of Law No. 19628. The period covered as a pandemic is from the detection of the first case of COVID-19 on March 1, 2020, until August 31, 2022.

Model

Based on the literature (A.A Cerda & García, 2010), a regression model was estimated, using the ordinary least squares method (OLS). Estimations were done with Stata. For the analysis it was established that air quality is related to a measure of particulate matter emissions (PM_{2.5} and PM₁₀), which is called the Air Quality Index(ICA); and will be studied according to four variables with daily data (t). The first two correspond to the minimum (T_{Mt}) and average temperatures ($T_{avg t}$), respectively, whereas the remaining are dummy variables that allow us to assess the effect of the pandemic (P_t) and quarantine periods (Q_t) in the ICA (1). Where $P_t=1$ if there are pandemic and zero if not. Similarly, $Q_t =1$ with pandemic period and 0 otherwise.

$$ICA_t = f[T_{Mt}, Tavg_t, P_t, Q_t] + \varepsilon \tag{1}$$

Equations (2) and (3) are the estimated final models:

$$PM2.5_t = \beta_0 + \beta_1 T_{Min_t} + \beta_2 T_{avg_t} + \beta_3 P_t + \beta_4 Q_t + \varepsilon \tag{2}$$

$$PM10_t = \beta_0 + \beta_1 T_{Min_t} + \beta_2 T_{avg_t} + \beta_3 P_t + \beta_4 Q_t + \varepsilon \tag{3}$$

The ICA is related to emissions of particulate matter; in this case, we considered PM2.5 and PM10. We included four independent variables: two related to temperature, and two dummy variables related to the pandemic. These were minimum temperature (T_{Min}), average temperature (T_{avg}), a dummy variable that allows us to assess the effect of the pandemic (P) and other to assess quarantine periods (Q) in the ICA (1).

Based on the literature (A.A Cerda & García, 2010), a regression model was estimated, using the ordinary least

squares method (OLS). Estimations were done with Stata. For the analysis it was established that air quality is a measure of particulate matter emissions, which is called the Air Quality Index (ICA); and will be studied according to four variables with daily data (t). The first two correspond to the minimum (T_{Mt}) and average temperatures (T_{avg_t}), respectively, whereas the remaining are dummy variables that allow us to assess the effect of the pandemic (P_t) and quarantine periods (Q_t) in the ICA (1). Where $P_t=1$ if there are pandemic and zero if not. Similarly, $P_t =1$ with pandemic period and 0 otherwise.

$$ICA_t = f[T_{Mt}, Tavg_t, P_t, Q_t] + \varepsilon \tag{1}$$

Equations (2) and (3) are the estimated final models:

$$PM2.5_t = \beta_0 + \beta_1 T_{Min_t} + \beta_2 T_{avg_t} + \beta_3 P_t + \beta_4 Q_t + \varepsilon \tag{2}$$

$$PM10_t = \beta_0 + \beta_1 T_{Min_t} + \beta_2 T_{avg_t} + \beta_3 P_t + \beta_4 Q_t + \varepsilon \tag{3}$$

The ICA is related to emissions of particulate matter; in this case, we considered PM_{2.5} and PM₁₀. We also estimate the above model for CO₂ and O₃. We included four independent variables: two related to temperature, and two dummy variables related to the pandemic. These were minimum temperature (T_{Min}), average temperature (T_{avg}), a dummy variable that allows us to assess the effect of the pandemic (P) and other to assess quarantine periods (Q) in the ICA (1).

Results

Antecedents

Table I presents the reference limits for emergency levels of the Primary Quality Standard for PM2.5 and PM10. These limits trigger emergency pollution control measures, which include promoting responsible and efficient wood heating practices, enforcing restrictions on visible smoke emissions from homes during specified hours, and prohibiting the operation of wood or coal boilers, among other actions.

Table I. Category Limits of Emergency Levels of the Quality Standard for pm_{2.5} and pm₁₀

Category	Daily concentration PM _{2.5} µm/m ³	Daily concentration PM ₁₀ µm/m ³
Good	Entre 0 y 79	Entre 0 y 194
Alerta	Entre 80 y 109	Entre 195 y 239
Pre-emergency	Entre 110 y 169	Entre 240 y 329
Environmental Emergency	170 o superior	330 o superior

Source: Ministry of Environment.

Table II shows the number of annual critical episodes of PM_{2.5}, in Talca. We can observe that the number of episodes in 2020, with confinement, is quite like the average number of critical episodes for 2017-2022 (Ministerio del Medio Ambiente, 2022).

Table II. Annual Critical Episodes Of PM_{2.5} in Talca

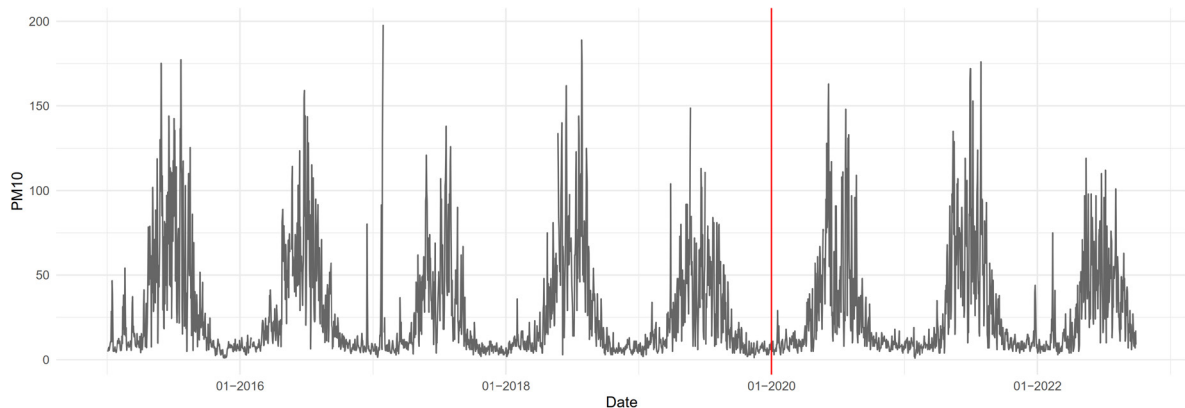
Year	Number of critical episodes
2016	49
2017	27
2018	59
2019	33
2020	42
2021	61
2022	30
Average	43

Source: Author’s elaboration based on reports of the evolution of critical episodes for MP_{2.5} of the Ministry of Environment between 2016 and 2022.

Figure 1 shows the daily record of PM₁₀ in µg/m³(micrograms per normal cubic meter) in the city of Talca, University of Talca Station, from January 1, 2015, to September 30, 2022. It follows that the average emission of PM₁₀ of the pre-pandemic period (taken from January 1, 2015, to December 31, 2019) was 42.42 µg/m³, according to va-

lidated records, with a minimum of 3 and a maximum of 210.6, while during the pandemic (taken from January 1, 2020, to September 30, 2022), it is shown that the average emission of PM₁₀ is 38.96 µg/m³, with a minimum of 4 and a maximum of 158 (Chilean Ministry of Environment, 2022).

Figure 1. Average daily emissions of PM₁₀, 01/01/2015 - 30/09/2022 at La Florida.

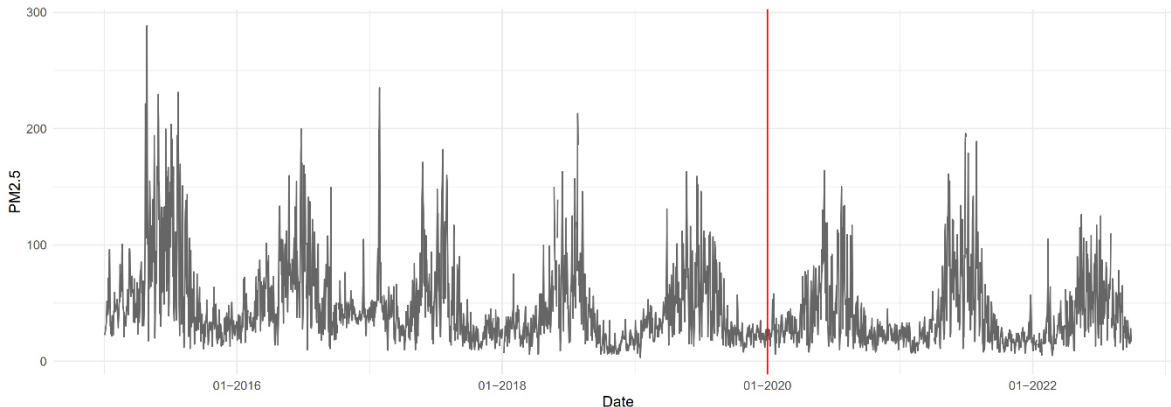


Source: Own elaboration based on data on PM₁₀ emissions from La Florida Monitoring Center. Data from the Air Quality Information System (SIMCA), Ministry of Environment. The red line marks the pre- and post-pandemic periods.

Figure 2 shows the average daily emission of PM_{2.5} in the pre-pandemic period (January 1, 2015, to December 31, 2019) is 17.83 µg/m³, with a minimum of 1 and a maximum of 161.3. During the pandemic (January 1,

2020, to September 30, 2022), the average PM_{2.5} was 16.96 µg/m³, with a minimum of 1 and a maximum of 127 (Ministerio del Medio Ambiente, 2021).

Figure 2. Average daily emissions PM_{2.5}, 01/01/2015 - 30/09/2022 at La Florida.



Source: Own elaboration based on data on PM₁₀ emissions from La Florida Monitoring Center. Data from the Air Quality Information System (SIMCA), Ministry of Environment. The red line marks the pre- and post-pandemic periods.

When comparing the pre-pandemic and pandemic periods, it follows that there was a change in both emissions of particulate matter, with aerodynamic diameters less than or equal to 10 micrometers and 2.5 micrometers. However, it can be noted that the change in the PM₁₀ had a greater decrease than that of the PM_{2.5}, passing its average from 42.42 to 38.96 µg/m³, and going from a maximum of 210.6 to 158 µg/m³.

The pandemic period was marked by the implementation of mandatory quarantine, which meant the obligation to remain at home for a certain period (Carvalho et al., 2021). These quarantines caused a change in the routine of the country, reducing transportation uses and the closure or reducing production in some companies, but also brought with it an increase in wood heating due to people staying at home, which contributes to the increase in fine particulate matter in some cases. The cities belonging to the south and south centers of the country were the most affected owing to the high consumption of this type of energy for heating (Morales-Solis et al., 2021).

Talca entered quarantine for the first time on January 23, 2021, with 415 active cases. The city ended its first quarantine on February 21, but on March 18, it was again mandated. There

are a series of periods in which the population was confined: January 23, 2021, February 21, 2021, March 18, 2021, April 28, 2021, and June 5 to June 23. The city has a total of 91 days. During this period of constant quarantines, from January 23 to June 23, the average PM_{2.5}, according to records validated by the Ministry of the Environment, was 18.54 µg/m³(36).

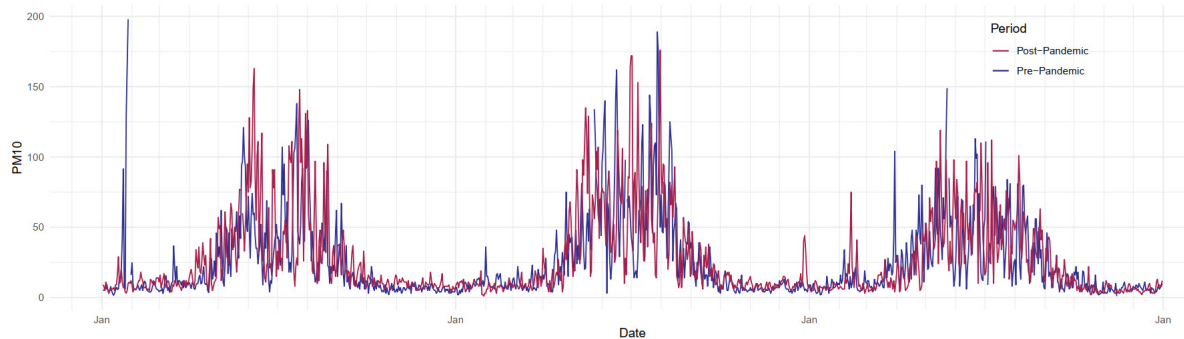
Data description

The descriptive analysis of the data showed that during the pandemic, there were higher emissions of PM, considering the number of critical episodes, by MP_{2.5}, which increased by 18 during the pandemic period, while those by MP₁₀ increased by five episodes. Between May and September, the highest levels of emissions were recorded, regardless of the observation period.

Daily Emission comparison between pre and pandemic periods

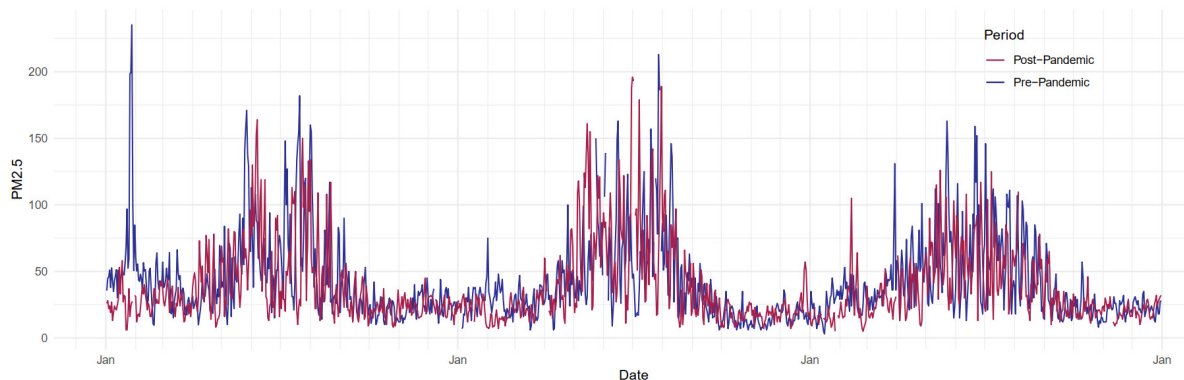
Fig. 3 and 4 show a daily comparison of PM₁₀ and PM_{2.5}, before the COVID-19 pandemic and during the pandemic, respectively. We can observe that the emission of PM_{2.5} increased considerably, especially in 2021, during the months of July and August (Table III).

Figure 3. Daily comparison of PM10 between pre-pandemic and pandemic emissions.



Source: Own elaboration based on data on PM10 emissions from La Florida Monitoring Center. Data from the Air Quality Information System (SIMCA), Ministry of Environment. Overlapped data considers the periods 2017-01-01 to 2019-12-31 and 2020-01-01 to 2022-12-31.

Figure 4. Daily comparison of PM_{2.5} between pre-pandemic and pandemic emissions.



Source: Own elaboration based on data on PM2.5 emissions from La Florida Monitoring Center. Data from the Air Quality Information System (SIMCA), Ministry of Environment. Overlapped data considers the periods 2017-01-01 to 2019-12-31 and 2020-01-01 to 2022-12-31.

Table III. Statistical Summary

	MP _{2.5}	MP ₁₀	CO ₂	Average Temperature	Minimum Temperature	Minimum Temperature Range
Pre-Pandemic	24.95 (28.22)	39.17 (29.67)	70.21 (59.88)	15.33 (5.8)	9.07 (4.5)	-3.84; 19.01
Post-Pandemic	30.24 (30.52)	40.47 (31.23)	73.51 (58.21)	14.1 (5.39)	8.22 (4.18)	-3.6; 17.3
Total	27.79 (29.59)	39.86 (30.52)	71.98 (58.99)	14.67 (5.62)	8.61 (4.35)	-3.84; 19.01

The averages for MP_{2.5}, MP₁₀, and CO are measured in µg/m³. The temperatures are measured in Celsius degrees. The numbers in parentheses are the standard deviations. The pre-pandemic period in our data and models corresponds to 01/01/2018 to 31/12/2019. The post-pandemic period corresponds to 01/01/2020 to 31/08/2022.

Models estimates

With a sample size of 2068 observations per variable, between pre-pandemic and pandemic periods, the study was carried out with the Air Quality Index (ICA) considering two models:

The models presented in Eqs. 2 and 3 were estimated for PM₁₀ and PM_{2.5}, for the La Florida monitoring station. The results of these estimations are presented in Table IV.

Table IV. Econometric model results for PM_{2.5} and PM₁₀, monitoring Station La Florida

Variable	La Florida monitoring station	
	Model 1 (PM10) Coefficient (t-student)	Model 2 (PM2.5) Coefficient (t-student)
Minimum Temperature (Tmin)	-0.6438*** (-2.60)	-2.3033*** (-8.10)
Average temperatura (Tavg)	-3.4166*** (-10.64)	1.8726*** (8.53)
QUARANTINE (Q)	2.2667 (0.83)	1.2833 (0.53)
PANDEMIC (P)	-2.6067** (-2.11)	0.8162 (0.75)
Constant	80.0181*** (41.39)	74.6442*** (43.57)

Model 1. R² = 0.3506; F statistic =229.35; valor-p < 0.000;
 Model 2. R² = 0.4597; F statistic =360.75; ***p-value < 0.001;**
 p-value < 0.005; ***p-value < 0.01

Estimation of Models 1 and 2 for La Florida Station

When the minimum temperature increases one degree, emissions of coarse particulate matter decrease by 0.64 micrometers (µg/m3). As the average temperature rises by one degree, emissions decrease by 3.41 µg/m3. On the other hand, if you are in periods of pandemic compared to pre-pandemic, and the rest constant, there will be a decrease of 2.60 µg/m3 in PM₁₀ emissions.

For the fine particulate matter PM_{2.5}, it was determined that the minimum temperature and average temperature are the only two significant variables, both of which have a negative relationship with PM_{2.5} emissions. When the minimum temperature increases one degree, emissions of fine particulate matter decrease by 2.30 micrometers (µg/m3). With an increase in the average temperature of one degree, emissions decrease by 1.87 µg/m3.

Estimation of Models 3 (CO2) and 4 (Ozone) for La Florida Station

For Ozone, the results showed that both minimum temperature and average temperature and quarantine are significant variables for the model, where minimum temperature, quarantine and pandemic have a negative relationship with O3, while average temperature has a positive relationship with it. When the minimum temperature increases one degree, O3 decreases by 0.28 parts per billion (ppb). When there is an increase of one degree in the average temperature, there will be an increase in Ozone of 0.62 ppb. On the other hand, if you are in quarantine periods, this will bring with it a decrease of 2.03 ppm.

Table V: Econometric model results for Co2 and ozone, monitoring center La Florida

Variable	La Florida monitoring station	
	Model 3 (CO2) Coefficient (t-student)	Model 4 (OZONE) Coefficient (t-student)
Minimum Temperature (Tmin)	-5.0896*** (-7.93)	--0.2863*** (-4.86)
Average temperatura (Tavg)	-2.0059*** (-4.04)	0.6254*** (13.74)
QUARANTINE (Q)	-1.9153 (-0.35)	-2.0345*** (-4.03)
PANDEMIC (P)	-3.2751 (-1.33)	-0.0765 (-0.34)
Constant	147.1234*** (38.05)	3.0697*** (8.64)

Model 5. R² = 0.3053; F statistic = 186.56; Model 6. R² = 0.2327;
 F statistic =128.48; valor-p < 0.000; ***p-value < 0.001;
 p-value < 0.005; *p-value < 0.01

DISCUSSION

Particulate matter and various chemical compounds can have significant impacts on both environmental quality and human health (Jin et al., 2022). Numerous studies have demonstrated that the burning of firewood for residential heating in the winter months can result in a reduction in air quality, which aligns with the results of our study when considering PM_{2.5}, which is related positively with the variable pandemic (A. Cerda et al., 2010; A. A. Cerda et al., 2010). However, other research has suggested that air quality improvements occurred during the pandemic due to reductions in several human activities. (Dahu et al., 2023; Kaied et al., 2021); the same occurred in China, where PM₁₀, PM_{2.5}, NO₂, and CO showed the largest reduction during the shutdown period of COVID-19 in 2020 (Niu et al., 2022). In our study, the variable pandemic was negatively related to PM₁₀, CO₂ and O₃, generating a better quality of the air. This does not happen with PM_{2.5}.

This can be explained by the fact that PM emissions and concentrations have multiple sources, including climate, traffic, industry, commerce, and home heating, which can have a positive or negative impact on air quality (Wang et al., 2022). The latter stands out because heating by burning wood is highly used in the region, and when spending extended periods at home, the population uses it to a greater extent, generating more emissions of particulate matter. Reinforcing this point, new studies have concluded that the decrease in traffic emissions is offset by an increase in PM₁₀ associated with domestic heating. Similar results were found in Italy, where certain air pollutants showed improvement during periods of the pandemic, unlike PM₁₀. The analysis of some cities revealed that the national closure did not affect the reduction of the average concentration of MP_{2.5} and PM₁₀ in the pre-closure and that they were higher during 2020 compared to the same period in 2019 (Feiferyte Skiriene & Stasiskiene, 2021).. Additionally, climate change can affect energy consumption and emissions levels (Dirks et al., 2015; Grima et al., 2021).

Summarizing de models result, for the dependent variables PM₁₀, CO₂, and O₃, the variables minimum, average temperature, and pandemic were significant and inversely related to said pollutants. For PM_{2.5}, the above is not true for the case of the pandemic which affects positively PM_{2.5}, worsening air quality measured by this indicator. The variable quarantine was not significant in all models.

CONCLUSIONS

The findings of this research reveal that the COVID-19 pandemic caused a shift in air quality within the city of Talca. While emissions of particulate matter typically increase between May and September each year due to the onset of autumn and winter and increased wood heating usage, the quarantine measures had a significant impact on these emissions (Grima et al., 2021). There was a marked increase in the frequency of critical episodes of both PM_{2.5} and PM₁₀ during the quarantine period, with PM_{2.5} exhibiting a higher increase because the pandemic.

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Research paper

Corporate social responsibility practices in the hotel sector of the Central Andes of Perú

Prácticas de responsabilidad social empresarial en el sector hotelero de los Andes Centrales del Perú

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ABSTRACT

This study investigated corporate social responsibility (CSR) practices in 15 hotels located in the Tarma province, Perú, applying a mixed-methodology approach to delve into their impact in terms of environmental sustainability and local economic benefit. Through the analysis of data collected from questionnaires and interviews, a notable commitment by these establishments towards the efficient management of natural resources has been observed, highlighting practices such as waste reduction, significant water savings, and the integration of renewable energies into their operations. Additionally, strong support for the local community and the valorization of the region's cultural heritage are made evident, aspects that are crucial for strengthening local identity and sustainable socioeconomic development.

Keywords: So Environmental sustainability, corporate social responsibility, sustainable tourism.

RESUMEN

Este estudio investigó las prácticas de responsabilidad social empresarial (RSE) en 15 hoteles ubicados en la provincia de Tarma, Perú, aplicando una metodología mixta para profundizar en su impacto en términos de sostenibilidad ambiental y beneficio económico local. A través del análisis de datos recogidos de cuestionarios y entrevistas, se ha podido observar un compromiso notable por parte de estos establecimientos hacia la gestión eficiente de recursos naturales, destacando prácticas como la reducción en la generación de residuos, el ahorro significativo de agua y la incorporación de energías renovables en sus operaciones. Además, se pone de manifiesto un fuerte apoyo a la comunidad local y la valorización del patrimonio cultural de la región, aspectos que son cruciales para el fortalecimiento de la identidad local y el desarrollo socioeconómico sostenible.

Palabras clave: Sostenibilidad ambiental, responsabilidad social empresarial, turismo sostenible.

INTRODUCTION

La integración de prácticas de responsabilidad social empresarial (RSE) en el sector hotelero se ha convertido en un tema de creciente importancia en la última década, marcando un cambio significativo en cómo las empresas se relacionan con sus stakeholders y el medio ambiente. En los Andes Centrales del Perú, una región caracterizada por su rica biodiversidad y patrimonio cultural, la adopción de estas prácticas no solo es crucial para la sostenibilidad ambiental, sino también para el bienestar social y el desarrollo económico local.

La RSE en la industria hotelera abarca una amplia gama de actividades, incluyendo la gestión ambiental sostenible, el apoyo a las comunidades locales, la conservación del patrimonio cultural y el fomento de la economía local a través de la contratación de servicios y productos locales. Estas prácticas no solo benefician a la sociedad y al medio ambiente, sino que también pueden traducirse en una ventaja competitiva para los hoteles, mejorando su reputación y atrayendo a un segmento de mercado cada vez más consciente de la sostenibilidad (Bohdanowicz et al., 2011; Font & Lynes, 2018).

La investigación sobre la RSE en el sector hotelero de los Andes Centrales del Perú es relativamente escasa, pero estudios realizados en contextos similares sugieren que la implementación de prácticas de RSE puede enfrentar desafíos únicos, tales como la falta de recursos, conocimientos técnicos y el equilibrio entre las expectativas de los stakeholders y los objetivos comerciales (Garay & Font, 2011; Tashman & Marano, 2009). Sin embargo, la creciente demanda por parte de los consumidores de prácticas empresariales sostenibles ofrece una oportunidad significativa para que el sector hotelero desempeñe un papel pionero en la promoción de la sostenibilidad en la región. Este artículo busca explorar las prácticas de RSE implementadas por hoteles en los Andes Centrales del Perú, examinando cómo estas prácticas contribuyen a la sostenibilidad ambiental, el desarrollo económico local y el bienestar social. A través de un análisis comprensivo, se pretende proporcionar una visión detallada de los beneficios y los desafíos asociados con la RSE en este sector, ofreciendo implicaciones prácticas y recomendaciones para su efectiva implementación.

METHODOLOGY MATERIALS AND METHODS

Este estudio se basó en la evaluación de prácticas de responsabilidad social empresarial (RSE) en 15 hoteles ubicados en la provincia de Tarma, Perú. Se utilizó un enfoque mixto que combinó métodos cuantitativos y cualitativos para obtener una comprensión profunda de las prácticas de RSE implementadas.

Se recopilaron datos a través de cuestionarios estructurados dirigidos a gerentes de hoteles, y entrevistas semiestructuradas con empleados, proveedores locales y miembros de la comunidad. Además, se realizó un análisis de contenido de los informes de sostenibilidad publicados por los hoteles y documentación relevante proporcionada por las instituciones de apoyo.

Los cuestionarios se centraron en medir aspectos específicos de RSE, incluyendo gestión ambiental, ahorro de agua, uso de energías renovables, apoyo a la comunidad, promoción del patrimonio cultural y compra a proveedores locales. Los datos cuantitativos se analizaron utilizando estadísticas descriptivas para determinar promedios y tendencias.

Las entrevistas y el análisis de contenido se utilizaron para explorar en profundidad las percepciones, motivaciones y desafíos asociados con la implementación de prácticas de RSE. Este enfoque permitió capturar la complejidad y los matices de cómo las prácticas de RSE se integran en la operación de los hoteles y su impacto en la comunidad y el ambiente.

Se empleó el software SPSS para el análisis cuantitativo. La triangulación de datos cuantitativos y cualitativos facilitó una interpretación más rica y una validación cruzada de los hallazgos.

RESULTS AND DISCUSION

La tabla resumida presenta un panorama general de cómo los hoteles en la provincia de Tarma, Perú, están implementando prácticas de responsabilidad social empresarial (RSE) en diversas dimensiones. Los promedios indican no solo el grado de adopción de estas prácticas, sino también su impacto potencial tanto en la operación hotelera como en la comunidad y el ambiente circundante.

Table 2: Promedios de las prácticas de responsabilidad social empresarial (RSE) evaluadas en 15 hoteles

Dimensión	Promedio
Gestión Ambiental (% reducción residuos)	44.67%
Ahorro de Agua (% reducción consumo)	23.33%
Energía Renovable (% reducción consumo energía)	24.67%
Apoyo a la Comunidad (% ingresos destinados)	5.87%
Promoción Patrimonio Cultural (Sí=1/No=0)	100%
Compra a Proveedores Locales (% sobre total compras)	62.67%

- Gestión Ambiental (% reducción residuos):** Con un promedio de 44.67% en reducción de residuos, los hoteles en Tarma están demostrando una dedicación notable hacia la minimización de su impacto ambiental. Esta tendencia no solo resalta una conciencia creciente sobre la importancia de la sostenibilidad en el sector hotelero, sino que también se alinea con la literatura científica que destaca la gestión de residuos como una estrategia crucial para la conservación ambiental y la sostenibilidad empresarial (Bohdanowicz et al., 2011). Los esfuerzos por reducir la producción de residuos pueden verse como parte de un enfoque más amplio de responsabilidad social empresarial (RSE), donde las prácticas ecológicas se integran en la operación cotidiana de los hoteles. Según Garay & Font (2011), las iniciativas de gestión ambiental no solo tienen el potencial de reducir significativamente el impacto ecológico de las empresas hoteleras, sino que también pueden contribuir a la eficiencia operativa y la reducción de costos. Este punto es corroborado por el comentario de un encuestado que señala una "disminución significativa en nuestros costos de operación gracias a la implementación de prácticas de gestión de residuos eficientes". Este testimonio subraya el beneficio dual de las prácticas de gestión de residuos: promover la sostenibilidad ambiental mientras se mejora la rentabilidad.
- Ahorro de Agua (% reducción consumo):** El ahorro de agua, con un promedio de reducción del consumo del 23.33%, destaca la creciente preocupación y esfuerzo por parte del sector hotelero de Tarma para gestionar de manera más sostenible este recurso vital. La conciencia sobre la importancia del agua y la adopción de tecnologías y prácticas destinadas a su conservación reflejan un compromiso ambiental importante que se alinea con los principios de sostenibilidad y res-

ponsabilidad social empresarial (RSE). La eficiencia en el uso del agua no solo reduce el impacto ambiental de las operaciones hoteleras, sino que también contribuye a la conservación de recursos para las comunidades locales. La adopción de tecnologías de bajo flujo, sistemas de reciclaje de agua y programas de sensibilización son medidas efectivas reconocidas para reducir el consumo de agua (Honey, 2007).

El comentario de un participante sobre la importancia de "la adopción de tecnologías de bajo flujo y la reutilización de agua" para lograr una reducción significativa en el consumo de agua destaca una tendencia práctica dentro del sector. Estas tecnologías y prácticas no solo representan un avance hacia la sostenibilidad, sino que también pueden ofrecer beneficios económicos a largo plazo mediante la reducción de los costos operativos relacionados con el consumo de agua.

- Energía Renovable (% reducción consumo energía):** Un promedio de 24.67% en la reducción del consumo de energía a través de fuentes renovables indica una tendencia hacia la eficiencia energética y la reducción de la huella de carbono. "Invertir en paneles solares ha sido una decisión estratégica tanto para nuestra sostenibilidad como para nuestra imagen pública", destaca un hotelero. La inversión en tecnologías de energía renovable, como los paneles solares mencionados por un hotelero, se está convirtiendo en una práctica cada vez más común dentro de la industria hotelera global. Estas tecnologías ofrecen una doble ventaja: reducen el impacto ambiental de las operaciones hoteleras y pueden generar ahorros significativos en costos energéticos a largo plazo. Becken & Simmons (2008) destacan que el turismo, y en particular la industria hotelera, tiene un papel crucial que desempeñar en la reducción de emisiones de gases de efecto invernadero a través de la adopción de energías renovables y prácticas de eficiencia energética.
- Apoyo a la Comunidad (% ingresos destinados):** El promedio de 5.87% de los ingresos destinados a la comunidad subraya el papel activo que juegan los hoteles en el apoyo al desarrollo local. Este enfoque en la responsabilidad social no solo mejora las vidas de las personas locales, sino que también construye relaciones sólidas entre los hoteles y sus comunidades. "Es fundamental para nosotros devolver a la comunidad

que nos acoge; es una relación de beneficio mutuo", explica un gerente. Este enfoque en el apoyo comunitario es coherente con la literatura que sugiere que las iniciativas de RSE pueden contribuir significativamente al desarrollo sostenible de las comunidades locales, especialmente en destinos turísticos. Según Murphy & Coombes (2009), cuando los hoteles participan activamente en mejorar la calidad de vida de las comunidades locales, no solo abordan las preocupaciones éticas y morales sino que también fomentan un entorno más estable y acogedor para sus operaciones y sus huéspedes.

Promoción Patrimonio Cultural (Sí=1/No=0): La unanimidad en la promoción del patrimonio cultural por parte de los hoteles en Tarma refleja una comprensión profunda de la importancia de integrar la cultura local en la experiencia turística. Este enfoque unánime destaca el valor asignado al patrimonio cultural como un elemento central no solo para atraer turismo, sino también para fomentar un sentido de identidad y pertenencia entre la comunidad local.

La promoción del patrimonio cultural se alinea con estudios que indican cómo la autenticidad cultural puede ser un factor diferenciador clave en la industria turística. Richards (2018) sugiere que el turismo cultural ofrece una oportunidad para que los destinos se destaquen en un mercado cada vez más saturado, proporcionando experiencias únicas basadas en la historia, las tradiciones y las artes locales. Al incorporar el patrimonio cultural en su oferta, los hoteles no solo enriquecen la experiencia del visitante, sino que también contribuyen a la conservación y difusión de dicho patrimonio.

El comentario de un entrevistado acerca de que preservar y promocionar el patrimonio cultural "atrae a más visitantes y refuerza nuestra identidad y orgullo local" encapsula la doble ventaja de estas prácticas. Desde la perspectiva del marketing turístico, la autenticidad y la singularidad del patrimonio cultural pueden ser atractivos significativos para turistas que buscan experiencias memorables y significativas. Además, estas iniciativas fomentan un vínculo más fuerte entre la comunidad y su patrimonio, lo que puede tener efectos positivos en la cohesión social y el orgullo comunitario.

- **Compra a Proveedores Locales (% sobre total compras):** La decisión de los hoteles en Tarma de adquirir un promedio del 62.67% de sus insumos de proveedores locales subraya una estrategia deliberada orientada hacia el apoyo de la economía local y la minimización del impacto ambiental. Este enfoque no solo refleja un compromiso con la sostenibilidad y la responsabilidad social, sino que también responde a una creciente demanda por autenticidad y calidad en los servicios turísticos.

La preferencia por los proveedores locales se alinea con un cuerpo de investigación que identifica los beneficios económicos y ambientales de acortar la cadena de suministro. Según Pretty et al. (2005), los sistemas de alimentos locales y sostenibles contribuyen a economías agrícolas más resilientes y a la reducción de las emisiones de carbono asociadas con el transporte de larga distancia. En el contexto hotelero, esto significa no solo apoyar la economía local a través de la inversión directa, sino también promover prácticas de negocio responsables desde una perspectiva ambiental. El comentario de un hotelero sobre cómo trabajar con proveedores locales "ha fortalecido la economía de nuestra comunidad y nos ha permitido ofrecer productos más frescos y auténticos a nuestros huéspedes" resalta dos aspectos clave. Primero, la inversión en la comunidad local puede tener un efecto multiplicador, fomentando el crecimiento económico y la sostenibilidad a largo plazo. Segundo, la capacidad de ofrecer productos frescos y auténticos mejora la experiencia del cliente, lo que puede traducirse en una ventaja competitiva en el mercado turístico.

CONCLUSIONS

Los hoteles en Tarma están implementando efectivamente prácticas de responsabilidad social empresarial, destacando su compromiso con la sostenibilidad, la economía local, y la cultura. Las estrategias abarcan desde la gestión ambiental y el ahorro de agua hasta el uso de energías renovables y el apoyo a la comunidad, promoviendo el patrimonio cultural y fomentando la economía local mediante la compra a proveedores locales. Estas iniciativas no solo mejoran la experiencia turística ofreciendo productos auténticos y frescos, sino que también refuerzan la identidad y el orgullo local, contribuyendo al desarrollo sostenible de Tarma.

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Beyond the reviews: Unveiling the hotel experience through text mining

Más allá de las reseñas: Desvelando la experiencia hotelera con minería de texto

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ABSTRACT

In hotel management, it is crucial to understand the factors that are essential to customer satisfaction and loyalty. This study aims to determine the attributes influencing tourist experiences in hotels in Santiago, Chile. The methodology consists of text mining, sentiment analysis, and binary logistic regressions were employed to analyze 1,467 online reviews from 10 hotels extracted from the Booking.com platform. Results highlight those comments on infrastructure, location, food, and staff, with similar sentiments. Additionally, it was found that the likelihood of a positive experience significantly increases when location, amenities, and price-quality ratio are adequate. It is concluded that data mining and sentiment analysis are practical tools to comprehend key attributes of the hotel experience, whose enhanced management could substantially enhance guest satisfaction and loyalty.

Keywords: *Data mining, hospitality, sentiment analysis, touristic experiences, Chile.*

RESUMEN

En la gestión hotelera, es crucial comprender los factores que resultan esenciales para la satisfacción y fidelización de los clientes. Este estudio tiene como objetivo determinar los atributos que influyen en las experiencias de los turistas que hospedan en hoteles de Santiago, Chile. La metodología consiste en técnicas de minería de textos, análisis de sentimientos y regresiones logísticas binarias para analizar 1,467 reseñas en línea de 10 hoteles extraídas desde la plataforma Booking.com. Los resultados destacan que los comentarios se concentran en la infraestructura, ubicación, comida y personal, con sentimientos similares. Además, se halló que la probabilidad de una experiencia positiva aumenta significativamente cuando la localización, las amenidades y la relación precio-calidad son adecuadas. Se concluye que la minería de datos y el análisis de sentimientos son herramientas efectivas para comprender los atributos clave de la experiencia hotelera, cuya gestión mejorada podría aumentar sustancialmente la satisfacción y la lealtad de los turistas.

Palabras clave: Minería de datos, hotelería, análisis de sentimiento, experiencia turística, Chile.

INTRODUCTION

In the realm of hotel management, it is crucial to acknowledge the unique characteristics of the service and guest experience offered by the establishment, as they play a pivotal role in establishing a competitive advantage and fostering customer loyalty. Within a constantly evolving global market, the ability to differentiate oneself becomes indispensable in order to distinguish amidst the diverse range of lodging options available. Hence, comprehending the evolving demands and expectations of clientele, and continuously adapting to emerging market trends, are critical factors in sustaining relevance and competitiveness within the hotel industry (Millán-García & Gómez-Díaz, 2018).

In this regard, when designing lodging services, it is essential to consider a multitude of factors that shape the visitor's experience throughout their stay. These factors encompass aspects such as price, infrastructure, location, staff, food, hygiene, amenities, and other crucial elements (Bi et al., 2020; Jawabreh et al., 2022; Mondaca-Marino et al., 2019; Nilashi et al., 2023; Stefko et al., 2020; Verma & Thakur, 2022; Xue & Chen, 2021). Overall, previous research has consistently shown that possessing positive and relevant attributes directly influences user satisfaction (Bi et al., 2020; Manolitzas et al., 2022; Spoerr, 2021), consequently fostering customer loyalty (Darmawan et al., 2021; Paulose & Shakeel, 2022).

Moreover, in the current landscape of continual technological advancement, the increasing use and analysis of big data present themselves as invaluable assets for hotel management (Carneiro et al., 2023). This field provides robust tools for scrutinizing vast datasets (both organized and disorganized) and extracting significant insights to gain a deeper understanding of tourists' preferences and requirements. Through sophisticated data analysis methodologies like text mining and sentiment analysis, hotels can discern patterns and trends within guests' feedback and reviews (Chatterjee, 2020; Khamphakdee & Seresangtakul, 2021; Zarezadeh et al., 2022). This empowers hotel establishments not only to pinpoint areas for enhancement in their services and operations but also to identify critical attributes that influence customer satisfaction and booking decisions. By adeptly harnessing data mining techniques, hotels can customize their marketing approaches, elevate the personalization of customer experiences, and carve out a distinct niche in the market.

In Chile, the hotel industry stands out as a dynamic, competitive, and essential sector within the lodging market (Castro et al., 2023). Santiago, the capital of the country and the epicenter of the domestic tourism industry, leads the nationwide hotel supply. Renowned for its urban and business tourism, Santiago maintains activity year-round and showcases a counter-cyclical dynamic comparison to sun and beach destinations. Furthermore, this metropolis is acknowledged as an emerging tourist hub, emblematic of others in Latin America (Mondaca-Marino et al., 2019).

In this context, the objective of the present article is to ascertain the factors that impact the experiences of tourists lodging in hotels in Santiago, Chile. To accomplish this objective, a blend of advanced methodologies including text mining, sentiment analysis, and binary logistic regressions is utilized to analyze feedback from tourists registered on the accommodation platform Booking.com. The choice of this platform is grounded in its significance and extensive adoption as an evaluation source (Mondaca-Marino et al., 2019; Moro et al., 2018; Özen & Özgül, 2023).

It's important to highlight that there is a scarcity of studies analyzing customer perceptions of the lodging experience in Chilean hotels using extensive datasets, despite the availability of freely accessible information sources like Booking.com. Additionally, recent scientific research on customer satisfaction among hotel guests in the country is limited. Therefore, the objective is to provide valuable insights from open platforms regarding how users perceive various hotel attributes. This, in turn, contributes to improving the quality of lodging services and delivering more satisfying experiences for visitors. Ultimately, this feedback aids in elevating quality standards across the entire hotel industry, fostering continuous improvement within the territorial tourism ecosystem.

The article is structured into four main sections, comprising this introduction, the study methodology, the results, and discussions, culminating in conclusions.

THEORETICAL BACKGROUND

The choice of lodging within the tourism sector entails considering numerous critical attributes that impact visitors' experiences throughout their stay, influencing their satisfaction and loyalty (Yoon & Uysal, 2005). In this regard, models of tourist behavior are grounded in the concept of consumer limited rationality (Conlisk, 1996), which posits

that each person, in their role as a decision-maker, is conditioned by their previous experience, cognitive abilities, time constraints, and other contextual factors. Rational choice theory assumes that consumers are homo economicus, meaning rational decision-makers seeking to maximize their utility or satisfaction (Jung & Kim, 2016). Thus, the consumer's decision regarding lodging is not only based on objective criteria such as price or location but also on a series of subjective factors that influence their perception of service quality and overall experience.

Therefore, understanding the market targeted by each company is crucial, especially in the tourism and hospitality industry, where the Lancasterian nature of tourist products is recognized. According to Lancaster's Theory, goods are composed of a series of attributes that are evaluated individually and contribute to the overall assessment of the customer experience. Thus, people's decisions focus more on product characteristics than on the products themselves (Boz et al., 2020). This complexity increases the difficulty in choosing lodging and underscores the importance of understanding the factors that influence this decision, especially considering that each tourist has unique expectations influenced by diverse motivations (Sánchez-Oro et al., 2021).

In the specialized literature, various attributes of hotels are highlighted, subject to extensive debate and analysis. Among these are food quality (Nilashi et al., 2023; Tager et al., 2021), hotel and room cleanliness (Stefko et al., 2020), infrastructure (Xue & Chen, 2021), location (Bi et al., 2020; Latinopoulos, 2020), pricing (Mondaca-Marino et al., 2019), staff quality of service (Jawabreh et al., 2022; Xin & Choi, 2020), administrative processes and services (Nunkoo et al., 2020; Wu et al., 2021), amenities (Shah & Bhatt, 2020; Verma & Thakur, 2022), and equipment (Stefko et al., 2020; Xue & Chen, 2021). When these aspects are positively evaluated, they become essential strategic elements in ensuring visitor satisfaction and loyalty.

On the other hand, data mining refers to a set of techniques and tools that allow the extraction of large volumes of data available in repositories or websites. Its applicability is wide-ranging, as it proves useful in various fields such as finance, retail, medicine, computer science, among others. Its primary objective is to collect data that initially do not exhibit a defined pattern and, through analysis and interpretation, utilize them for decision-making (Gupta & Chandra, 2020). In the literature review on Artificial Intelligence and Big Data in tourism conducted by Samara et al. (2020), it is evident that the use of Big Data Analysis can create value and advantages, such as increased efficiency, productivity, and profitability, in addition to offering a highly enriched and personalized experience for travelers. Particularly, text mining, focused on knowledge discovery from text-based databases, has been applied since the late 1990s, although its use in studies related to hospitality and tourism began in the mid-2000s (Huang et al., 2022). In hotel management, various applications of data mining techniques have been carried out. For instance, a study conducted by Kampalpour et al. (2017) explored the potential use of Data Mining and Web Mining techniques in the tourism industry to uncover underlying knowledge in hotel visitor information. More recently, Zarezadeh et al. (2022) determined that variables utilized by data mining techniques related to online reviews often cluster into two main aspects: guest-staff interaction and physical aspects of the hotel.

Additionally, sentiment analysis stemming from data mining of online comments is highlighted in the literature (Chatterjee, 2020; Khamphakdee & Seresangtakul, 2021). This technique involves assigning values based on emotions, feelings, personality, and other aspects to specific text (Ray et al., 2021), proving useful for categorizing comments or evaluations about a particular good or service and drawing conclusions from positively (positive sentiment) and negatively (negative sentiment) evaluated aspects. Such analysis is of paramount importance for businesses as it enables a summarized understanding of areas for improvement and management, thereby facilitating informed and strategic decision-making (Wankhade et al., 2022).

Building upon the preceding information, the hypothesis posits that certain attributes (infrastructure, staff, equipment, food, hygiene, location, amenities, price-quality ratio, and administrative processes and services) influence the generation of positive sentiments towards hotels.

Building upon the preceding information, the hypothesis posits that certain attributes (infrastructure, staff, equipment, food, hygiene, location, amenities, price-quality ratio, and administrative processes and services) influence the generation of positive sentiments towards hotels.

METHODOLOGY

The research was based on a quantitative approach, employing a non-experimental, descriptive-explanatory design with a cross-sectional scope. The purpose was to determine the attributes influencing tourists' experiences in hotels in Santiago, Chile, through the application of data mining techniques and multivariate statistical methods. To conduct the text mining process and sentiment analysis

sis, the methodological flow proposed by Wankhade et al. (2022) was followed, consisting of three primary phases: defining the level of analysis, selecting the data collection technique, and defining sentiment concepts.

In the first stage, phrases from user comments, both positive and negative, referring to one or more attributes were analyzed. Subsequently, in the second phase, a web scraping tool was employed to extract comments from the top ten hotels in Santiago, Chile, from the Booking.com platform. The web scraping process was conducted using code developed in the R programming language, gathering a total of 1,467 comments for the period between 2021 and 2023. Finally, in the third phase, relevant sequences of contiguous texts, such as bigrams (two words) and trigrams (three words), reflecting positive or negative sentiments in the comments were identified. These labels were manually applied using the ATLAS.ti software.

Table 1 presents examples of these text sequences used for labeling (categorizing) the units of analysis (phrases). However, it was necessary to conduct a detailed review of each review, especially regarding the metadata associated with each one. For instance, some comments classified as positive in the Booking.com system only mentioned the "location" attribute, so they were adjusted to "good location." Similarly, spelling corrections were made in several messages. Additionally, in the process of coding sentiments, labels associated with gender (male, female, or

other), hotel number (1 to 10), establishment attributes, and type of company (friends, family, couple, or other) were assigned.

Furthermore, a binary logistic regression analysis was conducted to statistically evaluate the probability that attributes (price-quality ratio, administrative processes and services, amenities, equipment, food, hygiene, infrastructure, location, and staff) could predict sentiment towards hotels. The response variable was encoded with values of 0 to represent a negative sentiment and 1 for a positive sentiment. In turn, the predictor variables were coded with values of 0 and 1 to represent negative and positive evaluations, respectively, for each attribute. Additionally, the final classification table of the overall percentage of correct predictions, Cox and Snell R-squared coefficients, Nagelkerke R-squared coefficients were evaluated, and the Hosmer-Lemeshow (H-L) test was conducted to demonstrate the quality of the proposed model.

The equation for binary logistic regression can be expressed as follows:

$$\ln\left(\frac{p}{1-p}\right) = b_0 + b_1x_1 + b_2x_2 + \dots + b_kx_k \quad (1)$$

Thus, it is possible to calculate the probability of the event of interest occurring, considering the values of the predictor variables, using the following formula:

Table 1. Examples of positive and negative bigrams and trigrams

Attribute	Positive comments	Negative comments
Quality-Price ratio	<ul style="list-style-type: none"> • Good option • Price-quality ratio • Meets expectations 	<ul style="list-style-type: none"> • Didn't like it • Expensive • Nothing extraordinary
Administrative processes	<ul style="list-style-type: none"> • Quick check-in • Connectivity service • Good timing 	<ul style="list-style-type: none"> • Slow check-in • Delay in check-in • Administrative issues
Amenities	<ul style="list-style-type: none"> • No towels • No replenishment • Poor Wi-Fi 	<ul style="list-style-type: none"> • Perfect bedding • Appreciated beverages • Complimentary ware
Equipment	<ul style="list-style-type: none"> • Comfortable bed • Good heating • Good Workplace 	<ul style="list-style-type: none"> • Small bed • Noisy air conditioning • Lack of heating
Food	<ul style="list-style-type: none"> • Great breakfast • Good bar • Good restaurant 	<ul style="list-style-type: none"> • Disastrous restaurant • Bad food • Breakfast flexibility

Hygiene	<ul style="list-style-type: none"> • Room hygiene • General cleanliness • Impeccable hotel 	<ul style="list-style-type: none"> • Sewer smell • Unclean bathroom • Musty smell
Infrastructure	<ul style="list-style-type: none"> • Good facilities • Spacious areas • Spacious room 	<ul style="list-style-type: none"> • Noise from outside • Few parking spaces • Hotel needs maintenance
Location	<ul style="list-style-type: none"> • Near subway stations • Excellent location • Excellent views 	<ul style="list-style-type: none"> • Unsafe neighborhood • Non-central location • Poor exterior view
Staff service	<ul style="list-style-type: none"> • Attentive staff • Good service • Friendly staff 	<ul style="list-style-type: none"> • No one answered • No assistance provided • Lack of friendliness

Source: Author's own survey data.

$$\hat{p} = \left(\frac{e^{\hat{b}_0 + \hat{b}_1 x_1 + \hat{b}_2 x_2 + \dots + \hat{b}_k x_k}}{1 + e^{\hat{b}_0 + \hat{b}_1 x_1 + \hat{b}_2 x_2 + \dots + \hat{b}_k x_k}} \right) \quad (2)$$

Where *p* represents the probability of experiencing a positive sentiment towards hotels, while the predictor variables refer to the nine evaluated attributes. A total of eleven models were created: one general model for the entire sample dataset, and the others segmented by gender (male, female, and other), type of companion (friends, family, and couple), and hotel star rating (two, three, four, and five). It is worth mentioning that all calculations were performed using IBM SPSS Statistics 24.

RESULTS

Sample characterization

The sample comprised 1,467 comments in total, with 58% expressing positivity and 42% negativity. Most comments were derived from hotels rated four or five stars (67%), while the minority stemmed from two-star hotels (11%) (Table 2).

Table 2. Sample characteristics

Variable	Segment	Frequency	Percentage
Type of comment	Positive	846	57.7
	Negative	621	42.3
Hotel star rating	2 stars	155	10.6
	3 stars	330	22.5
	4 stars	549	37.4
	5 stars	433	29.5
Guest gender	Male	696	47.4
	Female	600	40.9
	Other	171	11.7
Travel companions	Friends	347	23.7
	Family	360	24.5
	Couple	359	24.5
	Other	401	27.3

Source: Author's own survey data.

In terms of the guests' profile, it was noted that 41% of the reviews were from women, 47% from men, and 12% were unspecified gender. Additionally, 24% of tourists mentioned traveling with friends, 25% with family members, and another 25% as couples, while 27% indicated traveling with various types of companions.

Regarding the studied hotels, the majority (4) have four stars, followed by three five-star hotels, two three-star hotels, and one two-star hotel. The average overall score is 8.3 (on a scale of 1 to 10), with a standard deviation of 0.53, indicating some consistency in the good ratings given by guests (Table 3).

Table 3. Hotel details and statistics

Hotel	Stars	Score	Hotel	Stars	Score
1	3	7.2	6	4	8.7
2	2	8.7	7	4	8.2
3	3	7.9	8	4	8.4
4	4	9.1	9	5	8.9
5	5	8.2	10	5	8.1
Mean Score				8.30	
Confidence Interval for the mean score (95%)				[8.27 - 8.33]	
Standard Deviation of the score				0.53	

Source: Author's own survey data.

Analysis of comments

Most of the comments focus on infrastructure (429), location (375), food (344), and staff service (306), as shown in Table 4. In contrast, a smaller number of reviews mention hygiene (174), price-quality ratio (159), amenities (105), and other aspects (21) (Table 4).

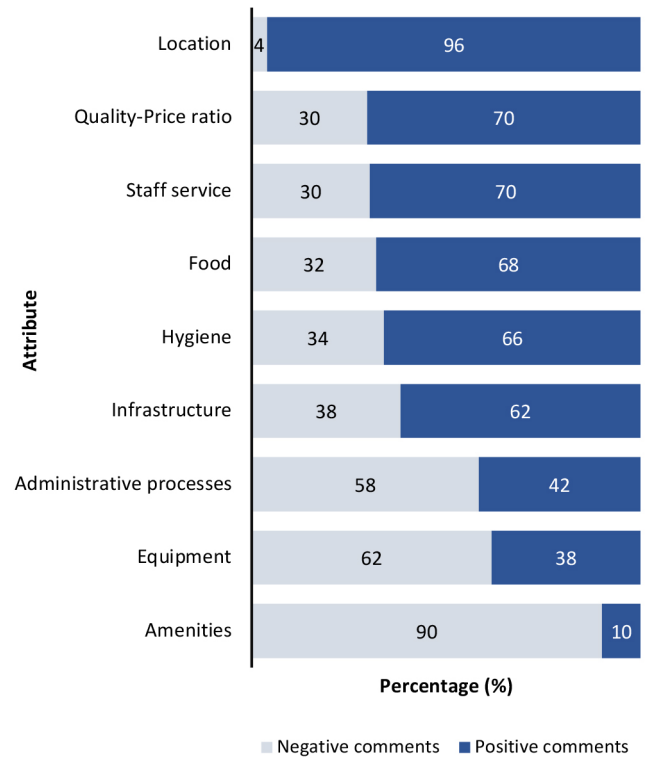
Table 4. Quantity and type of comments by attribute

Attribute	Total	Positive		Negative	
		Case	%	Case	%
Quality-Price ratio	159	112	70.4	47	29.6
Administrative processes	206	86	41.7	120	58.3
Amenities	105	10	9.5	95	90.5
Equipment	177	68	38.4	109	61.6
Food	344	234	68.0	110	32.0
Hygiene	174	114	65.5	60	34.5
Infrastructure	429	265	61.8	164	38.2
Location	375	362	96.5	13	3.5
Staff service	306	213	69.6	93	30.4
Others	21	5	23.8	16	76.2

Note: Percentage (%) calculated based on the total number of comments per attribute.

In general, location is one of the best-rated aspects (96%), followed by price-quality ratio (70%), staff (70%), food (68%), hygiene (66%), and infrastructure (62%). Meanwhile, the least well-rated aspects are amenities (10%), equipment (38%), and administrative processes and services (58%). See Figure 1.

Figure 1. Percentage of positive and negative comments, by attribute



Source: Author's own survey data.

The application of the chi-square independence test between comments and sample characteristics revealed a statistically significant association only between the type of visitor comment and the number of hotel stars ($\chi^2(3, N = 1,467) = 13.53, p < .01$). This demonstrates that positive ratings are more frequent in higher-rated hotels (four and five stars), while more negative opinions are found in two-star hotels. See Figure 2.

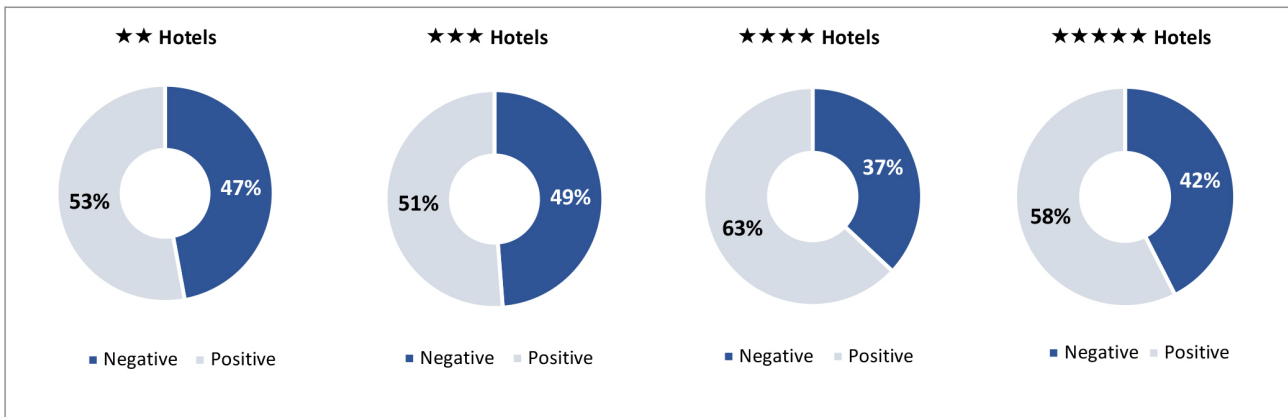
Binary logistic regression models

Table 5 summarizes the results of the logistic regressions by study segment. Overall, the most relevant attributes for hotel guests are location, amenities, price-quality ratio, staff, hygiene, food, and infrastructure. It is noteworthy that a visitor is more likely to experience a positive sentiment towards the hotel when satisfied with the location (56 times more likely), price-quality ratio (5.7 times), staff (3.3 times), hygiene (2.8 times), food (2.7 times), and infrastructure (2.2 times).

Therefore, it can be observed that the effects of the odds ratios (ORs) vary in intensity according to the hotel attribute. According to Chen et al. (2010) classification, the most relevant factors are location and amenities, which have a large impact ($OR > 6.7$). Secondly, in terms of importance, the price-quality ratio is moderate ($3.47 < OR < 6.71$). On the other hand, staff, hygiene, food, and infrastructure show a relatively smaller impact (between 1.68 and 3.47). In the analysis of attributes by sample characteristics, disaggregated by gender, it is highlighted that for both men and women, location ($b=3.8$ and $b=4.2$), amenities ($b=1.9$ and $b=2.6$), price-quality ratio ($b=1.3$ and $b=2.5$), staff ($b=1.2$ and $b=1.3$), food ($b=0.9$ and $b=1.1$), and infrastructure ($b=0.8$ and $b=0.9$) are prioritized aspects. Comparatively, it is notable that for women, the price-quality ratio and hygiene are more relevant than for men.

Regarding the type of companions, it is evident that location emerges as the primary attribute for all evaluated segments, i.e., for those traveling with friends ($b=4.3$), as a couple ($b=4.2$), or with family ($b=3.8$). Additionally, although with different relative importance, the significant influence of price-quality ratio, amenities, staff, and food is noted, with beta coefficients ranging between 0.69 and 2.8. Furthermore, the examination of differences between types of companionship shows that infrastructure is important for those traveling with friends ($b=1.2$) and as a couple ($b=0.9$), while administrative processes and services gain importance for those traveling with family members ($b=1.4$), and hygiene is crucial for those traveling as a couple ($b=1.1$). Additionally, it is noted that location, price-quality ratio, and staff are more relevant for those traveling with friends or as a couple.

Figure 2. Percentage of positive and negative comments, by hotel star rating



Source: Author's own survey data.

Regarding categorization by the number of hotel stars, it is revealed that the priority factors for guests, overall, are location, price-quality ratio, staff, and hygiene. Additionally, the significance of amenities is highlighted in most hotels, except for two-star ones. On the other hand, for guests in two-star hotels, food ($b=2.5$) and hygiene ($b=2.1$) are more significant, while for tourists choosing luxury establishments, administrative processes and services are essential ($b=1.5$). It is interesting to note that the price-quality ratio becomes more relevant for guests in two-star hotels ($b=4.9$), while location is established as a key factor for users of five-star ($b=4.5$) and four-star ($b=4.2$) hotels.

Finally, it is important to highlight that the models demonstrated a good fit according to the Hosmer-Lemeshow test ($p > .05$) and had a moderate level of explanatory power, with a Nagelkerke R-squared of approximately 50%, ranging between 43.4% and 68.6%. The models managed to explain a global percentage of between 74.3% and 83.3% of cases overall. Additionally, it is relevant to mention that the models related to the classification by number of hotel stars exhibited higher explanatory power, with an average Nagelkerke R-squared of 54%.

Table 5. Results of binary logistic regression by study segment, beta, and Odds Ratio (OR)

Attribute	Total (n=1467)	Male (n=696)	Female (n=600)	Other (n=171)	Friends (n=347)	Family (n=360)	Couple (n=359)	2-star (n=155)	3-star (n=330)	4-star (n=549)	5-star (n=433)
Quality-Price	1.73** 5.7	1.3** 3.7	2.51** 12.3	1.65* 5.2	2.29** 9.9	1.08* 2.9	1.83** 6.3	4.9** 134.4	1.47* 4.3	1.27** 3.6	1.85** 6.3
Admin. Serv.	0.16 1.2	0.03 1.0	0.13 1.1	1.02 2.8	-0.58 0.6	1.38** 4.0	-0.1 0.9	0.26 1.3	1.93 6.9	-0.22 0.8	1.54** 4.7
Amenities	2.27** 9.7	1.87** 6.5	2.63** 13.9	3.02* 20.4	2.18* 8.8	2.56** 12.9	2.76** 15.7	1.07 2.9	2.13** 8.4	3.68** 39.7	2.23** 9.3
Equipment	0.16 1.2	0.48 1.6	-0.08 0.9	-0.07 0.9	-0.3 0.7	0.5 1.6	0.42 1.5	-1.47 0.2	2.2** 9.0	-0.51 0.6	0.75* 2.1
Food	0.98** 2.7	0.87** 2.4	1.09** 3.0	1.11* 3.0	0.91* 2.5	0.83* 2.3	0.69* 2.0	2.49** 12.1	0.17 1.2	0.53 1.7	1.55** 4.7
Hygiene	1.02** 2.8	0.74* 2.1	1.32** 3.7	1.03 2.8	0.69 2.0	0.39 1.5	1.1* 3.0	2.05** 7.8	0.33 1.4	0.92** 2.5	0.79 2.2
Infrastructure	0.81** 2.2	0.8** 2.2	0.91** 2.5	0.54 1.7	1.16** 3.2	0.59 1.8	0.89* 2.4	1.41* 4.1	-0.83* 0.4	1.56** 4.8	0.77* 2.2
Location	4.03** 56.1	3.83** 46	4.15** 63.5	4.86** 128	4.31** 74.1	3.84** 46.7	4.15** 63.7	2.73** 15.4	21.82 M	4.23** 69	4.47** 87.4
Staff service	1.19** 3.3	1.19** 3.3	1.28** 3.6	0.82 2.3	1.48** 4.4	0.99** 2.7	1.53** 4.6	1.93** 6.9	0.9* 2.5	0.91** 2.5	1.49** 4.4
Constant	-3.75**	-3.47**	-4.04**	-4.79**	-2.86**	-5.03**	-4.33**	-2.46*	-6.81**	-4.01**	-5.66**
HL Test	.143	.209	.853	.509	.920	.245	.765	.841	.279	.464	.183
Cox & Snell R2	.343	.324	.376	.358	.341	.350	.372	.390	.515	.322	.382
Nagelkerke R2	.461	.434	.506	.485	.459	.470	.501	.521	.686	.439	.513
% Global	.755	.743	.778	.760	.755	.772	.783	.761	.833	.769	.762

Note: *p<5%, **p<1%. Dependent variable = positive sentiment. M = very large number. Effect size of the OR: insignificant (OR <1.68), small (1.68 < OR < 3.47), moderate (3.47 < OR < 6.71), and big (OR > 6.7).

DISCUSSION

The study findings confirm the Lancasterian conception of hotel lodging services, demonstrating that tourists' feelings towards establishments, whether positive or negative, are based on the unique value attributed to a proposition or combination of accommodation attributes, such as location, infrastructure, amenities, and staff service, among other factors (Boz et al., 2020). These preferences, in turn, vary according to the behavioral and socio-demographic characteristics of each individual (Laesser et al., 2019). Furthermore, the findings align with models of bounded rationality of the consumer, which suggest that people (in this case, tourists) make decisions based on heuristics that are strongly influenced by their cognitive capacity, availability of time, and resources (Conlisk, 1996).

In this context, a series of predominant attributes have been identified that influence tourists' perceptions and feelings about hotels. Among the positive aspects, location, value for money, staff, food, hygiene, and infrastructure stand out. In contrast, amenities were negatively highlighted. These attributes, together, define the overall experience of the tourist during their stay at a hotel, emphasizing the importance of considering both favorable and unfavorable aspects to drive continuous improvement and differentiation in an increasingly competitive global market (Mondaca-Marino et al., 2019).

The regression models analysis confirms that location is pivotal in generating positive emotions among tourists towards hotels, serving as a key strategic factor for competitive advantage (Bi et al., 2020). In this regard, Latinopoulos (2020) concluded that location is highly significant for guest satisfaction, considering factors such as proximity to points of interest, convenience for travel within and outside the city, neighborhood ambiance (hospitality), availability of recreational activities, and the option to enjoy panoramic views from the room. Moreover, it was observed that location is more relevant for those traveling with friends or partners, possibly due to the greater availability of options and experiences. For instance, families often prefer renting vehicles for more independent travel, which implies they may opt for less central locations but more convenient in terms of comfort and access. Additionally, this preference is accentuated in three-star hotels and attenuated in two-star ones, which could reflect a classic trade-off between less convenient placement and

a more economical price. These findings carry significant implications for entrepreneurs and policymakers in determining where to build hotels to ensure an attractive offer for tourists.

Another crucial aspect is the amenities, as they represent a minimum standard expected by guests during their stay. These complementary services, such as toiletries, gifts, internet access, gym, pool, among others, significantly contribute to the guest's well-being. For example, Shah and Bhatt (2020) revealed that inadequate provision of amenities can impact tourist satisfaction and their willingness to repeat the visit. Verma and Thakur (2022), on the other hand, while confirming the relevance of this attribute, argue that the adoption of technological amenities can be a differentiating element that positively influences guest sentiment. Along these lines, it is interesting to note the differences found among different visitor segments regarding the importance attributed to hotel amenities. While for female tourists, or those traveling as couples or choosing higher-category hotels, this aspect is more relevant, for male travelers or those opting for lower-category hotels, its impact is lower. These discrepancies underscore the need to consider demographic and behavioral aspects when evaluating the tourist experience, as supported in previous studies (Mak et al., 2012; Tian et al., 2023; Wong et al., 2016).

The price-quality ratio also emerges as a crucial aspect for guests during their stay, significantly impacting their level of satisfaction and loyalty (Ahmed et al., 2023). The results indicate that this attribute becomes more relevant for female tourists (Hong et al., 2020) or those traveling with friends (Xu, 2018), as well as for guests staying in lower-star-rated hotels (Razavi & Israeli, 2019). Consequently, these segments would exhibit higher price sensitivity in terms of elasticity. In contrast, for men and those traveling with family, the effect of the price-quality ratio becomes relatively less significant.

The quality of service provided by the staff also emerged as a fundamental pillar in the hotel experience, highlighting the importance of empathy, reliability, and excellence in service, in line with findings in the specialized literature (Castanha et al., 2023). Jawabreh et al. (2022) emphasize that the quality of attention and the communication skills of the staff are priorities for providing excellent service, emphasizing the need for appropriate recruitment and selection mechanisms for staff and continuous training.

ning and development processes. Likewise, Xin and Choi (2020) confirm the strategic and positive influence of service quality on guest satisfaction and loyalty. The authors emphasize the importance of maintaining clarity in the functions and responsibilities of each employee through effective communication from the management team.

Hygiene similarly represents a prominent attribute for guests (Hernández et al., 2022). As evidenced in the study by Stefko et al. (2020), hygiene can generate divergent opinions among tourists, making it a fundamental factor that hotel managers should consider to ensure guest satisfaction. Furthermore, the findings showed that it is especially relevant for women, who often value hygiene as an aspect that guarantees comfort and health during their stay (Sürme, 2022). Additionally, it was found to be more valued by those staying in two-star hotels, where hygiene issues are more likely to arise compared to higher-category accommodations. Therefore, it is essential for these types of establishments to implement rigorous measures to maintain high standards of hygiene and cleanliness in their rooms.

Regarding food, the results demonstrate that it is a fundamental component in the overall evaluation of the lodging experience (Nilashi et al., 2023). According to Tager et al. (2021), the quality of food service not only affects guest satisfaction but also influences their willingness to return to the hotel and their propensity to recommend it. It is interesting to note that this aspect showed a significant effect in two- and five-star hotels. In one-star hotels, where services are usually more basic, food may be one of the few aspects where guests expect a satisfactory experience, being essential to compensate for potential deficiencies and ensure a pleasant stay (Boto-Garcia et al., 2021). On the other hand, in five-star hotels, the quality of food becomes a primary factor in the overall luxury experience. Visitors seek refined and memorable gastronomic service that complements the high level of service they expect to receive in all aspects of their stay (Ismail et al., 2022).

Infrastructure also emerges as a critical feature for guests. According to Xue and Chen (2021), maintaining facilities in optimal conditions helps prevent a negative perception of the hotel. Users assume that this minimum standard will be met, and its absence can result in significant dissatisfaction and disinterest in using the establishment's services again. The findings indicate that infrastructure becomes more relevant among female guests or those

traveling with friends, which could be linked to requirements sought during the stay such as safety, comfort, accessibility, and overall experience (such as recreational activities), which influence the quality, functionality, and design of the facilities.

On the other hand, administrative processes and services, such as reservations, guest check-in and check-out, payment management, among others, were only relevant for families and guests of luxury hotels (Clauzel et al., 2020), highlighting their importance for those prioritizing a family-oriented and exclusive lodging experience. Additionally, while equipment was significant, it could be considered a secondary aspect compared to other elements that more directly influence the guest experience.

Finally, the study revealed that in higher-rated hotels, especially those with four or five stars, positive reviews are more common, while unfavorable ones predominate in two-star hotels. This phenomenon, linked to the service standard, shows that higher-rated hotels offer a wide range of services and amenities, resulting in more satisfying experiences and, consequently, more positive guest reviews (Lo & Yeung, 2020). In contrast, the most negative reviews in two-star hotels would reflect perceptions of less satisfactory services, such as cleanliness deficiencies or lack of room amenities, and visitors are likely to have lower expectations, increasing the likelihood of expressing negative reviews if these expectations are not met (Boto-Garcia et al., 2021).

CONCLUSIONS

From the study results and their discussion, it is concluded that data mining and sentiment analysis are effective tools for understanding the factors related to tourists' positive and negative emotions, as well as their ability to predict the choice of one hotel over another. These findings have significant implications for hotel management, as understanding the dynamic behavior of tourists becomes a key competitive advantage for any hotel. Especially, since it has been demonstrated that meeting expectations is positively and significantly related to tourist satisfaction and subsequent loyalty (Yoon & Uysal, 2005).

Furthermore, this research provided updated and relevant information regarding the sentiments of tourists staying in hotel establishments in Santiago, Chile, which is useful for managers associated with the hotel industry and for

scholars associated with the study of tourism and hospitality industry. The analysis of the results indicates that there are critical attributes that influence the generation of a positive perception towards hotels, the effective management of which would significantly increase the likelihood of satisfaction and loyalty from tourists.

The location emerged as the most decisive and highly valued aspect by visitors. It is followed in importance by amenities and the price-quality ratio. Additionally, it is indispensable to consider aspects such as having well-trained and friendly staff, adequate infrastructure, quality food, and high standards of hygiene in hotel management. In this sense, the results suggest that lower-category hotels can effectively compete with higher-category ones by focusing on attributes such as price-quality ratio, hygiene, and service personnel, rather than on infrastructure or amenities provision.

Finally, it is recommended to expand this type of study by applying data mining techniques to other accommodation platforms or related websites, and geographical contexts. Additionally, it would be interesting to complement the results through the collection and analysis of primary data, either quantitative or qualitative in nature, which would enrich the understanding of the factors influencing customers' tourism experiences, identify emerging trends, and adapt hotel management strategies more precisely and effectively. Furthermore, based on the study findings, it is relevant to delve into the determinants of guest satisfaction from the perspective of hotel category, considering the socio-demographic and psychographic profile of the visitor. This would provide key insights for personalizing and improving service offerings, addressing the specific preferences and needs of each tourist segment.

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Research paper

Prefeasibility of the installation of tourist services in the laguna de pampahuasi protected reserve, town center of lliupapuquio, district of San Jeronimo, province of Andahuaylas, Perú

Prefactibilidad de la instalación de servicios turísticos en la reserva protegida laguna de pampahuasi, centro poblado de lliupapuquio, distrito de San Jerónimo, provincia Andahuaylas, Perú

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ABSTRACT

The general objective of the research is to describe the feasibility of adapting complementary services for the enjoyment of the landscape in the protected reserve Laguna de Pampahuasi, Lliupapuquio Population Center, San Jerónimo district, Andahuaylas province, Perú. The methodology applied was the mixed approach with an impact on the quantitative, descriptive type, explanatory level, and non-experimental design, supported by documentary review, interviews, and on-site verification of the characteristics of the terrain, accessibility, signage, traffic risks, and rest points, among others. The instruments used were registration forms for on-site verification, interviews with groups of those involved, and a verification form for secondary source registration. In conclusion, there is feasibility because the real load capacity of 57 visits per day and 15,332 visitors for 270 days per year does not generate alteration and destruction of the ecosystem of the natural landscape: the investment cost of S/. 398,916.95 soles for its adaptation and implementation, the investment can be recovered in 5 years, by assigning a ticket office with an entrance price of S/. 5.00 per visitor, excluding other complementary income such as souvenirs, food sales, crafts, and guided tours.

Keywords: accessibility, adaptation, cost, investment, risk, signage, feasibility.

RESUMEN

El objetivo general de la investigación es describir la viabilidad de adecuar servicios complementarios para el disfrute del paisaje en la reserva protegida Laguna de Pampahuasi, Centro Poblado de Lliupapuquio, distrito de San Jerónimo, provincia de Andahuaylas, Perú. La metodología aplicada fue el enfoque mixto con incidencia en el cuantitativo, tipo descriptiva, nivel explicativo, diseño no experimental, apoyado en la revisión documental, entrevista y comprobación in situ de las características del terreno, la accesibilidad, señalización, riesgos de tránsito, puntos de reposo, entre otros. Los instrumentos usados fueron: fichas de registro para la comprobación in situ, entrevistas con grupo de involucrados y ficha de verificación registro de fuente secundaria. Conclusión, existe viabilidad por que la capacidad de carga real de 57 visitas por día y a 15,332 visitantes por 270 días al año, no genera alteración y destrucción del ecosistema del paisaje natural; el costo de inversión por s/. 398,916.95 soles para su adecuación e implementación, se puede recuperar la inversión en 5 años, al asignar un boletaje el precio de ingreso s/. 5.00 por visitante, fuera de otros ingresos complementarios caso de souvenirs, venta de alimentos, artesanías, guiado, entre otros.

Palabras clave: accesibilidad, adecuar, costo, inversión, riesgo, señalización, viabilidad.

INTRODUCTION

The subject of intervention is the Pampahuasi lagoon, located in the territory of the rural community of Lliupapuquio, district of San Jerónimo, province of Andahuaylas, department of Apurímac. The identified reason is that there is a huge potential to be harnessed; however, there is no infrastructure or service implemented related to tourist activity that allows initial and sustainable exploitation over time, despite the area's characteristics, landscape, and the sighting of native species, which is its main factor. The Pampahuasi lagoon, through Administrative Resolution No. 0342-2011-ANA-BAJO APURÍMAC-PAMPAS, is located from the progressive 0+000 km at coordinates 8479066N 690089E to the progressive 5+635 km belonging to the locality of Lliupapuquio, district of San Jerónimo, province of Andahuaylas, department of Apurímac. This tourist resource is approximately 4,200 and 4,300 meters above sea level, with an average temperature ranging from 6°C to 14°C. It is an area with strong winds surrounded by rocky mountains, where various tree species such as pine, queñua, and other wild plants grow; grass plants like straw and ichu; the surrounding geography is good for agriculture, particularly for increasing potato varieties. There are no houses or continuous public transportation in the area.

Figure 1: Mountain



Note: The figure shows the mountain on the east side of Pampahuasi Lagoon. Source: Own elaboration.

Therefore, the set of public tourist services that will be provided by the project to turn it into a tourist attraction arises from the following causes: a) Adaptation of the lagoon: Currently, Pampahuasi Lagoon is considered a water reservoir useful for crop irrigation in the lower Chumbao Valley; b) Observation Services: Strategic points are sustained by mountain climbing characterized by height, ground adaptation, and accessibility, lacking equipment or other support means for climbing and protection; c)

Traffic safety: Currently, there are no routes that allow adequate visitor traffic; d) Tourist orientation and information services: There is no fixed or permanent operator that fulfills the role of disseminator.

Figure 2: Landscape



Note: The image shows the landscape above Pampahuasi Lagoon. Source: Own elaboration.

Additionally, the following causes were identified: e) Internal route services for the tourist resource: Trails are used without adequate infrastructure for the journey in several sections, with risks from wetlands, slopes, and landslides; f) Services for the exhibition of flora or fauna: Landscape and species observation is exploited without the necessary support to enhance the experience and improve photographic services; g) Parking and other services: There is no infrastructure in the study area to guide and organize the controlled use of parking; h) Recreation services: The geography of the study area will allow the implementation of activities such as trekking, fishing, climbing, picnicking, and cycling, which will not alter the lagoon's ecosystem and will be carried out with due care, seeking to protect the integrity of visitors and local biodiversity.

Among the involved institutions, we have: a) Town Center of Lliupapuquio: According to observations made during visits and dialogues with the residents, there is interest in carrying out activities that promote the growth and development of their community; however, the initiative of their authorities is null, and the advice they receive is insufficient. These reasons do not allow them to diversify their municipal activities to exploit and adapt the tourist attractions that could be utilized to benefit the local population. Local authorities and the general population must become aware of the importance of tourism as an engine of economic and social development; b) District Municipality

of San Jerónimo: The residents of Lliupapuquio, according to data collected through interviews, express concern about the lack of interest from the district municipality in promoting tourism in the area. Despite having natural landscapes of great beauty, the area has not received the necessary support to develop its tourism potential; c) DISA Apurímac II: The health center in the town center of Lliupapuquio has a large and adequate infrastructure, with several specialists such as doctors, nurses, and pharmacy technicians. Additionally, it has the necessary equipment to attend to cases of degree I-2; however, it is not adequately equipped for more serious and urgent emergencies, so patients are referred to health centers in Andahuaylas or San Jerónimo; d) UNAJMA: The National University José María Arguedas of Andahuaylas is interested in adapting and strengthening the Pampahuasi Lagoon tourist resource and other resources in the area through the initiative of professors and students through research and University Social Responsibility activities; e) Local Educational Management Unit: The entity has no commitment to promoting local tourism among students and the general population of the province and region; f) LOCAL WATER AUTHORITY: Carries out non-continuous monitoring of the state of the Pampahuasi Lagoon.

Figure 3: Panoramic photograph of the Pampahuasi Lagoon



Source: Own elaboration.

The identified hazards are as follows: The Pampahuasi Lagoon, despite its natural beauty, presents challenges that require attention to ensure a safe and pleasant experience for visitors. The high altitude, mountainous terrain, and lack of adequate infrastructure pose risks that need to be addressed through prevention and improvement strategies, as well as ensuring the long-term viability of tourism in the area and the conservation of the surrounding ecosystem. Regarding the vulnerability analysis: a) Exposure of the tourist resource: The

lagoon is in a mountainous environment, making it susceptible to landslides, especially during the rainy season. Future constructions may be affected if not built in suitable spaces; b) Accessibility: Access to the lagoon by road is difficult due to the poor condition of the roads, increasing the risk of accidents. Additionally, poorly maintained paths hinder transit and increase vulnerability to accidents; c) Visitor exposure: Visitors are exposed to dangers such as lightning, landslides, traffic accidents, and falls on trails. The lack of signage and safety measures at some points of the route increases their vulnerability; d) Fragility: The lagoon and its infrastructure are considered moderately fragile in the face of identified dangers. Landslides could cause considerable damage to the lagoon, trails, and viewpoints, while traffic accidents and falls could result in injuries or even death to visitors or staff; e) Resilience: The lagoon and its surroundings have low resilience to hazards. Rehabilitation or reconstruction of tourist facilities affected by landslides or accidents could take a considerable amount of time. Additionally, the lack of contingency measures and adequate evacuation plans could hinder emergency response. The general objective of the research was to describe the feasibility of adapting complementary services for the enjoyment of the landscape in the Laguna Pampahuasi protected reserve, located in the town center of Lliupapuquio, district of San Jerónimo, province of Andahuaylas, Perú.

METHODOLOGY MATERIALS AND METHODS

Based on Hernández and Mendoza (2016), the approach was mixed, with a focus on quantitative, descriptive, and explanatory levels. The non-experimental design was supported by documentary review, interviews, and on-site verification of terrain characteristics, accessibility, signage, traffic risks, and rest points, among other things. The instruments used were registration forms for on-site verification, interviews with involved groups, and verification records from secondary sources. The methodological source was the Investment Projects Manual for the Tourism Sector.

RESULTS AND DISCUSSION

Workshops developed with the involved groups allowed for identifying and verifying problem causes and the consequences if the problem persists. We developed problem trees, objective trees, and stakeholder matrices, arriving at the following results: the main problem is that visitors arriving at the Pampahuasi Lagoon enjoy the landscape with limitations because there is no compre-

hensive infrastructure; that is, a regular state access road, signage based on ancient livestock route marks, mountain lookout points without complementary means for rest. This originated from a) inadequate conditions and ease of access to the Pampahuasi Lagoon, b) inadequate conditions on the internal trail limiting visits, and c) deficient municipal management in the tourism sector. These direct causes stem from indirect causes, which

are: a.1) deficiencies in entry attention; a.2) deterioration of rudimentary signage and access road; a.3) weak maintenance of the access road; b.1) inadequate conditions of the internal trail; b.2) impact of climatic hazards; b.3) deficient management and enabling of the internal trail; c.1) weak tourism management by authorities; c.2) low tourism culture among the local population; c.3) lack of mobile coverage and assistance.

Table 1. Problem Tree

Problem formulation	Visitors receive inadequate complementary services to enjoy the landscape in the Laguna de Pampahuasi protected reserve.
Causes	
Direct	a) Inadequate conditions and tourist facilities for entry to the Pampahuasi lagoon, b) Poor conditions within the natural resource Laguna Pampahuasi, c) Poor municipal tourism management for the Pampahuasi lagoon
Indirect	a.1) Visible deterioration of the road and lack of signage, a.2) Poor maintenance of the road and lack of wider access; b.1) Inadequate conditions for the internal route, b.2) Impact of climatic hazards; c.1) Low tourist culture of the population, c.2) Lack of mobile coverage, support and assistance service.
Effects	
Live	a.1) Poor access routes generate dissatisfaction and danger among visitors; a.2) Weak image and demand for the preservation and promotion of the tourist resource.
Indirect	b.1) Loss of ability to improve income for families of community tourism operators.

Source: Own elaboration

Table 2. Objective Tree

Objective formulation	Visitors receive adequate complementary services to enjoy the landscape in the Laguna de Pampahuasi protected reserve.
Media	
Live	a) Adequate conditions and tourist facilities for entry to the Pampahuasi lagoon, b) Sufficient conditions within the natural resource Pampahuasi Lagoon, c) Improvement in municipal tourism management for the Pampahuasi lagoon
Indirect	a.1) Improvement of the road and lack of signage, a.2) Sufficient maintenance of the road and lack of wider access; b.1) Adequate conditions for the internal route, b.2) Minimization of the impact of climatic hazards; c.1) Strengthening of the tourist culture of the population, c.2) Existence of mobile coverage, support, and assistance service.
Finnish	
Live	a.1) Poor access routes generate dissatisfaction and danger among visitors; a.2) Weak image and demand for the preservation and promotion of the tourist resource.
Indirect	a.1) Restoration of access routes generate satisfaction and security for visitors; a.2) Strengthening of the image and demand for the preservation and promotion of the tourist resource.
Indirect	b.1) Expansion of the capacity to improve income for families of community tourism operators.

Source: Own elaboration

The main objective is for visitors arriving at the Pampahuasi Lagoon to enjoy the landscape without limitations because there is comprehensive infrastructure; that is, a regular state access road, signage based on location marks, interpretation points, mountain lookout points with complementary means for rest, access to a secure parking center, and safety on the internal trail. This originated from: a) adequate conditions and ease of access to the Pampahuasi Lagoon; b) adequate conditions on the internal trail that limits its visit; c) sufficient municipal management in the tourism sector. These direct causes stem from indirect means, which are: a.1) adequate entry attention; a.2) improvement of rudimentary signage and access road; a.3) sufficient maintenance of the access road; b.1) adequate conditions of the internal trail; b.2) mitigation of climatic hazards; b.3) sufficient management and enabling of the internal trail; c.1) secure tourism management by authorities; c.2) expansion of tourism culture among the local population; c.3) existence of mobile coverage and assistance.

The physical load or gross capacity of the tourist resource allows identifying the number of visits per day that it can support, creating some alterations that may deepen if not controlled. For the study topic, the physical carrying capacity is 1,750 visits per day and 472,500 visits per year during 270 days per year, managing 3 groups of visits per day.

Table 4. Physical Carrying Capacity

Physical Carrying Capacity	Path
Circuit length	1000 ml
Section of the circuit	2 ml
Length used by the person	1.2 ml
S	1000 m2
Sp	1.2 m2
Hv	8 hours/day
TV	5 hours/day
Number of working days for visit	270 days a year
Calculations	
Hv	3 visits/day
Physical load capacity (CCF per day)	1750 visits/day
Physical carrying capacity (CCF per year)	472500 visits/year

Source: Own elaboration.

The real carrying capacity applies when the tourist resource is not yet an attraction but is in process and is characterized by having restrictions related to the proper use and provision of the tourist service to visitors or tourists. Therefore, the real carrying capacity is subject to various fac-

tors that allow adjusting the visitor flow without altering the conditions of the area or natural reserve. The visits per day are 57, and the annual visits reach 15,332 during 270 days of operation per year.

Table 5. Real Carrying Capacity

Real Carrying Capacity	Path
Actual load capacity	1750 visits/day
Social correction factor	0.231
Erodibility correction factor	0.357
Accessibility correction factor	0.543
Precipitation correction factor	0.833
Sunlight correction factor	0.87
Calculations	
Actual load capacity per day	57 visits/day
Actual load capacity per year	15332 visits/year

Source: Own elaboration.

Before 2019, visitors to the Apurímac region reached over 700,000. We have spent three years overcoming the Covid-19 pandemic and have not exceeded the number of visitors in 2019. The same happens with overnight stays; before the Covid-19 pandemic, we exceeded 900,000 visitors, and three years later, in 2024, we have not surpassed this benchmark.

Table 6. Number of Visitors and Overnight Stays in the Apurímac Region

Years	N° de visitors	N° overnight stays
2013	308122	422541
2014	359532	444657
2015	408129	515935
2016	489533	644658
2017	532431	690181
2018	563429	675188
2019	732843	919994
2020	213537	270666
2021	284944	335053
2022	384651	425028

Source: National Institute of Statistics and Informatics/ Statistical Compendium of the Apurímac Region 2022 referenced from the Regional Directorate of Foreign Trade and Tourism - Tourism Directorate.

The linear regression method by least squares allowed us to know the preliminary behavior of the Tourism sector's recovery, but it is not adequate, especially considering the three consecutive years of recession in the Tourism sector, affecting projections of a favorable to regular scenario. However, given the vulnerability of the Tourism sector, it is linked to forecasts of Perú's GDP growth rates; thus, if the national growth rate is 3.6% for 2024, the Tourism sector may grow by a third. The technical part of the proposal involves designing the trail sectioning and implementing complementary works necessary to turn the tourist resource into a tourist attraction.

Figure 16: Trail Sectioning



Note: In this image, the distances in meters of the route are detailed, as well as the number of people per group and the space between groups to better manage the recreational activity. Own elaboration.

Figure 2: Projection of Complementary Works for the Improvement of Tourist Services



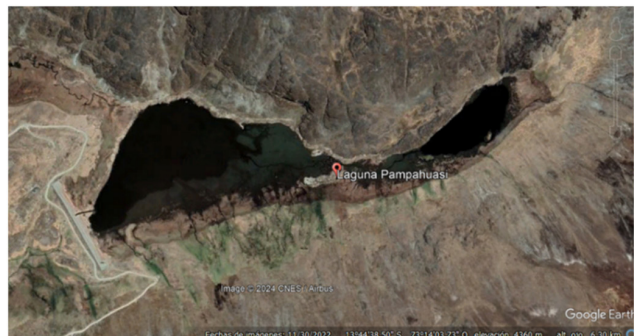
Note: The image shows icons of the various services that will be implemented in the tourist resource, which will improve the service for tourists or visitors. Own elaboration.

Figure 3: Summary of Projected Activities and Tourist Facilities



Note: The image shows the location of each of the facilities that will be implemented to improve the tourist service. Own elaboration.

Figure 4: Satellite view of the project intervention in Pampahuasi lagoon



Note: The approximate satellite coordinates, where the lagoon is located with UTM data: 13°44'55.01" south and 73°14'05.81" west at an altitude of 4,216msnm. Own elaboration

Table 7. Identification of Hazards in the Pampahuasi Lagoon

Hazards identified	Record	Studies	Frequency			Intensity			Description
			Low	Half	High	Low	Half	High	
1. Heavy Rains	Yeah	Yeah		x				x	Heavy rains can cause landslides and affect roads and the safety of visitors.
2. Electric shocks	Yeah	No		x				x	Electrical shocks can be extremely dangerous for visitors, especially if they are in open areas or high on rocks.
3. Landslides	Yeah	Yeah	x					x	The Pampahuasi lagoon is located in a rocky mountainous area, which increases the risk of landslides.
4. Roads in poor condition	Yeah	No		x			x		Poor road maintenance can result in potholes, sinkholes and uneven surfaces, which can be dangerous for vehicles and visitors.
5. Trails	Yeah	No		x			x		The trails are often in poor condition, especially during the rainy season, and have no signage or lighting.
6. Narrow Roads	Yeah	No		x			x		Narrow roads can make it difficult for vehicles to pass and increase the risk of accidents.
7. Lack of nearby medical center	Yeah	No		x				x	In case of a medical emergency, there is no medical center close to Laguna de Pampahuasi. The nearest medical center is located in the city of Andahuaylas approximately 1 hour away.
8. Lack of Communication	Yeah	No		x				x	at Laguna de Pampahuasi . In the event of an emergency, it may be difficult to contact emergency services.
9. Lack of security	Yeah	No	x					x	Due to its location in a remote environment with a sparse population, the Pampahuasi Lagoon lacks permanent surveillance or security personnel.
10. Frost	Yeah	No		x				x	Frosts occur seasonally and also restrict accessibility.

Source: own elaboration

Table 8. Summary of Private Costs

COST SUMMARY		
No.	DETAIL	AMOUNT
1	TICKET OFFICE	S/4,521.38
2	PARKING LOT	S/22,661.30
3	WAITING HUT	S/2,573.00
4	WELCOME SIGN	S/1,076.26
5	GENERAL SIGNAGE	S/4,034.28
6	CONSTRUCTION OF ACCESS TO THE VIEWPOINT (FIRST ROCK)	S/54,117.65
7	RAILINGS	S/27,443.24
8	PERIMETER FENCE	S/1,462.48
9	ADMINISTRATOR'S CABIN	S/6,136.30
10	LIGHTNING ROD	S/11,750.66
11	KIOSK CABIN	S/5,891.30
12	BANKING IMPLEMENTATION (4 UNITS)	S/4,148.78
13	TOURIST VIEWPOINT	S/18,885.30
14	CONSTRUCTION OF GABIONS	S/13,337.60
15	CONSTRUCTION OF 1 WOODEN BRIDGE - 4 METERS	S/9,717.75
16	CONSTRUCTION OF DAIRY HOUSE	S/6,730.50
17	CONDITIONING OF CASKS	S/67,000.00
18	ECOLOGICAL TRASH CANS	S/8,825.00
19	CONSTRUCTION OF 2 BIODIGESTORS	S/3,732.18
20	SENSITIZATION	S/3,850.00
21	OPERATOR FORMALIZATION PROGRAM	S/3,850.00
22	DISSEMINATION PROGRAM	S/4,600.00
23	Promotional Fair	S/6,600.00
24	MAINTENANCE OF FACILITIES AND TRAIL	S/25,136.29
25	IMPLEMENTATION OF FIRST AID KITS	S/660.70
26	WORKER PROTECTION AND SAFETY IMPLEMENTATION MATERIALS	S/10,175.00
TOTAL		S/328,916.95

Source: Own elaboration.

The real carrying capacity of 57 visits per day and 15,259 visitors for 270 days a year represents a moderate visitor flow that does not generate alteration or destruction of the natural landscape ecosystem. The investment cost is calculated at S/. 398,916.95 for its adaptation and implementation is sufficient; however, it must be adjusted according to price inflation behavior. The investment can be recovered in 5 years by assigning a ticket price of S/. 5.00 per visitor, taking into account the scenario of the state's protective and subsidiary role to guarantee a permanent budget for maintenance by the District Municipality of

San Jerónimo. However, another form of administration could involve granting the administration to a tourism operators' association, with the General Sales Tax (IGV) percentage going to the State, from which the Municipality would receive 2% for the Municipal Compensation Fund, plus this second form does not generate permanent payroll expenses for the local Municipality, in addition to other complementary income sources such as souvenirs, food sales, crafts, guided tours, among others offered by the bidding association. For this second form, 18% of IGV is added to the cost of S/. 5.00 soles.

CONCLUSIONS

The development of tourism services in Pampahuasi Lagoon promotes environmental sustainability by implementing conservation practices and responsible management of natural resources. This project ensures that economic growth does not endanger the integrity of the local ecosystem. In social terms, the project will promote the inclusion and participation of the local community, who will benefit directly by obtaining the bidding to manage the future tourist complex. The economic opportunities generated from tourism will lead to personal development. Moreover, they will be responsible for ensuring the project's sustainability. The first scenario is a fixed entry fee of S/. 5.00 soles with municipal budget injection is not sustainable in the long term; the second mode of administration through bidding favors sustainability because the winning legal entity will be responsible for the maintenance and administration of the future tourist complex, which will also implement other complementary services for the enjoyment of the landscape.

This investment project in Pampahuasi Lagoon's total market cost is estimated at S/. 328,916.95 soles for the year 2024. Despite this initial investment, it is recommended to update it after the year due to inflationary effects. The project launch will drive the economic development of Liupapuquio through the promotion of sustainable tourism and the creation of new business opportunities.

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Exploring the potential of Villa Mirador de Mayabe for implementing creative tourism

Explorando las potencialidades de la Villa Mirador de Mayabe para la implementación del turismo creativo

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ABSTRACT

Creative tourism in rural areas improves economic opportunities and promotes sustainability. The objective of the research was to analyze the scientific production on creative tourism in rural areas, in the Scopus database, in order to identify the key factors for its implementation in the Villa Mirador de Mayabe in the tourist destination of Holguín, Cuba. The methodology included the search of scientific articles in Scopus and the elaboration of the reading portfolio; the identification of key factors for the development of creative tourism in rural areas, as well as the potentialities of Villa Mirador de Mayabe for this type of tourism; strategic guidelines were also formulated to achieve it. As the main results, two relevant lines of research were determined: the use of the local community to develop creative tourism and the authenticity and personalization of the creative tourism experience in rural areas. Among the key factors identified were the diversification of the offer and the link between tourists and the rural community. It was concluded that the Village possesses the necessary potential for developing creative tourism. The guidelines focused on integrating local culture, historical heritage, and the community's daily activities into the tourism experience.

Keywords: creative tourism, rural area, Scopus

RESUMEN

El turismo creativo en zonas rurales mejora las oportunidades económicas y fomenta la sostenibilidad. La investigación tuvo como objetivo analizar la producción científica sobre turismo creativo en áreas rurales, en la base de datos Scopus, en función de identificar los factores clave para su implementación en la Villa Mirador de Mayabe del destino turístico Holguín, Cuba. La metodología incluyó la búsqueda de artículos científicos en Scopus y elaboración del portafolio de lectura; la identificación de factores clave para el desarrollo del turismo creativo en áreas rurales, así como las potencialidades de Villa Mirador de Mayabe para este tipo de turismo, se formularon además directrices estratégicas para lograrlo. Como principales resultados se determinaron dos líneas de investigación relevantes el aprovechamiento de la comunidad local para el desarrollo del turismo creativo y la autenticidad y personalización de la experiencia turística creativa en zonas rurales. Entre los factores clave identificados se encuentran la diversificación de la oferta y el vínculo entre los turistas y la comunidad rural. Se concluyó que la Villa posee las potencialidades necesarias para el desarrollo del turismo creativo. Las directrices se enfocaron en la integración de la cultura local, el patrimonio histórico y las actividades cotidianas de la comunidad en la experiencia turística.

Palabras clave: turismo creativo, zonas rurales, Scopus

INTRODUCTION

Tourism is a sector characterized by the constant dynamism of supply, due to the need to meet consumer expectations linked to the search for memorable and enriching experiences. In response to the characteristics of demand, creative tourism has emerged as a transformative trend that embraces a dynamic approach, establishing strong connections between culture, creativity and co-creation of the tourism experience.

This type of tourism is an excellent alternative, as it allows diversifying a destination's offer, opening the way to quality tourism, optimizing material and immaterial resources, and distributing tourism activity throughout the year. Due to its non-seasonal nature, this generates higher income. In addition, it can be carried out in different places and combined with other tourism modalities to create differentiating proposals (Ovalles China, 2017).

Creative tourism is considered a successor tourism modality to cultural tourism, marking a shift from passive to active consumption and from a focus on static, tangible heritages to a living, intangible culture (Richards, 2011), (Blapp & Mitas, 2018). The definition of creative tourism, first assumed by Richards and Raymond (2000) refers to the type of tourism that allows travelers to explore their creative potential through active practice in courses and learning experiences, which are characteristic of the vacation destination. From this same perspective, creative tourism is understood as that which provides activities related to the destination in fields such as music, visual arts, theater, sports, gastronomy, languages, art workshops, or writing (Blapp & Mitas, 2018).

Therefore, the range of activities encompassed by the practice of creative tourism is diverse and broad and focuses mainly on exploring and interacting with cultural heritage. This is materialized through the active participation of visitors with local communities, allowing them to immerse themselves in the traditions and customs of the residents. This approach leads to the creation of educational and memorable experiences for travelers. Interaction with local culture offers the possibility of immersing oneself in interactive creative environments.

In short, creative tourism emphasizes the promotion of exchanges of experiences and knowledge of cultural riches, traditions, and customs between tourists and inhabitants

of local communities (Cabeça et al., 2022). In a context increasingly oriented towards providing authentic and memorable experiences, this tourism modality adds value to the experience. It contributes to the enriching development of tourist destinations, which has led to the interest of the international scientific community in the subject.

Main lines of research in creative tourism

Currently, the predominant areas of research in the field of creative tourism cover a variety of topics. The research of Serrano-Leyva et al. (2022) points out three fundamental lines of research; these are creativity and tourism, creative experience, and creative spaces.

The production of tourism and creativity focuses on redirecting current models of "cultural tourism" towards new modes driven by creativity. Therefore, it is important to highlight that creative tourism is a necessary evolution of cultural tourism that responds to tourists' changing demands. It allows them to participate in creative and authentic experiences, thus satisfying their longing for interpersonal relationships and meaning.

On the other hand, it should be noted that tourists seek unique, memorable, and inspiring experiences. The research of Serrano-Leyva et al. (2022) reflects different approaches to studying this main line. Among the topics addressed are the profile of creative tourists and the perception of the experience, as well as the importance of offering tourism experiences that allow tourists to participate actively, taking into account current tourism trends and changes in how people interact with tourism destinations.

In terms of creative spaces, the urban area emerges as a predominant setting for creativity, exemplified through case studies. This is particularly evident in the collaborative reform of the urban landscape, which has given new life to its physical and socio-cultural framework through co-creation processes involving different actors (Serrano-Leyva et al., 2022). The imbalance between urban and rural environments has also been studied, as creative tourists nowadays seek to experience local life and participate in unique activities and processes not found elsewhere (Remoaldo et al., 2020).

However, other studies evaluate how the focus on natu-

ral and cultural resources, as well as the local identity of a region, influence tourism development. They also delve into issues related to offering authentic and memorable tourism experiences by taking advantage of tourism opportunities present in rural areas. Precisely, the authors agree with Remoaldo et al. (2020) that rural areas emerge as attractive destinations to foster creativity, as they offer visitors the opportunity to immerse themselves in unique narratives, processes and products that can only be experienced in that specific community and environment.

Creative tourism in rural areas

Creative tourism represents an opportunity for small places and underdeveloped rural areas, as each place has its own tangible and intangible attractions that make it unique and allow for the creation of authentic experiences for visitors. In recent years, more attention has been paid to the creative potential of smaller places, as they offer a higher quality of life, which attracts a growing number of creative tourists (Richards, 2019).

In addition, rural areas can be used as a strategic local industrial alternative as they can become alternative centers of industrial production. This may involve the development of industries that process local resources, manufacture sustainable products or provide specialized services. Enjoying with authenticity the resources of the countryside and its traditions, sensitizes younger people to worlds they have never experienced and transports them to absolutely new realities, allowing them a relationship with the rural world and an interpretation of these experiences never thought of before (Remoaldo et al., 2020), by interacting with local traditions and resources, visitors can develop a new appreciation for the rural world and its importance.

Therefore, creative tourism constitutes a development opportunity for rural areas and small towns, and consequently, accommodations located in these areas can create and preserve all the resources to satisfy economic, social, and aesthetic needs while preserving cultural integrity.

Based on the importance of creative tourism in rural areas different authors have addressed this topic, among them Bakas, Duxbury, Remoaldo, et al. (2019), Remoaldo et al. (2020) y Aguiar (2018); however, despite highlighting the

importance of taking advantage of tourism opportunities in rural areas and promoting creative tourism, these studies do not identify the key factors for its development.

In this context the Villa Mirador de Mayabe located 8 km from the city of Holguin, Cuba, in the heights of Mayabe (200 meters above sea level), is characterized by the presence of beautiful natural landscapes, which make it a privileged natural viewpoint from where you can appreciate the Mayabe Valley and the capital of Holguin. This area offers a special attraction for ecological and/or health tourism, fused with the legend of the Valley and the fame of its donkey Pancho, main tourist attraction for its peculiar habit of consuming beer and pork rinds.

The Villa houses the Finca de Campesino, built around 1989, characterized by the presence of fruit trees, medicinal plants, birds and a great variety of animals. Among its main attractions is a typical peasant house, with the intention of being rehabilitated, which shows, through its constructive characteristics, furniture, and natural environment, the customs of peasant life, evoking a bygone era.

The objectives of the research are as follows:

- To carry out a review of the scientific production on creative tourism in rural areas in the Scopus database in order to identify the key factors for its implementation.
- Determine the potential of the Villa Mirador de Mayabe as a creative tourism product.

METHODOLOGY

The following methodology was used for the development of the research:

- 1) Search of scientific articles and elaboration of the reading portfolio

A search was conducted in the Scopus database, using the thematic descriptors “creative tourism”, AND, “rural areas” in the title, abstract or keywords of scientific articles. The time frame was not restricted in order to achieve more accurate results.

In order to clean the database of the articles found, a rea-

ding of the abstracts was carried out, eliminating those that did not address the subject matter as the object of study. The criteria for the selection of articles for the preparation of the reading portfolio were as follows:

- Focus on rural areas and small towns: priority was given to articles exploring creative tourism practices in rural areas and small towns located on the outskirts of metropolitan cities.
 - Focused on creative tourism: articles were selected that specifically explored the potential of creative tourism as a driver of development in rural areas, not only in other types of tourism.
 - Analysis of the potential of creative tourism: studies that analyze the possibilities of implementing and developing creative tourism practices in rural areas, taking advantage of their particular characteristics, were favored.
- 2) Identification of key factors for the development of creative tourism in rural areas through content analysis of scientific articles.

The identification of key factors for the success of creative tourism in rural areas was based on a qualitative content analysis applied to the selected scientific articles. This analysis consisted of an exhaustive and systematic reading of each article, with the objective of identifying the ideas, concepts and arguments related to the successful development of creative tourism in this type of geographic space. The frequency of appearance of each key factor in the articles as a whole was analyzed, which made it possible to establish its importance in this context.

- 3) Identification of the potential of Villa Mirador de Mayabe for the development of creative tourism and proposal of strategic guidelines to achieve it.

To identify the potential of Villa Mirador de Mayabe for the implementation of creative tourism, taking into account the key factors identified, interviews were conducted with local specialists related to tourism, culture, history and development of Villa Mirador de Mayabe. These consultations allowed us to obtain local perspectives on the potential of the product for the development of creative tourism, the needs of the community and the challenges to be faced. Brainstorming sessions were also held with

specialists and members of the local community to define strategic guidelines.

RESULTS AND DISCUSION

Search for scientific articles and preparation of the reading portfolio

The initial literature review identified 17 articles in the Scopus database. However, after an analysis of the abstracts, 5 articles that did not fit the research focus were excluded. Twelve articles were selected that address how rural communities use creative practices to make the most of their environment, creating authentic experiences that take advantage of their culture, heritage and history.

Identification of key factors for the development of creative tourism in rural areas through content analysis of scientific articles

The analysis of the articles evidences the presence of two fundamental lines of research on creative tourism in rural areas, they are: taking advantage of the local community for the development of creative tourism in rural areas addressed in the research by Bakas, Duxbury and Vinagre de Castro (2019), Pourzakarya (2022), Ramírez-García et al. (2023) y Bakas, Duxbury, Remoaldo, et al. (2019) and authenticity and personalization of the creative tourism experience in rural areas by Marujo et al. (2021), Remoaldo et al. (2020), Kastenholz et al. (2023) y Blapp and Mitas (2018). These lines were identified through content analysis, each of which has vital importance to better understand the development of creative tourism in rural areas.

Leveraging the local community for creative tourism development focuses on the progress of these rural areas and the relevance of collaboration between diverse stakeholders, such as artisans, entrepreneurs and local communities, for the success of creative tourism. The key factors identified through content analysis of the articles are referenced below:

Key Factor 1: Alliances between artisans/entrepreneur mediators for creative tourism development

Strategic alliances between artisans and mediating entrepreneurs are a crucial factor for the development of creative tourism in rural areas. Collaboration between these actors makes it possible to overcome the barriers that have

traditionally prevented the full integration of handicrafts into tourism value chains. Business mediators, with their expertise in marketing, distribution and promotion, act as a bridge between artisans and the tourism market, facilitating the commercialization of handicraft products and generating opportunities to access new markets. These alliances not only boost local economic growth, but also contribute to the preservation of craft traditions and the development of the community's cultural identity.

An example of this collaboration can be seen in Portugal, where a group of mediating agents has partnered with local artisan-tourist entrepreneurs to guide and lead the new activities of these artisans. This alliance between artisans and mediator entrepreneurs has developed a program of guided visits to the artisans' workshops, where visitors can witness the process of making the pieces and purchase quality products. In addition, this collaboration has had a decisive impact on the part of the mediators in the promotion and marketing of crafts, along with barriers and facilities in their collaboration. This alliance demonstrated the essential role of the mediator-entrepreneurs in assuming leadership roles in linking the *atesanos* with creative tourism, has generated greater income for the artisans, has raised awareness of the local artisan tradition and has contributed to the development of creative tourism in the region. (Bakas, Duxbury, & Vinagre de Castro, 2019)

Key factor 2: Diversification of supply, including handicrafts and local production

Diversification of the tourism offer, including handicrafts and local production, is a key factor for the development of creative tourism in rural areas. This strategy makes it possible to offer authentic and personalized experiences, attracting visitors seeking to connect with the local culture and environment. The inclusion of handicrafts as a tangible expression of cultural identity and local production, with their focus on sustainability and quality, generates added value to the tourism experience. The integration of these activities allows the development of unique tourism products and services, differentiating the offer and creating a memorable experience for the visitor.

The practical application of this factor is seen in the Alentejo region of Portugal. The region has developed a tourism program that includes visits to artisan workshops, tastings of local gastronomy, and workshops for traditional products, such as doll making, and for the region's

nature, such as bird nest making. In addition, hiking trails allow visitors to explore nature and discover local agricultural products. This diversified offer attracts a broad public and promotes sustainable tourism, supporting the local economy and preserving the region's cultural heritage (Marujo et al., 2021).

Key Factor 3: Linkage between tourists and rural community

The link between tourists and the rural community is a key factor in the development of creative tourism, as it generates memorable, enriching, and authentic experiences. Encouraging interaction between visitors and local residents creates a space for cultural exchange, mutual learning and the building of meaningful relationships. This connection allows tourists to understand the local identity, traditions and lifestyle of the community, conveying a sense of authenticity and connection to the destination. A genuine bond fosters community participation in tourism development, strengthening the sustainability and positive impact of tourism in the region.

In practice this factor can be observed in traditional cultural regions, where community tourism programs are implemented a clear example is evidenced in Blapp and Mitas (2018) where community leaders in the Bali region created the Bali Community Based Tourism Association (CoBTA) to develop tourism in rural areas in this way as community tourism aims to involve local communities and bring tourists and locals closer together. Visitors can participate in activities such as traditional cooking workshops, handicraft making, visits to family farms, etc., interacting directly with local residents. This experience allows tourists to learn first-hand about the traditions, history, and customs of the region, strengthening the bond between visitors and the community. This model of tourism promotes local participation, the conservation of cultural heritage, and the socioeconomic development of the region.

Key Factor 4: Leveraging the Heritage and Cultural History of Rural Communities

Leveraging the heritage and cultural history of rural communities emerges as a key factor in creative tourism development due to its ability to generate authentic and immersive experiences for visitors. Cultural authenticity, expressed through traditions, customs, architecture, gastronomy, handicrafts and local events, represents a unique attraction that differentiates rural tourism from other des-

tinations. By incorporating local heritage into the tourism offer, a unique proposal is created that attracts visitors in search of authentic cultural experiences, stimulating interest in knowledge and appreciation of cultural diversity.

In practice, this factor translates into the CREATOR Project, which exemplifies the leveraging of the cultural heritage and history of rural communities in the development of creative tourism through the active participation of 40 cultural organizations in Portugal, selected for their cultural value, diversity, and ability to attract tourists. This collaborative approach generates authentic experiences that reflect local identity, such as craft workshops, which not only enrich the visitor experience but also contribute to the income of local artisans, thus fostering the economic sustainability of the community. In addition, the creation of a creative tourism network facilitates the exchange of information and experiences among stakeholders, which drives the continuous improvement of tourism offerings and ensures a positive impact on the prosperity of the regions. (Cabeça et al., 2022)

Key Factor 5: Principle of Co-creation of Tourism Experiences

The principle of co-creation of tourism experiences stands as a key factor for the development of creative tourism in rural areas due to its ability to generate shared value between visitors and local communities. The integration of everyday community activities into the tourism offering allows travelers to experience local culture in an authentic way, creating immersive and meaningful experiences that go beyond simple consumption. This collaborative approach not only enriches the tourist experience but also contributes to the socioeconomic development of the area, empowering local communities and fostering sustainable development.

A practical example of this principle can be seen in the rise of wine tourism in rural areas. Wine production, traditionally linked to community life, has become an attractive tourism experience (Kastenholz et al., 2023). Through co-creation, tourists can participate in the grape harvest, learn about winemaking techniques, or taste local wines in family wineries. This active participation not only adds value to the tourist experience but also generates income for the local community, revitalizing the region's traditions and cultural heritage.

Future lines of research

As future lines of research, it is recommended to investigate how tourists impact creative tourism entrepreneurial ecosystems through the co-creation of tourism experiences. Exploring the interaction between tourists, artisans, and mediating entrepreneurs could provide new insights into these dynamics (Bakas, Duxbury, & Vinagre de Castro, 2019) It would also be important to analyze how to boost the creative economy in rural areas, as highlighted by Pourzakarya (2022) with Rudkhan Castle through cultural tourism, identifying opportunities for the growth of local creative industries and supporting artisans and artists in the region.

For future research Marujo et al. (2021) propose to continue exploring adaptation strategies in creative tourism, collaboration with national and international networks, and planning for similar crisis situations. On the other hand, Remoaldo et al. (2020) suggest further exploration of creative tourist profiles and motivations, as well as strategies to promote and sustain creative tourism initiatives.

Identification of the potentialities of Villa Mirador de Mayabe for the development of creative tourism. Proposal of strategic guidelines

Villa Mirador de Mayabe, with its exuberant landscapes, rich history and the warmth of its people, offers an idyllic setting to develop creative tourism that moves away from conventional models and embraces the authenticity of the place. Its potential is based on the unique combination of nature, culture and heritage, providing the opportunity to offer authentic, immersive and enriching experiences for visitors. From the possibility of exploring hidden nature trails and learning about the local flora and fauna, to the experience of traditional handicrafts and the tasting of local cuisine. Villa Mirador de Mayabe is an ideal product for those who are looking for a transforming trip and who value the connection with the authentic. With this in mind, a series of strategic guidelines were proposed to make the most of the identified potentialities.

Key factor 1: Alliances between artisans/entrepreneurs as mediators for the development of creative tourism.

Strategic guideline 1: "Artisan's route: preserving the local legacy".

Objective: To foster collaboration between local artisans and the Villa Mirador de Mayabe tourist lodging in order to

create an authentic experience for tourists and artisans.

Steps to follow:

1. Identification and training of artisans: carry out a process of identifying local artisans with tourism potential, including those who practice traditional techniques such as ceramics, wood carving, and weaving, among others. Subsequently, implement training programs in areas such as marketing, administrative management, product design, and customer service in order to strengthen their business skills and prepare them for interaction with tourism.

2. Creation of a guided tour program: Design a program of guided tours to the artisans' workshops, where tourists can witness the process of making the pieces, interact with the artisans, and purchase authentic products. The program can be complemented by the creation of an informative brochure describing the different artisan techniques, the stories behind each piece, and the importance of preserving the local cultural legacy.

3. Integration with the village's tourist offer: Visitors staying at Villa Mirador de Mayabe should include visits to the artisan workshops in their itinerary. Information about the program should be included in the village's promotional material, website, and social networks, ensuring the handicraft offer's visibility to visitors.

Consequently, the Villa can be positioned as a perfect environment for creative tourism. An example of creative activities that can be offered are interactive workshops where tourists can participate in the elaboration of handicraft products such as painting natural landscapes of the village or weaving with natural fibers. It is also recommended that a QR code system be implemented in the workshops so that tourists can access additional information about the products and artisans through their mobile devices. The sale of handcrafted products as souvenirs can be promoted in the village store, with a space dedicated to the exhibition and sale of the pieces and also organize cultural events that combine music, dance and handicrafts.

Key Factor 2: Diversification of the offer to include local crafts and local production

Strategic guideline 2: "Flavors and traditions: authentic rural experiences".

Objective: Diversify the tourism offer of the Villa Mirador de Mayabe, integrating local handicrafts and agricultural production to create authentic, personalized and sustainable experiences.

Steps to be taken:

1. Integration of local production: establish a collaborative program with local farmers and producers to incorporate fresh, seasonal produce into the village's gastronomic offerings. Culinary experiences can be offered that include tastings of local products, traditional cooking classes and visits to farms and orchards. It is also suggested to promote the direct purchase of agricultural products from local producers, fostering the local economy and sustainability.

2. Development of unique tourism experiences: design tourism experiences that combine local crafts, agricultural production and the natural environment of the village. Some ideas include:

- Themed walking tours: guided visits to trails in the area, including stops at local artisan workshops and farms, with the possibility of tasting fresh produce and purchasing local crafts.
- Agro-ecological experiences: visits to sustainable farms with the possibility of participating in the harvesting of produce, learning about organic farming and enjoying a picnic lunch with local products.

3. Promotion of the offer: design a specific marketing strategy to promote the diversified offer of the village. It is suggested to use digital channels such as websites, social networks and online travel platforms. Collaboration with travel agencies, travel bloggers and local and international media is also recommended.

The implementation of this guideline will make it possible to transform the Villa Mirador de Mayabe into an innovative and attractive tourist product that offers genuine and personalized experiences.

Key Factor 3: Link between tourists and the rural community.

Strategic guideline 3: "Connection with the essence: community-based tourism in Villa Mirador de Mayabe".

Objective: Strengthen the link between tourists and the rural community of Villa Mirador de Mayabe, creating authentic and memorable experiences through the active participation of local residents.

To this end, the following elements are suggested:

1. Community-based tourism programs:

- **Traditional cooking workshops:** Visitors will learn how to prepare typical dishes of the region using local ingredients and traditional techniques. Workshops with local chefs and farming families, who will share their recipes and culinary knowledge, are suggested.
- **Guided tours by local guides:** Create guided routes through the area, including historical, cultural, and natural sites, with the participation of local guides who can share stories, legends, and anecdotes about the region.

2. Integration of the community in the tourist offer: Implement strategies to promote the consumption of local products in the village's restaurants and stores, such as creating menus with traditional dishes and selling handicrafts made by the residents.

3. Creation of unique experiences:

- **Bird watching experience:** establish bird watching hiking trails, including information about the species present in the region and their importance to the ecosystem.
- **Astrotourism experience:** taking advantage of the Villa's high altitude location, star and planet watching experiences can be offered, with the possibility of using telescopes and learning about astronomy.

The proposed guideline for Villa Mirador de Mayabe seeks to strengthen the bond between tourists and the community, creating authentic and memorable experiences. The active participation of local residents and the integration of the region's culture and lifestyle into the tourism offerings are key to the success of this creative tourism model.

Key Factor 4: Leveraging the cultural heritage and history of rural communities

Strategic guideline 4: "Treasures of Mayabe: discovering history and culture".

Objective: Leverage the heritage and cultural history of the Villa Mirador de Mayabe to offer immersive and authentic tourism experiences, strengthening the link between visitors and the local community.

Steps to follow:

1. **Rescue and revitalization of cultural heritage:** Conduct a study of the historical and cultural heritage of Mayabe, including architecture, traditions, gastronomy, legends, and relevant characters. This study will identify distinctive elements of the local culture that can be integrated into the tourism offer. Traditional handicraft workshops can be organized, such as making yarey hats or weaving with natural fibers, reviving ancestral techniques and encouraging the participation of local artisans.

2. **Design immersive experiences:** Offer guided tours of the area, emphasizing Mayabe's history and heritage. Visit historical sites, local museums, and traditional houses. Create hiking trails to appreciate the local flora and fauna, with the possibility of bird watching or medicinal plant workshops.

3. **Strengthening the link with the community:** Develop training programs for local inhabitants in tourist services and the development of tourism products. It is recommended that a cultural exchange program be established between visitors and local residents, with the possibility of organizing events such as traditional Cuban music nights, folkloric dance presentations, or handicraft workshops.

In this way, the Villa Mirador de Mayabe can position itself as a unique tourist product that offers visitors an authentic and enriching experience.

Key factor 5: Principle of co-creation of tourism experiences.

Strategic guideline 5: "Living culture: co-creating authentic experiences in Villa Mirador de Mayabe".

Objective: Implement the principle of co-creation of tourism experiences in Villa Mirador de Mayabe, integrating the community's daily activities to offer authentic experiences that generate shared value between visitors and local residents.

Steps to follow

1. Linkage with local agriculture:

- Participatory orchards and farms: Implement orchards and farms where tourists can participate in planting, caring for, and harvesting local products. This experience will allow visitors to learn about traditional agriculture, connect with nature, and contribute to sustainable development.

- Farmers' markets: organize farmers' markets where local residents can sell their agricultural, artisanal and culinary products to tourists, promoting the local economy and the direct connection between producers and consumers.

2. Unique experiences with "Pancho" the donkey

- Care and feeding of "Pancho": Tourists will be able to participate in feeding and caring for "Pancho," learning about the care of the donkey and its importance in Cuban culture.

- Art and craft workshops with "Pancho" as the central theme: workshops of painting, drawing, sculpture, and other artistic expressions with "Pancho" as inspiration will be organized, where visitors will be able to create their own works of art and leave a unique souvenir of their experience.

3. Encourage local participation:

- Volunteer program: design a volunteer program where visitors can participate in community development projects, such as building trails, cleaning up nature or collaborating in cultural activities.

The guideline of co-creating tourism experiences in Villa Mirador de Mayabe seeks to generate shared value between visitors and the local community, empowering residents and promoting sustainable development. The active participation of the community in the tourism offer will allow the creation of immersive and meaningful experiences, enriching the tourist experience and revitalizing the region's culture and heritage.

CONCLUSIONS

The study includes a bibliographic review of 12 articles searched through the Scopus database. A rigorous selec-

tion was made based on the exclusion of studies that did not focus on creative tourism practices in rural areas. The selected articles showed how rural communities use creative practices to make the most of their environment and create authentic experiences that build on their culture, heritage and history.

Content analysis of scientific articles revealed two lines of research essential to understanding the development of creative tourism in rural areas: leveraging the local community for creative tourism development and authenticating and personalizing the creative tourism experience in rural areas.

Similarly, the selected bibliography showed a series of key factors determining creative tourism's success in rural areas. Among these factors are the alliances between artisans/entrepreneurs as mediators for the development of creative tourism, the diversification of the offer including crafts and local production, the link between tourists and the rural community, the use of the heritage and cultural history of rural communities, and the use of the principle of co-creation of tourism experiences.

Regarding the identification of the potential for the successful implementation of creative tourism in Mirador, the area's natural, cultural, and historical richness stands out as an ideal scenario for the development of authentic and transformative creative tourism. The analysis of the Village's potential and the review of scientific literature on creative tourism in rural areas made it possible to design a series of strategic guidelines to make the most of this potential.

The proposed guidelines focus on integrating the local culture, historical heritage and community's daily activities into the tourism experience. They seek to generate immersive and authentic experiences that allow visitors to connect with the essence of the place, through active participation in craft workshops, routes guided by local guides, agro-ecological activities, and the co-creation of experiences with the community. In this way, the project seeks not only to diversify the tourism offer and generate greater local economic development, but also to strengthen the link between visitors and the community, preserve the cultural heritage, promote sustainable tourism, and foster the creation of a tourism model that contributes to the integral development of the region.

The limitations of the research are that the search was only carried out in the Scopus database, the exclusion of research generates bias in the determination of other key factors for the development of creative tourism in rural areas. Future research can expand the search in other databases.

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Impact of the offer of gastronomic experiences in creative tourism and sustainable development in Mazatlán Sinaloa

Incidencia de la oferta de experiencias gastronómicas en el turismo creativo y el desarrollo sustentable en Mazatlán Sinaloa

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ABSTRACT

The creative tourism industry, prioritizes the cultural and traditional attributes of the destinations, impacting sustainable development from various related activities with local cuisine. The goal is to stand out traditional attributes of the offer of creative and combined gastronomic experiences with the cultural knowledge of iconic tourist places from Mazatlan Sinaloa, Mexico; using the conditioning factors scheme, adaptable to a system of strategies sustainable tourism promotion that combines the local gastronomic offer with traditional historical principles, cultural and sustainable. With a qualitative methodological approach exploratory and descriptive type, the systematic analysis method was applied and the sapiens method for the development of the field study, implementing the elBulli model; starting from observation, semi-structured interview was used to 12 creative tourism entrepreneurs. It was found that tourism promotion strategies, creative and combined, facilitate the achievement of the Sustainable Development Goals, highlighting as main contributions that the active participation of women in equal opportunities for leadership, allows the promotion of beneficial and sustainable tourism by creating jobs and decent work, entrepreneurship creative and innovative that highlight cultural expressions, preserved to make cultural heritage visible and natural destinations. With the model, it is part of conceptualizing the ideas that arise by spontaneity to materialize them with cognitive acuity through conditioning aspects to transit of the semantic, historical and conceptual, to the systemic, cultural and sustainable of creative experiences.

Keywords: Creative tourism, Sustainable development, Gastronomic experience, Creative gastronomy, ElBulli model

RESUMEN

La industria del turismo creativo, prioriza los atributos culturales y tradicionales de los destinos, impactando en el desarrollo sustentable a partir de diversas actividades relacionadas con la gastronomía local. El objetivo es destacar los atributos tradicionales de la oferta de experiencias gastronómicas creativas y combinadas con el conocimiento cultural de lugares turísticos icónicos de Mazatlán Sinaloa, en México; utilizando el esquema de factores condicionantes, adaptables a un sistema de estrategias de promoción turística sustentable que compagine la oferta gastronómica local con los principios históricos tradicionales, culturales y sustentables. Con un enfoque metodológico cualitativo de tipo exploratorio y descriptivo, se aplicó el método de análisis sistemático y el método sapiens para el desarrollo del estudio de campo, implementando el modelo elBulli; partiendo de la observación, se empleó entrevista semiestructurada a 12 emprendedores de turismo creativo. Se encontró que las estrategias de promoción turística, creativa y combinada, facilitan el cumplimiento de los Objetivos del Desarrollo Sostenible, destacando como principales aportaciones que la participación activa de mujeres en igualdad de oportunidades de liderazgo, permite la promoción de un turismo beneficioso y sostenible al crear empleos y puestos de trabajo decentes, emprendimientos creativos e innovadores que destacan las expresiones culturales, preservadas para visibilizar el patrimonio cultural y natural de los destinos. Con el modelo, se parte de conceptualizar las ideas que surgen por espontaneidad para materializarlas con agudeza cognitiva mediante aspectos condicionantes para transitar de lo semántico, histórico y conceptual, a lo sistémico, cultural y sustentable de las experiencias creativas.

Palabras clave: Turismo creativo, Desarrollo sustentable, Experiencia gastronómica, Gastronomía creativa, Modelo ElBulli.

INTRODUCTION

Tourism is considered a relevant factor in the social, economic, cultural and environmental spheres, and has undergone transformations driven by the changing needs of society. In daily life, work or travel, the behavior of people who travel is often inappropriate or contrary to actions to care for and protect the environment. This type of behavior should be discouraged, if what is proposed is to encourage sustainable well-being and development from tourism activity. Pan, Ren & Fang (2024) critically argue that the uncivil behavior of tourists negatively alters tourism development and consider that a positively civic attitude of tourists and hosts is necessary to encourage service and attention that promotes economic, social and environmental development to favor sustainable development.

Since the concept of "Sustainable Development" was introduced in 1992 through the World Conference on Sustainable Tourism, the concept of sustainability has been sought to be applied in various areas, including tourism, fulfilling this purpose and with the support of UNESCO (2021), the World Tourism Organization (UNWTO), the United Nations Environment Programme and other international entities have implemented the concept of sustainability in the sector touristy; which is why, based on the global need for sustainable development that integrates economic activities with social and environmental activities, tourism models aligned with the Sustainable Development Goals (SDGs) emerge.

In this sense, this research gives importance to the analysis of creative gastronomic experiences as a creative tourism strategy to contribute to sustainable development, in order to understand the impact, contribution and areas of opportunity, for future adaptations to the cultural tourism models that the Ministry of Tourism has promoted (May 14, 2015) to explore, Understand and appreciate the set of distinctive factors of a place, both spiritual and material, intellectual and affective, that define a specific destination.

The approach suggests providing reflections and tourism alternatives aligned with the global trend with a local perspective. Hence, the central question of this study is: What conditioning factors of the iconic tourist places of Mazatlan, Sinaloa, are adaptable to a system of sustainable tourism promotion strategies that combine the local gastronomic offer with traditional, cultural and sustaina-

ble historical principles? Considering that the objective of the study is to highlight the traditional attributes of the offer of creative gastronomic experiences, combined with the cultural knowledge of iconic tourist places of Mazatlan Sinaloa; using the approach of conditioning factors adaptable to a system of sustainable tourism promotion strategies that combine the local gastronomic offer with traditional, cultural and sustainable historical principles.

Literature review

As an essential aspect to enrich the argument, the theory of sustainable development, followed by the United Nations and the Economic Commission for Latin America and the Caribbean (1991), is taken up to highlight the need to achieve balance in the three axes of sustainability (economic, social and environmental).

At the international level, agreements have been established in response to the World Charter for Sustainable Tourism, formalized at the United Nations World Conference on Sustainable Tourism (1995) held in April of that year, as a formal instrument with which the international community, governments and other public authorities, public, private and social organizations related to tourism are called upon to adopt the principles and objectives for sustainable development.

The sustainability of tourism

Hence, what is stated in Gutiérrez Garza (2007, p.57) gains strength when he argues that sustainable development is based on "the need for the intervention of both the State and society and its organizations to promote growth and income distribution, having as its center the mobilization of society and the care of life". which strengthens the ideas of González King-Kee (2016) Santos, et al. (2022), Noel Mansilla, Kiatkovski and Rossi (2021) when considering that creative tourism could be the engine of sustainable tourism development through responsible management of its tangible and intangible resources for the necessary promotion of "cultural and creative tourism", through cultural heritage, the arts, cultural and creative industries, recovering what was proposed in the United Nations Development Program (2021).

Hence, it is considered that creative tourism is based on creativity, actively involving the tourist in the develop-

ment of their creative potential through unique tourism experiences of sustainable basis through the participation and interaction of government, companies and society with broad expectations of learning, creating or exhibiting their talent, traditions and culture. For his part, Margallo Moscoso (2022), points out that consumption in the tourism industry is different from most economic sectors, due to the fact that the tastes and preferences of tourists change continuously; which is why currently, both Vu, et al. (2024) as Zhao, et al. (2024) propose the necessary promotion of a sustainably creative tourism that offers from traditions and culture, novel experiences, and spectacular natural places, which make the beauty of the local visible from an intangible and intangible perspective.

The UNWTO (2005 and 2017) argues that since tourism is one of the global engines of development that favors tourist destinations anywhere in the world, solving economic and social life, and also promoting respect and environmental care, which shows that the implementation of a creative model could enhance the profitability of companies and enterprises in local tourist destinations by attracting national and international visitors, solving economic, social and environmental problems of the destinations.

The sustainable tourism development indicators for tourism destinations proposed by UNWTO (2005) and promoted by INAFED (2017) suggest that the SDGs should be followed to promote social, economic and environmental progress at the global level. This coincides with the foresight of Bonilla, et al. (2024) when considering that sustainable tourism is a pillar for transformative recovery from a territorial and community approach to destinations or tourist routes, reinforcing the strategy proposed by Peralta (2022) on the use of practical tools for the management and promotion of creative and sustainable development activities that support tourism sustainability and creative tourism.

Recently, UN Tourism (March 08, 2024) recovers what Azcárate et al. (2019) pointed out, as the basis of a new international standard to follow actions that promote the sustainability of international tourism. This is the UNE 0083:2024 standard, proposed by the Spanish Association for Standardization (2024) to transform the tourism sector, providing a reference that can be adopted by all types of tourism organizations, especially small and me-

dium-sized enterprises. A framework that Mexico recognizes as a pioneer in taking advantage of the possibilities offered by the integration of information to enhance the sustainability of creative tourism through evidence-based government policies and programs and in correspondence with Jurado Rivas and Sánchez Rivero (2022), giving rise to the statistical system of indicators that are linked to the key aspects of governance, process management and creative economy.

Following Peralta (2022), it is observed that the SDG directly related to tourism is SDG 8 on decent work and economic growth and its target 9, referring to promoting tourism that benefits the inhabitants of communities with a direct, profitable and sustainable impact, which explains why the intergovernmental organization works at the service of the member countries of the World Tourism Organization. that promote, by 2030, the development and application of public policies aimed at promoting sustainable tourism that generates jobs and encourages the culture of local consumption, reconsidering the central criteria that correspond to the environmental, cultural, social, economic and management aspects, proposed by ECLAC (July 23, 2024) and Peralta (2022), for the transformation of the creative tourism system.

Turismo creativo

Desde la perspectiva de grupos de interés, Liu & Kou (2024) sostienen que uno de los determinantes que contribuyen Mainly to the sustainable development of creative tourism and promote a transformative change in the community with respect to tourism, it is the traditional culture that each place or community has, considering that it detonates the economy of the place.

Although Rugkhapan (2023) emphasizes the relationship of tourism with the community from a creative perspective, he also recognizes its adverse effect if what is promoted only responds to the interests of interest groups and the multicultural aspects of the place are not prioritized, identifying like Clements (2024), that in these determinants of creative tourism, an important area is observed for the creation of employment of native tour guides, with narrative skills linked to the historical, literary, multicultural and creative events of the place, which would correspond to Kenis, et al. (2023) by attributing importance to spaces of common in-

terest of self-directed co-creation, which, according to Yin, Huang & Huang (2024) can be planted from a virtual vision that proposes something different.

In this sense, Yin, Huang & Huang (2024) highlight the attributes of virtual tourism to enhance cultural heritage, its benefits and values, so that learning experiences are carried out in tourists, which represents a content attribute based on entertainment, uniqueness, the feeling of novelty, comfort and the feeling of participation as factors that conceive the user's personal satisfaction with virtual tourist destinations in cultural heritage. Likewise, Lim, Ok & Lu (2024) highlight the importance of innovative behaviour in workers in hotel and restaurant activities and creative tourism experiences, given that integrating individual and organisational behaviour and attitudinal skills have a psychological influence on tourists, generating confidence, certainty, security and above all an enthusiastic desire to live tourist experiences based on novelty.

On the other hand, Kumail, et al. (2024) and Pécot, et al. (2024) observe an interrelationship between the growth of experience tourism, technological advances, climate change and the gender perspective, considering the factors of regional diversity in ecological technological innovation and social innovation, as a basis for the design and formulation of public policies based on global information for sustainability, which implies the design of sustainable tourism strategies that offer personalized experiences that they are driven from the application of creative actions aligned with the SDGs to mitigate climate change.

This is complemented by the peri-urban proposals put forward by Jørgensen, Fuglsang & Sundbo (2024) to take advantage of the dynamics of the challenging tourism transition due to the lack of accommodation services, restaurants and star attractions at the urban-rural and rural-urban interfaces, which is why both Zhuo, et al. (2024) and Wu & Ma (2024) consider that the solid progress of destinations will not only depend on the potentially tourist peri-urban characteristics that give identity to each rural place as a catalyst for tourism development, but also on the real interests that the different stakeholders have to serve as competition or complementary attention.

For this reason, it is interesting to investigate the factors that contribute to the sustainable development of creative tourism. Likewise, Ting & IokTeng (2024) suggest that strategies for promoting creative synergies to encourage

the sustainable growth of the tourism industry, considering that the positive attitude of suppliers is crucial to take advantage of the creative perspective that fuses local culture and regional knowledge of traditions with the development of creative products, for which financial resources and public policies are demanded to encourage creative infrastructure through the planning of the development of tourist destinations.

For their part, Qu, Zhou & Cao (2024) confirm that interactions between host and guest are important as they are positively encouraged from the sense of belonging of the tourist host, but their effect on the psychological healing needs of tourists is still uncertain in the regulation of tourists' emotions. Despite the stress load, low self-esteem and positive inhibition generated by services and customer service, given that according to Lv, et al. (2024) occupational stigma and perceived occupational dirt can inhibit proactive performance and positive attitude aimed at customer service.

In this sense, Kuo & Chang (2024) observe as an area of opportunity the experience of foreign students who are ready to live novelties in a creative trip, which shows that the tourist flow is based on the novelty of the experience lived from a creative intention, being familiarity with the experience what reaffirms the possibility of living it again or not.

Also, the study by Muhtasim Mir, Shelley & Ooi (2024) records that the sustainable development of creative tourism finds an area of opportunity from educational strategies for community development, however, they highlight the scarcity of research on the mobilization of tourism for educational attainment in regional communities, but highlight that the tourism industry and community developments are interrelated, therefore, it is important to take advantage of the organization of creative tourist routes from an educational perspective for young people and children, in order to obtain benefits for the economic and social sectors of a community. Similarly, Lamers, Steins & van Bets (2024) find that polar cruise tourism tourist routes are also an area of opportunity for scientific practices, which fosters the economy and social practices of combined science and tourism activities.

This combined model of tourism activities with economic and social development activities demands the development of sustainable tourism destinations that, according to Hajarramah, Gard McGehee & Soulard (2024), pro-

mote regenerative tourism and creative entrepreneurship promoted by tourism social enterprises as agents of change for tourism, while Frías-Jamilena, et al. (2024) and propose that activities combined with social and economic purposes, are co-created from various pro-ambient perspectives of the tourist, where the catalyzing factor is the social and environmental perspective, in addition to online value, generating greater opportunities for the promoters of tourist destinations through digital marketing strategies as a perspective of co-creation of online value, useful to build sustainable creative content for any tourist destination, considering in the digital ecosystem the preponderant role of suppliers, visitors, residents, destination marketing organizations, hotels, restaurants, transporters and entrepreneurs who co-create experiences, Gato, et al. (2022) and (Dickinger & Kolomoyets, 2024).

In this regard, Deng, et al. (2024) and Hadining, et al. (2024) emphasize the promotion of experiential marketing of the tourism industry to promote co-creation experiences based on creative tourism novelty based on eight dimensions (entertainment, immersion, sense of achievement, novelty, authenticity, uniqueness, education and interaction), in order to understand the needs of consumers and for stakeholders to act accordingly; however, Moreira dos Santos, et al. (2024) emphasize that the empowerment of residents will be key to contributing to the sustainable development of tourism, despite the fact that in countries such as Mexico, it is necessary to work under neoliberal models of free market and breadth to foreign investment, what will have to be seen is whether it can be an advantage and an opportunity.

From the strengths of natural resources such as mountains, as well as Cui, et al. (2024) also Devi Rosalina, et al. (2023) propose ecocultural strategies that merge culture, tourism and natural resources to promote agrotourism and highlight the agricultural, silvicultural and forestry wealth of natural areas, considered ecologically prominent for the development of agroforestry and agrosilvopastoral activities as part of the natural heritage of the regions, encouraging social and economic activities related to cultural tourism to eradicate poverty and promote rural regeneration.

Cui, et al. (2024) also propose novel cultural tourism strategies, based on regional strengths in natural resources such as mountains. These are eco-cultural strategies, which enhance natural areas, considered ecologically prominent for the development of agroforestry and agrosilvo-

pastoral activities, with which the agricultural, silvicultural and forestry wealth can be highlighted as part of the natural heritage of the regions, encouraging social and economic activities related to cultural tourism to eradicate poverty and promote rural regeneration.

In a complementary way, the technological and digital aspect must be used to encourage creative tourism. Garray-Tamajón & Roelofsen (2024) highlights the area of opportunity of geek culture in tourism, understood as the action of the creative use of computers, electronics and in general of new technologies, using channels of social interaction, enhance tourism through the internet and social networks such as Twitter (X). Likewise, based on the principle of universal digital accessibility, both Cerdá-Mansilla, et al. (2024) and Cranmer, Dieck & Jung (2023) propose alternative smart destination strategies, especially in the little-explored social context; However, tourists and hosts remain skeptical that they favor the influx of guests, estimating that the hosts are more aware of environmental, economic and social sustainability.

In this sense, to protect and promote cultural heritage tourist destinations, Yin, Huang & Huang (2024) attach importance to the attributes of virtual tourism, considering that convenience is the fundamental value when offering satisfactory experiences and mainly enriched by the cultural learning of users, which represents a personal value. Technological change is leading to a mandatory digital transformation in the main activities related to tourism, which for Yang, et al. (2024) and Yan & Halpenny (2021) represents a practical basis for decision-making and sensory and tasting experience interactions within the hotel or restaurant; which confirms that the path of digital transformation favors hospitality experiences based on the olfactory, auditory, visual and gustatory senses, thus allowing hotel and restaurant brands to increase their coverage and participation according to their technological compatibility, extending their coverage and determining digital penetration in gastronomic tourism from a social perspective.

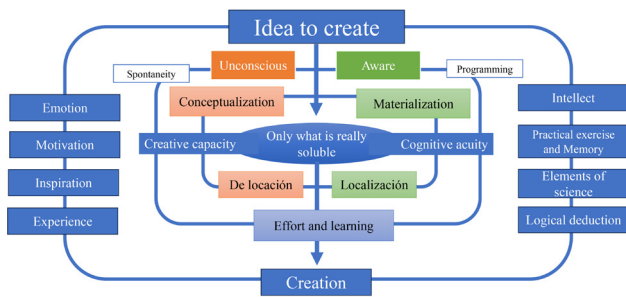
METHODOLOGY: MATERIALS AND METHODS

To answer the question: What conditioning factors of iconic tourist places are adaptable to a system of sustainable tourism promotion strategies that combine the local gastronomic offer with traditional, cultural and sustainable historical principles?

A qualitative, exploratory and descriptive methodological approach is adopted, considering various theoretical perspectives, applying the method of systematic analysis of scientific literature, the collection of information was carried out through consultation of primary and secondary sources that met eligibility criteria in terms of impact, timeliness, approach, among other factors of reliability and validity.

In addition, for the development of the field study, the *sapientis* method proposed by Ferran and García (2021) was considered, since it is based on the creative capacity that connects knowledge, experience and traditional endemic aspects of a locality, in order to move from the semantic, historical and conceptual, to the systemic, cultural and sustainable of creative experiences that could encourage creative tourism for the sustainable development of the regions. localities and communities; for this reason, in order to identify the conditioning factors of the creative process, it is proposed to apply the *eIBulli* model that arises from the gastronomic vocation and is developed from a creative idea (See Figure 1).

Figure 1: Model of the *eIBulli* creative process



Source: Own elaboration based on Ferran and García (2021), adapted from Harley (2022) and García Serena (2023).

Based on the creative techniques of the *eIBulli* model proposed by Ferran and García (2021), a specific idea can be created to solve a problem with creative capacity and cognitive acuity. According to Harley (2022) and García Serena (2023), this idea can appear spontaneously from the unconscious or in a programmed way from the conscious, understanding that the perspective of the unconscious obeys the conceptualization only as a product of the imagination of the concept based on emotion, motivation, inspiration or some experience; while the conscious pers-

pective leads to the structured materialization of the idea based on the effort of learning and development of the intellect that is encouraged by the practical exercise that is memorized according to elements of science, or by the logical deduction of some event.

In this sense, García Serena (2023) highlights that the *eIBulli* model recovers relevance from both perspectives, on the one hand the unconscious perspective obeys intrinsic or introspective actions of the human being, which can lead to the location of ideas or unlearning; while on the other hand, the conscious perspective obeys localizable and therefore adaptable external facts, which may well be a discovery, a serendipity or something unexpected, and which leads to the location of structured events that can be defined. Participant observation techniques and semi-structured interviews were also applied to twelve study subjects.

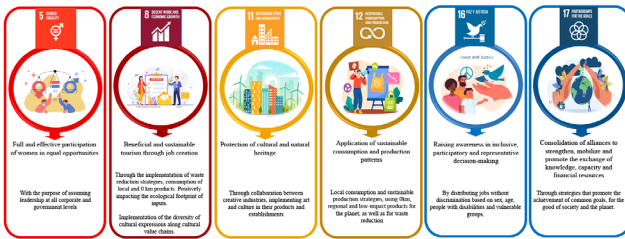
RESULTS

The exploration of information led to the analysis of the SDGs that had an impact on creative tourism based on the gastronomic experiences of the tourist destination of Mazatlán Sinaloa, in Mexico, which resulted in the choice of the SDGs that represent actions developed in the establishments of the 12 tourism and gastronomy-based entrepreneurs who were interviewed.

These 12 subjects agree that their activities are related to 6 of the 17 SDGs enunciated by the United Nations (see figure 2), highlighting as main contributions the full and effective participation of women in equal leadership opportunities, the promotion of beneficial and sustainable tourism by creating jobs and decent jobs, ventures based on creativity and innovation to highlight cultural expressions that are protected to safeguard cultural and natural heritage to enhance the creative industry.

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Figura 2: Modelo del proceso creativo elBulli Actividades de turismo creativo que inciden en los ODS



Fuente: Elaboración propia con base a Ferran y García (2021), adaptado de Harley (2022) y García Serena (2023).

The efforts recognized as the strategies carried out by entrepreneurial subjects who offer experiences through the gastronomy and culture of a community or region, are shown by the interviewees, who assure that the activities they carry out have the purpose of attracting visitors to live a gastronomic experience accompanied by tours, comics and regional passages. traditional production processes and cultural activities of the community or region.

These activities are resilient and holistic ventures, since they take advantage of existing resources and historically established conditions. It is argued that there are the same opportunities for men and women when occupying spaces in the business or ventures, considering contributions equally.

Regarding SDG 8 on decent work, it is shown that the main contribution of the study subjects is based on the number of jobs generated, given that 4 of the interviewees register the employment of 1 to 6 collaborators who promote gastronomic experiences in the destinations, which corresponds to 33.33% of the occupation. while 3 entrepreneurs generate between 13 and 18 jobs (25%), 2 entrepreneurs generate 7 to 12 (16%); and only 1 entrepreneur generates 19 and 24 jobs (10%). It is shown that the study subjects promote local culture and local products, through gastronomy, rescuing culture and tradition in their dishes, strengthening the local economy.

Table 1: Jobs generated

Creative and sustainable tourism-based entrepreneurs	Number of jobs generated	Percentage
4	1 a 6	33%
3	13 a 18	25%
2	7 a 12	16%
1	19 a 24	10%
2	0	0%

Source: Authors' elaboration based on interviews

Among the people interviewed, it was possible to detect that with creative and sustainable tourism-based entrepreneurship activities, the generation of employment prevails, given that 10 of the 12 entrepreneurs, representing 82% of the interviewees, generate employment. This responds to SDG 8 on decent work, contributing to the promotion of local culture, traditions and local products, through the development of gastronomic tours that evoke experiences based on local gastronomy, highlighting the gastronomic values of the destinations where their culture and tradition are reflected in the dishes that root the sense of belonging. as well as the consumption of local products that strengthen the local economy.

In addition, that they comply with target 8.9 by responding to policies aimed at promoting sustainable tourism that creates jobs, promotes culture and local products; as well as by complying with target 8.3 which refers to promoting development-oriented policies that support productive activities, the creation of decent jobs, entrepreneurship, creativity and innovation, and encouraging the formalization and growth of micro, small and medium-sized enterprises, including through access to financial services. In this sense, creative tourism strategies are aimed at encouraging the senses of taste, smell, sight and touch, which allows a creative experience to be recalled and consequently, the activation of the senses and the recognition of the culture and traditions of tourist destinations stand out as legendary, historical and organic attributes of gastronomy.

Goal 11 refers to Sustainable Cities and Communities, in its goal 11.4 it specifies that the cultural and natural heritage of the world must be protected, so that the subjects of study through the promotion, elaboration and presentation of their gastronomic products, enhance the local culture and tradition in a creative way, which is promoted through their own social networks and advertising and that of their consumers. as well as the prevalence of typical recipes that are part of the culinary tradition of the place, in addition to this, the actions they carry out in the care of energy, water and consumables are a fundamental part of the care of the natural heritage, because the lower the consumption the lower the environmental impact.

Additionally, it is evident that the efforts made by this group of entrepreneurs of creative and sustainable tourism, focus on carrying out the elaboration, presentation and promotion in a creative way of their gastronomic

products, enhancing the local culture and tradition of the destinations that are promoted through the use of social networks and advertising focused on their visitors who become consumers of the gastronomy and typical recipes that prevail that are part of the culinary tradition of the place, in response to the achievement of target 11.4 of SDG 11 regarding the protection of the world's cultural and natural heritage.

Additionally, the actions carried out by these entrepreneurs in the care of energy, water and consumables, are a fundamental part of the care of the natural heritage of their localities, cities and communities; because, the lower the consumption of these resources, the lower the negative environmental impact. Another way in which they support natural protection is the consumption of local products and Okm, which are provisions, supplies and in this case food made in a holistic, resilient and organic way in the same locality or destination where they will be consumed, considering that their preparation is carried out with local resources and their transportation at the point of production to the point of sale and consumption. does not exceed one kilometer in distance. In this sense, the efforts made by creative and sustainable tourism entrepreneurs imply the reduction of the ecological footprint of products, reducing travel time and promoting the consumption of seasonal products, so these actions also have a favorable impact on SDG 12, which suggests the need to produce and consume responsibly.

Likewise, it was observed that the interviewed subjects share the way they hold weekly meetings with the purpose of and active participation of citizens willing to assume themselves as hosts of the visitors, so, after a consensus analysis, they contemplate and apply the ideas presented by the collaborators, which confirms the execution of the distribution of jobs and activities aligned with target 16.7 of SDG 16. which raises the need to adopt strategies to raise awareness in inclusive, participatory and representative decision-making, ensuring that they respond to the needs of people with disabilities and vulnerable groups in society. Likewise, SDG 5 is complied with, respecting the decisions and opinions that are made in an equitable manner, seeking gender equality and non-discrimination.

In addition, with the actions carried out by the interviewees, it is recorded that they are constantly seeking partnerships to achieve the Development Goals in order to achieve target 17.16 that proposes to improve the

Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and exchange knowledge, expertise, technology and financial resources. In this sense, the inquiry made it possible to verify that at the local level, the establishments promoted by these entrepreneurs are linked to networking; that is, 25% that is represented by 3 of the interviewees, stressed that they are collaborating in a network with members of associations such as CANIRAC (National Chamber of the Restaurant and Seasoned Food Industry), the National Association of Women Entrepreneurs, Mazatlan Chapter and CANACO and the Mazatlan Unit of the Autonomous University of the West, with the purpose of receiving accompaniment and mentoring related to their activity, which allows them to share experiences, information and resources, specifically in the promotion of products, collaborative events, digital advertising, strategic promotion and marketing and socio-emotional strategies.

However, 75% of the actors represented by 9 entrepreneurs say they do not belong to a network, but they consider it necessary to make their work more productive, informed and professional, since they consider that the union of restaurateurs and other activities related to tourism would strengthen organizations and make a significant change in tourism activity in general. impacting the economic, social and environmental.

After obtaining this information derived from the interviews, it is confirmed that the epicenter of analysis of gastronomy and sustainability is the human being, who has influenced the evolution of both fields through creative strategies and activities intuitively based on the techniques of the eIBulli model, by developing actions derived from the unconscious that materialize in response to emotions, motivations, inspirations and strategies that drive the efforts of learning, entrepreneurship and development of the intellect that determine experiences based on the persistence of traditions and the prevailing culture in the destinations as an essential conditioning attribute, contributing both to the unconscious perspective of creativity that obeys the intrinsic part of the human being, which can lead to the location of ideas and practices unfavorable to the environment; and to the conscious perspective that obeys facts from the outside that may well be a discovery, a serendipity or something unexpected, favoring the location of events that can be definable and consequently experiential.

In this research, it is verified that the study subjects consciously and unconsciously introduce actions in gastronomy that contribute to the achievement of six Sustainable Development Goals (SDGs) linked to particularities and attributes related to a) gender equality by promoting the full and effective participation of women in equal opportunities, b) decent work by developing routes and promotions of beneficial and sustainable tourism for all that makes it possible to achieve the quality of the world. the creation of employment, c) sustainable cities and communities through the protection of the cultural and natural heritage of the destinations, encouraging typical gastronomic practices and registering recipe books that show the culinary art of the localities, d) responsible production and consumption through the application of 0km consumption and sustainable production modalities, e) peace, justice and strong institutions through awareness-raising actions in inclusive, participatory and representative decision-making, and (f) in partnerships to achieve the goals through networking with associations, government and higher education institutions that enable the consolidation of partnerships for strengthening, mobility and the promotion of knowledge sharing, financial capacity and resources.

DECISION

Currently, there are several problems directly related to creative tourism, attributing that it is carried out under criteria of satisfaction and customer service, meeting the needs of the tourist, the community, the environment and its different interest groups related to gastronomic experiences.

Gastronomic experience in creative tourism

From a social sustainability perspective and considering the cultural diversity of a community, both Irimiás, Csapody & Jászberényi (2024) and Thelen and Kim (2024) estimate that online communication promotes gastronomic festivals and emphasizes the intergenerational virtues of places, among which their physical infrastructure and typical local gastronomy stand out as a way of preserving local food heritage. that guarantees the sense of social community through access, inclusion and equity of digital communication by making visible the members of a community who remained anonymous, promoting social sustainability

Like Yang, et al. (2024), a collaborative perspective for

Molina-Collado, et al. (2024) it is of interest to identify the drivers of the creative experience of gastronomic tourism, so it is necessary to know both the sensory environment in terms of food appeal and thematic setting of the restaurant, as well as the personal environment that generates the experience and learning based on the service and attention received by the gastronomic tourist.

From the perspective of gastronomic experience, Maldonado-Erao, et al. (2019) state that gastronomy stands out for its participation in the creative industries, emerging as an area recognized by UNESCO (2024) to promote international cooperation in the context of creative cities that use culture, creativity and innovation as a driver of urban development and impact on the achievement of the SDGs. and where it is increasingly taken up as an important element in tourism.

Another perspective is the one that considers creative gastronomy as an integral part of cultural tourism and intangible cultural heritage that offers opportunities to generate economic alternatives for local enterprises, which according to Arcos-Pumarola, Georgescu Paquin & Hernández Sitges (2023) could make it a tool with the potential to generate social change through the appreciation and revaluation of local culture, benefiting the tourism sector that plays a fundamental role in the creative strategy.

The experience of sensory tasting of food is one of the essential, which may explain why it triggers the mobility of people on tourist tours, as stated by Tena, Tirado, and Bonfill (2022) when recognizing that an important aspect of selecting a tourist destination is gastronomy, which explains that creative gastronomic experiences, represent the positioning, marketing and branding of a place with gastronomic potential.

Stone & Sthapit (2024) emphasize that the attributes of food and drink generate memorable sensory experiences that encourage culinary tourism, considering the quality of the food/drink as triggering factors; sanitation/food security; cultural differences; dietary menu restrictions; attributes of the service; price/perceived value; and high availability of food or restaurants at the destination. Therefore, it can be deduced that gastronomy is a variable that impacts the visitor's experience.

Tourists may have different motivations for consuming local cuisine, according to Kim and Eves (2012) there

are five factors that incite tourists. The first is the cultural experience linked to the local cuisine, which offers the opportunity to learn about the history of the place and experience its authenticity. In this regard, Pérez-Priego, et al. (2023) emphasize that the set of knowledge, practical skills, rituals, traditions, and symbols related to crops and harvests, including the way food is preserved, transformed, cooked, shared, and consumed, are aspects that motivate the tourist visit.

Thelen and Kim (2024) based on relational theory of society, confirm that social and environmental sustainability are symbiotic in food festivals and therefore their influence and mutual interaction should be considered in the planning of sustainable and long-lasting food tourism events. The relevance and effectiveness of the relational theory of society as a paradigmatic and theoretical lens is presented in the context of gastronomic tourism events and festivals and sustainability, for which local gastronomy can be consolidated based on sensory gastronomic experiences that give meaning to a distinctive or a brand endowed with recognition to enhance regional tourism development. Recuero-Virto & Valilla Arróspide (2024).

Based on the theory of the transformative potential of meditation on the psychological and emotional well-being of tourists, Liu, et al. (2024) find that recreation and meditation are positively related to leisure activities, a reason for interest in regulating emotions through tourism.

However, the motivational aspect is represented in the sensory appeal of food, that is, the pleasure it generates in the five senses through the gastronomic tasting experience, which entails connecting the tasting experience with the sense of food health as a factor linked to the principle of health care based on organically healthy food. considered by Kim and Eves (2012) as the most significant factor in food consumption.

Regarding Mexico, the Government of Mexico (2015) states that "Mexican cuisine is a living cultural manifestation, which represents humanity for its antiquity, historical continuity, the originality of its products, techniques and procedures. Mexican culinary art is very elaborate and full of symbols."

Precisely, the expression is still valid and highly pertinent to the place where this research was developed, by virtue of the fact that Mazatlán Sinaloa is represented with these

attributes; therefore, the possibility of it being recognized as a creative city for its typical gastronomy is strengthened, making the city not only a fascinating destination for its places; but rather, as a city remarkable for its gastronomic landscapes that transitions to being a sustainable gastronomic destination where the heritage value of gastronomy stands out, linked to the care of the environment with specific purposes of well-being and healthy living. Currently, wills are being added to achieve this distinction, which recognizes the efforts and undertakings that are characterized by offering gastronomic experiences in which creativity stands out.

CONCLUSIONS

Conclusively, other benefits that were detected in the implementation of actions that generate sustainable gastronomy are identified:

- a) Intermediation is eliminated in a transversal way
- b) Communication between the customer and the producer is enhanced, keeping local food production alive.
- c) Greater access to information on the origin and handling of products is facilitated.
- d) The exchange of traditional recipes of the way of cooking and the preparation of fresh ingredients that were produced in the region or locality is encouraged.
- e) Pollution is reduced by holistic transfer 0.1km. and by the reduction of packaging.
- f) The regeneration of the development of villages is encouraged through interaction between urban and rural communities.
- g) Employment and family coexistence are encouraged.
- h) It contributes to the local economy.
- i) Trade with producers produced in or around the locality is strengthened.

These benefits are based on the determining factors of the creation of ideas that are conceptualized from the unconscious and are materialized from the conscious aspects that promote the cognitive acuity that is reinforced

by the intellect, practical exercise and memorization, as well as the scientific bases and logical deduction, impacting tourism on gastronomic authenticity that is motivational and evokes emotions that generate individual and community well-being derived from the lived and shared experience.

Currently a tourism approach is sought that not only promotes sustainable development, but also adapts to the diverse demands of tourists. As a result of the analysis, terms such as alternative tourism are observed, covering categories such as nature tourism, sustainable tourism, cultural tourism, adventure tourism, creative tourism, among others. Within creative tourism, creative gastronomic experiences play an important role, both to expose the traditions and culture of the places, and to influence sustainable development and the achievement of the SDGs through responsible and environmentally friendly consumption, producing with local organic inputs and promoting routes and routes that offer the visitor, Locally specific creative dining experiences, thus contributing to the promotion of sustainable and resilient food systems.

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Greenwashing in the tourism and hospitality sector: A systematic analysis of the literature

Greenwashing en el sector turístico y hotelero: Un análisis sistemático de la literatura

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ABSTRACT

"Greenwashing" is a deceptive practice that presents a company as environmentally responsible without real support. This study reviews the existing literature on greenwashing in the tourism and hospitality sector, highlighting the importance of transparency and corporate responsibility in consumer perception. Using the PRISMA method for systematic reviews and meta-analysis, a bibliometric analysis was carried out that identified thematic clusters such as green finance, sustainability, green marketing and corporate image. Although research on greenwashing has increased, specific studies in the hospitality sector are limited. Key questions for future research are raised, such as the influence of scientific journals and the main research topics in the hotel sector. The study methodology combines qualitative and quantitative approaches, underlining the importance of transparency in the results. In summary, the need for more research and concrete actions to combat greenwashing is emphasized, promoting authenticity and responsibility in tourism and hotel companies.

Keywords: Greenwashing, Green Confusion, Green Brand Equity, Credibility, Falsificación De Datos, Responsabilidad Social Corporativa, Green Marketing.

RESUMEN

El "greenwashing" es una práctica engañosa que presenta a una empresa como ambientalmente responsable sin un respaldo real. Este estudio revisa la literatura existente sobre greenwashing en el sector turístico y hotelero, destacando la importancia de la transparencia y la responsabilidad corporativa en la percepción de los consumidores. Utilizando el método PRISMA para revisiones sistemáticas y metaanálisis, se realizó un análisis bibliométrico que identificó clústeres temáticos como finanzas verdes, sostenibilidad, marketing verde e imagen corporativa. Aunque la investigación sobre greenwashing ha aumentado, los estudios específicos en el sector hotelero son limitados. Se plantean preguntas clave para futuras investigaciones, como la influencia de las revistas científicas y los principales temas de investigación en el sector hotelero. La metodología del estudio combina enfoques cualitativos y cuantitativos, subrayando la importancia de la transparencia en los resultados. En resumen, se enfatiza la necesidad de más investigaciones y acciones concretas para combatir el greenwashing, promoviendo la autenticidad y la responsabilidad en las empresas turísticas y hoteleras.

Palabras Claves: Greenwashing, Green Confusion, Green Brand Equity, Credibility, Falsificación De Datos, Responsabilidad Social Corporativa, Green Marketing

INTRODUCTION

A growing concern among management theorists revolves around the condition of the world that future generations will inherit (Islam et al., 2023 ; Sajid et al., 2023). Issues such as oil spills, deforestation, global warming, unethical scandals and pandemics have led global entities such as the United Nations and the World Economic Forum to intensify their calls to conduct business sustainably. In response, consumers show great interest in purchasing environmentally friendly products, motivated by environmental concerns (Ioannou et al., 2023). Consequently, due to increasing pressures from consumers and other stakeholders, a multitude of corporations have initiated the launch of environmentally friendly products and have participated in various environmental initiatives (Islam et al., 2023; Sajid and Zakkariya, 2022). However, it has been observed in various sectors, from energy to retail, that certain companies engage in deceptive practices (Adegeest, 2022 ; Li et al., 2022).

The practice of "washing" has emerged as a relevant phenomenon in the field of marketing and business communication, covering a variety of sectors and aspects of contemporary times. This term denotes the manipulation of perceptions through the misleading presentation of products, services or activities, which has given rise to the conceptualization of various categories that reflect their different manifestations. In this context, five main types of washing are identified: pinkwashing, bluewashing and greenwashing. Each of these modalities involves particular strategies that capitalize on different issues and social concerns with the purpose of promoting commercial or political interests, thus generating debates around ethical issues, authenticity and corporate responsibility. The objective of this study is to explore and analyze these variants of "washing", investigating their characteristics, repercussions and implications in various social and business environments.

Pinkwashing, a term coined by Breast Cancer Action's Think Before You Pink campaign in 2002, describes when companies that sell breast cancer-related products market those products in conjunction with breast cancer charities or awareness organizations (Action and Pink, 2023). There are no trademarks or other restrictions on the use of the pink ribbon in marketing, allowing any company to use breast cancer-related brands in their marketing campaigns (Harvey and Strahilevitz, 2009).

"Bluewashing", which is defined in this paper as UNGC members "paying lip service to the true objectives of CSR rather than undertaking substantial but costly changes to their environmental and human rights" (Berliner and Prakash, 2015). The disconnection between discourse and practices is not limited to the environmental aspects of sustainability. In fact, it can be present in communication on all UNFC principles and the SDGs. Several scholars have highlighted bluewashing practices (Berliner and Prakash, 2015; Hamann et al., 2009; Junaid et al., 2015; Rasche et al., 2013).

Greenwashing refers to a practice where companies attempt to gain undeserved moral credit by not "walking" their Corporate Social Responsibility (CSR) "talk" (Papa- giannakis et al., 2024). Conceptually, greenwashing represents a phenomenon of moral inconsistency whereby companies attempt to obtain an undeserved moral benefit by appearing more sustainable than they really are (Effron & Helgason, 2023).

Greenpeace defines greenwashing as "a public relations tactic used to make a company or product appear environmentally friendly without significantly reducing its environmental impact" (Greenpeace, 2021), while Terra-Choice defines greenwashing as " the act of misleading consumers about a company's environmental practices or environmental performance and positive communication about environmental performance" (TerraChoice, 2007).

The phenomenon of greenwashing has become a major concern as companies increasingly respond to the call for sustainability (Li et al., 2022; Sajid and Ertz, 2024). Among other things, the goal is to attract consumer sympathy through a positive image and social responsibility, increase product value, increase popularity, respond to market needs and test new markets (Lintang, Y., 2022).

A significant impact of greenwashing is that it can lead consumers to make uninformed purchasing decisions, believing that they are making environmentally responsible decisions when they are not (Santos et al., 2023). This can result in greater environmental damage as consumers continue to purchase products with significant environmental impacts. When consumers discover that a company engages in greenwashing, they may feel deceived and lose faith in the company's environmental commitment (Jaiswal et al., 2021).

Greenwashing can be found in various industries where companies promote products or practices as environmentally friendly, according to Zhang (2022) the greenwashing risk of extreme events in the form of a shock to the regulation of the green financial system, and found that green financial regulation makes highly polluting companies more likely to engage in greenwashing. Xing et al. (2021) investigated how, due to corporate greenwashing, companies with higher environmental disclosure quality do not obtain more loans. Only green innovation promotes access to corporate loans.

The malpractice of this phenomenon is also found in the banking sector, according to Aras, in recent years, the issue of greenwashing is also affecting the banking sector. Banks play an important role in the transition to a low-carbon economy, as they are responsible for financing many of the projects that contribute to greenhouse gas emissions (Aras et al., 2018; Gangi et al., 2019 ; Galletta et al., 2021; As a result, there has been growing interest in sustainable finance and environmental, social and governance (ESG) investments (Zhang et al., 2022; Zheng et al., 2023; Galletta et al., 2022; Khan, 2022; Long et al., 2022)

(Borel-Saladin & Turok, 2013) analyzed how a green economy is often promoted as a way to promote sustainability and environmental protection. However, they warned there is a danger of greenwashing, when companies or governments make exaggerated or false claims about their environmental credentials to mislead customers or investors.

In the agricultural sector, 3 vital themes were found: the implementation of sustainable practices in production units, especially in small farms; the influence of supra-national organizations on the sustainability of the sector through their policies; and the effect of certification programs, which can both improve and distort the environmental perception of production. Therefore, research in this area focuses mainly on sustainability and legitimacy, with less attention on end consumer perception. Within the first topic we can locate the works of Bager and Lampin (2020) on the adoption of sustainable practices in the coffee industry; Francis (2004), addressing the impact of corporate agriculture on sustainability; and Francisco et al. (2007), who studied the influence of farm size on the adoption of sustainable practices. Alexander (2019) analyzed the impact of the Global Alliance for Climate Smart Agriculture on sustainability. Alons (2017) studied the inclusion of Environmental Policy Integration in the

EU Common Agricultural Policy (CAP) through the analysis of the historical evolution of the CAP. Finally, DeFries et al. (2017) focused on the effects of adopting voluntary certification programs for smallholder tropical produce farms. The main concern of papers related to the food industry is related to labels and packaging, considering both the information they reveal about the product and the impressions they make on end customers. Organic foods play the leading role in some of these studies. Thus, marketing and communication emerge here as the main areas of concern. Elving and Steenhuis (2014) studied the impact that an industrial label has on consumers. Organic foods caught the attention of three studies: Yarosh and Mitina (2018), who study the accuracy of organic food producers' claims in Crimea; Nguyen et al. (2019), who address the mediating role of green skepticism in the relationship between greenwashing and green purchase intentions; and Schuldt and Hannahan (2013), who conducted two studies analyzing the role of the personal degree of environmental activism in the perception of organic products.

In the fashion and beauty sector, recent studies show that consumers expect fashion brands to communicate not only their commitments, but more importantly, the actual procedures the company follows to avoid regulatory arbitrage, prevent corruption and human rights violations, as well as the company's performance metrics and corrective mechanisms. uses to save water, reduce carbon emissions and prevent biodiversity loss (Jestratišević et al., 2020; Schafer, 2023). Recent research reports show that the COVID-19 crisis exacerbated existing problems in the fashion industry, increasing the lack of transparency about emerging failures in the supply chain, including but not limited to order cancellations, purchasing practices and workers' salaries (Sumarlah et al., 2021; Fashion Revolution, 2022). During the pandemic, the global fashion industry's quest for greater transparency faced significant obstacles. Brands like H&M, committed to being circular and climate positive by 2030, symbolized the industry's pre-pandemic ambition to execute "perfect tasks" (Jestratišević et al., 2022).

Finally, there is the tourism sector, it is one of the most important economic sectors in many countries (World Travel and Tourism Council, 2020), and travelers increasingly consider sustainability as a key criterion in their travel choices (Antonides, 2017; Croce et al., 2019;

This emerging group of consumers, seeking more authen-

tic and satisfying experiences that benefit the body, mind and soul, is often referred to as the 'Lifestyles of Health and Sustainability' (LOHAS) market segment. According to Kotler (2011), 'the market for LOHAS products is growing' (p. 144); therefore, 'producers will have to decide more carefully what to produce, how to produce it, how to distribute it, and how to promote it' (p. 144). This search for holistic experiences is driving tourism operators to develop new business models focused not only on profits but also on social and environmental sustainability (Pan et al., 2018; Więckowski, 2021).

Existing literature has widely explored sustainable tourism from various perspectives (Butler, 1999; de Lange and Dodds, 2017; Ivars-Baidal et al., 2021; Streimikiene et al., 2021; Timur and Getz, 2008). Since the tourism industry contributes approximately 8% of total carbon dioxide emissions worldwide (Lenzen et al., 2018), most studies have focused on green tourism (Font et al., 2021; Jones, 1987; Lenzen et al., 2018; Line et al., 2018), while others have studied the impact of tourism on the quality of life of residents in tourist destinations (Hassan, 2000; Jeon et al., 2016; Mihalic and Kušcer, 2022; Ramkissoon, 2020).

This research note seeks to address these limitations, namely: a) the paucity of research into the extent to which large tourism and hospitality providers are greenwashing and therefore whether they are prepared to address regulatory challenges such as the Directive on Green Statements, b) whether customers penalize such behavior through actual purchases (and not purchase intentions), and c) the lack of a theory-based, standardized measure to measure greenwashing in the weather and tourism sectors and hospitality. In doing so, the literature review has several strengths: a) it uses data from multiple secondary sources; b) operationalizes greenwashing in a more comparable way across companies (i.e., the same elements for all companies) by adopting a novel theoretically driven measure that builds on recent management work (Kassinis et al., 2022)

In the current context where there is growing interest within the hotel sector, it is crucial to investigate the different marketing strategies carried out by companies in the sector, within these is "greenwashing" and therefore we want to understand how the use of This practice affects customer perception on a personal and financial level. By carrying out this study, vital information will be obtained to answer the research questions posed.

RQ.1. Which scientific journals are most influential in the field of greenwashing?

RQ.2. What are the main research topics on greenwashing in the hotel and tourism sector?

RQ.3. What are the most influential articles for greenwashing research in hotel and tourism companies?

METHODOLOGY

A systematic review collects all relevant evidence that fits prespecified eligibility criteria to answer a research question. We adopted the PRISMA model, an approach derived from healthcare studies where it is necessary to provide clinical practice guidelines and inform clinical decision making under a predefined methodological approach and an associated protocol (Moher et al., 2009, 2015; Cooper et al., 2018). The use of systematic reviews, particularly the PRISMA method, is motivated by the search for a systematic and rigorous research approach (Tranfield et al., 2003). This method can help researchers summarize existing literature based on a meticulous, explicit and transparent step-by-step iterative process (Liberati et al., 2009). In this sense, employing a methodological approach based on a systematic review of the literature can provide feedback on the relevance of this gap.

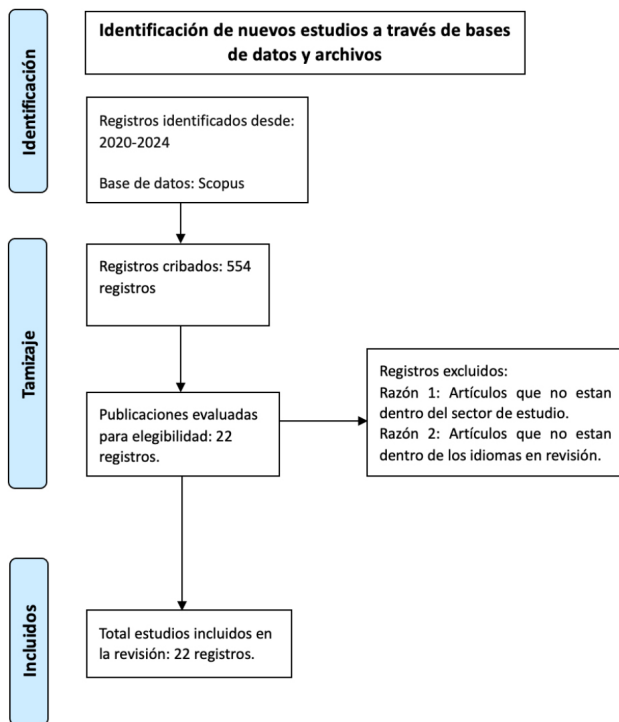
The PRISMA method (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is a guide that establishes a set of guidelines for the transparent and complete presentation of systematic reviews and meta-analyses in the scientific literature. The PRISMA method helps standardize the way these types of studies are reported, making it easier to evaluate the quality of the research and the replicability of the results.

The PRISMA process consists of several highly relevant steps:

- The first step is identification and in this stage, the research question is defined and exhaustive searches for relevant studies are carried out.
- Secondly, there is selection, this step consists of selecting the identified studies based on their relevance and applying inclusion and exclusion criteria.
- Thirdly, there is inclusion, which is where it is verified that the studies that meet the eligibility criteria are included in the systematic review.

- Fourthly, there is evaluation and in this step the quality of the selected studies is evaluated and their relevance to the research question is analyzed.
- Fifthly, there is the synthesis, which is where the findings of the included studies are synthesized and presented in a clear and coherent manner.

Figure 1: Prism Map



Source: Prepared by the authors

Subsequently, upon completing the steps satisfactorily and following the PRISMA guidelines, the aim is to guarantee rigor and transparency in the conduct and presentation of this type of research.

Regarding the hotel sector, the PRISMA method is used to carry out specific systematic and bibliometric reviews on aspects related to corporate social responsibility and organizational commitment in the hotel industry. By following PRISMA guidelines in this context,

we seek to rigorously and transparently identify relevant literature, systematically analyze it, and present the results in a structured and coherent manner. This allows researchers and professionals in the hotel sector to obtain a clear and up-to-date understanding of the interaction between corporate social responsibility and organizational commitment in the hotel industry, identifying possibilities for theoretical and empirical development in this specific area.

Greenwashing is a green marketing strategy that brings with it a better reputation towards companies that take this resource as a strategy. It is understood that this will affect the company, denoting a better image at an institutional level; fatal consequences for society, as well as probable financial falls due to the discovery of these practices by clients.

In the hotel sector, the concept of greenwashing is relevant due to the importance of sustainability and social responsibility in the sector. Greenwashing in hotels occurs when companies excessively communicate their environmental or social initiatives to be perceived as more responsible than they really are or have been, without supporting these statements with concrete and credible actions. Likewise, hotels that practice greenwashing can have negative consequences, such as the loss of trust of their users and a possible large-volume decrease in sales or services. Therefore, it is essential for hotels to avoid greenwashing to maintain the credibility and trust of their customers.

This research was guided by qualitative and quantitative approaches, since literature review and bibliometrics were used for the structure of the research, through metrics and content analysis. Two types of bibliometric techniques were used, evaluation and relationship; The first included measures of productivity (number of articles per year, countries, journals and authors) and impact (citations per author).

When carrying out this first search, 1019 articles on “green marketing” were obtained in Scopus, while doing the second search 551 articles on “greenwashing” were obtained. Showing that research in conjunction with the hotel sector is limited.

Table 2. Statistical adjustment of the different models

	Search equations	Results
SCOPUS	((TITLE-ABS-KEY ("green marketing")) (Limited to Business, Management and Accounting))	1019
	((TITLE-ABS-KEY ("greenwashing")) (Limited to Business, Management and Accounting)).	551

Source: Prepared by the authors

BIBLIOMETRIC ANALYSIS:

In the last 5 years, there has been growth in articles on greenwashing research, with greater growth in the publication of articles in 2023 and a drop in the publication of these articles in the following year. Greenwashing is a topic that is gaining more attention in recent years due to the confusion that companies or corporations create as part of their marketing to add value to their brand.

Figure 2. Articles published by years



Source: Prepared by the authors

In relation to the language, it can be observed that in the countries where English is the language, they are the countries that carry out the most scientific work on greenwashing, being the main sources for more than 90%, exposing a limited interest in research on the variable in the English language.

Table 3. Articles published by language

Row labels	Count of Source title
English	542
French	1
Portuguese	5
Russian	1
Spanish	2
Total general	551

Source: Prepared by the authors

In relation to the most productive scientific journals on the topics of “green marketing” and “greenwashing”, the magazines “Journal of Cleaner Production” and “Business Strategy and the Environment” stand out. These two magazines represent 72 magazines out of 551. Focusing on the financial and hospitality field.

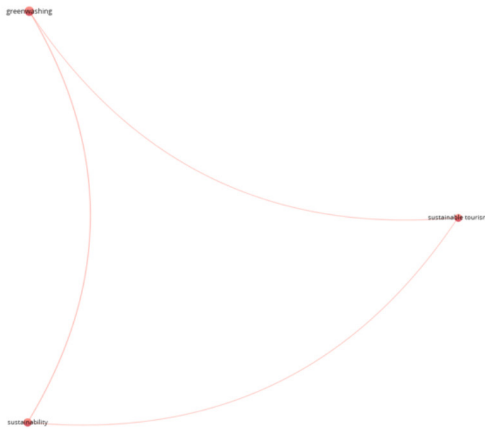
Table 4. List of scientific journals with the most publications

Row labels	Count de Source title
Journal of Cleaner Production	38
Business Strategy and the Environment	34
Journal of Business Ethics	24
Corporate Social Responsibility and Environmental Management	22
Journal of Sustainable Finance and Investment	8
Business Ethics, the Environment and Responsibility	8
International Journal of Advertising	7
Sustainability Accounting, Management and Policy Journal	7
Developments in Marketing Science: Proceedings of the Academy of Marketing Science	7
Organization and Environment	6
CSR, Sustainability, Ethics and Governance	6
Research in International Business and Finance	5

Source: Prepared by the authors

After sifting through a large amount of information on greenwashing, one specific area has been identified that reveals a notable gap in the literature: greenwashing in the tourism sector. This selective approach allows us to highlight new perspectives or little explored areas within the field of study of corporate sustainability applied to tourism. In this study, more than 551 articles published between 2020 and 2024 were filtered, coming exclusively from magazines specialized in business, administration and accounting. After an exhaustive analysis, only 22 articles were selected that offered relevant and specific information on greenwashing in tourism. This rigorous approach has allowed us to exhaustively select and analyze the most relevant information on greenwashing in the specific context of tourism.

Figure 5. Keyword network on greenwashing and tourism

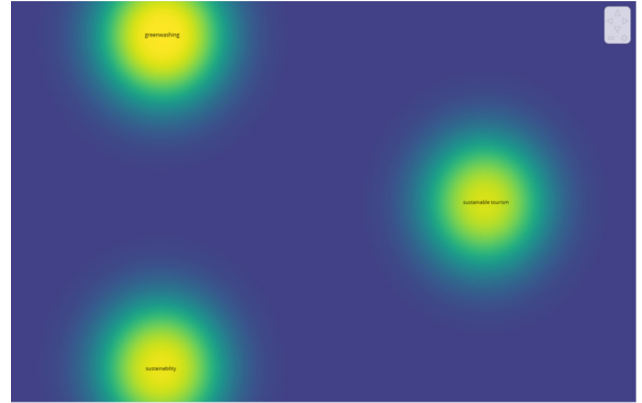


Source: Prepared by the authors

The choice to focus on this specific aspect highlights the contemporary relevance of the topic and underlines the importance of research that not only identifies problems, but also proposes innovative solutions. This direction can contribute significantly to the academic and practical field, offering new ideas to improve the environmental and social integrity of business practices.

By focusing on this less explored area, research is positioned as a valuable resource to inform policy, guide business strategies, and move toward a future where sustainability and corporate responsibility are more than just slogans, but effective and transparent commitments to global well-being.

Figure 6. Density display



Source: Prepared by the authors

DEVELOPMENT AND DISCUSSION

Analysis of relevance and evolution of variables

In the current context of growing environmental awareness and corporate responsibility, the phenomenon of greenwashing has acquired unprecedented relevance in the global business environment. As Figure 1 illustrates, the concept of greenwashing is experiencing a notable rise, reflecting a significant change in the attitudes and behaviors of consumers and society at large. This rise in the appreciation of environmentally friendly practices has placed greenwashing at the center of the discussion, as companies come under increasing pressure to demonstrate a genuine commitment to sustainability.

Green Washing

Greenwashing strategies and their intensity could be better understood by considering underlying issues related to two important issues, namely, institutional context (external factors related to a given country and its social actors) and corporate governance (a factor related to the company) (Velte, 2022).

Greenwashing is a disclosure-based strategy (Lee & Raschke, 2023; Seele & Schultz, 2022; Seele & Gatti, 2017; Cooper et al., 2018) that may depend on certain conditions, incentives or external pressures that characterize the institutions. national context in which these strategies are used (Zharfpeykan, 2021; Velte, 2022; Marquis et al., 2016; Seele & Schultz, 2022; Li et al., 2023) or that they are shared within the global context. For the most part, companies aim

to adjust to the institutional context to which they belong, which is composed of a social system, legislation, and the norms and rules that govern the activities of companies (Guo et al., 2017). Indeed, companies fear the reputational damage they could suffer if they violate global environmental standards and, consequently, deceptively moderate their disclosure with the intention of addressing the threat to their reputation (Marquis et al., 2016).

Greenwashing perception

The Oxford Dictionary (2023). Greenwashing is activities carried out by a company or organization to make people believe that they care about the environment, even if their business damages it. Many studies explain greenwashing, Zhang et al. (2018c). Greenwashing is a company's excessive communication about its environmental performance, Guo et al. (2018). Greenwashing can be attributed to corporations' environmental claims about green products that are ambiguous and misleading to create a positive "green" image without delivering on green promises, Blome et al. (2017). Greenwashing can be defined as "misleading consumers about the ecological (often, in a broader sense, sustainable) performance of a company or the environmental (sustainable) benefits of a given practice, product or service." Greenwashing is a false marketing practice that causes consumers to form a false impression of a company's environmental practices in the process of advertising and communicating to consumers. Greenwashing, also known as greenwashing, whitewashing, greenwashing, greenwashing, green finery or green perspective washing, is a form of illusory advertising to promote a company's product objectives or policies and thus increase the compound profits of the product. product. (Kahle and GurelAtay, 2015; Mayrand and Trottier, 2011). Guo et al. (2017). A large number of studies show that the dangers of greenwashing are well documented, as trust between green brands and their stakeholders is significantly damaged after the implementation of greenwashing. Junior.S.B et al. (2019).

Green awareness

Green awareness is knowledge among people about the environment, the key relationships and major issues related to environmental impacts, an appreciation of 'whole systems' and the joint responsibilities necessary for sustainable development (Chelliah et al. , 2017, p. 44). Environmental knowledge is positively correlated with

eco-conscious customer behavior (Alamsyah et al., 2020). The industry has observed such behaviors and uses green marketing strategy to attract the customer towards the manufactured products. It started with "recognizing and remembering the brand as a green brand as a result of green activities and associations based on green consciousness" (Mourad et al., 2012). Suki et al. (2016). A growing awareness of corporations' environmental commitment because these commitments enhance competitive advantage (Chen and Chang, 2013).

Environmental Trust

Kotler and Keller (2016) noted that building trust is one of the prerequisites for a great long-term relationship (p. 230). According to them, trust is a company's willingness to trust a business partner and depends on interpersonal and interorganizational factors, such as the company's perceived competence, integrity, honesty, and benevolence (Kotler & Keller, 2016, p. 231). Additionally, personal interactions with company employees, opinions about the company, and perceptions of "trust" will grow with experience. An organization or company will be more easily considered trustworthy if it provides complete and honest information and incentives to its employees. Aligned with customer needs, partners with customers to help them learn to be self-sufficient and makes valid comparisons to competitors. Trust is essential to understanding tenants' behaviors and intentions toward extending or renewing their rental contracts. (Nguyen & Nguyen, 2019).

Corporate social responsibility

Environmental management is a perspective that permeates most CSR studies, due among other reasons to the controversial behavior of the hotel industry in causing negative ecological impacts such as pollution caused by waste and excessive use of natural resources, among others. Research under this approach has been advancing over the years (AlSuwaidi et al., 2021; Boğan and Dedeoğlu, 2020; Channa et al., 2021; Farooq and Salam, 2020; Farmaki and Stergiou, 2021; Kim et al. , 2020; Rhou and Singal, 2020), topics such as staff perceptions regarding the environmental practices carried out by hotels are addressed (Raza et al., 2021; Shah et al., 2021; Srivastava and Shree, 2019; Tian and Robertson, 2019); also, about the effect that CSR has on work well-being, and the ecological behavior of the organization (Ahmed et al., 2020; Su and Swanson, 2019), and of employees (Fung Wong and

Kim, 2020; Kim et al. al., 2018; Pereira et al., 2021; Shah et al., 2021; Shao et al., 2021).

Recent studies show that there are CSR factors such as quality of work life that increase the loyalty of workers, therefore, they are actively involved with the company in solving problems and achieving objectives (Xue et al., 2022; Wong et al., 2021). CSR provides workers with a sense of security, self-esteem and belonging (Kunda et al., 2019; Supanti and Butcher, 2019). CSR actions generate a competitive advantage in the hotel sector through innovation and creativity (Da Silva & Da Silva, 2020).

CONCLUSIONS

The conclusions derived from an exhaustive analysis of greenwashing in the tourism and hotel sector reflect the imperative need to address this phenomenon in a critical and proactive manner, given its growing relevance in a context where sustainability and social responsibility have emerged as primary values. both for consumers and for society in general. According to Lopes, Gómez and Trancoso (2023), "The phenomenon of greenwashing in the era of sustainability is like a moving, complex and continuously evolving objective", according to this, greenwashing represents a significant challenge that companies in this sector must face with transparency and coherence, in order to preserve its credibility and contribute effectively to its sustainability. It is essential to highlight the importance of companies in the tourism and hospitality field adopting genuine practices of social and environmental responsibility. Greenwashing, by presenting a false image of commitment to sustainability, not only misleads consumers, but also undermines trust in companies and compromises their long-term reputation. Authenticity in environmental and social actions emerges as a fundamental pillar for building customer trust and strengthening the sustainability of the sector.

Furthermore, according to Lopes, Gómez and Trancoso (2023), "greenwashing should be seen exclusively as a deceptive business practice that only misleads consumers", it is evident that greenwashing can have negative consequences at an institutional and social level. Although this strategy could initially improve the perception of companies, once deceptive practices are discovered, they are exposed to risks of fatal repercussions for society and possible financial consequences. Loss of consumer confidence, damage to reputation and possible legal sanctions are emerging as some of the consequences that compa-

nies could face when resorting to greenwashing as a marketing strategy. Another relevant aspect lies in the need to educate and raise awareness among both companies and consumers about greenwashing. Companies must understand the ethical and legal implications of these deceptive practices, as well as the importance of acting responsibly and transparently in their operations. For their part, consumers must be trained to identify and question companies' environmental and social claims, fostering a more informed and critical consumer culture.

In this context, transparency and independent verification emerge as crucial elements in preventing greenwashing and promoting sustainable and responsible development in the tourism and hospitality industry. Companies must be willing to subject their environmental and social practices to public scrutiny and meet rigorous disclosure and reporting standards. Strong oversight and stricter regulations are necessary to ensure that companies meet their sustainability commitments and avoid resorting to greenwashing as a misleading marketing strategy. It is essential to highlight that greenwashing not only affects the perception of companies, but also it significantly affects consumer confidence and their purchasing decisions. Consumers are increasingly aware and demanding about the authenticity of companies' sustainable practices, and greenwashing can undermine that trust and generate skepticism around brands' environmental and social claims.

In summary, the analysis of greenwashing in the tourism and hospitality sector highlights the importance of honesty and authenticity in business actions, as well as the need to promote a culture of genuine social and environmental responsibility in the industry. Avoiding greenwashing is essential to maintain reputation and customer trust, as well as to effectively contribute to the construction of a more sustainable and ethical tourism and hospitality sector for the benefit of society as a whole. The fight against greenwashing constitutes a crucial step towards a more transparent, responsible and sustainable future in the tourism and hospitality industry.

Future research should focus on developing more rigorous and objective metrics that allow for a more detailed evaluation of the impact of greenwashing on consumer behavior and perceptions. It is essential that they be explored through systematic reviews, it is crucial to investigate through meta-analysis the specific greenwashing strategies used in the hotel sector to identify predominant

patterns and trends in each of them. Additionally, it would be a good idea to add longitudinal studies since they are of great value to analyze the long-term repercussions of greenwashing on consumer trust in brands and progress towards global environmental sustainability. These investigations will provide a solid foundation for the development of more effective interventions and the formulation of more informed and efficient public policies.

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Tourism territories: Challenges for decarbonisation

Territorios turísticos: desafíos para la descarbonización

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ABSTRACT

This paper aims to analyse the energy challenges faced by tourism territories in a critical climate scenario. The methodology is based on consulting secondary information sources from government reports, regulatory frameworks, and specialized bibliography. The results show that the main challenges for decarbonization are linked to the continued growth of tourism, the institutionalization of interests, policy formulation, difficulty in introducing improvements and radical changes, a focus on technologies, and the dissemination of scientific and institutional knowledge. Thus, it is concluded that current tourism appropriation is incompatible with global climate objectives, and to overcome the six challenges outlined above, a commitment from all stakeholders is needed. In addition, each territory presents different challenges to achieve this, as these transition processes involve different factors (economic, political, social, cultural, technological, and environmental) that affect each other and involve multiple actors with different interests, logics, and power capacities.

Keywords: *tourism, decarbonisation, energy transition.*

RESUMEN

En el presente trabajo se propone como objetivo analizar los desafíos energéticos que enfrentan los territorios turísticos en un escenario climático crítico. A fin de lograrlo, este estudio se fundamenta en la consulta a fuentes de información secundarias provenientes de informes gubernamentales, marcos normativos y bibliografía especializada. Los resultados arrojan que los principales desafíos para la descarbonización se vinculan: al crecimiento continuo del turismo, a la institucionalización de los intereses, a la formulación de políticas, a la dificultad de introducir mejoras y cambios radicales, a un enfoque centrado en las tecnologías y a la divulgación del conocimiento científico e institucional. De este modo, se concluye que la apropiación turística actual es incompatible con los objetivos climáticos globales, y a fin de superar los seis desafíos enunciados, resulta necesario un compromiso de todos los actores intervinientes. A lo expuesto, se añade se cada territorio presenta diferentes retos para lograrlo, ya que en estos procesos de transición intervienen diferentes factores (económicos, políticos, sociales, culturales, tecnológicos y ambientales) que se afectan entre sí, e involucran a una multiplicidad de actores con distintos intereses, lógicas y capacidades de poder.

Palabras clave: turismo, descarbonización, transición energética.

INTRODUCTION

Climate change is the main environmental challenge facing societies in the 21st century, driven by anthropogenic greenhouse gas (GHG) emissions and those naturally released into the atmosphere. These processes contribute to global warming, threatening the planet's climate stability. The search for solutions to this global problem has been the subject of international discussions, conferences, and agreements since the 1970s. Currently, global commitments are focused on fulfilling the Paris Agreement and the 2030 Agenda for Sustainable Development, which are positioned as an alternative to respond to the problems caused by unsustainable production and consumption models. Countries have committed to carry out policies and actions aimed at reducing GHG emissions, with an emphasis on those anthropogenic activities responsible for the greatest emissions. In particular, the energy model that shapes and structures the world today is 82% dependent on fossil fuels (International Energy Agency [IEA], 2018), being responsible for 2/3 of global GHG emissions (International Renewable Energy Agency [IRENA], 2019).

In search of the decarbonisation of the current energy model

In a critical climate scenario, transitioning from the current energy model - dependent on fossil fuels - to a more diverse and sustainable one acquires relevance in global agendas. This is contemplated in the Paris Agreement, which focuses on reducing greenhouse gas emissions to keep the global average temperature at no more than 2°C, to limit it to 1.5°C (United Nations, 2015a). On the other hand, the 2030 Agenda sets out 17 Sustainable Development Goals (SDGs), including SDG 13 on climate action, which proposes targets related to climate change mitigation and adaptation. Likewise, SDG 7 stands out, linked to ensuring access to affordable, safe, sustainable and modern energy for all (United Nations, 2015b). Therefore, there is an intrinsic relationship between measures to combat climate change and the energisation processes of the territories. In this context, the rational use of energy (RUE), energy efficiency (EE) and renewable energies (RE) are positioned as effective strategies to face the growing global demand for energy, to diversify the energy matrix dependent on fossil fuels and, indeed, to mitigate greenhouse gas emissions that are detrimental to the sustainability of the planet (Pasquevich, 2012; Brunstein & Carrizo, 2015; Kern & Markard, 2016; IEA, 2018; IRENA, 2020).

The RUE is linked to actions to reduce energy consumption through efficient and smart energy use (Ham, 2016). It's subject to the consumption habits of each individual, such as turning off lights when they are not needed and closing doors and windows when air conditioning equipment is on, among others (Pasquevich, 2016). In other words, RUE requires understanding and analysing how energy is used in a given situation linked to EE. The EE consists of using the least amount of energy possible to obtain the same level of energy service without affecting the quality of the well-being sought (World Energy Council, 2012; Gil, R., Iannelli & Gil, S., 2015). However, the World Energy Council (2010) states that reductions in energy consumption are generally associated with technological changes but can also result from better organization and management or behavioural changes (RUE), which are also referred to as "non-technical factors." Energy consumption depends on the time and power used by the equipment. Therefore, the World Energy Council (2015) adds that to conserve energy, one should change habits and choose efficient equipment by consulting the EE label. This is an instrument designed so that the user can know the energy performance of a piece of equipment or building, by visualizing different EE classes categorized by colors and letters (Inter-American Development Bank [IDB], 2015), so green is the most efficient and red the least efficient; and the letters that define it vary according to the type of equipment (household appliance, gas appliance, transport), the type of building and the regulations in force.

In relation to RE, these come from renewable resources. In other words, those with the capacity to recover naturally and continuously (World Energy Council, 2012). These include: the solar energy (harnesses radiation from the sun and converts it into heat [photothermal] or electricity [photovoltaic]); wind energy (harnesses the kinetic energy of the wind, converting it into mechanical or electrical energy either through windmills or wind turbines); biomass (use of materials from living animals or plants); hydropower (conversion of the kinetic and gravitational potential energy of water into mechanical energy that is finally transformed into electrical energy); tidal energy (energy obtained from the movement of the tides); and geothermal energy (harnesses the heat that can be extracted from the earth's crust and transforms it into electrical energy or heat).

Consequently, IRENA (2020) argues that the implementation of strategies linked to each of the pillars mentio-

ned above will contribute to providing access to energy services in a secure manner to the entire population and to present and future territories; to reducing energy consumption, associated financial costs and GHG emissions. In this way, it is imperative to consolidate the path towards decarbonisation and efficient energy use.

Tourism territories in a critical climate scenario

Tourism appropriations don't escape these challenges, as they are responsible for 8% of global emissions and their energy trajectories are incompatible with current climate targets (Lenzen, et al., 2018; Becken, 2019; Gössling & Higham, 2021; Scott, 2021). In this context, Olcina (2012) states that:

If we consider tourism as a GHG emitting country as a whole, it would occupy 5th place, behind the United States, China, the European Union and Russia; so we are facing an economic activity with a great impact in relation to the control of GHG emissions causing global warming and which requires urgent measures to prevent further increases in emissions worldwide. (p. 16).

The World Tourism Organization (UNWTO, 2016) states that: "Tourism both contributes to and is affected by climate change. It is therefore in the sector's own interest that it plays a leading role in the global response to climate change" (p. 3). In line with this, several authors agree that tourism territories face two major challenges: mitigation and adaptation to climate change (Scott, Hall & Gössling, 2015, 2016; Becken, et al., 2020; Gössling & Higham, 2021).

This work focuses on mitigation. For this reason, the aim of this paper is to analyse the energy challenges faced by tourism territories in a critical climate scenario.

METHODOLOGICAL APPROACH

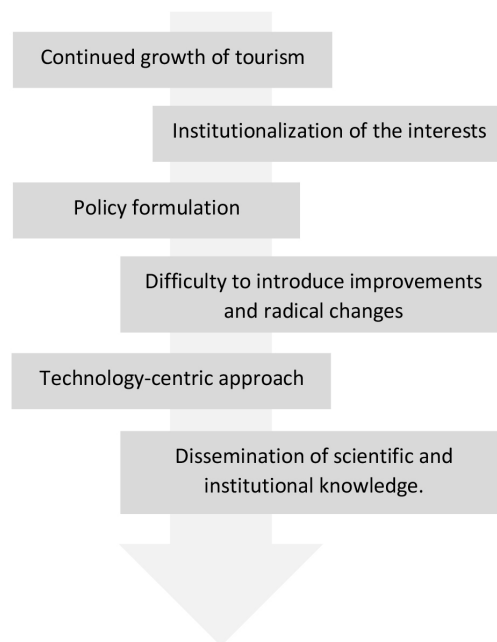
The study adopts a qualitative-quantitative approach, mediating access to secondary sources of information. This bibliographic review exercise consists of access to reports from international organizations linked to climate change and the energy transition (United Nations, IEA, World Energy Council, IRENA, among others). Furthermore, in this work documents from institutions linked to the tourism sector (UNWTO, International Civil Aviation Organization [ICAO], among others) were used. Finally, a specialized bibliography was consulted on decarbonization processes in tourism, RUE, EE, and ER at different spatio-temporal scales.

RESULTS AND DISCUSION

The academic debate on the relationship between tourism and climate change has deepened recently (Becken, 2013; Velasco, García & Barquín, 2014; Loehr & Becken, 2021; Scott, 2021). This is evident in the background review, which highlights studies that focus on their analysis of the effects of climate change in tourist areas and how they can be adapted (Kaján & Saarinen, 2013; Olcina & Vera Rebollo, 2016; Martín, López & Iglesias, 2017). At the same time, other research emphasizes the role of tourism as a contributor to global GHG emissions, where actions aimed at mitigation are identified (Gössling, et al., 2010; Gössling & Scott, 2018; Lenzen, et al., 2018 ; Becken, 2019). At the same time, in recent years academic works and government reports have been detected that show that the use and consumption of energy based on fossil sources in the tourism value chain are determinants of GHG emissions (Teng et al., 2012; Huang, et al., 2015). Consequently, some studies focus their analysis on strategies linked to URE, EE and RE in tourist territories (Maciel et al., 2015; Nogar & Flensburg, 2016; Rodríguez Cruz, 2018; Escobedo, et al., 2019; Flensburg, 2024).

Based on the documentary review, six challenges to the decarbonisation of tourist territories (Figure 1) can be identified. These don't imply that they are the only ones, but they are the main ones.

Figure 1. Challenges for decarbonisation



The first challenge is the continued growth of tourism. In the 1950s, 25 million international visits were recorded, rising to 1.5 billion in 2019 (UNWTO, 2019). This growth in the flow of tourism generates economic, social, and environmental implications in the territories. The latter, various sources state that given the relationship between tourism and the environment, it is closely linked to global warming processes (Gössling et al., 2010; Peeters & Landré, 2012; Dwyer, 2018). In this scenario, Fernández & Sánchez (2014), Olivera & Cristóbal (2014) and Lastra Bravo et al. (2015) affirm that from the moment tourism appropriation of territories is promoted, actions are manifested that involve, among others, the use of fossil fuels, deforestation processes and changes in land use with their consequent environmental imbalances. In this sense, the report published by UNWTO & UNDP (2008) states that in 2005: "Tourism contributed approximately 5% to total global CO₂ emissions" (p.21). The report published by Lenzen, et al. (2018) states that: "Between 2009 and 2013, the global carbon footprint of tourism has increased from 3.9 to 4.5GtCO₂e, four times more than previously estimated, representing approximately 8% of global GHG emissions" (p. 1). Both documents point to transport (specifically aviation), tourist accommodation, and other services as the main contributors to these emissions. It should be noted that transportation faces difficulties in reducing GHG emissions due to its rapid growth, its energy intensity and the high cost of technological change (Peeters et al, 2016; Higham, et al., 2019; Larsson et al., 2019). The same happens in tourist accommodations, since they experience high energy consumption, specifically of fossil origin, being partly responsible for GHG emissions (Huang et al., 2015; Abeydeera & Karunasena, 2019; Jaraba et al., 2020; Melo et al., 2021).

Scott et al. (2016) argue that tourism stakeholders have ignored this issue for decades and pursued growth strategies without considering the implications for climate change. In terms of Peeters et al. (2019), these strategies have created vulnerabilities, including environmental externalities that must now be considered. In this way, and given the instability observed in the global tourism system and the tendency to become more vulnerable, Scott et al. (2019) consider it imperative to promote profound changes in the management approaches of tourism territories, where the materialization of actions focused on the reduction of energy consumption and the use of renewable sources is key, to face the climate challenges of the 21st century.

In 2020, tourism suffered the repercussions of the Covid-19 pandemic, with a 74% drop in international arrivals (UNWTO, 2021). The pandemic has led governments to take extraordinary measures, with health fines, limiting the transit of people and goods, closing borders, and suspending and interrupting activities (Varela & Urdangarin, 2020; Mantecón, 2020). This situation has led to a short-term decline in emissions (Le Quéré et al., 2021; Hiernaux, 2021; Friedlingstein et al., 2022; Gössling et al., 2023). The UNWTO (2024) report establishes that international tourism will reach pre-pandemic trends in 2024. This implies recovering the associated GHG emissions trajectories.

In line with what has been stated and recognizing the need to modify and minimize the emissions trajectory, the UNWTO (2018) states that it is transcendental to promote initiatives linked to ecological design, new equipment and technologies, renewable energies, recycling and waste, landscape protection, awareness campaign, and others. In this sense, Becken (2019) recognizes that concern about climate change has become part of public discourse (Dwyer, 2018), but actions (individual and collective) remain marginal and are often balanced against the personal or economic benefits of tourism (Higham, Cohen & Cavaliere, 2014).

The above leads to the second challenge for the decarbonization of tourism, which has to do with the institutionalization of the interests (Becken, 2019). This challenge is based on the belief that growth has been institutionalized and the concomitant structures provide increasingly powerful greater than a small number of key actors who support the prevailing ideology. This "elite" has successfully built a system that promotes their interests and offers few opportunities for alternative points of view. In terms of Kilbourne, Beckmann, & Thelen (2002) and Becken (2019), changing political or economic structures exists is not in the interest of decision makers, as this could result in a loss of power.

For its part, Gössling & Scott (2018) analyze the perspective of 17 tourism leaders (UNWTO, UNEP; aviation [IATA, ATAG], cruises [CLIA], tour operators, private sector, and others) regarding the problem of climate change. While there was full agreement that the climate is already changing and that tourism must contribute to mitigating it, there was no consensus on achieving this. In this way, the authors identify three types of leaders. Firstly, the leaders in decarbonization stand out, who recognize the need to promote mitigation

actions immediately through policies, financing lines, and sociocultural change. Secondly, the authors mention the technological optimists, who revealed less urgency regarding the need for mitigation, expressing their belief that technology would significantly contribute to reducing emissions. They consider the promotion of policies that increase the process of technological innovation. Third, the authors recognize the conservatives of the economics of carbon, who state that tourism does not need decarbonization fast since this (in relation to other sectors) does not emit a significant amount of GHG. Consequently, the leaders revealed different points of view and even contrasting differences on mitigation, making it difficult to identify strategies that the actors can adopt as a whole.

This is linked to the third challenge associated with policy formulation. Becken (2019) suggests that politicians avoid getting involved in unknown topics that may include risk and negative connotations at the time of management, thus creating policies based on what is known and desirable futures (Peeters et al., 2019). For his part, Scott (2021) states that: "Those in charge of formulating policies and tourism planning appear to be disconnected from the substantive scientific literature available" (p. 23). Likewise, Magrin (2015) and the United Nations (2019) add that the shortcomings of climate action are not due to a lack of solutions but instead to the absence of political will and the materialization of specific actions, which make it impossible to make improvements and radical changes. This last constitutes the fourth challenge. In this sense, Becken (2019) argues that instead of accepting the imperative to reduce GHG emissions and work to achieve it: "(...) tourism continues to adopt a position of extrapolation of past trends and hopes that they will somehow converge with decarbonization goals" (p. 11). However, various studies show the different strategies based on cleaner technologies that have been implemented in recent years throughout the value chain (Lastra Bravo et al., 2015; Molina & Arias, 2016; ICAO, 2016; Cingoski & Petrevska, 2018; Peeters et al., 2019). In this scenario, the fifth challenge is identified, which is linked to the existence of an approach focused on technologies, leaving sociocultural issues (behaviors, consumption habits, etc.) in the background. The above requires collective action requiring greater integration between human resources and technological innovations through communications and training that guarantee efficient use.

The sixth challenge is linked to the dissemination of scientific and institutional knowledge. According to all of the

above, producing academic-scientific knowledge on current energy trajectories in tourist territories becomes relevant. Multiscalar and multidimensional analysis is key to these challenges. In fact, Scott (2021) maintains that: "(...) research must be proportional to the scale of massive information needs between the local and the global for tourism to respond effectively to the climate crisis" (12). For their part, Loehr & Becken (2021) point out the lack of holistic approaches that critically address challenging questions about tourism's role in a climate crisis context. A common limitation to knowledge production is the lack of solid and context-specific data, making decision-making difficult. Likewise, the authors recognize other limitations, including the differences in institutional environments (academic, public, and private), including divergent objectives, needs, and priorities, representing a significant barrier to the production and mobilization of knowledge from the management academy. According to Moyle & Col (2017) (cited in Loehr & Becken, 2021), "Literature tends to raise problems instead of providing solutions" (p. 704). For the authors, this generates a disconnection between knowledge production in academia and decision-makers' need for practical solutions. However, the authors recognize discrepancies in the information exchange circuits from public management and the private sphere to academia since there are often difficulties in accessing statistics, management reports, etc., generating knowledge gaps, inaccessibility, and lack of exchanges. However, it may happen that it is not due to a lack of will to socialize the data but rather that the data may not exist. Hence, the challenge for academics lies in collecting their own data to study a specific reality and produce and disseminate knowledge. According to the contributions of Scott (2021), to overcome these knowledge gaps, it is necessary to improve communications and knowledge mobilization, increase research capacity, and (re)build synergies between planners, politicians, academics, and private actors. Furthermore, the author notes that much research is needed to inform the low-carbon transition in all components of the tourism system, from international aviation and tourist accommodations to destination management and traveler behaviors (Scott & Gössling, 2018; Gössling & Higham, 2021).

CONCLUSIONS

Thus, it is concluded that current tourism ownership is incompatible with global climate objectives. A commitment of all stakeholders in the medium and long term is necessary to overcome the six challenges identified.

The decarbonization of tourism territories is possible by incorporating strategies linked to RUE, EE, and RE and implementing sustainable production and consumption patterns. To this end, it is necessary to promote changes in energy appropriation models through education, the socialization of information, and the management of specific practices that users must incorporate. Likewise, these transition processes require developing and implementing new technologies and more efficient processes, reliable and secure long-term economic and financial support, and formulating policies that align with internationally agreed objectives, among others. These changes can start from the bottom up and be driven by tourism providers, consumers (tourists and excursionists), public administration representatives, and private associations.

These transition processes do not respond to a single pattern, are not linear, nor can they be programmed. They are multidirectional and arise from heterogeneous associations between agents and materialities, making them possible under specific conditions of existence. In addition, each territory presents different stages of progress in overcoming the challenges of decarbonization, as these transition processes involve different factors (economic, political, social, cultural, technological, and environmental) and a multiplicity of actors (located at different scales of action) with different interests, logics, and power capacities. These multidimensional, multi-scalar, and multi-stakeholder relationships act as drivers and barriers to decarbonizing tourism territories. Such linkages should not be avoided in research, as they enable a holistic and enriching approach to a problem that requires immediate action.

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Scientific production on tourism experience in Scopus: a bibliometric study

Producción científica sobre experiencia turística en Scopus: un estudio bibliométrico

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ABSTRACT

Tourism experience has become a central element in the tourism industry. The bibliometric study aimed to map the scientific production of tourism experience in scientific articles available in Scopus, identifying the main trends, emerging research areas, and knowledge gaps. A search was conducted using the descriptor "tourism experience" in the title, abstract, and keywords of scientific articles. The results were processed in Biblioshiny to analyze the most relevant journals, authors with the highest impact, etc. The research was complemented by content analysis of the selected articles to identify the main lines of research. The global leadership of China in generating studies on tourism experience was revealed, while the United States stands out for the quality and impact of its research. There is a trend toward studying memorable tourism experiences concerning constructs such as perceived image, satisfaction, and loyalty. Tourism experience research has developed from different perspectives, including the co-creation of experiences, the impact of technology, and the importance of authenticity. The field of tourism experience is well established, with a growing scientific output; however, there are emerging research areas.

Keywords: bibliometric indicators, tourism experience, scientific literature, Scopus, Biblioshiny

RESUMEN

La experiencia turística se ha convertido en un elemento central en la industria turística. El estudio bibliométrico tuvo como objetivo mapear la producción científica sobre experiencia turística en artículos científicos disponibles en Scopus, identificando las principales tendencias, áreas de investigación emergentes y brechas de conocimiento. Se realizó una búsqueda utilizando los descriptores "tourism experience" en el título, resumen y palabras clave de artículos científicos. Los resultados fueron procesados en Biblioshiny para analizar las revistas más relevantes, los autores con mayor impacto etc. Se complementó la investigación con análisis de contenido de los artículos seleccionados para identificar las principales líneas de investigación. Se reveló un liderazgo global de China en la generación de estudios sobre experiencia turística, mientras Estados Unidos destaca por la calidad e impacto de sus investigaciones. Existe una tendencia hacia el estudio de la experiencia turística memorable en relación con constructos como la imagen percibida, la satisfacción y la lealtad. La investigación sobre experiencia turística se ha desarrollado desde diferentes perspectivas, incluyendo la co-creación de experiencias, el impacto de la tecnología y la importancia de la autenticidad. El campo de la experiencia turística está bien establecido, con una creciente producción científica; sin embargo, existen áreas de investigación emergentes.

Palabras clave: indicadores bibliométricos, experiencia turística, literatura científica, Scopus, Biblioshiny

INTRODUCTION

Travellers today have increasingly high expectations, seek authentic and transformative travel experiences and relish the opportunity to create them themselves (Golja & Paulišić, 2021; Stavrianea & Kamenidou, 2022). Hence, in today's tourism market, creating meaningful experiences for tourists has been identified as a key factor (Hernández et al., 2019; Matovelle & Baez, 2018). Offering eye-opening tourism experiences has a positive mental and physical impact on tourists, contributing to their subjective well-being (Rasoolimanesh et al., 2022; Teoh et al., 2021).

A large number of authors such as Azis et al. (2020) Rasoolimanesh et al. (2022), Seyfi et al. (2020), Sthapit et al. (2024), Skavronskaya et al. (2020) and Wei et al. (2019) have addressed that these experiences play an essential role in enhancing tourism value as well as future tourist behavior, such as word of mouth, repeat visit intention and strengthening loyalty. Consequently, tourism organizations recognize the importance of providing positive experiences as a key factor for competitiveness and sustainability in the sector (Sthapit et al., 2020; Tung & Ritchie, 2011). It is therefore increasingly understood that providing experiences to tourists is not only a tool for differentiation and attracting more visitors (Azis et al., 2020; Seyfi et al., 2020), but also a crucial element for the success of tourism products (Skavronskaya et al., 2020) and marketing decision-making (Matovelle & Baez, 2018).

Although the tourist experience has been studied since the 1970s (Bolzán & Mendes-Filho, 2022; Montoya et al., 2024), in recent years there has been a notable increase in the number of research studies in this field (Sthapit et al., 2023). This is because changes in tourist preferences have been significant, due to the existence of factors that were not so present in previous times (Bolzán & Mendes-Filho, 2022; Montoya et al., 2024). In the current context, the tourism experience is presented as a relevant construct that has captured the attention of numerous researches (Stavrianea & Kamenidou, 2022), as it is not only fundamental in itself, but also raises crucial aspects for tourism research and constitutes the main product of travel (Bolzán & Mendes-Filho, 2022).

From the above arises the need to carry out bibliometric studies that are responsible for analyzing and evaluating the scientific production on this topic and thus be able to identify trends, areas of interest, and possible gaps in

the current literature. During a previous analysis, research by Bolzán & Mendes-Filho (2022), Teoh et al., (2021) and Montoya et al. (2024) were identified as background studies. The contributions of these authors constitute literature reviews on tourism experience, however, they do not focus on a quantitative analysis of the existing scientific production.

The time frame of the cited studies is limited to 2021, the selection of keywords was restricted by Teoh et al. (2021) and Montoya et al. (2024) to tourism experience design and transformative tourism experiences respectively. Bolzán & Mendes-Filho (2022) declare tourism experience as a keyword in a general sense, as addressed in the present research. However, they review international scientific literature in journals that publish articles in the area of tourism and do not declare a specific database. Following this same line, Montoya et al. (2024) use Proquest, Scopus, ResearchGate, Redalyc Scielo, and Academia as sources, while Teoh et al. (2021) declare Google Scholar.

The novelty of the research is that the time frame is extended from the first article on tourism experience in Scopus to January 2024. A number of indicators were analysed to understand the evolution of research in this field, including the most cited papers, productivity by country, the most influential institutions and authors, and research gaps and trends.

The aim of this research is to map the scientific production on tourism experience in scientific articles available in the Scopus database and to identify gaps, trends and future lines of research.

Literature review

The tourism experience is a multifaceted concept that varies according to the different theoretical perspectives that address it (Bolzán & Mendes-Filho, 2022), which makes it difficult to define (Stavrianea & Kamenidou, 2022). Some research focuses on the experience as a value offered within the experience economy paradigm, while others focus on the experiences that are part of the tourism travel cycle as a ritual. Other radical perspectives suggest that the tourism experience dissolves into everyday practices without distinguishing between tourism and non-tourism (Bolzán & Mendes-Filho, 2022).

Tung & Ritchie (2011) define tourism experience as an individual's subjective evaluation and experience (i.e., affective, cognitive, and behavioral) of events related to their tourism activities that begins before (i.e., planning and preparation), during (i.e., at the destination) and after the trip (i.e. recall). These authors consider the entire tourism process, from the anticipation and expectation before the trip, through the experience itself during the stay at the destination, to the reflection and memory that lingers after the return. This approach addresses the different emotional, cognitive, and behavioral aspects that influence the appreciation of the tourism experience.

Golja & Paulišić (2021) also argue that the tourism experience is subjective reactions and feelings associated with tourism activities, being psychological phenomena based on and originating from the individual tourist. In this way they further emphasise that the customer's experience of tourism is intrinsically linked to their personal reactions and feelings, highlighting the subjectivity and individuality of each experience. This implies that each person may perceive and experience the same tourism activity differently, depending on their emotions, expectations and previous experiences.

Bolzán & Mendes-Filho (2022) and Steinmetz et al. (2021), in relation to the definition of Tung & Ritchie (2011), argue that the tourist experience is not an isolated event but a series of interconnected moments from trip planning to return home that managers must take into account to design valuable tourism offerings. In contrast to other definitions more focused on the tourist perspective, this approach looks at the management and strategic planning point of view.

More generally, the tourism experience encompasses the acquisition of various elements such as knowledge, emotions, images, meanings, sensations, and desires throughout the tourist's travel process. It is a dynamic and complex phenomenon that can have both positive and negative aspects, which are influenced by the environment in which it takes place (Bolzán & Mendes-Filho, 2022).

In order to understand the complexity of the tourism experience and its evolution in the current context, this bibliometric study focuses on analysing the scientific production on the subject. Starting from the definition and key dimensions of the tourism experience set out in the theoretical references section, the research aims to map the relevant

scientific literature, identifying the main trends, research areas, and most influential authors in the field.

METHODOLOGY

Approach

The research is a mixed study that is mainly aligned with an exploratory and descriptive approach to comprehensively understand the topic. It seeks to identify trends, patterns and relationships in the scientific production on the tourism experience and to guide future research. Furthermore, it summarises and presents the current state of knowledge in this specific area. To carry out the study, a bibliometric search and processing of scientific information was carried out and articles were selected for content analysis, followed by content analysis of the selected scientific articles.

Study population

The study was based on a review of the existing literature on tourism experience in Scopus, one of the most comprehensive bibliographic databases in scientific research worldwide. The search focused on titles, abstracts and keywords of the available scientific articles, using "tourism experience" as the thematic descriptor. The period under study covered the period from 1982, the year of publication of the first article on the subject, to January 2024.

For the selection of the articles to be analyzed, the following inclusion and exclusion criteria were taken into account: scientific articles and systematic reviews published in indexed scientific journals; bibliographic sources published in the last 7 years; relevance of the research topics; sources that address the specific research topic; articles that carry out critical analyses, theoretical and statistical studies.

Analysis processing

For the processing and analysis of the information, the Biblioshiny application of the Bibliometrix package of RStudio Cloud (Aria & Cuccurullo, 2017) was used, which allowed the study of certain bibliometric indicators. Annual productivity was calculated to understand the evolution of research on tourism experience over time. The calculation of productivity and citations by country allows us to assess the scientific contribution and impact of research in different regions of the world. The most significant affiliations were

also highlighted in order to identify the institutions with the greatest impact in the field of research.

The most relevant sources were identified and analyzed in depth by calculating the h-index to identify the most locally relevant sources and, thus, the most influential journals and publishers in tourism experience research. To understand the influence and relevance of research in different contexts, the most cited papers globally and locally were highlighted. In addition, the output of the different authors over time was calculated, and those with the highest impact locally were identified according to the h-index to assess the contribution and influence of the different authors in this field of study.

Identifying the most cited articles locally in the field of tourism experience led to an exhaustive review of these documents, to which we had access in their entirety. This analysis made it possible to identify the thematic lines of research on tourism experience, explore the different theoretical and methodological perspectives used, and understand the current state of knowledge in this field.

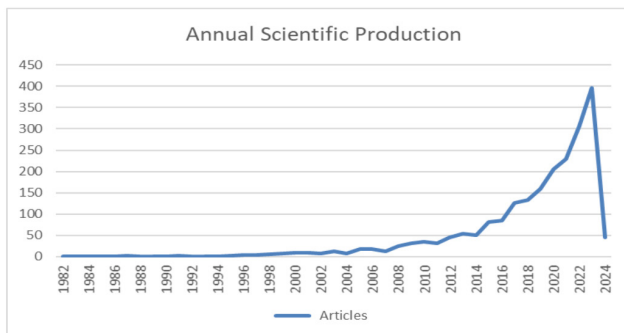
RESULTS AND DISCUSSION

Analysis of scientific production

Annual productivity

The first article related to the subject in the Scopus database dates back to 1982. In the period analysed (1982-2024), 2 169 publications on the subject were recorded (see Figure 1).

Figure1. Growth of annual scientific production



Source: Own elaboration based on Scopus

Research on the tourism experience has grown steadily in recent years, reflecting academic interest in this field. Scientific output has been increasing since 2004, culminating in a peak of publications in 2023. This boom further

deepens the study of the tourism experience, recognising its importance in both academic and professional circles. Productivity and citations by country

Table 1 shows the 5 countries with the highest number of publications. China is identified as the country with the highest productivity, with 1017 publications, coinciding with the number one position in the list of most relevant affiliations, corresponding to The Hong Kong Polytechnic University, with 73 publications (see Table 2). This suggests this region's leadership in scientific research on tourism experience worldwide.

Table 1. Article productivity by country

Country	Number of articles
China	1017
USA	616
Australia	557
UK	381
Portugal	363

Source: Own elaboration based on Scopus

Table 2. Most relevant affiliations

Affiliations	Number of articles
The Hong Kong Polytechnic University	73
Griffith University	67
Nanjing University	56
University of Aveiro	46
Sun Yat-Sen University	43

Source: Own elaboration based on Biblioshiny.

The country with the highest number of citations is the United States with 8385 (see table 3), which represents the high impact and relevance of the tourism research produced in this country in the context of the research.

Table 3. Most cited countries

Countries	Number of Citations
USA	8385
Australia	8038
China	8022
UK	6435
Portugal	2788

Source: Own elaboration based on Biblioshiny.

Seven countries coincide among the top ten countries in the tables, both in terms of productivity and citations: the United States, Australia, the United Kingdom, Portugal,

Spain, and Italy. Therefore, the documents produced in these countries are not only abundant in quantity but also highly relevant in this field.

Most relevant sources

Table 4 shows an analysis of the 5 most relevant sources focused on publishing articles on tourism experiences. The most prominent journal in this field is Sustainability (Switzerland), with 101 articles published, consolidating itself as a reference source in this field. Other relevant sources in this field are Annals of Tourism Research, Current Issues in Tourism, Tourism Management, and Journal of Travel Research, with 89, 85, 79, and 64 publications, respectively.

Table 4. Most relevant sources

Journal	Number of publications
Sustainability (Switzerland)	101
Annals Of Tourism Research	89
Current Issues In Tourism	85
Tourism Management	79
Journal Of Travel Research	64

Source: Own elaboration based on Scopus

After examining the most relevant sources at the global level, an analysis was made of those most relevant at the local level, using the h-index. The h-index is a metric proposed by Jorge Hirsch in 2005 that reflects both the productivity and the impact of a researcher's citations, making it possible to compare the influence of authors within the same academic community (Rojas & Samudio, 2022). In this context, Annals of Tourism Research stands out as the most significant source, with an h-index of 51, which shows its importance in the local field of tourism research.

Most cited papers

Global citation was investigated to find out which research in the field of tourism experience has had a significant impact on the academic community worldwide. The analysis resulted in the identification of the 5 most cited papers globally from the dataset studied (see table 5).

The paper with the most global citations in the period from 1892 to January 2024 is the article published by Wang (1999) with a total of 2192 global citations. The article provides a conceptual clarification of the meanings of authenticity in tourism experiences, discussing three approaches: objectivism, constructivism and postmoder-

nism. The author suggests that existential authenticity is an alternative source in tourism, regardless of whether the objects visited are authentic, this concept is classified into two different dimensions: intrapersonal and interpersonal.

Table 5. Most cited documents globally

Documents	Author	Total citations
Rethinking authenticity in tourism experience	Wang (1999)	2192
Exploring the essence of memorable tourism experiences	Tung & Ritchie (2011)	916
Value dimensions, perceived value, satisfaction and loyalty: An investigation of university students' travel behaviour	Gallarza & Saura (2006)	909
Development of a scale to measure memorable tourism experiences	Kim et al. (2012)	833
Food, place and authenticity: Local food and the sustainable tourism experience	Sims (2009)	809

Source: Own elaboration based on Scopus

Table 6 shows the 5 most cited papers locally in the tourism experience environment, in order to find out which research is particularly relevant in this context.

Table 6. Most cited documents locally

Documents	Author	Total citations
Exploring the essence of memorable tourism experiences	Tung & Ritchie (2011)	197
Rethinking authenticity in tourism experience	Wang (1999)	138
A model of perceived image, memorable tourism experiences and revisit intention	Zhang et al. (2018)	95
Development of a scale to measure memorable tourism experiences	Kim et al. (2012)	94
Cultural tourism: An analysis of engagement, cultural contact, memorable tourism experience and destination loyalty	Chen & Rahman (2018)	86

Source: Own elaboration based on Scopus

Leading the list of local citations is the work of Tung & Ritchie (2011) from the University of Calgary, Canada, with 197 local and 916 global citations, published in 2011. The article discusses the consequences of experiences, such as improvements in social relationships, intellectual development, self-discovery and overcoming challenges and their contribution to making them memorable. In addition, the authors refer to memorable experiences and their influence on future travel decisions and overall satisfaction with the tourism sector.

Prolific academics in the field of tourism experience

Analysis of the research data identified the most prolific authors in the field of tourism experience. Wang Y stands out as the most prolific author, especially since 2020. Li Y, one of the first authors to publish on the topic, has resumed his research in recent years with highly cited publications.

On the other hand, the authors with the greatest impact were analyzed using the h-index, to find out which research has had a significant influence on the academic community of the tourism experience. As a result, a figure was drawn up with the five authors with the greatest impact in the field of research in the period analyzed (see Table 7).

Table 7. Authors with the greatest impact locally according to the h-index

Authors	Impact measure: h
Lehto X	12
Wang Y	11
Kastenholz E	10
Kim J-H	10
Scott N	10

Source: Own elaboration based on Biblioshiny.

The leading author is Letho X, with an h-index of 12, which means that this author has at least 12 publications that have been cited at least 12 times. This result suggests that future studies of the tourism experience should take this author's work into account.

Lines of research addressed in the scientific production on tourism experience in Scopus

Memorable tourism experiences, main line of research

Creating positive memorable experiences has become the

new focus of the tourism industry, as quality and satisfaction are no longer enough for today's customers (Kim et al., 2012). Several studies, such as Tung & Ritchie (2011), delve into the dimensions of memorable experience, identifying four key aspects: affect, expectation, consequentiality and recall. Positive affect increases happiness and psychological growth, which drives the customer's exploratory behaviour and creates learning opportunities. Expectations are met with surprise, generating pleasure in exceeding expectations. Consequentiality refers to responses to the journey, including social interaction, intellectual development and self-discovery. Finally, recall focuses on the intention to revisit the place and share the experience with others.

Kim et al. (2012), in addition to establishing the dimensions that make up a memorable experience, managed to use them to develop a scale for measuring memorable experiences. They obtained 7 dimensions (hedonism, refreshment, local culture, meaning, knowledge, participation and novelty) and 24 indicators that show high reliability and validity values. The study shows that the 7 dimensions identified affect a person's memory of memorable tourism experiences. It also shows that customers tend to remember positive experiences more easily than negative ones, substantiating the implications of knowledge of unforgettable experiences for tourism management today.

The study by Chandralal et al. (2015) obtained results congruent with those of Kim et al. (2012), with the particularity that the latter determined the dimensions based on the analysis of travel blog narratives on the Internet. In addition, he found another set of dimensions highlighting shared experiences, stating that experiences shared with close fellow travellers and other travelers tend to become good memories for tourists. Wei et al. (2019) also proved from a psychological point of view that the dimensions of memorable experiences are those raised by Kim et al. (2012). Furthermore, he posited the moderating effect of age, indicating that age had a negative effect on novelty, involvement, and recall. For as people get older, they may not be as sensitive to something new as they used to be.

On the other hand, Sthapit & Coudounaris (2018) follow this same line of research and demonstrate how the seven dimensions of memorable experiences proposed by Kim et al. (2012) influence tourists' subjective well-being. The study highlights that hedonism and meaning are dominant factors that positively influence subjective well-being, while

the rest of the dimensions have a negative influence. It is important to note that this research focuses on a specific tourist destination in Finland, so in other destinations the result may vary. Furthermore, it proved that variables such as gender, age and nationality have a significant effect on the link between the dimensions of memorable experiences and customer subjective well-being.

Knobloch et al. (2017) in contrast to the study by Sthapit & Coudounaris (2018) investigate experiences as a result of emotions and personal meanings linked to customer well-being and quality of life. This research does not argue that memorable experiences can be described or created from a limited set of factors. Instead, it proposes that the elements that contribute to a memorable experience are context-specific and depend on the individual tourist. Furthermore, he argues that while the tourism industry is largely concerned with hedonism, customers want more from their experiences than just hedonic enjoyment. This is why he proposes to focus less on the cognitive and hedonic aspects and more on the emotional and personal meaning of the experience, ensuring that this understanding of tourism consumption positively influences an individual's well-being and quality of life.

Zhang et al. (2018) propose a model that relates perceived image, memorable experiences and revisit intention. They show that perceived image positively influences memorable experiences, which in turn directly impact on repeat visit intention, although they can also generate positive recommendations. Memorable experiences act as a mediator between perceived image and revisit intention, reflecting the existing harmony with the human psychological process: cognition (perceived image and some experiences), affect (other experiences), and intention (behaviour).

Sthapit and Coudounaris (2018) explore the relationship between memorable experiences and customer behavioural intention. Based on the dimensions of Kim et al. (2012), they identify that only hedonism, local culture, involvement, and knowledge positively impact behavioural intentions. They suggest modifying the measurement scale to include emotional aspects to better predict behavioral intentions. Ballantyne et al. (2011) study participants' experiences in wilderness activities and explore how these experiences may lead to long-term changes in conservation behaviour.

On the other hand (Servidio & Ruffolo, 2016) investigated

the relationship between memorable experiences and emotional behaviour during the four categories of travel planning. Through customer narratives, it was found that only five of the six core emotions (disgust, happiness, fear, anger, surprise and sadness) support the recall of memorable tourism experiences. Anger does not have a significant effect, as any tourism event should encourage and lead to relaxation and offer social and cultural experiences.

Chen & Rahman (2018) studied the relationship between visitor engagement, cultural contact, memorable experiences and destination loyalty in cultural tourism. The research, like Kim et al. (2012), highlights participation and local culture as elements that condition the creation of memorable experiences, arguing that greater visitor participation increases cultural contact and that greater cultural contact generates more memorable experiences. Furthermore, it confirms that memorable experiences have a positive effect on customer loyalty, agreeing with Zhang et al. (2018) that only remembered experiences influence tourists' future decisions.

A similar study by Loureiro (2014) explores the effect of experience economy on place attachment and behavioral intentions, specifically in a rural tourism destination. The results showed that memory is a mediator between experience and behavioral intentions, suggesting that an enthusiastic and satisfied customer is more likely to memorize the experience. On the other hand, Zátori et al. (2018) study how service providers can enhance memorable tourism experiences from on-site conditions. He argues that visitor engagement is one of the most important factors in creating memorable experiences.

Hosany & Witham (2009) analyse the underlying dimensions of cruisers' experiences and investigate the relationship between experiences, satisfaction and intention to recommend. The research concluded that the underlying dimensions are education, escapism, entertainment and aesthetics, noting that the four dimensions differ in importance. It also suggests that a pleasurable experience will positively impact overall satisfaction ratings, which in turn influences travelers' intention to recommend.

Research on memorable tourism experiences has evolved from analyzing their dimensions to exploring their relationship with other tourism-relevant concepts such as subjective well-being, perceived image, customer intentions, and emotions. Cultural and rural destinations, as

well as strategies to enhance service providers' creation of memorable experiences, have been explored in depth. Other strands addressed by the authors.

Tourism research is not only limited to the memorability of experiences. Binkhorst & Dekker (2009) emphasise the importance of co-creation of experiences, where customers interact with companies and create their own unique and authentic experiences. Technology plays a crucial role in this process, empowering consumers to co-create their own tourism experiences.

Neuhofer et al. (2013) explored the influence of ICT on the creation of tourism experiences. They found that new technologies facilitate the creation of new activities and experiences, transforming conventional ones. Technology is positioned as a key factor for the development of enhanced experiences, leading to different types of experiences. The authors proposed a matrix of nine types of experiences to understand how intensified technology generates enhanced experiences.

One of the most critical technological advances today is the development of social media. Munar & Jacobsen (2014) state that, although social networks are not the main communication channel, they are increasingly relevant for sharing tourism experiences. This study, although limited to the destination of Mallorca and focused only on tourists from Denmark and Norway, has very interesting findings related to when and where customers post, what type of content they post and what aspects motivate them to share their experiences through this medium.

The authenticity of the tourism experience has been studied from different perspectives. Wang (1999) discusses three approaches: objectivism, constructivism and existentialism. Objectivism focuses on the intrinsic authenticity of the visited object, while constructivism considers the social construction that makes it authentic. On the other hand, the existential approach is based on the personal and inter-subjective feelings that are activated during the experience, allowing authenticity to be sought even in inauthentic objects.

Zátori et al. (2018) focused on how service providers can enhance authentic tourism experiences through on-site activities. Sims (2009) delved into the link between authenticity and local food, arguing that local food can appeal to tourists' desire for authenticity, appealing from

simply seeking typical products to seeking a more authentic meaning. The research highlights that the meaning and authenticity behind local food is what many tourists seek. In summary, the research community has investigated other issues beyond memorable experiences, which are related to the co-creation of experiences, the influence of technology and the development of social networks on the creation and socialisation of experiences and the authenticity of tourism experiences.

CONCLUSIONS

Tourism experience is a well-established field of study, with a solid knowledge base and a growing scientific output. The research analysis in this field reveals a global leadership of China, where a large amount of research on tourism experience is generated. The United States, on the other hand, stands out for the high quality and impact of its research in this field. Other countries, such as Australia, the United Kingdom, Portugal, Spain and Italy, also stand out in terms of productivity and citations, as they not only produce a considerable volume of publications, but their work is also highly relevant and influential.

The journal *Sustainability* (Switzerland) has established itself as a worldwide reference source on the subject. Still, despite its global impact, the journal has not yet achieved a consolidated presence at the local level. In this context, the article by Wang (1999) is the most cited worldwide, while the work of Tung & Ritchie (2011) leads the citations in the local context. The relevance of this research to different global and local audiences underlines their importance and the quality of the studies conducted in both cases. On the other hand, to deepen the future study on tourism experience, it is also significant to consult Letho X's research, as he is the most relevant author in this line of research.

Research on the tourism experience has focused on memorability, exploring its relationship with the perceived image, behavioral intention, satisfaction, recommendation, and consumer loyalty. Topics such as co-creation of experiences, the impact of technology and social media, and the importance of authenticity have also been investigated.

For future research, it is suggested that the scope be broadened by using new keywords and exploring additional databases. The impact of the COVID-19 pandemic on tourists'

expectations and behaviours, as well as on the memory of experiences, is a relevant area for current research. Furthermore, developing new tools and methods to measure the tourism experience, considering emotions, memories, and long-term satisfaction, is crucial for a deeper understanding.

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Economic impact of sustainable tourism: a bibliometric analysis.

Impacto económico del turismo sostenible: un análisis bibliométrico.

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ABSTRACT

Sustainable tourism is crucial for economic development and environmental conservation. This study aims to understand the economic impact of sustainable tourism in rural areas. Through a comprehensive literature review, the significance of key terms like "Sustainable tourism," "Economic impact," "Rural area," and "Economic analysis" is highlighted. The main goal is to conduct a bibliometric analysis using VosViewer software and Scopus data from 2019-2024. This analysis will identify relationships between these terms and assess the co-occurrence of concepts in the reviewed articles. The study also aims to design density maps to visualize these co-occurrences, providing a clear representation of the connections between key concepts. Additionally, it proposes identifying the density of matches in the literature and co-citations of authors, offering a solid foundation for future research in sustainable tourism. The article's structure includes an introduction, literature review, methodology, results analysis, and conclusions, providing a comprehensive framework to understand the economic impact of sustainable tourism in rural areas. This approach allows researchers and industry professionals to explore new directions and better understand the mechanisms influencing sustainable economic development through tourism.

Keywords: Sustainable tourism, economic impact, rural area, local employment.

RESUMEN

El turismo sostenible es fundamental para el desarrollo económico y la conservación del medio ambiente. Este estudio busca comprender el impacto económico del turismo sostenible en las zonas rurales. A través de una revisión exhaustiva de la literatura, se destaca la importancia de términos clave como "Turismo sostenible", "Impacto económico", "Área rural" y "Análisis económico". El objetivo principal es realizar un análisis bibliométrico utilizando el software VosViewer y datos de Scopus para el período 2019-2024. Este análisis permitirá identificar las relaciones entre estos términos y evaluar la co-ocurrencia de conceptos en los artículos revisados. También se busca diseñar figuras de densidad que visualicen estas co-ocurrencias, ofreciendo una representación clara de las conexiones entre conceptos clave. Además, el estudio propone identificar la densidad de coincidencias en la literatura y las co-citaciones de autores, proporcionando una base sólida para futuras investigaciones en el campo del turismo sostenible. La estructura del artículo incluye una introducción, revisión de la literatura, metodología, análisis de resultados y conclusiones, proporcionando un marco completo para comprender el impacto económico del turismo sostenible en las zonas rurales. Este enfoque permite a los investigadores y profesionales explorar nuevas direcciones y comprender mejor los mecanismos que influyen en el desarrollo económico sostenible a través del turismo.

Palabras clave: Turismo sostenible, impacto económico, área rural, emplee local.

INTRODUCTION

Sustainable tourism has become an increasingly important issue in the field of economic development and environmental conservation worldwide. Sustainable tourism represents a significant opportunity to boost local economic development while preserving the region's natural and cultural resources. However, despite the obvious potential, there is a need to better understand the economic impact of sustainable tourism in this rural area.

In addition to providing researchers with an outline of theoretical development and key points of seminal literature, this article provides a visual summary of the field's literature on the economic impact of sustainable tourism in rural areas. It also reveals interesting current research topics and provides a reference direction for studies on the mechanisms shaping the economic impact of sustainable tourism in rural areas and empirical research. In order to provide future researchers with a solid research foundation and suggest directions for future research.

This article arises as a response to the literature review stage and the state of the art of the subject, associated with research on: "Analysis of the economic impact of sustainable tourism". Consequently, a bibliographic search of review and research articles was carried out, which allow establishing the direct relationship between the terms of Sustainable Tourism (Sustainable tourism), Economic Impact (Economic impact), Rural area (Rural area), Economic analysis (Economic analysis).

In fact, the following formulation of the problem is used: what degree of co-occurrence exists between the terms Sustainable tourism, Economic impact, Rural area, Economic analysis according to the articles consulted in the Scopus databases, during the period between 2019-2024?

The general objective is to carry out a bibliometric analysis of article searches in the Scopus scientific databases, related to the concepts of Sustainable Tourism, Economic Impact, Rural Area, Economic Analysis, during the period 2019-2024, through the application of the VosViewer software.

The specific objectives were as follows: to identify the search equations, using as filters the keywords, the time horizon and the nature of the articles reviewed; to design the *figurasdensity* and visualization of the co-occurrences in the consulted databases, based on the VosViewer

application, and to determine the density in the literature coincidences from Scopus 2019-2024 of the keywords and co-citations of authors associated with the consulted databases, through the interpretation of the *figurasdensity* visualization, word overlap and conceptual networks.

An introduction is provided in Section 1. The literature is reviewed in Section 2. The study methodology and data source are presented in Section 3. An overview of the research on the economic impact of sustainable tourism in rural areas is provided in Section 4. Critical points of the research are discussed in Section 5, along with implications for future research. Research findings and insights are compiled in Section 6.

METHODOLOGY

The methodological perspective on which the bibliometric analysis was based corresponds to a mixed approach, since it describes the characteristics associated with the affinities and correlations of the keywords found in the bibliographic references consulted in the Scopus databases, during the period between 2019 and 2024, both qualitatively and quantitatively.

Thus, the aim was to carry out a literature review of the articles reviewed in this database, which show the advancement of knowledge associated with the relationship between the concepts of the economic impact of sustainable tourism in rural areas. Likewise, the type of research applied in the article corresponds to the documentary approach, since it was based on the collection, classification and search of bibliographical references, delimited in terms of the words "economic impact", "sustainable tourism" and "rural area" which were consolidated in the database, and later, were taken into account for the bibliometric analysis through the VosViewer application.

Meanwhile, the specific research method applied in the present analysis corresponds to the categorical system, in which documentary research strategies were applied in order to categorize the words or keywords in the development of bibliographical reference searches in Scopus. Therefore, the categorical system was applied in the first instance, taking into account the Boolean operators for the definition of the ranges and search criteria in Scopus, involving the search equations.

Therefore, the systematic literature review methodology was applied, which involves a review of quantitative and qualitative aspects of primary studies. Likewise, (Peña-Azpiri and Escudero-Nahón, 2020) establishes that the systematic literature review has three fundamental stages: design and planning of the searches to be carried out, application of the search equations and reporting and analysis of the results applying the bibliometric tools. Taking into account the bibliographic references collected in the Scopus databases, the procedure that allowed the bibliometric analysis using the VosViewer software is presented below .

Table 1: Procedure for bibliometric analysis VosViewer.

Number	Activity
1	Design of the search equations: " Economic impact " "Rural tourism " " Economic development "
2	Entering search equations into the Scopus database.
3	Export of files in .CSV (Scopus) formats of the searches obtained.
4	Loading databases into the VosViewer application .
5	Setting the minimum number of keywords for which co -occurrences and affinities were required in the database.
6	Loading and displaying the figurasnetworks, overlay and density generated in the database loaded in VosViewer .
7	Analysis of keyword co-occurrences and density figures visualized in the VosViewer application .

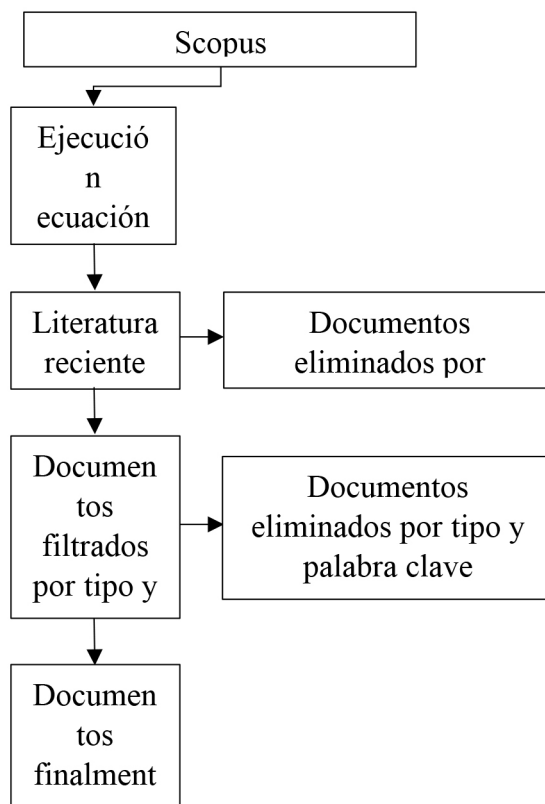
Source: Own elaboration.

The following search formula was applied: " Economic impact " AND "Rural tourism " AND " Economic development ". The The equation used in this bibliographic search includes terms such as " impact", "economic", "rural", "tourism", "economic development" to refer to the economic impact of tourism in journal-type files.

The initial search without restrictions on language, document type or knowledge areas yielded 1,677 files from the Scopus database from 1976 to 2024. However, to focus

on more recent literature, the search was refined considering studies published from 2019 to 2014, yielding 967 documents. Then, the files that were considered the most relevant and related to the study topic were filtered according to document type and keyword. This resulted in a total of 469 documents. The detailed search process is represented in the following figure.

Figure 1: Bibliographic search process

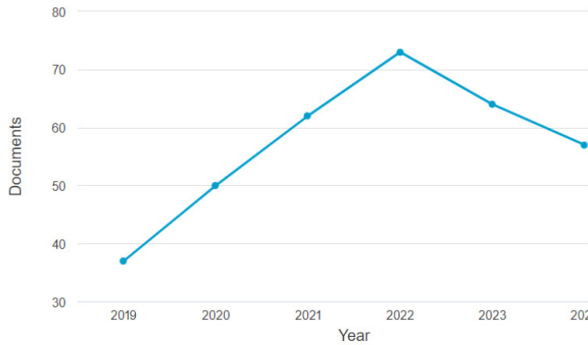


Source: Own elaboration.

DISCUSSION AND RESULTS

Below is a presentation of the evolution of the number of publications over time, identifying temporal trends in the research on the economic impact of rural tourism, using the search equation " economic impact " AND " economic development " AND "rural area ", applied to the Scopus database .

Figure 2: Evolution of the number of publications over time

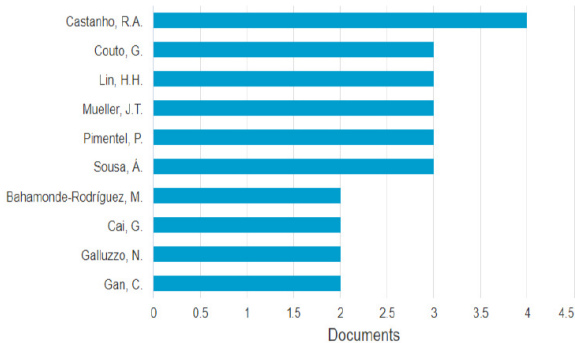


Source: Scopus database, obtained with the search equations.

Figure 2 shows a steady increase in the number of publications on the economic impact of rural tourism from 2019 to 2022, peaking in 2022 with 73 papers, indicating a growing interest in the topic, probably due to the recognition of the importance of rural tourism in the economy and changes in travel trends. However, from 2023 onwards, a decrease in publications is observed. Despite the drop, the number of papers in 2023 and 2024 remains high compared to 2019.

Continuing with the identification of the most influential authors in the field, we can observe the following.

Figure 3: Most influential authors



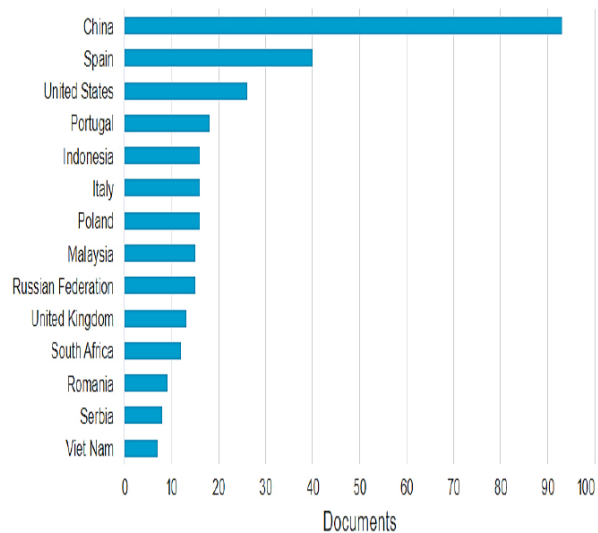
Source: Scopus database, obtained with the search equations.

On the other hand, we have the number of documents published by different authors on the subject, highlighting Castaño, RA (Castaño, et al., 2023) (Castaño, et al., 2020) (Castaño, et al., 2020) (Castaño, et al., 2019) as the most prolific author with 4 documents. The authors

Couto, G., (Couto, et al., 2023) (Couto, et al., 2020) (Couto, et al., 2020) Lin, HH, (Lin, et al., 2024) (Lin, et al., 2022) (Lin, et al., 2020) Mueller, JT, (Mueller, et al., 2022) (Mueller, et al., 2020)(Mueller & Tickamy, 2020) Pimentel, P., (Pimentel, et al. 2023) (Pimentel, et al., 2020) (Pimentel, et al., 2020) and Sousa, Á. (Sousa, et al. 2023) (Sousa, et al., 2020) (Sousa, et al., 2020) have a similar elaboration, with 3 documents each, indicating a significant but minor contribution compared to Castaño. Other authors such as Bahamonde-Rodríguez, M., (Bahamonde-Rodríguez, et al., 2024) (Bahamonde-Rodríguez, et al., 2023) Cai, G., (Cai, et al., 2023) (Cai, et al., 2023) Galluzzo, N., (Galluzzo, 2022) (Galluzzo, 2020) and Gan, C. (Gan, et al., 2024) (Gan, et al., 2023) have published 2 papers, suggesting more limited engagement in research on this topic.

economic " are presented below. impact " AND " economic development " AND "rural area ", applied to the Scopus database.

Figure 4: Classification of articles by country of origin Scopus 2019-2024 Search equation " economic impact " AND " economic development " AND "rural area ".



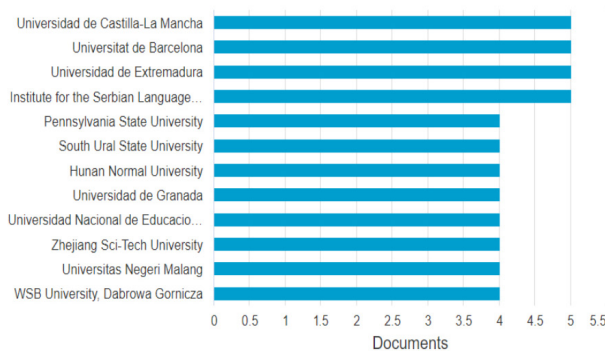
Source: Scopus database, obtained with the search equations.

Based on Figure 3, it is important to clarify that with respect to the search equation " economic impact " AND " economic development " AND "rural area ", applied to the Scopus database, the three countries with the most related articles were shown to be China, presenting 93 documents.

ments, followed by Spain, which presents 40 documents and 26 documents whose country of origin is the United States; It should be noted that in the Scopus database, 2 articles published in Colombia were registered, developed by (Forero, 2022) and (Vianchá Sánchez, 2021).

Additionally, documents are determined by affiliation, identifying academic and research institutions in the field of the topic on the economic impact of rural tourism.

Figure 5: Documents by affiliation

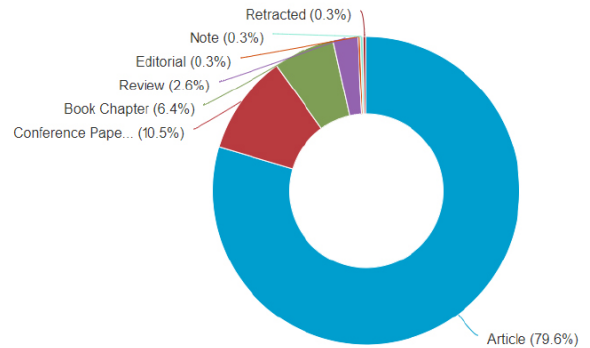


Source: Scopus database, obtained with the search equations.

The University of Castilla-La Mancha, the University of Barcelona, the University of Extremadura and the Serbian Language Institute of SASA lead with 5 papers each, demonstrating a significant contribution to research in this field. Pennsylvania State University University also stand out with 4 documents each, as does South Ural State University. University, Hunan Normal University, and the University of Granada, each with 4 documents. Other institutions such as the National University of Education, Zhejiang Sci-Tech University, Negeri Malang University, and WSB University, Dabrowa Gornicza, have contributed 4 papers each. This publication pattern reflects a broad international participation in research on the economic impact of rural tourism, with institutions from diverse regions contributing knowledge and perspectives to the topic.

Next, there are documents by type, where they are classified according to the type, whether it is a journal article, conferences, book chapters, among others. Evaluating the distribution of types of publications in the field.

Figure 6: Documents by type

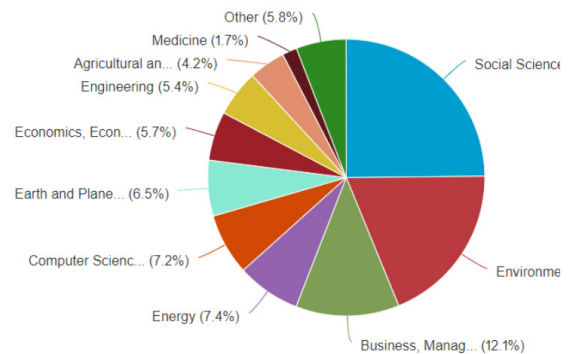


Source: Scopus database, obtained with the search equations.

Considering Figure 6, it can be observed that the predominant type of document under this model is the article, representing 79% of the total. This high percentage indicates a preference for publishing articles in academic journals, which suggests greater visibility and recognition in the community. In second place, session documents constitute 10%. Finally, book chapters comprise 6%, which indicates a smaller but significant contribution to collective works. These data highlight the diversity of formats in the dissemination of knowledge about the economic impact of rural tourism.

Additionally, there are documents by area, identifying the predominant thematic areas in the research and analyzing how these relate to the economic impact of rural tourism.

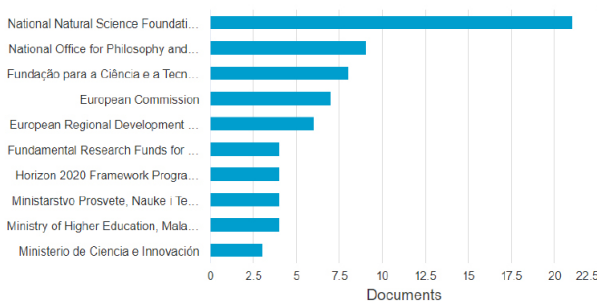
Figure 7: Documents by area



Source: Scopus database, obtained with the search equations.

Continuing with the most relevant area, social sciences, with 24% of the total. This is followed by environmental science with 19%, highlighting the importance of this field in research on the economic impact of rural tourism. In third place are business, management and accounting, representing 12%, which underlines the interest in administration and the economic implications within this context. Finally, there are documents by Sponsor, determining the main sources of funding for the research.

Figure 8: Documents by sponsor



Source: Scopus database, obtained with the search equations.

Data on the main funding sources for research into the economic impact of rural tourism highlight the significant influence of diverse funders. The National Natural Science Foundation of China leads with 21 papers, underlining its crucial role in fostering scientific output. The National Office of Philosophy and Social Sciences and the Foundation for Science and Technology follow with 9 and 8 papers respectively, reflecting their strong support in these areas. The European Commission and the European Regional Development Fund, with 7 and 6 papers, show the importance of European funding in research. Other funders, such as the Fundamental Research Funds for the Central Universities, the Horizon 2020 Framework Programme, and the Ministry of Higher Education of Malaysia, each contribute 4 papers, highlighting a diverse international contribution. Finally, the Ministry of Science and Innovation, the Ministry of Education of the People’s Republic of China, and the Russian Foundation for Basic Research, with 3 papers each, illustrate a more specific but significant support in their respective countries. These data reflect a global panorama of funding, evidencing the positive impact of multiple sponsors in the promotion and development of scientific research in the field of rural tourism.

Continuing with the journals with the most citations throughout the selected years.

Figure 9: Cited journals

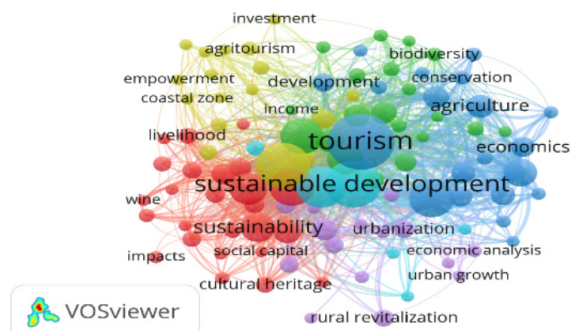


Source: Scopus database, obtained with the search equations.

Figure 9 shows the citations of different journals between 2019 and 2024, highlighting the importance and impact of these publications in areas such as sustainability, tourism and environmental sciences. “Sustainability (Switzerland)” stands out with the highest citations, especially in 2020 with 131 citations and 2019 with 122 citations, reflecting its influence on research. Newer journals such as the “Journal of Cleaner Production” and the “Journal of Hospitality and Tourism Management”, although with fewer citations, are starting to gain relevance. Overall, the distribution of citations shows both the durability of some publications and the growing impact of others in these fields of study.

However, taking into account the processing of searches in the bibliometric software VosViewer, the visualization of the network figure of the Scopus database is presented below.

Figure 10: Network figure co-occurrences keywords articles Scopus - VosViewer.



Note: This figure was created in VosViewer from the search equations entered in the Scopus database, filtering the time criterion from the year 2019 to the year 2024.

Considering the network visualization map of the keywords associated with the searches in the Scopus database, it is perceived that 3 clusters of terms are formed. The articles selected for this bibliographic research demonstrate that sustainable rural tourism has a significant economic impact on local communities. These studies highlight benefits such as job creation, increased income for local businesses and improved infrastructure. In addition, they underline the importance of proper management to maximize these benefits and ensure balanced development. Overall, the reviewed literature reaffirms that sustainable tourism is a viable tool for rural economic development.

The keyword co-occurrence figure generated by VOSviewer reveals the relationships between the most frequently used terms in research on rural tourism and sustainable development, organized into six clusters.

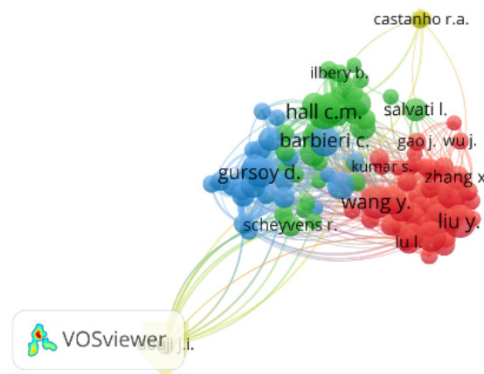
The first cluster, with 25 items, seems to focus on concepts related to “tourism”, “sustainable development”, “economic impact”, “sustainable tourism” and “cultural tourism”, showing the interconnection between tourism activity and sustainable practices. The second cluster, with 20 items, groups terms associated with “economic aspect”, “environmental economics” and “economic development”, indicating a focus on cultural preservation and its relationship with tourism. The third cluster also contains 20 items, but is oriented towards words such as “rural tourism” and “development”, suggesting an interest in the economic implications of rural tourism.

The fourth cluster, with 17 items, is linked to terms such as “agrotourism” and “biodiversity,” highlighting the relationship between tourism and sustainable agricultural practices. The fifth cluster, with 15 items, focuses on terms such as “economic growth” and “socioeconomic condition,” reflecting a focus on the social and economic impact of tourism on rural communities. Finally, the sixth cluster, although smaller with 6 items, includes terms such as “innovation” and “sustainable development,” signaling an interest in economic investments and their role in promoting rural tourism.

This figure reflects the breadth and complexity of the field of study, showing how different aspects of rural tourism

are interrelated through economic, social, cultural and environmental concepts. The grouping of key terms suggests areas of research that are deeply connected, underlining the interdisciplinary nature of rural tourism and sustainable development.

Figure 1. 11: Co-citation network map figuravizualization of Scopus articles - VosViewer .



Note: This figure was created in VosViewer from the search equations entered in the Scopus database, filtering the time criterion from the year 2019 to the year 2024.

Figure 11 of the co-citations generated by VOSviewer illustrates the citation relationships between authors who have contributed to research on the economic impact of tourism. Different colors represent groupings of authors who are frequently cited together, indicating that their work is closely related in thematic terms.

Several groups of authors are also highlighted. The blue group, with authors such as Barbieri C., Gursoy D., and Scheyvens R., indicates a strong citation network in areas that probably focus on sustainable tourism and local development. The green group, where authors such as Hall CM, Ilbery B., and Salvati I. are observed, could be associated with topics related to rural development and tourism practices. On the other hand, the red group, with authors such as Wang Y., Liu Y., and Zhang X., suggests a focus on more recent or emerging research, possibly linked to specific case studies or new methodologies in tourism analysis.

Castanho RA, represented in yellow, appears to be more isolated, suggesting that although his work is relevant, he might be addressing slightly different or more specialized topics compared to the main groups. The connections

between the different groups indicate a cross-pollination of ideas and references that enriches the field of study, showing how research from different geographical areas and methodological approaches interrelate and contribute to the body of knowledge on the economic impact of tourism. This figure highlights the collaboration and dialogue between researchers, reflecting the complexity and interdisciplinary nature of this area of study.

CONCLUSIONS

The findings of the bibliometric analysis of the economic impact of sustainable tourism in rural areas reveal a growing trend in research on the topic between 2019 and 2022, highlighting the significant increase in publications in 2022, suggesting a growing interest in rural tourism as an economic driver. However, a decrease in publications is observed from 2023 onwards, which could indicate a change in research priorities or an exhaustion in the exploration of the topic within current frameworks. Furthermore, the analysis of the most influential authors and the identification of leading countries and universities in this area of research show a strong presence of China, Spain and the United States, reflecting the global relevance of sustainable tourism and its economic impact.

The study also highlights the diversity in document types, with a predominance of journal articles, indicating a rigorous academic approach in knowledge dissemination. Analysis tools such as VosViewer allowed for the visualization of keyword co-occurrences and affinities, offering a deeper understanding of conceptual connections in the reviewed literature. These findings not only consolidate the importance of sustainable tourism in rural development, but also open new avenues for future research, especially in less explored or emerging areas in the context of sustainable tourism and its economic impact.

Limitations and future research

Limitations of this study include the possible exclusion of relevant studies due to keyword and database selection, the temporal restriction of the analysis, and the focus on quantitative data that limits in-depth exploration of the qualitative content of the reviewed studies.

For future research, it is essential to explore the impact of tax reforms in Colombia from a longitudinal perspective, analyzing how recent modifications affect different eco-

nomie sectors and how they compare with international practices. It would also be valuable to investigate the perceptions of taxpayers and tax professionals regarding the fairness and efficiency of these laws, as well as to evaluate the effectiveness of the measures implemented to combat tax evasion. Furthermore, a deeper analysis of the social and economic implications of these policies in various regions of the country could offer a more complete view of their impact.

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