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RIAT

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Editorial

The post-COVID-19 pandemic tourism sector

El sector turístico post-pandemia COVID-19

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The COVID-19 pandemic severely impacted the tourism sector, causing a drastic drop in the number of travelers and significant economic losses. Tourism businesses faced unprecedented challenges, from travel restrictions to the need to implement new health protocols. This situation required rapid adaptation and the implementation of innovative strategies to survive and regain the confidence of travelers.

In response, the tourism sector ramped up its digital transformation, embracing cutting-edge technologies to enhance the customer experience and sustain interest during restrictions. Equally important was the enforcement of stringent health and safety measures to rebuild consumer confidence, with health certifications gaining prominence. The adoption of more sustainable practices and flexibility in cancellation policies also became pivotal in adjusting to the new normal.

Domestic and nature and wellness tourism emerged as predominant trends during the pandemic. Travelers began to rediscover local destinations, boosting regional economies and diversifying tourism offerings. In addition, the pandemic increased awareness of sustainability, leading to an increased demand for responsible and eco-friendly travel options, to which tourism businesses responded with more responsible and sustainable practices.

Despite the ongoing recovery, the tourism sector is still grappling with challenges such as the uncertainty surrounding new virus variants and disparities in travel policies among countries. However, the sector's resilience and the burgeoning interest in sustainable tourism paint a hopeful picture for the future. The lessons learned during the pandemic, including the value of flexibility, rapid adaptation, and technology integration, are better equipping tourism businesses to handle potential similar crises in the future. Collaboration among governments, businesses, and communities will be instrumental in fostering a more robust and resilient tourism sector, with a strong focus on sustainability and the well-being of local communities.

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Research paper

Analysis of Social Networks on the Don Vasco tourist route in Michoacán, Mexico, a post-covid-19 analysis

Análisis de Redes Sociales en la ruta turística Don Vasco en Michoacán, México un análisis poscovid-19

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ABSTRACT

Social Network Analysis (SNA) and Smart Tourist Destinations (STDs) are closely interrelated due to the extensive use of goods and services, though the COVID-19 pandemic impacted both STDs and SNA through border closures and a decrease in visitor numbers. Thus, the objective is to calculate the clustering coefficient on the Don Vasco tourist route, which refers to SNA in a context that is taking its first steps towards building an STD. The method used was a Delphi, which involved the application of a semi-structured questionnaire processed with Gephi software. Among the findings, a notable clustering coefficient of 83% among central actors and 90% among tourist operators was observed. It was concluded that the route possesses a solid convex relationship between associations and tourist operators, which remains robust against changes in the tourism industry, thereby contributing to social cohesion.

Keywords: *Interrelationships, community tourism, social actors.*

RESUMEN

El análisis de redes sociales (ARS) y los destinos turísticos inteligentes (DTI) están estrechamente interrelacionados por la cantidad de bienes y servicios utilizados, aunque con la pandemia Covid-19, los DTI y ARS se vieron afectados por el cierre de fronteras y una disminución en el número de visitantes. Así el objetivo es calcular el coeficiente de agrupación en la ruta turística Don Vasco, que hace referencia al ARS en un entorno que está dando sus primeros pasos hacia la construcción de un DTI. El método usado fue un Delphi, el cual implica la aplicación de un cuestionario semiestructurado que fue procesado con el software Gephi. Entre los resultados obtenidos, destaca un coeficiente de agrupación del 83% entre los actores centrales y un 90% entre los operadores turísticos. Se concluyo que la ruta cuenta con una sólida relación convexa entre las asociaciones y los operadores turísticos, la cual se mantiene robusta frente a los cambios en la industria turística, lo que a su vez contribuye a la cohesión social.

Palabras clave: interrelaciones, turismo comunitario, actores sociales.

INTRODUCTION

Tourism activity has experienced steady growth over time (UNWTO, 2020), although it slowed down during the Covid-19 pandemic (UNWTO, 2021). To continue with the analysis, it is emphasized that in this document, tourism is conceived as a social, cultural, and economic phenomenon that involves the movement of people to new environments for personal, professional, or commercial reasons. These individuals can be referred to as travelers or tourists. Currently, new ways of developing this activity have emerged, even in the context of the Covid-19 pandemic. Countries like Mexico, for example, have climbed in the global rankings, moving from sixth to third place in terms of most visited destinations (Government of Mexico, 2020). Among the transformations in the tourism industry, Smart Tourist Destinations (STDs) have gained prominence. Both nationally and internationally, STDs are being promoted, but What exactly is meant by a smart tourist destination?

It is defined as:

"[...] an innovative space, accessible to all, supported by a cutting-edge technological infrastructure, which ensures the sustainable development of the tourist territory, and facilitates the interaction and integration of the visitor with the environment, enhancing the quality of their experience at the destination" (SEGITTUR, 2017:11).

This implies that destinations have multiple interrelations that should be understood as "reciprocal relationship between individuals, objects, or elements" (RAE, 2019) both directly and indirectly in tourism activity. This is how smart tourist destinations have gained significance in the international market. While internationally, countries like China or the United States and even the European Union region are developing programs aimed at transforming their tourist destinations into smart ones, in the case of Latin America, smart destinations have gradually evolved, with Mexico particularly noting the cases of Quintana Roo and Guadalajara.

In Mexico, there is also the Don Vasco tourist route located in Michoacán, which includes a network of institutional, business, and communicative interrelations with an orientation towards the current transformation into a Smart Tourist Destination (STD). The route itself is a journey with a different starting point from the end, where tangible and intangible activities for tourism are presented. Thus, for the present research, a destination will be understood based on the WTO (2021) as: a place visited for recreational purposes; thus, the route will be considered as a potential place. Therefore, it is significant for the Don Vasco route to analyze how the interrelation of the actors in the route has been post-COVID in the area. Thus, this document is comprised of the following sections: impact of COVID on tourist routes, social network analysis on the Don Vasco tourist route, method, results, discussion, and conclusions.
Impact of COVID on Tourist Routes

The COVID-19 pandemic has had a significant impact on the global tourism industry. In 2020, amidst the international pandemic, the World Tourism Organization (UNWTO) identified a 70% drop in international arrivals during the first eight months of 2020. This unprecedented decline has impacted the tourism sector and put millions of jobs and businesses at risk. North America alone saw a 65% drop compared to 2019. In 2021, Mexico experienced a gradual improvement, while in 2022, a sustained rebound was observed (UNWTO, 2020), which remained stable in the early months of 2023. Post-COVID-19 changes in tourism continue in some areas, such as projects aimed at smart destinations, which faced a scenario of uncertainty and developed immediate actions to address the situation. In the case of Mexico, it held a strategic position in Latin America in terms of tourism, ranking third globally despite the global and national tourism downturn (UNWTO, 2021). The ability to maintain a stable level of tourism compared to other countries is attributed to Mexico not closing its borders during COVID, and domestic tourism remained active.

Considering the analysis of the positioning of tourist routes in tourism, the case of the Ribera del Duero Smart Wine Route in Valladolid stands out, which managed to mitigate the effects of COVID through its social interrelations. Regarding the State of the Art of tourist route research, there are four main divisions focused on: 1) proposals for new routes considering the tourism potential with works by Aparicio (2013), Cardoso, et al. (2018), Cabrera (2016), Chávez, et al. (2017), Fernández and Guzmán (2005), Gómez (2017), Gonzales (2011), Litvinova and Voronina (2018). 2) Analysis and proposals aimed at diversifying and enhancing the competitiveness of new routes based on existing ones, with researchers such as Campos (2017),

Chamba, et al. (2017), Hernández (2011), Folgado-Fernández, et al. (2017), Meina and Terressa (2008), and Mira (2017). 3) Evaluation of existing routes in networks, with research presented by Canto (2000), Delgado and Pantoja (2015), Hiriart and Mínguez (2016), García, et al. (2018), and Maak (2009). 4) Analysis of routes in diagnostics, historical or descriptive studies highlighting research by Ascanio (2009), Barón and Gálvez (2016), Barbosa, et al. (2017), CODESPA (2013), García (2017), and Mafé, et al. (2016). Although the importance of the post-COVID tourism rebound is relevant to identify strategies, the following aspects are generally presented:

- Border Closures and Travel Restrictions: Many countries implemented border closures and travel restrictions to contain the spread of the virus (Félix, et al. 2020). In Mexico, there was no border closure, but there were restrictions in tourist areas.

- Cancellations and Refunds: With the spread of the virus and travel restrictions, numerous cancellations of flight bookings, hotels, cruises, and tourist activities occurred (Cerda, 2021). In Mexico, this impact was mitigated by internal mobility and the mobility of foreigners on platforms such as Airbnb, which focused on longer stays than usual in the country.

- Closure of Tourist Attractions and Establishments: Many tourist destinations temporarily closed popular attractions, theme parks, museums, restaurants, and hotels due to social distancing measures and government-imposed restrictions. This led to job losses and negatively affected the local economy (Araya-Pizarro, 2021).

- Change in Tourist Preferences and Behaviors: The pandemic has altered the preferences and behaviors of tourists. Many travelers now avoid crowded destinations and seek less crowded places and outdoor activities (Salazar, et al. 2021).

- Impact on Employment and the Economy: Tourism is a major source of employment in many countries. With the decline in tourism, there were mass layoffs and a significant loss of jobs in the industry. Additionally, the reduction in income from tourism negatively impacted the economy of many destinations dependent on this industry (Madera, 2020).

Overall, COVID-19 has posed significant challenges to the tourism industry in Mexico, but it is expected that, over time, the industry will recover as adequate health measures are implemented and travel restrictions are eased.

Social Network Analysis on the Don Vasco Tourist Route

The theory of Social Network Analysis (SNA) was first proposed by J. Barnes in 1954, defining social networks as structures consisting of nodes connected through various social ties that form networks. Boffil (2017:18) defines the network as follows: "a social network is generally defined as a set of specific relationships (for example, collaboration, support, advice, control, or influence) among a limited number of actors." Social networks are thus a multidirectional chain, comprised of several dimensions that relate people and create a social area (Zequeira, 2009).

Thus, the unit of analysis is not the social actor but the links between those actors (Albicette, et al. 2017). By addressing a society in terms of structures and relationships, Social Network Analysis (SNA) identifies positions within networks of relationships and their functional characteristics in relation to the entire network; this way, it is possible to differentiate positions, strategies, transaction flows, and power distribution (Espejo and Salinas, 2018; Fernández and Díaz, 2018).

During the pandemic, network analysis identified the interrelations along the route, as the environment changed in the way tourist destinations are managed, promoting the adoption of concepts such as "smart destinations." Below are some actions that have been undertaken at the intersection of COVID-19 and smart destinations:

- Digitalization and Technology: Tourist destinations are accelerating the digitalization of their services and adopting innovative technologies (Verduzco, 2020). Solutions such as mobile apps, online booking platforms, QR codes for accessing information, and contactless payment systems are being implemented.

- Technological Infrastructure: Investments are being made in technological infrastructure, such as improving internet connectivity and installing smart sensors in public spaces. This allows for the real-time collection of data to ensure the safety and sustainability of the destination.

- Smart Destination Management: Smart management systems are being used to optimize the planning and operation of tourism services.

- Sustainable Tourism: Sustainable tourism practices are being promoted, such as reducing paper use through digital solutions, implementing renewable energies, and efficiently managing natural resources (Palafox and Rubí, 2020).

- Communication and Citizen Participation: Citizen participation is being encouraged through digital platforms (Korstanje, 2020).

These actions aim to adapt tourist destinations to the new reality imposed by the pandemic, prioritizing health, safety, and sustainability. Additionally, they promote a more personalized and efficient tourism experience through the use of technology and innovation. Thus, taking as a basis the implications generated by COVID-19 in tourism and its interrelations across the sector, the analysis is based on the Don Vasco route, which was launched in 2008 in the State of Michoacán, Mexico, by the initiative of the Michoacán Tourism Secretariat with the goal of promoting the endogenous development of the territory through the launch and implementation of the cultural tourist route in the market.

Figure 1. Territorial Delimitation of the Don Vasco Route

Source: Website of the Government of Michoacán for the Don Vasco Tourist Route (2016).

The development approach of the tourist route encompasses various crucial aspects, such as improving competitiveness, generating value, developing the offer, promoting public-private cooperation, implementing positioning strategies, and establishing an effective coordination framework. Notably, in 2011, the route received prestigious recognition as the "Best Tourist Product" during the XVI edition of the competition for the Best Active Tourism Product, sponsored by the International Tourism Trade Fair (Fitur) and AireLibre magazine (Ceballos, 2019). Additionally, in 2020, representatives from the Government of Michoacán participated in the International Tourism Trade Fair (FITUR) in Spain, with the purpose of promoting the Don Vasco Route and exploring advancements in managing the locality of Madrigal de las Altas Torres, the birthplace of Don Vasco de Quiroga. Madrigal de las Altas Torres is a Spanish municipality located in the province of Ávila, within the autonomous community of Castilla y León.
Currently, the project known as "Kilometer Zero of the Don Vasco Route" is underway, a joint tourism initiative with Spain aimed at strengthening the ties between this place and Michoacán (Quadratín, 2020).

METHOD

Gephi is an open-source network analysis and visualization software that allows the analysis and exploration of networks, complex systems, and dynamic and hierarchical graphs (Kuz, et al. 2016). Among the features it offers for network acquisition is the adjacency matrix, which is represented by the graph G (V, E) where G is the degree, V is the vector, and E is the link. The interactions occur as follows: |V|=n, thus the adjacency matrix takes an entry aij (where a is the entry from row i and column j), which is defined in the following manner:

Equation (1)
$$a_{ij} = \begin{cases} 1 \; si \; e(vi, vj) \epsilon E \\ 0 \; si \; e(vi, vj) \notin E \end{cases}$$

Clustering coefficient, which measures the interconnectedness of the nodes and their neighbors, is represented by the following formula:

Equation (2)
$$\frac{\#\, edges \; of \; the \; complete \; graph \; of \; \; Nv(v)}{\#edges \; of \; G(Nv(v), E)}$$

In social networks, nodes with high betweenness can control the flow of knowledge that occurs within the network (Hanneman, 2001).

Sample of the Don Vasco Tourist Route

The target population consists of members of the Don Vasco route. Therefore, the Social Network Analysis (SNA) focuses on linking experts in the field of analysis, based on the tourist associations of the area which will represent the network's nodes. The considered associations are as follows:

- The Hotel and Motel Association of the State of Michoacán (AHMEMAC)
- The Tourist Guide Association of the State of Michoacán
- The Michoacan Association of Spas and Water Parks, A.C.
- The Craftsmen's Association.
- Michoacán's Secretary of Tourism

Initially, the nodes represent the macro level constituted by the associations. In a second instance, all the tourist operators concentrated on the Don Vasco route are analyzed with a sample of 16 companies.

Semi-structured Questionnaire for the Don Vasco Tourist Route

The questionnaire was administered in May 2021 through both in-person and virtual modalities to the following stakeholders: The Michoacán State Hotels and Motels Association (AHMEMAC), The Michoacán State Tourist Guides Association, The Michoacán Association of Spas and Water Parks, The Artisans Association, and the Michoacán State Tourism Secretariat (three departments linked to the route: 1. Training and modernization, 2. Digital marketing, and 3. Works and projects).

The network of nodes, along with its corresponding mapping, identified the importance of tourist operators on the route. Therefore, a virtual questionnaire was conducted at the end of May 2021, with an 80% response rate.

RESULTS

MICRO-LEVEL INTERRELATIONSHIPS OF THE DON VASCO TOURIST ROUTE

The results obtained on the Don Vasco tourist route in Michoacán show that the major tourist hubs are: Morelia, Pátzcuaro, and Uruapan, due to the concentration of goods and services they offer. This is followed by five magical towns located along the route, which are: Cuitzeo, Pátzcuaro, Santa Clara del Cobre, Tzintzuntzan, and Paracho. These places focalize tourist activity due to the articulation between society, government, and businesses. On the other hand, tourist operators along the route present a perspective ranging from stable to poor due to the slowdown in the tourist market in the state of Michoacán caused by the pandemic, despite multiple institutional supports to mitigate adverse effects. Regarding the perception of the management of the tourist route, operators identify little support despite the government website where services are offered. A positive aspect among the perceived issues is the importance of the government program called "Pueblos Mágicos" which has maintained intra-regional and national tourism.

The interrelationships among the central actors of the route reveal that the Michoacán State Tourism Secretariat and the Tourist Guides Association are the actors that concentrate the most significant interactions in the synergy of the route. They are followed by lesser interactions between the Michoacán Hotels and Motels Association and the Association of Spas and Water Parks. Among the main activities, it is observed that the government is dedicated to the development of projects, programs, and the regulation of the route, although the departments of infrastructure, digital marketing, training, and modernization have also collaborated throughout the tourism sector, both within and outside the route. Other notable interrelationships are related to Chambers of Commerce and the magical towns within the route. Likewise, universities play a relevant role in the training of qualified professionals in the sector.

Table 1. Parameters of tourist operators regarding the nodes of the Don Vasco tourist route, Michoacán, Mexico.

Factors	Indices	Interpretation
Clustering Coefficient	0.78	78% of actors work in a network.
Number of Components	5x5	The network is connected because all actors have interrelations.
Network Centrality	0.40	Implies the centrality of nodes, with Tourist Guides and the Michoacán State Tourism Secretariat being the nodes with the highest centrality within the network.

Distance between Nodes	1.25	Actors are, on average, 1.25 links apart.
Neighbors	2.8	The average direct collaborations of each node are 2.8.
Betweenness Centrality	0.3338	40% of the networks lie between two actors, which are the Tourist Guides Association and the Michoacán State Tourism Secretariat.
Number of Nodes	5	All central actors of the Don Vasco route.

Source: Own elaboration based on field data and the use of Gephi software.

The average clustering coefficient of a network is a measure indicating the tendency of nodes in a network to form interconnected groups or communities. It provides information about the cohesion and local structure of the network. The average clustering coefficient is calculated by taking the average of the individual clustering coefficients of all nodes in the network. In the micro-level analysis of the route network, the average clustering coefficient is 0.783, implying that nodes are interconnected by 78%.

Regarding network centrality, 40% of the nodes are represented by two nodes, namely the Tourism Secretariat and the Certified Guides Association. This results in a connected network, meaning a network with multiple interrelations, averaging 2.8 relationships with other actors within the network. The network that articulates the tourist route needs to develop mechanisms for knowledge management that foster innovation and adaptation both internally and externally. Thus, network actors share knowledge, forge alliances, collaborate, and exchange information formally and informally, contributing to achieving common objectives. The network needs to have dynamic capabilities to absorb innovation within institutions and organizations to achieve successful adaptation of the route towards a smarter approach.

Macro-level Interrelations of the Don Vasco Tourist Route
The interrelations are linked with other associations solely due to the actions taken by the government to generate pre-established packages and make them available to the general public. This implies that tourist operators maintain direct and indirect relationships with more associations, leading to a greater connection in the tourist system of the route.

In the overall analysis of actors, along with businesses within the Don Vasco Tourist Route, there is a consistent linkage between associations and actors of the tourist route. These linkages also include relationships with other businesses, magical towns, the municipality, and communities.

Table 2. Parameters of nodes in the Don Vasco Tourist Route, Michoacán, Mexico

Factors	Indices	Interpretation
Clustering Coefficient	0.83	83% of actors, associations, and businesses work in a network.
Number of Components	15x15	The network is connected because all of them have links.
Network Centrality	0.90	90% implies that associations and tourist operators have centrality in the network, achieving connection among all.
Distance between Nodes	0.268	Actors are, on average, 0.26 links apart.
Neighbors	1.083	The average for each node has two direct collaborators.
Betweenness Centrality	2.85	The linkage of associations and tourist operators includes an average of 2.85 links.
Number of Nodes	5	All central actors of the Don Vasco route.

Source: Own elaboration based on field data and the use of Gephi software.

The clustering coefficient of a specific node measures the proportion of possible links between the neighbors of the node. In other words, it indicates how many of the node's neighbors are connected to each other in relation to the total number of possible connections among them. Thus, the average clustering coefficient of the macro network encompasses associations and tourist operators, with a connectivity value of 83%.

Regarding the macro centrality of the network, 90% of the interrelations are concentrated in two central actors: the Tourism Secretariat and the Certified Guides Association. The network has five nodes represented by associations, but only two of them account for 90% of all formal relationships within the route. This implies that only two actors demonstrate strength in their relationships with the entire

network, while the rest need to strengthen their interactions through the implementation of projects, programs, or regulations that enable them to maintain more active relationships with the rest of the network comprising the route.

On the other hand, the clustering coefficient of 83% reflects a solid linkage as it is above 80%, indicating that institutional actors, associations, and tourist operators maintain an interrelation that facilitates orientation and action execution within the context of the route. However, the coefficient could be improved by further integrating relationships among the actors involved in the route. Therefore, there is a missed collaborative opportunity in this regard.

DISCUSSION OF THE SOCIAL NETWORK ANALYSIS OF THE DON VASCO ROUTE IN A POST-PANDEMIC ENVIRONMENT

One of the strengths of the network is the direction it receives from the Tourism Secretariat, which facilitates the connection between associations and tourist operators. Additionally, it provides public investment in infrastructure and trains tourist operators. The relationships present form a network of formal and informal actions on the route; that is, sometimes these actions are accompanied by contracts, while in others they are based solely on verbal agreements among network actors (North, 1993). Ideally, the relationships should be more formal for the participation of route actors (PE, 2016).

Furthermore, it is important to consider that interrelations provide and strengthen intelligence in tourism, although connectivity, information, and project ties still need to be strengthened to denote solid and constant interrelations that benefit the network. Now, among the aspects that the Don Vasco route addresses and the impact of the Covid-19 pandemic in Mexico, several strategies have been implemented to boost economic and tourist recovery. Here are some highlighted strategies:

Health and safety protocols: Strict health and safety protocols have been established throughout the tourism industry (Sánchez, et al., 2020). This includes measures such as mandatory mask-wearing, social distancing, regular disinfection of spaces, temperature checks, and training in sanitary practices for staff. These protocols aim to ensure the confidence and safety of both domestic and international tourists.

Certification of safe destinations: The "Safe Travels Stamp" has been launched by the World Travel & Tourism Council (WTTC) in collaboration with the Mexican Ministry of Tourism. This stamp certifies destinations that meet international health and hygiene standards, providing a signal of confidence to visitors.

Promotion of domestic tourism: Given that international travel restrictions have limited the arrival of foreign tourists, greater emphasis has been placed on promoting domestic tourism. Campaigns and programs offering discounts and promotions have been launched to encourage Mexicans to travel and discover domestic destinations (Zepeda, et al., 2020).

Financial support for tourism businesses: The government has implemented financial support programs for tourism businesses affected by the pandemic. This includes credit lines, grants, and economic recovery programs to help companies overcome financial difficulties and maintain their operations.

Promotion of sustainable tourism: The adoption of sustainable and responsible tourism practices has been promoted. Awareness is being raised about the importance of preserving natural and cultural heritage, as well as promoting community tourism and the development of tourism products that benefit local communities.

Strengthening of digital tourism: Promotion and sale of destinations and tourism services through digital platforms have been encouraged. Websites, mobile applications, and digital marketing campaigns have been created to reach a wider audience and facilitate travel planning and booking online.

These strategies aim to boost the recovery of the tourism industry in Mexico and adapt to the new normality generated by the pandemic. The goal is to foster tourists' confidence, promote economic reactivation, and ensure a safe and appealing experience for visitors.

CONCLUSIONS

The Don Vasco tourist route and its linkage in social network analysis can be successful in offering tourists a more enriching, convenient, and personalized experience, while benefiting local communities and promoting sustainable practices. The adoption of technology and adaptation to the changing needs of travelers can drive the success of such tourist routes.

Furthermore, the route concentrates its linkage with some Magical Towns that could be linked to strengthen rural and local environments through the services provided. Additionally, the analysis can bring about the following linkages:

• Enhancement of tourist experience: A smart tourist route can provide tourists with real-time information, personalized recommendations, and interactive guides using mobile applications, wearable devices, or augmented reality. This enhances the tourist experience by providing them with relevant and contextualized information, facilitating their navigation, and helping them to better discover and enjoy destinations.

• Efficient management of tourism resources: With technology and data, smart tourist routes can help manage tourism resources more efficiently, such as historical sites, monuments, or popular attractions. Reservation and queue management systems can be implemented to reduce wait times, optimize venue capacity, and ensure equitable distribution of visitors over time.

• Conservation and sustainability: Smart tourist routes can promote the conservation of natural and cultural environments by promoting sustainable practices. They can provide information about the importance of preservation, offer sustainable transportation options, promote waste reduction, and encourage participation in responsible tourism activities.

• Local economic boost: A smart tourist route can help promote tourism in lesser-known or visited local areas, distributing the flow of tourists more evenly. This can benefit local communities by generating economic opportunities, creating jobs, and stimulating the development of tourism services such as restaurants, accommodations, and crafts.

• Data collection for decision-making: By implementing a smart tourist route, data on visitor patterns, preferences, and needs can be collected. This data can be analyzed to better understand tourist behavior, identify areas for improvement, tailor tourism offerings, and make informed decisions for tourism development in the area.

Additionally, the smart tourist route in the post-pandemic context can incorporate health safety measures, facilitate visitor flow and capacity management, offer contactless experiences, provide personalized recommendations, and promote sustainable practices. These adaptations will help restore tourist confidence and drive the recovery of the tourism industry safely and sustainably.

BIBLIOGRAPHY

Albicette, M., Baptista, R., Montes, O. (2017). El análisis de redes sociales: ¿qué es? y ¿cómo se usó en el proyecto UFFIP?. INIA. 51 (1). Pp. 51-56. http://www.ainfo.inia.uy/digital/bitstream/item/8201/1/revista-INIA-51-diciembre-2017.-p.51-56.pdf

Ascanio, A. (2009). Rutas gastronómicas chilenas: una aproximación al tema. PASOS: Turismo y Patrimonio Cultural. 7(2). 321-325. https://doi.org/10.25145/j.pasos.2009.07.023

Araya-Pizarro, S. (2021). Incidence of Covid-19 in the behaviour of tourists of the Coquimbo region. Interamerican Journal of Environment and Tourism. 17(2). Pp. 102-112. http://dx.doi.org/10.4067/S0718-235X2021000200102

Aparicio. M. (2013). El reto del turismo en los espacios naturales protegidos españoles: la integración entre conservación, calidad y satisfacción. Tesis Doctoral Universidad complutense de Madrid. Facultad de ciencias económicas y empresariales. Departamento de Comercialización e Investigación de Mercados. https://eprints.ucm.es/id/eprint/20836/

Barón, L., & Gálvez, R. (2016). Ruta cultural turística religiosa en Sahuayo, Michoacán. Programa de Aprovechamiento y Conservación Plan Maestro Vía Verde de Chapala. Instituto Tecnológico y de Estudios Superiores de Occidente. https://docplayer.es/82068095-Ruta-cultural-turistica-religiosa-en-sahuayo-michoacan.html

Barbosa, F., Viegas, C., Santos dos Santos, A., Sellitto, M (2017). Rutas de turismo en la región de la campaña gaúcha El caso de la Estancia del Vino Guatambu en Don Pedrito (RS – Brasil). Estudios y Perspectivas en Turismo. 26 (1). Pp. 718–730. https://www.redalyc.org/pdf/1807/180752116012.pdf

Boffil, H. (2017). Análisis estructural de las redes de cooperación entre actores del alojamiento turístico en Santa Clara. (Trabajo de Diploma). Departamento

de Turismo, Universidad Central Marta Abreu de Las Villas, Santa Clara.

Canto, C. (2000). Nuevos conceptos e indicadores de competitividad territorial para las áreas rurales. Revista Manuales de Geografía de la Universidad Complutense. 20(1). Pp. 69-84. file:///C:/Users/ROSAL/Downloads/ecob,+AGUC0000110069A.PDF.pdf

Campos, G. (2017). La cultura como motor de desarrollo turístico: inventario del patrimonio y diseño de la ruta turística "morón oculto." International Journal of World of Tourism. 4(7). Pp. 35-46. https://doi.org/10.12795/IJWT

Cardoso, L., Pereira, M., Marques, A. (2018). Turismo de raíces rutas de la memória de la diáspora portuguesa. Estudios y Perspectivas en Turismo. 27(1). Pp. 213–232. https://www.redalyc.org/journal/1807/180755394003/

Cabrera. S. (2016). Diseño del corredor ecoturístico para impulsar el turismo sostenible en el cantón el empalme. Trabajo de grado previo a la obtención del título de ingeniería en ecoturismo. Pp. 11-14. Universidad Nacional de Ecuador. https://www.google.com/search?client=firefox-b-d&q=Cabrera.+S.+%282016%29.++Dise%C3%B1o+del+-corredor+ecotur%C3%ADstico+para+impulsar+el+turismo+sostenible+en+el+cant%C3-%B3n+el+empalme.

Chávez, C., Rodríguez, J., Granizo, O., Chiriguayo, J; Ruiz, E., Carrasco, J. (2017). Turismo comunitario, alternativa de desarrollo turístico estudio de caso: estudio de factibilidad para la implementación de una ruta de turismo comunitario de las comunidades shuar atahualpa, shuar nantip y waorani ñoñeno para el cantón francisco de orellana provincia de orellana. European Scientific Journal 13(8). Pp. 200-225. 10.19044/esj.2017.v13n8p200

Chamba, J., López, P., Yanez, J. (2017). Technical feasibility study for the repowering of the tourist route of the stones sector. Gestión Ingenio y Sociedad. 2(2). Pp. 114-117. https://www.coursehero.com/file/p6k17eun/Considerando-de-eje-central-la-ruta-tur%C3%ADstica-Don-Vasco-se-orienta-los/

Ceballos, M. (2019). Entrevista con el encargado del Departamento de la Ruta Turística Don Vasco en Michoacán Miguel Ángel Sevallos el 08/01/2019.

Cerda, A. (2021). Tourism and economic development: the impact of the pandemic. Prolog. ttp://dx.doi.org/10.4067/S0718-235X2021000100001

CODESPA (2013). Programa rutas: La apuesta por un turismo inclusivo en Latinoamérica. Fundación CODESPA y CAF y el Banco de Desarrollo de América Latina en el marco del Programa RUTAS: Turismo Comunitario con Calidad Sostenible en América Latina desarrollado durante enero de 2012 y junio 2013. https://www.codespa.org/app/uploads/modelo-rutas-turismo-rural-comunitario.pdf

Delgado, A., & Pantoja, F. (2015) Valoración del paisaje en una propuesta de turismo sostenible: la "Ruta del Oro", Nariño (Colombia). Cuadernos de geografía. 25(1). Pp. 233-253. DOI: https://doi.org/https://dx.doi.org/10.15446/rcdg.v24n1.50157

Espejo, M., & Salinas, V. (2018). Articulación externa en proyectos culturales fomentados en el marco de la gestión social en gobiernos locales: caso de la gerencia de juventud, deporte, educación, cultura y turismo en la municipalidad de pueblo libre en el período 2015-2018. Tesis de la Pontificia Universidad Católica del Perú facultad de gestión y alta dirección. https://proceedings.ciaiq.org/index.php/ciaiq2018/article/view/1726

Félix, A., García, N., Vera, R. (2020). Participatory diagnosis of the tourism sector in managing the crisis caused by the pandemic (COVID-19). Interamerican Journal of Environment and Tourism. 16(1). Pp. 66-78. http://dx.doi.org/10.4067/S0718-235X2020000100066.

Fernández, P., & Díaz, E. (2018). Development of stakeholder analysis protocol and metrics using the perspective of social network analysis (SNA). 22nd International Congress on Project Management and Engineering Madrid, 11th – 13th July 2018. Pp. 1-13. http://dspace.aeipro.com/xmlui/bitstream/handle/123456789/1556/AT01003_2018.pdf?sequence=1&isAllowed=y

Fernández, G., & Guzmán, A. (2005). Patrimonio industrial y rutas turísticas culturales: algunas propuestas para Argentina. Cuadernos de Turismo,

15(1). Pp. 97-112. https://www.redalyc.org/pdf/398/39801506.pdf

Folgado-Fernández, R., Campón-Cerro, A., Hernández-Mogollón J. (2017). Productos gastronómicos con identidad y desarrollo del destino turístico. un estudio sobre rutas del queso en España. International Journal of Scientific Management and Tourism. 3(1). Pp.93-109. file:///C:/Users/ROSAL/Downloads/Dialnet-ProductosGastronomicosConIdentidadYDesarrolloDelDe-5975069.pdf

García, A. (2017). La puerta de Latinoamérica (desde las rutas argentinas): san salvador de Jujuy en geografías audiovisuales amplias. Folia histórica del noroeste. 30(1). Pp. 95-124. http://dx.doi.org/10.30972/fhn.0302724

García, M., Martínez, O., García, J. (2018) La realidad turística actual de Santiago de Compostela. Análisis de las cifras de llegada de visitantes y prognosis de futuro. International Journal of Scientific Management and Tourism. 4(3). Pp. 167-176. https://dialnet.unirioja.es/servlet/articulo?codigo=6773947

Gobierno del Estado de Michoacán (2016). Ruta Tata Vasco o Don Vasco. https://www.gob.mx/sectur/articulos/ruta-tata-vasco

Gobierno de México (2020). Ascendería México, de manera coyuntural, al tercer lugar mundial en la recepción de turistas. https://www.gob.mx/sectur/prensa/ascenderia-mexico-de-manera-coyuntural-al-tercer-lugar-mundial-en-recepcion-de-turistas

Gómez, M. (2017). Proyecto de ruta turístico-cultural. Ruta del emperador Carlos V en Mallorca. Tesis para el Grado de Turismo. Universidad de Baleares, España. https://dspace.uib.es/xmlui/bitstream/handle/11201/148138/Roig_Gomez_Casero_Marta.pdf?sequence=1&isAllowed=y

Gonzales. M. (2011). Una propuesta para desarrollar turismo rural en los municipios de Zacatecas, México: las rutas agro-culturales. Turismo y Patrimonio cultural. 9(1). Pp. 129-145. https://doi.org/10.25145/j.pasos.2011.09.011

Hanneman. R. (2001). Introduction to Social Network Methods. Capítulo tercero: representación de redes sociales mediante grafos. Departamento de Sociología de la Universidad de California Riverside. http://wizard.ucr.edu/~rhannema/networks/text/textindex.html

Hernández, J. (2011). Los caminos del patrimonio. Rutas turísticas e itinerarios culturales. PASOS de turismo y patrimonio cultural. 9(2). Pp. 225-236. https://doi.org/10.25145/j.pasos.2011.09.021

Hiriart, C., & Mínguez, M. (2016). Coyuntura, retos, oportunidades y estrategias para el desarrollo de un producto turístico cultural en México: la ruta don vasco en Michoacán. International Journal of Scientific Management Tourism. 2(3). Pp. 369-396. file:///C:/Users/ROSAL/Downloads/Dialnet-CoyunturaRetosOportunidadesYEstrategiasParaElDesar-5665940.pdf

Korstanje, M. (2020). El COVID-19 y el turismo rural: una perspectiva antropológica. Dimensiones Turísticas. 4(1). Pp.179-196. https://doi.org/10.47557/CKDK5549

Kuz, A., Falco, A., Giandini, R. (2016). Análisis de redes sociales: un caso práctico. Computación y Sistemas. 20(1). Pp. 89-106. https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=web&cd=&ved=0CAIQw7AJahcKEwiA_Pi8i7z_AhUAAAAAHQAAAAAQAw&url=http%3A%2F%2Fwww.scielo.org.mx%2Fscielo.php %3Fscript%3Dsci_arttext%26pid%3DS1405-

Litvinova, O., & Voronina, O (2018). The inclusion of historical routes in tourist and recreational potential of the Siberian region. IOP Conf. Series: Earth and Environmental Science 204(1). Pp.1-6. 10.1088/1755-1315/204/1/012026

Maak, K. (2009). El camino de Santiago como posible motor turístico en zonas rurales de escasos recursos: el caso de Brandeburgo. Cuadernos de Turismo, 23(1). Pp.149-171. https://revistas.um.es/turismo/article/view/70081

Madera, J. (2020). Turismo rural: desafíos de las comunidades rurales en el contexto del coVid-19. Dimensiones Turísticas. 4(7). Pp.181-190. https://doi.org/10.47557/YISD4269

Mafé, A., Sanagustín, M., Doménech, F. (2016). Valencia: capilla del santo cáliz. destino de peregrinos de la ruta europea del santo grial. International Journal

of Scientific Management Tourism. 2(2). Pp. 189-207. file:///C:/Users/ROSAL/Downloads/Dialnet-Valencia-5665883.pdf

Meina, X., & Terressa, J. (2008). Turismo enológico y rutas del vino Cataluña. Pasos de turismo y Patrimonio cultural 6(3). Pp.493-509. https://doi.org/10.25145/j.pasos.2008.06.037

Mira, J. (2017). Castles as a tourist cultural product in the province of Alicante (Spain): actions, initiatives, and proposals. Structural Studies, Repairs and Maintenance of Heritage Architecture XV. WIT Transactions on The Built Environment. 171(1). Pp. 171-79. DOI: 10.2495/STR170151

North, D. (1993). Instituciones, cambio institucional y desempeño económico. Fondo de Cultura Económica. México.

OMT, (2020). El turismo internacional cae un 70% mientras las restricciones de viaje afectan a todas las regiones. HTTPS://WWW.UNWTO.ORG/ES/TAXONOMY/TERM/347

OMT, (2021). 2020: el peor año de la historia del turismo, con mil millones menos de llegadas internacionales. En La organización mundial del turismo. https://www.unwto.org/es/taxonomy/term/347

Palafox, A., y Rubí, F. (2020). La gota que derramó el vaso en el turismo en Quintana Roo, México: precariedad laboral y COVID-19. Dimensiones Turísticas. 4(1). Pp. 131-148. https://doi.org/10.47557/IMGO5677

PE (2016). Plan Estratégico de la Ruta Don Vasco. SECTUR Gobierno de Michoacán, 2016. https://www.gob.mx/sectur

Quadratin, (2020). Conoce Silvano avances del Kilómetro Cero de la Ruta Don Vasco. https://www.quadratin.com.mx/sucesos/conoce-silvano-avances-del-kilometro-cero-de-la-ruta-don-vasco/

RAE (2019). Real Academia Española (RAE). Diccionario de la lengua española. https://dle.rae.es/

Ruta Don Vasco, (2020). Página web oficial de la Ruta Don Vasco. http://rutadonvasco.com/es/restaurantes/todas

Sánchez, A., Propin, E., Casado, J. (2020). Tipología de territorios turísticos en México según incidencia de COVID-19. Dimensiones Turísticas. 4(1). Pp. 9-36. https://doi.org/10.47557/ZXVV5344

Salazar, K., Serrano, S., Calle, M. (2021). Analysis of the current situation of the hotel sector in the face of the COVID-19 health crisis. Case: Machala-Ecuador. Interamerican Journal of Environment and Tourism. 16(1). Pp.2-13. http://dx.doi.org/10.4067/S0718-235X2021000100002

SEGITTUR. (2017). Destinos Turísticos Inteligentes (DTI): Visión Estratégica. La Sociedad Estatal para la Gestión de la Innovación y las Tecnologías Turísticas, S.A. Pp. 1-38. Barcelona, España. https://www.segittur.es/destinos-turisticos-inteligentes/

UNWTO (2020). Panorama del turismo internacional 2019. Organización Mundial del Turismo. https://www.e-unwto.org/doi/pdf/10.18111/9789284421237

UNWTO (2021). Nuestra Historia. Disponible en web: https://www.unwto.org/es/omt-historia

UNWTO (2021). Glosario de términos de turismo. https://www.unwto.org/es/glosario-terminos-turisticos.

UNWTO (2020). El turismo en la Agenda 2030. https://www.unwto.org/es/turismo-agenda-2030

Verduzco, B. (2020). Estimación de la vulnerabilidad de los municipios turísticos de Jalisco ante la pandemia del COVID-19 y opciones de política pública. Dimensiones Turísticas. 4(1). Pp.93-130. https://doi.org/10.47557/WDDL6015

Zepeda, A., Medina, L., Flores, A. (2020). Política turística ante el COVID-19: el caso de México. Dimensiones Turísticas. 4(1). Pp. 69-94. https://doi.org/10.47557/WOXQ7908

Zequeira, C. (2009). Redes de relaciones entre actores del alojamiento turístico en Trinidad. Departamento Turismo. Tesis de la Carrera Licenciatura en Turismo. Universidad Central "Marta Abreu" de Las Villas. http://bdigital.unal.edu.co/51542/

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Research paper

Procedure to evaluate the impact of crises on hotel facilities

Procedimiento para la evaluación del impacto de las crisis en instalaciones hoteleras

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ABSTRACT

The hotel industry faces a series of challenges and crisis situations that can have significant repercussions on its operations, profitability, and reputation. From natural disasters such as earthquakes and hurricanes to economic crises and public health situations like pandemics, these contingencies can cause significant disruptions in hotel operations and affect guest demand. It is essential to understand how crises impact hotel facilities and what measures can be taken to mitigate negative effects and achieve a rapid recovery. The main objective of this research is to assess the impacts of the COVID-19 crisis on the Brisas Guardalavaca hotel through a procedure that collects and analyzes relevant data to evaluate the direct and indirect impacts of the crisis on the hotel and identify its main strengths and weaknesses in this regard. Indeed, the results indicate a negative impact caused by the pandemic and identify areas for implementing improvement actions.

Keywords: *crisis, impact, impact evaluation, crisis management, hotel, COVID-19, procedure, tourism.*

RESUMEN

La industria hotelera se enfrenta a una serie de desafíos y situaciones de crisis que pueden tener repercusiones significativas en su funcionamiento, rentabilidad y reputación. Desde desastres naturales como terremotos y huracanes, hasta crisis económicas y situaciones de salud pública como pandemias, estas contingencias pueden causar interrupciones significativas en las operaciones hoteleras y afectar la demanda de los huéspedes. Es esencial comprender cómo las crisis impactan a las instalaciones hoteleras y qué medidas se pueden tomar para mitigar los efectos negativos y lograr una rápida recuperación. El objetivo principal de esta investigación es evaluar los impactos provocados por la crisis del COVID-19 en el hotel Brisas Guardalavaca a través de un procedimiento que recopila y analiza datos relevantes para evaluar los impactos directos e indirectos de la crisis en el hotel e identificar las principales fortalezas y debilidades de la instalación en este sentido. Precisamente, los resultados arrojan un impacto negativo provocado por la pandemia e identifica áreas para la implementación de acciones de mejora.

Palabras clave: crisis, impacto, evaluación de impactos, gestión de crisis, hotel, COVID-19, procedimiento, turismo

INTRODUCTION

Tourism has been one of the economic sectors most affected by the COVID-19 pandemic. In 2020, the Economic Commission for Latin America and the Caribbean (ECLAC) estimated that the effects of COVID-19 on global tourism would be greater than those caused by the 2008 financial crisis (CEPAL, 2020): between 100 and 120 million jobs at risk; billion-dollar losses in tourism exports; and a reduction of 1.5% to 2.8% of the global Gross Domestic Product (GDP), according to the ONU (2020).

In the current context of an interconnected and globalized world, crises have proven to be inevitable challenges affecting various industries, including the hotel sector (Ramos-Giral et al., 2022). Hotel facilities, as fundamental pillars of tourism and hospitality, face a series of significant impacts during times of crisis, ranging from decreased demand and changes in consumption patterns to operational challenges and destination image issues (Agag et al., 2022; Ramos-Giral et al., 2022; Wang et al., 2023).

Hence, the assessment of the impact of crises on hotel facilities is a matter of vital importance in today's landscape marked by uncertainty and volatility (Doğan et al., 2023). Crises, whether economic, political, social, or health-related, have the potential to generate devastating effects on the hotel industry, affecting both independent hotels and hotel chains globally (Melián-Alzola et al., 2020).

During an economic crisis, the demand for accommodation is affected due to a decrease in available income for travel and changes in consumption patterns (Yurievna, 2022). Hotels experience a decline in bookings, cancellations, and a reduction in occupancy, directly impacting their revenue and profitability (Deriu et al., 2022). Additionally, operating costs such as supplies and labor may increase, exerting further pressure on hotel profitability (Okumus et al., 2005). Similarly, the decreased attractiveness of a destination due to a crisis, combined with restrictive measures implemented to combat it, has the potential to significantly impact local economies dependent on tourism (Ferreira et al., 2023).

Political and social crises also influence accommodation demand (Sönmez, 1998). Political conflicts, social tensions, and situations of instability can lead to the cancellation of events, conventions, and business trips, negatively impacting hotel occupancy (Türkcan & Erkuş-Öztürk, 2019). Likewise, destinations affected by political crises may experience a decline in tourist arrivals, directly affecting local hotels and the tourism economy overall (Bazazo et al., 2017).

The global health crisis caused by the COVID-19 pandemic has had an unprecedented impact on the hotel industry (Fang et al., 2021). Travel restrictions, border closures, and social distancing measures have led to a drastic decline in accommodation demand (UNWTO, 2021). Hotels have been forced to temporarily close or operate with greatly reduced occupancy, resulting in significant economic losses (Farmaki et al., 2020). Additionally, stricter health and safety protocols have been implemented, requiring additional investments to adapt facilities and ensure the protection of guests and staff (OECD, 2020).

Despite the challenges posed by crises, the resilience and recovery capability of hotel facilities are key aspects for their long-term survival (Soliku et al., 2021). Hotels that have adopted effective crisis management strategies and demonstrated flexibility to adapt to changing circumstances have managed to minimize negative impacts and position themselves for a swift recovery (Okafor et al., 2022). Assessing the impact of crises on hotel facilities involves analyzing not only immediate effects such as a drop in demand and revenue but also long-term impacts like destination reputation and the loss of regular customers (Yu et al., 2022). It is crucial to examine the ability of the hotels to maintain business continuity, implement effective marketing and communication strategies, and adapt to the new needs and preferences of guests (Ritchie, 2004).

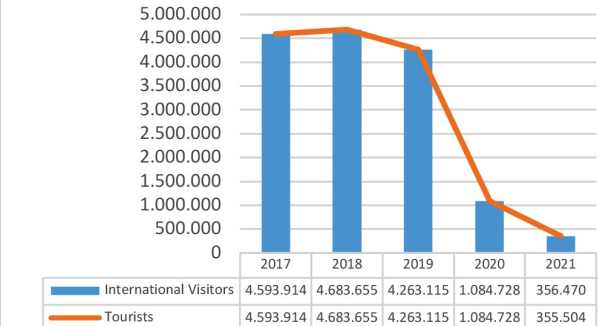
A research conducted in the ScienceDirect database of Scopus using the search equation "crisis AND tourism AND impact" identified 198 resources associated with the topic indexed in the database. Of these, only scientific articles were selected, totaling 174. The analysis of their keywords identified only 6 that address the evaluation of crisis impacts on tourism and focus on specific processes in the industry: cruise sector, communication, and customer satisfaction.

Impact of the COVID-19 crisis on cuban tourism

For Cuba, the impact of the crisis on the tourism sector was severely affected due to declines in key tourism indicators in the territory (ONEI, 2022). According to data provided by the National Office of Statistics (ONEI in spanish), in 2020, Cuba experienced a drastic decrease in the arrival of international

visitors to the island, losing approximately 75% of arrivals compared to 2019 (Figure 1). In 2021, the situation did not improve, as the country only managed to recover 8.36% of the arrivals from 2019. The behavior concerning international visitors considered tourists was similar. Aligned with these results, the loss of visitors by regions followed a similar pattern.

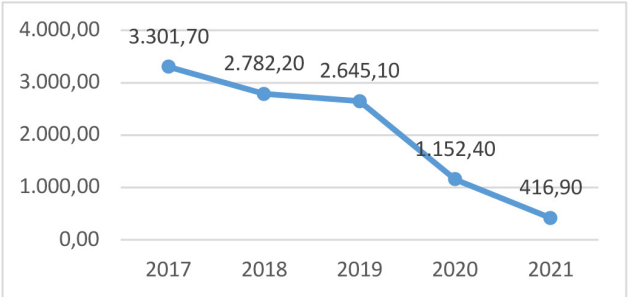
Figure 1: Arrival of International Visitors and Tourists to Cuba



	2017	2018	2019	2020	2021
International Visitors	4.593.914	4.683.655	4.263.115	1.084.728	356.470
Tourists	4.593.914	4.683.655	4.263.115	1.084.728	355.504

On the other hand, the island suffered losses valued in millions of USD due to a decrease in international tourism income (Figure 2), despite the country showing a slight decline in this indicator since 2017. However, following the impact of COVID-19 in 2020, the island lost 1492.7 million USD in income from international tourism compared to 2019. In 2021, the situation did not improve, and Cuba missed out on 2228.2 million USD in income compared to 2019.

Figure 2: Total Income Associated with International Tourism



The previous analyses demonstrate that the effects of the crisis triggered by the COVID-19 pandemic on Cuban tourism were not unnoticed, leading to the loss of traditional indicators for the island, such as the arrival of international tourists, tourism-related income, among others.

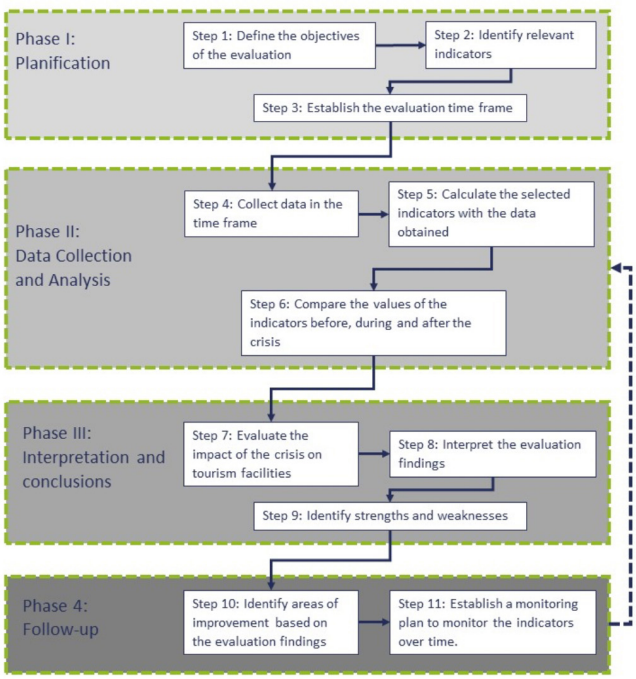
Therefore, it becomes necessary to assess the impacts that crises generate on tourist facilities, precisely to determine to what extent they have been affected and the strategies adopted by these facilities to mitigate the medium and long-term effects caused by the crisis.

Hence, this research aims to evaluate the impact caused by the COVID-19 crisis on Brisas Guardalavaca Hotel through the partial application of a procedure designed for this purpose. This procedure integrates a set of outcome indicators covering the main areas of the facility and employs statistical techniques for processing and understanding the data, facilitating the identification of the hotel's key strengths and weaknesses following the crisis.

METHODOLOGY

The procedure proposed by Ramos-Giral (2023) (Figure 3) aims to assess the impact of crises on hotel facilities by analyzing a set of indicators identified through a literature review. This allows tourism operators to identify key areas that are more or less affected after the impact of a crisis.

Figure 3: Procedure to evaluate the impact of crises on hotel facilities



Furthermore, this procedure was partially applied at Brisas Guardalavaca Hotel, a four-star facility that is part of the CUBANACAN Group under the Ministry of Tourism (MINTUR) of the Republic of Cuba. The facility comprises 437 rooms distributed in two sections: the hotel, founded in 1994 (231 rooms), and a section consisting of nine villas (206 rooms), founded in 1998, with each villa referring to the first seven villas established during the colonial period, with the addition of Remedios and Gibara. The facility is located on the beachfront in the Guardalavaca tourist pole, belonging to the Banes municipality in the Holguín province.

RESULTS AND DISCUSION

The proposed tool to assess the impact of crises on hotel facilities is divided into four phases, comprising a total of 11 steps. Below is a description of the designed procedure.

Phase I: Planning

The planning phase aims to establish the main objective of the study, particularly associated with the type of crisis under investigation. It seeks to identify the main indicators to assess and the timeframe of the study, allowing the recognition of the three phases of crises (pre-crisis, crisis, and post-crisis). This phase consists of three steps:

Step 1: Define the evaluation objectives.

The crisis triggered by the impact of the COVID-19 virus pandemic in Cuba has left significant marks on the Cuban economy, especially in the management of tourism on the island, where multiple factors have influenced.

On one hand, the economic crisis exacerbated by the country's situation has resulted in shortages in the supply of hotel facilities. Additionally, the still existing sanctions imposed by former U.S. President Donald Trump on the island in 2022 have hindered the importation and supply of products to Cuba.

In this scenario, and based on the current results achieved by Brisas Guardalavaca Hotel in the last period, the objective of this study is to assess the impact caused by the COVID-19 health crisis on the facility.

Step 2: Identify relevant indicators.

For the study, 15 indicators are selected, as listed below:

- Average length of stay
- Price-to-quality ratio index
- Occupancy rate
- Position on websites and review platforms
- Average length of stay
- Probability of repeat visits
- Repeat visit rate
- Total income
- Occupancy index by segment
- Percentage of local employment
- Average complaint or claim rate
- Employee turnover index
- Seasonal occupancy index
- Contribution to sustainability
- Customer satisfaction index

Step 3: Establish the temporal framework for the evaluation.

The temporal framework for this evaluation is established based on events in the Cuban tourism sector. Three moments corresponding to the pre-crisis, crisis, and post-crisis (recovery) stages are defined. Table 1 identifies these moments.

Table 1: Temporal framework of the study

Stage	Characteristics
PRE-CRISIS 2018-2019	• Normal operations
CRISIS 2020-2021	• January/2020: First cases in China • March/2020: First cases in Cuba • April/2020: Border closure. Tourism halted • September/2020: Slight operations with the domestic market • November/2020: First operations with the international market • January/2021: Start of the second wave, border closure. New halt to tourism • November/2021: Arrival of the first flights. Tourism reopening
POST-CRISIS 2022-Present	• Normal operations with difficulties caused by the crisis

This first phase will establish the foundations for the evaluation by determining the indicators to assess in the study and the temporal framework.

Phase II: Data Collection and Analysis

Phase II aims to analyze the data collected for the evaluation of each indicator within the temporal framework, allowing the establishment of comparison patterns. This phase consists of 3 steps.

Step 4: Collect data from the facility within the temporal framework.

For the study, it was necessary to consult a group of documents that provided the required data for the research. These include:

- Annual balance of Brisas Guardalavaca Hotel (2018-2022)
- Commercial results of Brisas Guardalavaca Hotel (2018-present)
- Economic and financial analyses of Brisas Guardalavaca Hotel (2018-2022)
- Quality balance of Brisas Guardalavaca Hotel (2018-2022)
- Analysis of the behavior of energy carriers at Brisas Guardalavaca Hotel (2018-present)
- Human Resources indicators of Brisas Guardalavaca Hotel (2018-2022)
- Analysis of the environmental management of Brisas Guardalavaca Hotel (2018-2022)
- Record of control of users of recreational sports facilities at Brisas Guardalavaca Hotel (2018-2022)

Step 5: Calculate the selected indicators using the collected data.

The processing of the collected data enabled the calculation of the indicators. For a better analysis, the indicators were divided into groups based on their nature (commercial indicators, quality indicators, economic indicators, Human Resources´s indicators, leisure indicators, and enviromental impact indicators).

Step 6: Compare the values of the indicators before, during, and after the crisis.

Number of stays

The data shows the negative impact that the COVID-19 pandemic had on the number of stays in days at the hotel. There was a significant decrease in 2020 and a partial recovery in the following years. However, the number of stays in 2021 and 2022 is still below pre-pandemic levels, highlighting the need to adapt to changing conditions and work to attract more guests as the situation improves.

Occupancy Rate

The year 2020 was particularly challenging, with a significant drop in occupancy. However, a gradual recovery is observed in the following years, although the occupancy rate has not yet reached pre-pandemic levels. The decrease in 2022 may indicate the need to adjust business strategies and adapt to changing market conditions.

Average Length of Stay

As the effects of the pandemic diminished, there was a gradual improvement in the duration of stays and a partial recovery in room density in the following years. However, occupancy has not yet reached pre-pandemic levels, which may require adjustments in marketing and promotional strategies to attract more guests.

Repeat Visit Rate

There is variation in the repeat visit rate of Brisas Guardalavaca Hotel over the years. In 2020, the lowest repeat visit rate was recorded, due to external factors such as the COVID-19 pandemic, significantly impacting the hotel industry. However, in 2022, the repeat visit rate increased, which could be due to increased customer loyalty or other factors motivating them to return to the hotel.

Occupancy Index by Segment

There was a significant decrease in the number of foreign customers in 2020 and a gradual recovery in the following years. On the other hand, domestic customers showed a higher presence at the hotel during the pandemic and an increase in the following years. As the situation improves and travel restrictions are eased, it is expected that the demand for international tourism will further recover.

Average Complaint or Claim Rate

The data reveals fluctuations in the average complaint and report rate over the years, with decreases in some

years and increases in others. These numbers may indicate changes in service quality, customer satisfaction, or other factors that can affect guests' experience at Brisas Guardalavaca Hotel.

Occupancy Index by Season

The data reveals variability in the occupancy of Brisas Guardalavaca Hotel during both high and low seasons over the studied years. Some important aspects to highlight are:

- General Trend: Overall, there is a progressive decrease in occupancy during the high season from 2018 to 2021, followed by a slight recovery in 2022. In the low season, there is also a decrease in the early years, followed by a recovery in 2022.

- Impact of the Pandemic: The data shows a sharp decrease in occupancy during both high and low seasons in 2020, which can be attributed to the impacts of the COVID-19 pandemic on the tourism industry.

- Annual Variations: There are annual fluctuations in occupancy, which can be influenced by factors such as economic conditions, competition from other tourist destinations, travel policies, among others.

Customer Satisfaction Index:

In 2018, a very positive rating was achieved, with a result of 98.39%. For 2019, it remains high, though slightly lower compared to the previous year. Still, a rating of 97.1% indicates significant customer satisfaction. In 2020, the customer satisfaction index remains at a high level with a rating of 97%. Despite challenges and changes due to the pandemic, customers continue to show generally positive satisfaction. In 2021, there is a decrease in the customer satisfaction index compared to previous years. However, a rating of 95.2% still indicates generally positive satisfaction, albeit with a slight decrease. In 2022, there is an increase in the customer satisfaction index compared to the previous year. With a rating of 98.1%, it indicates a high level of customer satisfaction.

Price-to-Quality Ratio Index:

The results achieved in each of the years show a positive relationship based on customer perception.

Position on Websites and Review Platforms:

The data shows how, over the temporal framework, the facility improved its position in the TripAdvisor ranking, which is considered negative. Similarly, there was a decrease in evaluations from HolidayCheck and TopHotels, which is also considered negative.

Probability of Repeat Visits:

The probability of repeat visits to Hotel Brisas Guardalavaca has shown a trend of slight decline in recent years, although it remains with results exceeding 90%.

Total Income:

When analyzing this indicator, it can be observed that the years 2020 and 2021 were highly affected, with 2021 being the year with the lowest income, only 18.4% compared to 2019. However, the hotel has been recovering satisfactorily in this indicator.

Percentage of Local Employment:

Hotel Brisas Guardalavaca has maintained stability in the average number of workers in the facility. Along with this, it ensures employment for 14 localities in the Holguin territory, where 23.25% of the staff comes from workers in localities near the hotel.

In general, the fact that a significant percentage of Hotel Brisas Guardalavaca's workers are locals has a positive impact on the locality. It contributes to job creation, stimulates the economy, promotes skill development, and strengthens the connection between the hotel and the community. This can have benefits for both the hotel and the locality in terms of economic development and general well-being.

Personal Turnover Rate:

The data reveals an inverse relationship between the average number of workers and the personnel turnover rate. As the average number of workers decreased, the turnover rate increased, and vice versa. This may indicate greater job stability when the size of the workforce is larger. Additionally, the pattern of the personnel turnover rate throughout the period remained below 10%, even during

the years of the pandemic's impact (2020-2021).

Contribution to Sustainability:

Regarding the facility's contribution to sustainability, the indicator is evaluated based on assessments of the use of energy carriers in the stages, as well as water consumption.

There is a decreasing trend in the consumption of different energy carriers by the hotel. The highest rates of decrease in consumption are recorded between the years 2020 and 2021 due to the long-term closure of the facility due to the cessation of tourist operations due to the impact of COVID-19. However, after that, it is observed that the hotel, in 2022, is approaching regular patterns of energy carrier consumption.

In the case of water consumption, the hotel shows a general decreasing trend, as water consumption decreases significantly from 2018 to 2021, with the lowest consumption in 2021. However, in 2022, there is an increase compared to the previous year. The year 2020 shows a notable decrease in water consumption compared to previous years. This decrease is related to the restrictions and operational changes caused by the COVID-19 pandemic. After the decrease in 2021, water consumption increased again in 2022, due to changes in the hotel's operations returning to normal.

In general, the impact of COVID-19 on the hotel caused a significant reduction in the consumption of energy carriers and water in the facility, representing a positive change in that period. However, the hotel is starting to show a return to normal consumption patterns, primarily due to the resumption of normal operations in that year.

Phase III: Interpretation and Conclusions

This phase focuses on determining the assessment of the impact of the crisis on the hotel facility based on the results obtained in the evaluation of each indicator. It also consists of three steps.

Step 7: Assessing the Impact of the Crisis on Hotel Facilities:

After evaluating each indicator, the general impact of the COVID-19 crisis on Hotel Brisas Guardalavaca is determined based on Table 2, which includes the 15 evaluated indicators and their results. Once the data is completed, the percentage representing the sum of positive and negative impacts of the total indicators is calculated. According to the author's proposal, if the positively evaluated indicators represent between 50% and 85% of the total, it is considered that the crisis had a positive impact on the tourist facility. Similarly, for negative evaluation, if it falls between 50% and 85%, then it is considered that the crisis had a negative impact on the facility. Based on the previous analyses, it is considered that 60.00% (9) of the indicators were negatively evaluated (Table 2), so the impact of COVID-19 on Hotel Brisas Guardalavaca was negative.

Step 8: Interpretation of Evaluation Findings:

After analyzing all the indicators and precisely determining that COVID-19 caused 9 out of 15 indicators to be negatively evaluated, leading to a general negative impact on the facility, further analyses can be made:

Table 2. Overall Evaluation of the Impact of the COVID-19 Crisis on Hotel Brisas Guardalavaca:

Indicators	Observations	EVALUATION	
		POSITIVE	NEGATIVE
Stay Days	Drastic fall in 2020 and 2021		X
Occupancy Rate	Drastic fall in 2020 and 2021		X
Average Stay Time	Drastic fall in 2020 and slight recovery in 2021		X
Repeat Rate	Drastic fall in 2020 and slight recovery in 2021		X
Segmental Occupation Index	Drastic fall in 2020 and 2021		X
Average Complaint Rate	High rates in all years except during the pandemic	X	
Seasonal Occupancy Index	High variability and decrease in 2020 and 2021		X
Customer Satisfaction Index	High indices in all years	X	
Price-Quality Ratio Index	High indices in all years	X	
Position on Websites and Reviews	Trend to decrease in all years	X	

Repeat Probability	Trend to decrease in all years		X
Total Revenues	Drastic fall in 2020 and 2021		X
Percentage of Local Employment	Remained stable	X	
Employee Turnover Index	Remained stable	X	
Contribution to Sustainability	During COVID-19, a decrease in energy carriers consumption	X	
	Total	6	9
	% Total	40.00	60.00
	Evaluation	NEGATIVE	

1. Occupancy Rate: The hotel's occupancy rate has experienced fluctuations over the years. In 2020, due to the COVID-19 pandemic, the occupancy rate was significantly low, reaching only 37.70%. However, in 2021, despite the hotel operating for only 4 months, the occupancy rate recovered and reached 85.10%.

2. Stay Days: The total number of stay days has decreased dramatically in 2021, as the hotel was only open for 4 months. It went from 129,949 in 2020 to 42,772 in 2021.

3. Average Nights: The average number of nights per stay has consistently decreased in recent years. In 2021, it was only 2.93 nights per stay.

4. Room Density: Room density has experienced some fluctuations but has generally remained relatively stable. In 2021, the density was 1.95 persons per room.

5. Market Type: The number of foreign tourists has significantly decreased in 2021 due to travel restrictions related to the pandemic. On the other hand, the number of domestic tourists has increased.

6. Repeat Rate: The repeat rate, indicating the proportion of guests returning to the hotel, has been relatively stable in recent years, with a slight increase in 2021.

7. Average Complaint Rate: The average complaint rate has consistently decreased in recent years, indicating an overall improvement in customer satisfaction.

8. Seasonal Occupancy Rate: The occupancy rate varies by season. Generally, the high season has a higher occupancy rate than the low season.

9. Revenue: The hotel's revenue has experienced significant fluctuations. In 2021, despite limited operation, revenue decreased dramatically due to the closure of operations.

10. Staff Turnover: Staff turnover has been relatively stable, with minimal changes in recent years.

11. Local Employees: 23.25% of employees are local, which is positive in providing greater community involvement in local tourism operations.

12. Customer Satisfaction Index: The customer satisfaction index has been generally high, although there was a slight decrease in 2021.

13. Price-Quality Ratio Index: The price-quality ratio index has remained high overall, with a slight decrease in 2021.

14. Contribution to Sustainability: There is a reduction in resource consumption in 2021 due to operational limitations. This decrease can be considered a positive contribution to sustainability. However, there are still areas for improvement to continue moving towards more sustainable practices, especially in terms of energy, fuel, and water consumption.

Step 9: Identify Strengths and Weaknesses.
Strengths:

- Customer Satisfaction Index: The hotel has maintained high levels of customer satisfaction over the years, which is a positive sign of the quality of its services and the level of customer care.

- Average Incomes: The data shows a gradual increase in the average income of tourists in the hotel over the years, indicating possible growth in the tourism sector and an improvement in the average spending of visitors.

- Repetition Rate: The hotel has managed to maintain a relatively stable repetition rate, implying that guests are satisfied and choose to stay at the hotel again on future visits.

- Room Density: Room density has remained stable over the years, indicating effective capacity management and a comfortable lodging experience for guests.

- Price-to-Value Index: The hotel has maintained a high price-to-value index, indicating that guests consider they receive good value for their money in terms of service quality and offered prices.

- Local Workers: The hotel has a significant percentage of local workers, which can be a strength in promoting local community participation and economic development, as well as providing an authentic experience and local knowledge to guests.

Weaknesses:

- Stay Days and Average Nights: The number of stay days and the average nights per stay have significantly decreased in recent years, especially in 2021 due to the reduction in the hotel's operating duration. This may indicate a possible decline in demand or guest preference for shorter stays.

- Staff Turnover: Although staff turnover has been relatively stable, the fact that it increased in some years, such as in 2019 and 2022, may be a sign of potential challenges in talent management and staff retention.

- Average Complaint Rate: Although it has decreased in recent years, the hotel has recorded an average complaint rate, which may indicate possible areas for improvement in service quality and overall guest satisfaction.

- Low Season Occupancy Rate: The hotel has experienced very low occupancy rates during the low season, especially in 2020 and 2021. This suggests the need to develop effective marketing and promotional strategies to attract more guests during these periods.

DISCUSSION

This research examined the impact of crises on tourist facilities, with a particular focus on the behavior of hotels during such situations and their ability to recover. The study centered on the crisis triggered by COVID-19 and assessed how it affected 15 key indicators of tourism operation at the Brisas Guardalavaca Hotel. A significant decrease in occupancy rate and revenue was found, although the hotel's ability to maintain high levels of customer satisfaction and retain part of its staff was highlighted.

Similarly, critical areas requiring attention were identified, such as the development of effective strategies to increase occupancy rates during the low season and improve sustainability practices. Despite the demonstrated resilience, ongoing challenges are recognized, such as the need to adapt marketing strategies and enhance long-term competitiveness. It is important to note that the research has limitations, particularly in the selected sample, but there is believed to be potential to extend the analysis to other facilities to establish comparisons and demonstrate the adaptability of the procedure to diverse conditions.

However, other studies gathered in the scientific literature have sought to assess how different situations have similarly impacted tourism operations, as seen in the articles by Meneghello (2023) and Nusantara et al. (2021).

The study of Meneghello (2023) was conducted using a correspondence analysis approach to investigate the relationships between respondents (visitors, operators, and residents) and the values associated with tourist landscapes in the Riviera del Brenta, a region near Venice in Italy, during the COVID-19 pandemic. This method allowed for the combination of variables and the unraveling of hidden dimensions that describe clusters in terms of spatial and social participation in this specific context.

The impact assessment was conducted using correspondence analysis to identify and analyze the relationships between the different actors involved in tourist landscapes during the pandemic in the Riviera del Brenta. Perceptions and attitudes of visitors, tour operators, and local residents were examined, allowing for the identification of significant patterns based on the responses of stakeholders in this area near Venice, Italy.

The impacts of the pandemic on the tourist landscapes of the Riviera del Brenta are analyzed from the perspective of different actors, including visitors, tour operators, and local residents. Effects are explored in terms of perception and valuation of tourist landscapes, community participation in destination management during the crisis, and adaptation strategies of tourist actors in this Italian region. The main contributions of the study include a better understanding of dynamics and relationships in tourist landscapes in times of crisis in this specific context, although limitations related to the scope of the sample, the representativeness of participants, and the limitations of correspondence analysis are acknowledged.

Meanwhile, Nusantara et al. (2021) adopts a single case study approach to assess the impacts of changes in tourism development policies in Surakarta. Using semi-structured interviews with seven key stakeholders, the aim is to explore perceptions and assessments of how modifications in tourism policies have influenced tourism and cultural development in the region. A georeferenced online questionnaire was employed to gather quantitative and qualitative data on perceived and practiced landscapes in the area.

The impact assessment focuses on various aspects of economic, cultural, and social development in Surakarta resulting from changes in tourism development policies. Stakeholders' perceptions regarding the preservation of traditional culture, tourism infrastructure, destination authenticity, and community participation in decision-making are examined. This qualitative analysis seeks to capture the complexity of impacts and perspectives of the involved participants.

The contributions of the study include a deeper understanding of the evolution of tourism development strategies in Surakarta, from preserving traditional culture to modernizing tourism infrastructure. Additionally, both positive and negative effects of tourism development policies in the city are highlighted, emphasizing the importance of stakeholder participation in decision-making. However, limitations such as sample size and potential response bias are identified, which could affect the generalization of findings to other tourism contexts.

The analyzed studies provide a detailed and valuable insight into the impact of various situations on tourism operations in different geographic contexts. The study on Hotel Brisas Guardalavaca stands out for its specific focus on the COVID-19 crisis and its impact on tourism facilities, identifying critical areas requiring attention. However, it is acknowledged that the limitations of the sample need to be considered.

On the other hand, the studies by Meneghello (2023) and Nusantara et al. (2021) explore the effects of changes in tourism development policies in the Riviera del Brenta near Venice, Italy, and in Surakarta, Indonesia, respectively. These studies highlight the importance of stakeholder participation in decision-making regarding tourism development and emphasize both the positive and negative effects of tourism policies on local communities.

Together, these studies underscore the need to adopt multidisciplinary approaches and mixed methodologies to understand the complexity of impacts on tourism operations. Additionally, they point out the importance of considering the particularities of each geographic and situational context when designing strategies for recovery and sustainable tourism development in the future.

CONCLUSIONS

This research provides an approach to the importance of studies related to the impact of crises on tourist facilities, primarily to offer an overview of hotel behavior during such situations and to determine how they have recovered or not.

At the same time, the global tourism industry is increasingly facing various crisis situations. Therefore, this article contributes a procedure dedicated to accurately assessing the impact of a specific crisis on hotels.

The application of the procedure to evaluate the impact of the crisis on hotel facilities applied at the Brisas Guardalavaca hotel allowed evaluating how 15 indicators of tourism operation are affected during the crisis caused by COVID-19. The results reveal that the impact of COVID-19 is clearly reflected in the evaluated indicators, with a significant decrease in occupancy rate, revenues, and other key aspects of the hotel's operation. Despite these challenges, the hotel has demonstrated some resilience by maintaining high levels of customer satisfaction and retaining a significant portion of its staff.

However, areas requiring attention have been identified,

such as the need to develop effective recovery strategies to increase occupancy rates during the low season and improve staff retention. Additionally, there are opportunities to enhance the hotel's sustainability, especially in terms of resource consumption and environmental practices. Prioritizing the customer experience and maintaining a good value proposition are key aspects for the hotel's competitiveness, so it is essential to continue focusing on these areas. The hotel also exhibits strengths in indicators such as customer satisfaction, staff retention, and community engagement, which can be leveraged to drive continuous improvement and sustainable growth.

Although a complex landscape is identified for the hotel, largely influenced by the impact of COVID-19 and its consequences on the tourism industry, the facility has demonstrated resilience by maintaining high levels of customer satisfaction and retaining a significant portion of its staff. However, critical areas requiring immediate attention are identified, such as the development of effective strategies to increase occupancy rates during the low season. Additionally, the need to improve sustainability practices and adapt marketing strategies to new market conditions are key aspects to ensure the hotel's long-term competitiveness and viability.

The limitation of this study lies in the selected sample for the application of the procedure, which can be extended to other facilities within the same tourist destination context. This would allow for patterns of comparison of the results to be established. Similarly, it would demonstrate the adaptability of the procedure to the different characteristics and conditions of other hotel facilities.

REFERENCES

Agag, G., Aboul-Dahab, S., Shehawy, Y. M., Alamoudi, H. O., Alharthi, M. D., & Hassan Abdelmoety, Z. (2022). Impacts of COVID-19 on the post-pandemic behaviour: The role of mortality threats and religiosity. Journal of Retailing and Consumer Services, 67, 102964. https://doi.org/https://doi.org/10.1016/j.jretconser.2022.102964

Bazazo, I., Elyas, T., Awawdeh, L., Faroun, M., & Qawasmeh, S. a. (2017). The Impact of Islamic Attributes of Destination on Destination Loyalty via the Mediating Effect of Tourist Satisfaction. International Journal of Business Administration, 8(4), 65. https://doi.org/10.5430/ijba.v8n4p65

CEPAL. (2020). Evaluación de los efectos e impactos de la pandemia de COVID-19 sobre el turismo en América Latina y el Caribe: aplicación de la metodología para la evaluación de desastres (DaLA). https://www.cepal.org/es/noticias/turismo-sera-sectores-economicos-mas-afectados-america-latina-caribe-causa-covid-19

Deriu, S., Cassar, I. P., Pretaroli, R., & Socci, C. (2022). The economic impact of Covid-19 pandemic in Sardinia. Research in Transportation Economics, 93, 101090. https://doi.org/https://doi.org/10.1016/j.retrec.2021.101090

Doğan, B., Ghosh, S., Tiwari, A. K., & Abakah, E. J. A. (2023). The effect of global volatility, uncertainty and geopolitical risk factors on international tourist arrivals in Asia. International Journal of Tourism Research, 25(1), 1-62. https://doi.org/https://doi.org/10.1002/jtr.2550

Fang, Y., Zhu, L., Jiang, Y., & Wu, B. (2021). The immediate and subsequent effects of public health interventions for COVID-19 on the leisure and recreation industry. Tourism Management, 87, 104393. https://doi.org/https://doi.org/10.1016/j.tourman.2021.104393

Farmaki, A., Miguel, C., Drotarova, M. H., Aleksić, A., Časni, A. Č., & Efthymiadou, F. (2020). Impacts of Covid-19 on peer-to-peer accommodation platforms: Host perceptions and responses [Article]. International Journal of Hospitality Management, 91, Article 102663. https://doi.org/10.1016/j.ijhm.2020.102663

Ferreira, J.-P., D. Court, C., Basurto-Cedeño, E., & Pennington-Gray, L. (2023). Using the 2016 Zika outbreak to estimate the potential tourism impacts of a Chikungunya event in Florida. Tourism Economics, 13548166231185984. https://doi.org/10.1177/13548166231185984

Melián-Alzola, L., Fernández-Monroy, M., & Hidalgo-Peñate, M. (2020). Hotels in contexts of uncertainty: Measuring organisational resilience. Tourism Management Perspectives, 36, 100747. https://doi.org/https://doi.org/10.1016/j.tmp.2020.100747

Meneghello, S. (2023). Mapping tourist landscapes in pandemic times: a dwelling-in-motion perspective. Tourism Geographies, 25(7), 1730-1745. https://doi.org/10.1080/14616688.2023.2172604

Nusantara, A. C., Volgger, M., & Pforr, C. (2021). Evaluating the complex impact of policy changes on tourism development: The case of Surakarta, Indonesia. Journal of Global Scholars of Marketing Science, 31(4), 614-623. https://doi.org/10.1080/21639159.2021.1935291

OECD. (2020). OECD Tourism Trends and Policies 2020. OECD Publishing. https://doi.org/10.1787/6b47b985-en

Okafor, L., Khalid, U., & Gopalan, S. (2022). COVID-19 economic policy response, resilience and tourism recovery. Annals of Tourism Research Empirical Insights, 3(2), 100073. https://doi.org/https://doi.org/10.1016/j.annale.2022.100073

Okumus, F., Altinay, M., & Arasli, H. (2005). The impact of Turkey's economic crisis of February 2001 on the tourism industry in Northern Cyprus. Tourism Management, 26(1), 95-104. https://doi.org/https://doi.org/10.1016/j.tourman.2003.08.013

ONEI. (2022). Capítulo 15: Turismo (Anuario Estadístico Cuba, Issue. https://www.onei.gob.cu/sites/default/files/publicaciones/2023-09/15-turismo-2022_0.pdf

ONU. (2020). Informe de políticas: COVID-19 y la transformación del turismo. Retrieved from https://unsdg.un.org/es/resources/informe-de-politicas-covid-19-y-la-transformacion-del-turismo

Ramos-Giral, G. V. (2023). Procedimiento para la evaluación del impacto de las crisis en instalaciones hoteleras [Tesis en opción del grado académico de Máster en Gestión Turística, Universidad de Holguín]. Holguín, Cuba.

Ramos-Giral, G. V., Batista-Matamoros, C. R., & Torralbas-Blazquez, A. D. (2022). Analysis of the scientific production on crisis management in tourism during the period 1980-2021. BIBLIOTECAS-ANALES DE INVESTIGACION, 18(3).

Ritchie, B. W. (2004). Chaos, crises and disasters: A strategic approach to crisis management in the tourism industry [Article]. Tourism Management, 25(6), 669-683. https://doi.org/10.1016/j.tourman.2003.09.004

Soliku, O., Kyiire, B., Mahama, A., & Kubio, C. (2021). Tourism amid COVID-19 pandemic: impacts and implications for building resilience in the eco-tourism sector in Ghana's Savannah region. Heliyon, 7(9), e07892. https://doi.org/https://doi.org/10.1016/j.heliyon.2021.e07892

Sönmez, S. F. (1998). Tourism, terrorism, and political instability [Article]. Annals of Tourism Research, 25(2), 416-456. https://doi.org/10.1016/S0160-7383(97)00093-5

Türkcan, K., & Erkuş-Öztürk, H. (2019). The impact of economic and political crises on the survival of tourism-related firms: Evidence from Antalya. Tourism Economics, 26(7), 1152-1174. https://doi.org/10.1177/1354816619868614

UNWTO. (2021). Covid-19 and Tourism. Retrieved 14/01/2022 from https://www.unwto.org/covid-19-and-tourism-2020

Wang, C., Xu, Z., Li, S., & Shan, J. (2023). The impact of COVID-19 on the value of coastal recreational resource from the perspective of recreational behaviour change: Evident from China. Ocean & Coastal Management, 242, 106670. https://doi.org/https://doi.org/10.1016/j.ocecoaman.2023.106670

Yu, M., Cheng, M., Yang, L., & Yu, Z. (2022). Hotel guest satisfaction during COVID-19 outbreak: The moderating role of crisis response strategy. Tourism Management, 93, 104618. https://doi.org/https://doi.org/10.1016/j.tourman.2022.104618

Yurievna, S. I. (2022). Economic Changes and Their Impact on Consumer Behaviour: An Empirical Study in the Recent Economic Scenario. ECS Transactions, 107(1), 18165. https://doi.org/10.1149/10701.18165ecst

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Research paper

Accessibility in rural tourist destinations: An investigation on barriers and perspectives in communities of the Las Tunas tourist destination

La accesibilidad en destinos turísticos rurales: Una investigación sobre barreras y perspectivas en comunidades del destino turístico Las Tunas

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ABSTRACT

Accessibility for people with disabilities in rural tourism destinations has been an underestimated and under-researched topic. The objective is to investigate accessibility in rural tourism destinations for people with disabilities. The methodology consists of a descriptive quantitative study through surveys. The results show moderate accessibility in general in the tourist destination studied, although variability was identified in the quality of accessibility, especially in adapted facilities. Likewise, a moderate impact of inclusive tourism on local economic development and on the perception of rural communities as accessible tourism destinations was observed. Collaboration between local governments, non-profit organizations, tourism businesses and local communities was considered moderate. The conclusions are directed to the necessary improvement in the uniformity and quality of adapted facilities to ensure a positive and equitable experience for all people. In addition, the potential of inclusive tourism to generate sustainable economic benefits and promote local economic development is highlighted.

Keywords: *Rural Tourism, Tourist Accessibility, Visitor Experience, Social Inclusion, Sustainable Development, Accessibility Policies*

RESUMEN

La accesibilidad para personas con discapacidad en destinos turísticos rurales ha sido un tema subestimado y poco investigado. El objetivo es investigar la accesibilidad en destinos turísticos rurales para personas con discapacidades. La metodología consiste en un estudio cuantitativo descriptivo mediante encuestas. Los resultados muestran una accesibilidad moderada en general en el destino turístico estudiado, aunque se identificó variabilidad en la calidad de la accesibilidad, especialmente en las instalaciones adaptadas. Asimismo, se observó un impacto moderado del turismo inclusivo en el desarrollo económico local y en la percepción de las comunidades rurales como destinos turísticos accesibles. La colaboración entre gobiernos locales, organizaciones sin fines de lucro, empresas turísticas y comunidades locales se consideró moderada. Las conclusiones son dirigidas a la necesaria mejora de la uniformidad y calidad de las instalaciones adaptadas para garantizar una experiencia positiva y equitativa para todas las personas. Además, se destaca el potencial del turismo inclusivo para generar beneficios económicos sostenibles y promover el desarrollo económico local.

Palabras clave: Turismo rural, Accesibilidad turística, Experiencia del visitante, Inclusión social, Desarrollo sostenible, Políticas de accesibilidad

INTRODUCTION

Tourism has experienced significant growth, and more and more people are seeking authentic and enriching experiences in rural environments. However, despite this increase in demand for rural tourism, accessibility for people with disabilities in these destinations has been an underestimated and under-researched issue. Lack of attention to accessibility can limit the full participation and enjoyment of all people, regardless of their physical or cognitive abilities.

The main objective of this manuscript is to analyze the current situation of accessibility in selected rural tourist destinations, in order to identify the barriers that exist in these communities. In addition, it seeks to understand the perspectives and experiences of local people in relation to accessibility in rural tourism.

The results obtained from the application of the questionnaire and the analysis of the data collected will provide a clear and precise vision of the existing barriers in terms of accessibility in the rural tourist destination studied. It will also identify opportunities for improvement and possible solutions to promote accessibility and ensure an inclusive tourism experience in these communities.

It is hoped that the findings of this research will provide a solid framework for decision-making and the implementation of concrete policies and actions aimed at improving accessibility in rural tourism. This study will contribute to existing knowledge in the field of tourism accessibility and to raise awareness of the importance of ensuring equal opportunities for all people, regardless of their abilities, in the context of rural tourism.

In the following sections, the detailed results of the analysis of each of the variables will be presented, followed by a discussion of the findings and practical implications. Finally, the conclusions will be presented and recommendations for future research and actions aimed at improving accessibility in rural tourism will be proposed.

LITERATURE REVIEW

Rural tourism plays a crucial role in the economic, social and environmental development of rural communities (Kumar et al., 2022). It contributes significantly to income generation, job creation, and the strengthening of local infrastructure (Díaz-Pompa et al., 2020; Jurado-Almonte, 2014). In addition, it promotes the conservation of cultural and natural heritage, while encouraging economic diversification and the revitalization of rural areas, (del Espino Hidalgo et al., 2022).

The interaction between tourists and local residents has a positive impact on promoting intercultural understanding and sharing knowledge and experiences (Kumar et al., 2022). In this sense, tourism in rural areas not only represents a source of income, but also an opportunity to preserve cultural identity, promote sustainability and improve the quality of life of rural communities (Castañeda Torres et al., 2020).

The drive towards inclusive and accessible tourism in rural settings is vital to ensure that all people, regardless of their physical or mental abilities, have the opportunity to enjoy tourism experiences (Ladu et al., 2023). The challenge of accessibility in rural tourism not only complies with the principles of equity and social justice, but also expands the potential customer base and strengthens the long-term sustainability of tourism in rural areas, (Castellano Montesdeoca, 2020).

The development of rural tourism from an inclusive and accessible approach benefits people with disabilities. It improves the tourism experience for all visitors and promotes safer, welcoming, and friendlier environments (Ladu et al., 2023). By adopting measures to ensure accessibility in rural tourism, the active participation of all people in the cultural, social and economic life of rural communities is encouraged, which contributes to a more equitable and sustainable development (Castañeda Torres et al., 2020).

Accessible tourism is defined as the practice of ensuring that tourist destinations, facilities, and services are accessible to all people, including those with physical, cognitive, or other disabilities (Gaona Suarez et al., 2020). This involves the removal of architectural barriers, the provision of clear and understandable information, and the training of staff to address the specific needs of visitors with disabilities, (Campozano-Figueroa, 2023).

The study of accessibility in rural environments is of utmost importance due to several factors. First, rural settings are often tourist destinations that offer unique cultural, natural and historical wealth, and it is important to

ensure that all people, including those with disabilities, can access and enjoy these experiences on an equal footing, (Chin et al., 2022).

In addition, rural tourism plays a significant role in the economic and social development of rural communities, and the promotion of accessibility contributes to broadening the potential visitor base, thereby strengthening the long-term sustainability of tourism in these areas, (Du et al., 2023). Therefore, the study of accessibility in rural environments makes it possible to identify existing barriers and develop effective strategies to promote inclusion and equal opportunities, which in turn contributes to improving the quality of life of rural communities as a whole.

The interest of academics and researchers in the topic of accessibility has been increasing due to the growing awareness of the importance of ensuring inclusion and equal opportunities in tourism, (Fuente-Robles et al., 2020). The diversity of perspectives and needs present in society has generated widespread recognition of the importance of studying and addressing accessibility in rural tourist destinations. This interest is reflected in a modest increase in research and academic publications addressing issues related to accessibility in rural tourism, including studies on adapted infrastructures (Gunawijaya & Pratiwi, 2016), inclusive services (Мантас & Айсте Барбора, 2020), economic and social impact of accessible tourism (Castanho et al., 2021), as well as strategies to promote collaboration between key actors in promoting accessibility (Ibanescu et al. al., 2020), among others. The analysis of this research allows us to better understand current challenges, best practices and areas of opportunity to improve accessibility in rural settings and promote inclusive and equitable tourism.

For example, the quality of road infrastructure is one of the barriers affecting access to different rural tourism products and services. The study by Orjuela Yusty (2020) analyzes road access to the different coffee tourist routes in Colombia. The findings reveal that having tourist routes with quality road infrastructure results in better accessibility and has a positive impact on the economic indicators of rural communities.

Additive, del Espino Hidalgo et al. (2022) propose a tool based on Geographic Information Systems applications for measuring the accessibility to heritage resources of a rural or vulnerable territory. Through the combined analysis of various factors, it contributes to the sustainable management of its cultural heritage. Among the main results, the need for articulation of the different actors in order to achieve greater accessibility to the heritage found in rural communities, as well as digital accessibility, stand out.

The lack of accessible infrastructure has been identified as a significant barrier to the participation of persons with disabilities in rural tourism. Studies show that the lack of ramps, handrails, and adapted restrooms are common physical obstacles that limit access and mobility in these destinations (Granda Maldonado et al., 2021). These physical constraints make it difficult to explore the natural and cultural environments that rural destinations have to offer.

Other studies reveal that the absence of appropriate signage and the existence of uneven terrain can create additional challenges for people with disabilities (Granda Maldonado et al., 2021). This underlines the importance of addressing physical accessibility and other aspects of the environment that can affect the experience of all visitors, ensuring that rural tourism is inclusive for all.

Lack of accessible information and inadequate communication have also been identified as key barriers to the participation of persons with disabilities in rural tourism. The limited availability of accessible tourism promotion materials and the lack of detailed information on the accessibility of rural destinations make it difficult for people with disabilities to make informed decisions (Gaona Suarez et al., 2020; Gunawijaya & Pratiwi, 2016). This lack of information makes it difficult to plan trips and select suitable destinations. In addition, poor communication between visitors and tourism staff can lead to frustration and limit the positive experience of tourists with disabilities, (Fuente-Robles et al., 2020).

On the other hand, numerous studies have emphasized the initiatives and solutions implemented to enhance accessibility in rural tourist destinations. The collaboration between local stakeholders, including governments, tourism businesses, and non-profit organizations, has played a crucial role in the development of accessibility measures. These initiatives encompass the adaptation of infrastructures, such as the construction of ramps and the installation of elevators, along with the provision of training for

tourism staff on accessibility issues (Galarza Justillo, 2021). Furthermore, sensitization and awareness programs have been put in place to promote inclusion and foster understanding of the needs of individuals with disabilities, (Ladu et al., 2023). These efforts reflect a concerted approach towards improving accessibility in rural tourist destinations, ultimately contributing to a more inclusive and welcoming environment for all individuals.

Research has highlighted the economic and social benefits derived from the promotion of accessibility in rural tourism. Accessible tourism can generate additional income for rural communities, foster local economic development and job creation, (Fuente-Robles et al., 2020). In addition, it can improve the image and reputation of rural destinations, attracting a wider segment of visitors, (Benedetto, 2023). It has also been observed that it can contribute to the reduction of discrimination and social exclusion by promoting the full participation of persons with disabilities in society.

A review of the scientific literature reveals the existence of few specific studies on accessibility in rural tourist destinations, and even fewer in the Cuban context. Despite the importance of rural tourism in Las Tunas, as an emerging tourist destination. Attention to accessibility in this context has been limited. This gap in research highlights the need to further explore the issue of accessibility in rural tourist destinations, focusing specifically on the Cuban context and the Las Tunas tourist destination. The present study proposes to address this research gap and contribute to the existing knowledge on accessibility in rural tourism, with the aim of identifying current barriers, evaluating existing practices and proposing strategies to promote inclusive and accessible tourism in Las Tunas, Cuba.

These findings provide a solid basis for the present research, which aims to deepen the analysis of accessibility in rural tourist destinations and explore the perspectives and experiences of local people in relation to this topic. Through data collection and analysis, it is expected to contribute to existing knowledge and provide practical recommendations to improve accessibility and promote inclusive tourism in rural areas.

METHODOLOGY

This research is quantitative and descriptive. The survey was selected as the data collection instrument as it allows for flexible and rapid data collection from a larger population. It made it possible to collect quantifiable data on the perception of different key actors in relation to accessibility in rural tourism.

The sample consisted of 259 actors (government, public sector, private sector, community) randomly selected in the rural tourist destination El Cornito. The aim was to obtain a representative sample that reflects the demographic and socioeconomic diversity of the population of this community.

The instrument was designed based on aspects related to tourist accessibility in rural tourism. The main elements addressed were the quality of the infrastructure, the availability of adapted services, accessible information and communication, and general satisfaction with the accessibility of the destination.

The questionnaire was structured in three parts. The first part offered an introductory summary with the objective of the study, instructions for filling out the questionnaire and information to respondents about voluntary participation, as a guarantee of anonymity and compliance with ethical aspects. The second part was aimed at obtaining the sociodemographic data of the sample (age, gender, educational level, among others). The third section includes the related items according to the dimensions under study.

The first version of the questionnaire consisted of 34 items, extracted from the bibliographic consultation carried out in order to evaluate the perceptions of key actors regarding accessibility in rural tourism. It included a Likert scale that considers 5 levels: 1- Strongly disagree, 2- Disagree, 3- Neither agree nor disagree, 4- Agree and 5- Strongly agree to measure the perceptions and attitudes of the participants.

Cronbach's alpha coefficient allowed to assess the stability of the rating of the scale used in the instrument, the SPSS program in its version 26 was used for its calculation, resulting in a value of 0.933, with a total of 25 items, which indicates that it is highly reliable.

Based on the results of the surveys, a database was created in the SPSS statistical software. Descriptive statistical techniques were used for the analysis of quantitative data. This made it possible to obtain an overview of the perception of accessibility in rural tourist destinations.

Ethical Considerations

Confidentiality and anonymity of participants were ensured, assigning them unique identifiers instead of using their real names in data records and analysis. In addition, informed consent was obtained from each participant prior to their inclusion in the study, assuring them that their participation is voluntary and that they can withdraw at any time without negative consequences.

Sample characterization

The sociodemographic distribution of the sample in terms of gender, age, educational level, and sector to which the participants in the study belong behaves as follows. In terms of gender, it is observed that 47.88% of the participants identified as female, while 52.12% are male.

Taking into account the age of the participants, the most representative group in the sample was 26 to 40 years old, with 38.9% of the total. In descending order, the 41-60 age group continues with 27.8%, the 18-25 age group with 22.4% and the 61-80 age group with 10.8%. When examining the cumulative percentage, it can be observed that 89.6% of the participants are between 18 and 60 years old. As age increases, the proportion of participants gradually decreases.

RESULTS

Characterization of El Cornito

El Cornito, located 9 km west of the city of Las Tunas, is a historical, natural and cultural site recognized as a Local Monument since 1993 (figure 1). This place was home to Juan Cristóbal Nápoles Fajardo, known as "El Cucalambé", for many years. The site was mainly promoted as a cultural or event tourist destination (Bravo Sánchez et al., 2009). In this scenario, various activities of great value are carried out, such as the Ibero-American Festival of the Tenth, a theoretical event that encourages the exchange of the décima and improvised verse between Spanish-speaking countries (Posada, 2003), as well as peasant festivities (Figure 2).

It offers a variety of tourist services, including accommodation, food, and recreation. In addition, it has infrastructure that includes roads, certain facilities and basic services (Partido Santanach et al., 2009).

Figure 1. Declaration of El Cornito as a Local Monument

Figure 2. Peasant festivals
Source: Taken from Ecured

It stands out for its natural resources, has an abundant presence of bamboo, giving visitors the opportunity to enjoy a lush and unique natural environment. Bamboo is an attraction for lovers of botany and gardening (Figure 3). It has a river and dam nearby that offers the possibility of water activities, such as fishing, kayaking or simply enjoying a natural environment with water. The natural environment is home to a diversity of flora and fauna, including endemic and unique species. Visitors can enjoy bird watching, native flora, and the chance to spot wild animals in their natural habitat (figure 4).

From a heritage point of view, there are ruins in the vicinity

of Cornito which offer visitors the opportunity to explore historical vestiges (figure 5), which enriches the tourist experience by providing a glimpse into the region's past. The existence of sculptures (figure 6) in the area adds an artistic and cultural element to the tourist experience, allowing visitors to appreciate local art in a natural environment, (Arada Clavería & Macías Reyes, 2019).

Figure 3. Vegetation of El Cornito

Figure 4. El Cornito Dam

It has a cultural richness, the Jornada Cucalambeana is a festivity that encompasses tenths, customs and local history (figure 7), offering visitors the opportunity to immerse themselves in the cultural traditions of the region (figure 8). This celebration can include folkloric events, traditional music, dances and typical gastronomy, providing an immersive experience in the local culture, (Orama Gómez, 2014). These natural, heritage and cultural tourist resources become tourist attractions that contribute to enriching the visitor's experience in El Cornito (figure 9). It offers a unique combination of natural beauty, historical heritage and cultural traditions rooted in the region for tourists to enjoy.

Figure 5. Ruins of the house of Juan Cristóbal Nápoles Fajardo

Figure 6. Sculptures in the area of El Cornito

Given the characteristics described, El Cornito is currently marketed for the national market as a rural tourism product, offering a new option within the tourist offer of the tourist destination of Las Tunas. This opportunity makes it possible to provide a different and attractive product for visitors, contributing economically to the

territory and satisfying the travel motivations of tourists. The implementation of various activities can contribute to reviving the site for the development of rural tourism, such as sport fishing, boat rides on the dam, horseback riding, points of sale of local handicrafts (Candó Gámez, 2012), visits to farms, the botanical garden and the zoo, points of sale of tropical fruits, contests of the tenth, roast pork in spikes and placement of handmade hammocks for tourists to rest in a natural environment, among other options.

Figure 7. Animal traction cart of the time

Figure 8. Peasant hut

These activities should not only be aimed at national tourism, but also at international tourists who love nature and are looking for rest, fun and entertainment. With these proposals, El Cornito becomes an attractive and diversified rural tourist destination.

Given the current status of El Cornito as a tourist product,

Figure 9. Vegetation and facilities of El Cornito

which is practically decommercialized and with the loss of its facilities, it is crucial that its recovery is an integral part of the tourism development plan in Las Tunas. The implementation of an investment plan that also seeks to improve its accessibility and inclusion conditions is essential to revitalize this tourist attraction. Therefore, it is necessary to investigate the aspects related to accessibility and inclusion, since these elements are essential for the successful conformation of El Cornito as a renewed tourist product. Consideration and enhancement of these aspects not only ensure that the site is accessible to a wide range of visitors, but also contributes to its long-term sustainability and the creation of an enriching and equitable tourism experience for all.

Accessibility is an important aspect to consider in the characterization of El Cornito as a tourist product. The privileged location in the tourist destination of Las Tunas offers some accessibility, as it is located within an environment relatively close to the urban areas and tourist infrastructures of the destination. Therefore, considering accessibility in the development and promotion of this place as a tourism product is essential to ensure that a wide range of visitors can enjoy this wonderful natural and cultural attraction in Las Tunas.

Actors' perception

By analyzing the actors' perception of physical barriers in El Cornito (Figure 10). The results obtained show a moderate perception regarding the existence of accessible infrastructures for people with disabilities (Mean = 3.132, Desv. = 0.7115). In terms of transport, there is a slightly

lower perception (Average = 3.102, Desv. = 0.7165). In relation to adapted facilities, the perception is lower (Mean = 3.09, Desv. = 0.8805), although with greater variability in responses and a perceived need for improvements in this aspect.

Figure 11 shows the variables related to the dimension of information and communication barriers. The data reveal that, on average, tourist information (Average = 4.100, Display = 1.1933) and communication channels (Average = 4.394, Speed = 0. 8532) in this destination are accessible, with average scores above 4. However, the standard deviation in both cases is high, which shows a greater variability in the responses regarding accessibility. On the other hand, there is a moderate perception regarding the preparation of tourist staff for the care of people with disabilities (Average = 3.059, Desv. = 0.7885).

Figure 10. Physical barriers

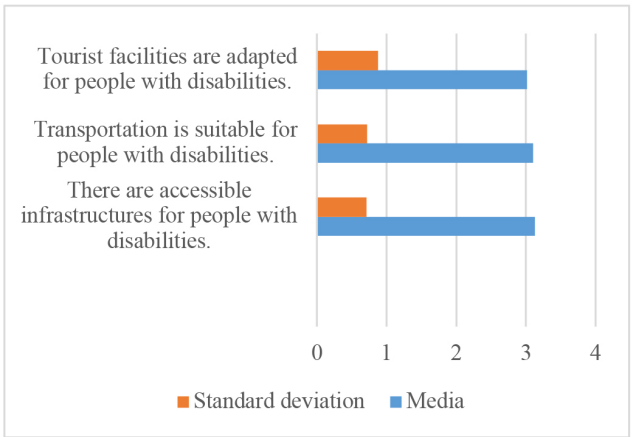


Figure 11. Information and communication

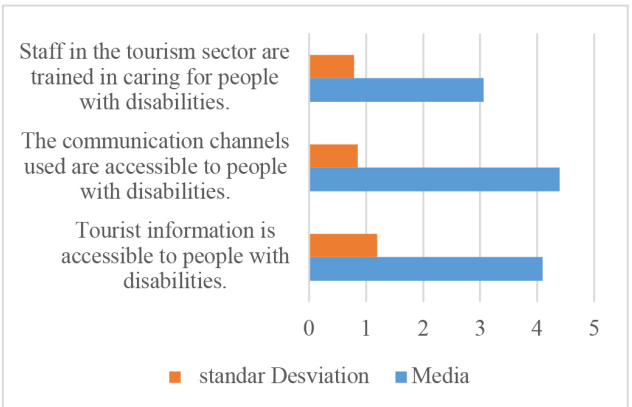
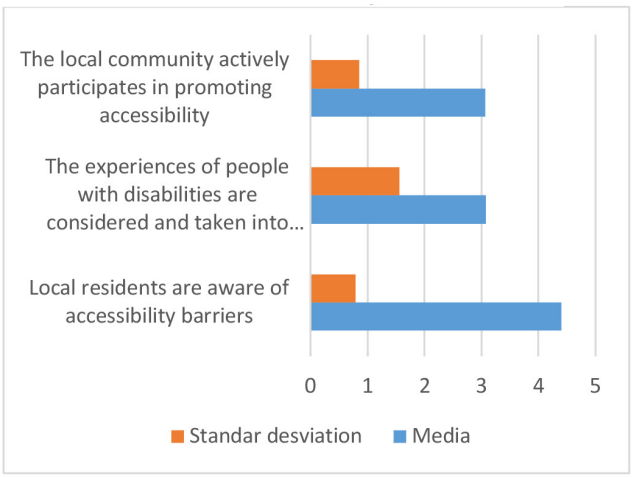


Figure 12 shows the variables related to the dimension of perception and experience of local people on accessibility. The results of the figure indicate that local residents are aware of the barriers that affect accessibility, with an average of more than 4. However, perceptions about the inclusion of the experiences of people with disabilities in tourism management receive a low score (Mean = 3.081, Desv. = 1.5618). Similarly, the value given to the active participation of the community in the promotion of accessible tourism is lower than the rest of the variables in this dimension (Mean = 3.062, Desv. = 0.8546).

Figure 12. Perception and experience of local people about accessibility



Regarding the dimension of accessibility support resources and services in rural tourist destinations (Figure 13), it can be observed that the assessment given by the respondents is moderate. In general, support services are perceived to be inadequate (Average = 3.092, Desv. = 0.8462), accommodation is not adapted (Average = 3.033, Desv. = 0.8069) and transport is not fully accessible for people with disabilities (Mean = 3.089, Desv. = 1.0077). However, the higher standard deviation in the variable on transport in rural destinations indicates a greater variability in respondents' perception compared to the other two variables.

Figure 13. Resources and services to support accessibility

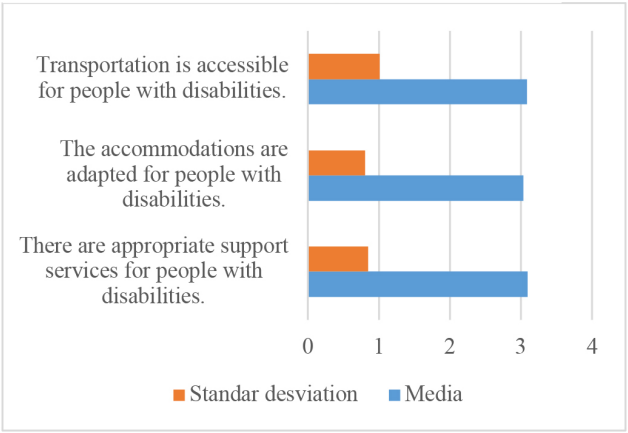
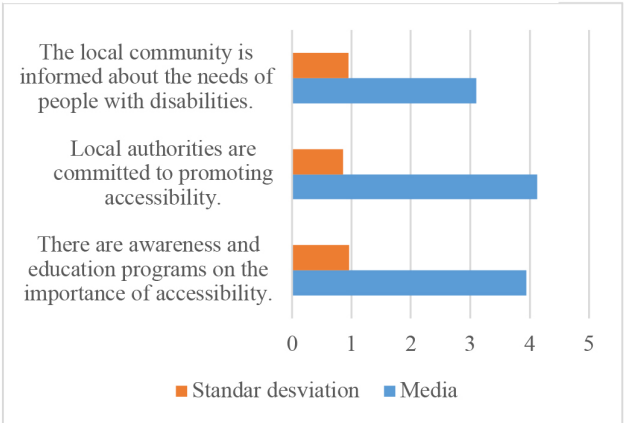


Figure 14 shows the evaluations of the variables related to the dimension of accessibility awareness and education. The highest score was given to the commitment of local authorities to promoting the development of accessible tourism (Mean = 4.124, Desv. = 0.8553). Likewise, there is evidence of the existence of programs aimed at raising awareness and educating in aspects related to accessibility and the development of a more inclusive and accessible tourism (Mean = 3.939, Desv. = 0.9584). However, the lowest score was given to the degree of information provided to the local community about the needs of persons with disabilities (Mean = 3.100, Desv. = 0.9451) for the design of products and services for this market segment. In general, it is observed that efforts are being made to raise awareness and educate about the importance of accessibility, that local authorities are committed to promoting accessibility, and that the local community requires more information about the needs of persons with disabilities for the design of products and services for this market segment in rural tourism.

Figure 14. Accessibility Awareness and Education



Regarding the dimension of collaboration and coordination between actors to promote accessibility. Figure 15 shows a moderate assessment by the sample studied. The variable related to the coordination between the different actors to improve accessibility receives a higher score (Mean = 3.247, Desv. = 1.0495). Community involvement in tourism planning and development receives a lower score (Mean = 3.045, Desv. = 1.1962) and collaboration between different actors receives a lower score (Mean = 3.019, Desv. = 1.1893). However, the standard deviation is high in each of the variables, indicating a greater variability in the respondents' perception of the variables in this dimension.

Figure 16 shows the variables related to the dimension of the accessibility quality assessment. In this case, the score given to each of the variables is moderate. It is perceived that tourist infrastructures do not fully comply with accessibility standards (Mean = 3.020, Speed Off = 0.9158), nor the quality of services and resources available (Average = 3.156, Speed Up = 0.8941), and visitors with disabilities perceive a moderate quality of accessibility in rural tourist destinations (Average = 3.149, Speed Off = 0.6132).

Figure 15. Collaboration and coordination between actors

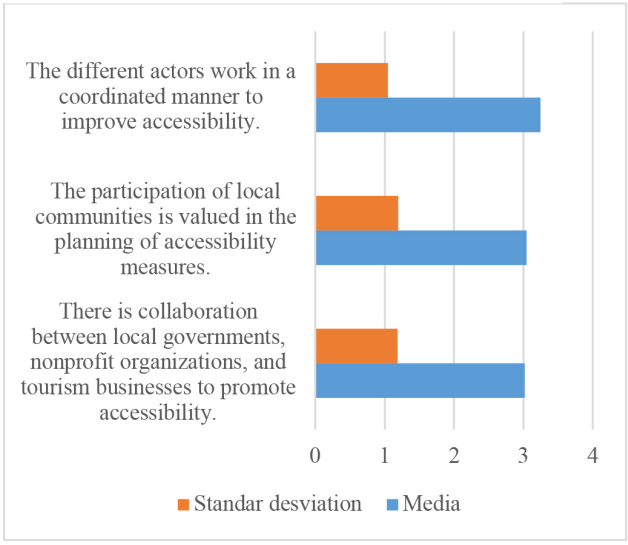
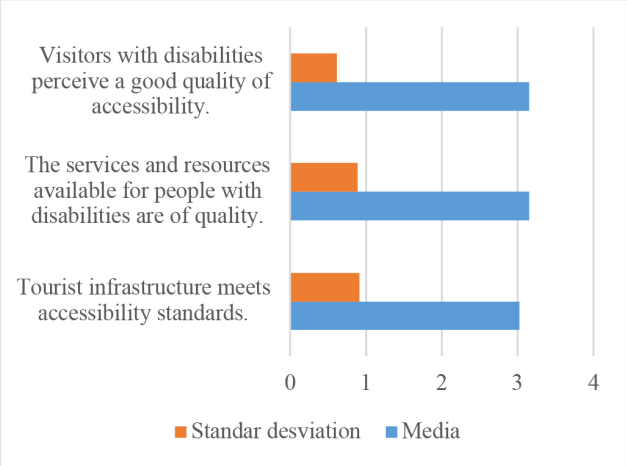
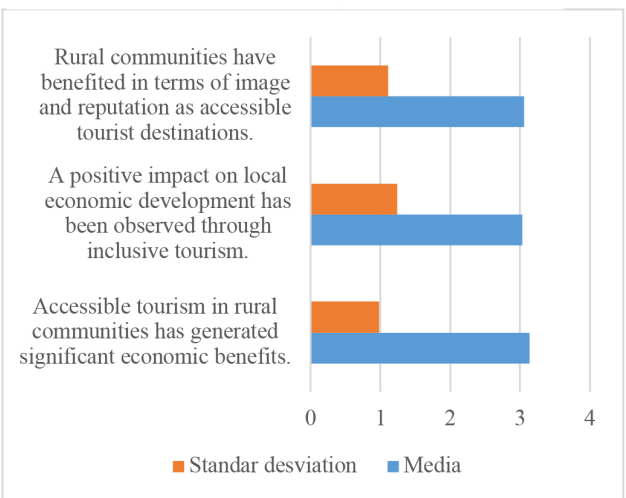


Figure 16. Accessibility Quality Assessment



Finally, Figure 17 shows the variables related to the dimension of economic and social benefits in local economic development. The variables analysed receive a score close to 3, which shows that the benefits generated by the promotion of accessible and inclusive tourism have not been fully perceived. Regarding the economic benefits generated by accessible tourism (Mean = 3.132, Desv. = 0.9793). Similarly, there is variability in the impact on the economic development of the locality (Mean = 3.045, Desv. = 1.1962) and in the benefit that communities receive from showing an image and having a reputation as an accessible tourist destination (Mean = 3.045, Desv. = 1.1962). High standard deviations in these variables indicate a perception with some variability in the perceived impact.

Figure 17. Economic and social benefits in local economic development



DISCUSIONS

Cuba is a tourist destination with many potentials for the development of rural tourism. However, it requires the design and development of these initiatives by the territories (Díaz-Pompa et al., 2020). In this sense, Las Tunas as a tourist destination has an inventory with potential for the development of this type of tourism. For example, El Cornito is a tourist destination with significant potential to become a rural tourism product for the national and international market. The diversity of attractions and natural, cultural, heritage and environmental resources give it a particular stamp (Partido Santanach et al., 2009). Especially if it is developed from an inclusive and accessible approach that benefits people with disabilities and the local community.

The main findings reveal the existence of physical barriers that limit people with disabilities from enjoying products and services and living meaningful experiences. Therefore, for the development of accessible rural tourism, it is necessary to eliminate them. These results are consistent with those of Orjuela Yusty (2020), who in his research reveals that the lack of quality of road access to different tourism products and services affects the tourist experience and the economic development of rural communities. In this sense, Granda Maldonado et al. (2021) and Barrientos Guzmán and Sandoval Hormazabal (2019) show in their studies that the absence of ramps, handrails, bathrooms and different spaces adapted to people with disabilities constitute obstacles that limit access and mobility within tourist destinations. Therefore, it is crucial to improve accessibility in rural tourism facilities with the removal of physical barriers to ensure a positive experience for all people, regardless of their physical or mental abilities. This analysis highlights the importance of working towards creating more inclusive and accessible tourism environments for all.

Access to information and adequate communication are essential to promote the participation of persons with disabilities in rural tourist destinations. The results of this research reveal a positive perception regarding access to information and the channels used for its dissemination, however, there is a low perception regarding the preparation of staff for the care of people with disabilities. These findings contrast with those of Gaona Suarez et al. (2020) who find that the lack of information and availability of tourism promotion materials aimed at people with disa-

bilities affects decision-making by people with disabilities. Similarly, Fuente-Robles et al. (2020) reveal that poor communication between tourists and tourist destination staff generates negative experiences in tourists with disabilities. Also del Espino Hidalgo et al. (2022) find that limited access to information through digital media is a factor that affects tourists. These results highlight the importance of ensuring that tourism information, communication channels, and tourism staff in rural destinations are adequately trained to provide an inclusive experience to all people, regardless of their abilities.

In the tourism sector, the attention given to tourists is essential, therefore, tourism companies must work on the training of their workers so that they do not have a discriminatory attitude towards this segment, which in many cases is the result of lack of knowledge and insecurity about how to meet the needs of these customers. (Castellano Montesdeoca, 2020).

According to Díaz-Pompa et al. (2020), the success of tourism activity in the rural context depends, to a large extent, on the degree of participation and involvement of the different actors. In the case of accessible rural tourism, the active participation of the local community in promoting accessibility in rural tourism is imperative to ensure that the needs of all people, including those with disabilities, are taken into account and effectively addressed. The evidence of the present research regarding the collaboration and coordination between the different actors shows its reservations. These results are similar to Galarza Justillo (2021) who reveals in his research the lack of articulation and participation of the main actors in the development of accessible rural tourism activity. Mainly the role of the government as the main actor in rural communities. In this sense, we agree with Porto and Rucci (2019) that the direct or indirect participation of each member of the community is a fundamental aspect to generate meaningful experiences for people with disabilities. This must occur through a process that ensures the active participation of all the actors involved, under political leadership that contributes to strengthening collaboration (del Espino Hidalgo et al., 2022).

Adapting infrastructures and services to the needs of people with disabilities is essential to provide quality experiences to this important segment (Galarza Justillo, 2021). In this sense, the evidence of the present research shows that there is a moderate perception regarding these elements. Since support services are not ensured, accommodation and transport are not fully adapted to the needs of tourists with disabilities. Therefore, it is necessary to improve and guarantee the availability and quality of support services, the adaptation of accommodations and the accessibility of transport to ensure a positive and equitable experience for all people who visit the destination.

According to Barrientos Guzmán and Sandoval Hormazabal (2019), developing more accessible rural tourism should focus on training, sensitization and awareness of the different actors, in such a way that it allows the generation of new and better tourist experiences, improves the quality of services, associated with equipment, infrastructure and fundamentally human capital. In the context of the study, positive results can be seen in terms of the existence of accessibility education programmes together with the commitment of local authorities. These findings are the result of extensive work at the national level to care for people with disabilities from each of the localities, established as a government policy. However, there is limited awareness of the needs of this important market segment by the community to provide products and services tailored to their needs. These findings are similar to those of Ladu et al. (2023) who in their research find that a greater understanding of the needs of people with disabilities is required, with personalized products and services based on the implementation of training and awareness programs.

Finally, the positive impact of inclusive tourism on local economic development and the perception of rural communities as accessible tourist destinations is highlighted. This result highlights the potential of inclusive tourism to generate sustainable economic benefits and promote local economic development in rural communities (del Espino Hidalgo et al., 2022). This finding is consistent with previous research that has highlighted the potential of inclusive tourism to generate income and employment in rural communities, as well as to promote sustainable development (Campozano-Figueroa, 2023; Jurado-Almonte, 2014). It is essential to continue incentivizing accessible tourism in rural communities to continue generating significant economic benefits, promoting sustainable local economic development (Leyva Fernández et al., 2017) and strengthening the reputation of these communities as inclusive tourism destinations.

CONCLUSIONS

This research highlights the potential of El Cornito for the development of rural tourism in Las Tunas. The variety of attractions, natural, cultural, heritage and environmental resources provide the possibility of renewing it from a more inclusive and accessible approach for the national and international market. Consequently, it benefits the wider market and the local community.

The survey of the potentialities of accessible rural tourism in El Cornito from the perception of the different actors reveals that there are potentialities such as accessibility to information and communication. There is evidence of accessibility education programmes and the commitment of local authorities. In addition, the impact of inclusive tourism on local economic development and the perception of rural communities as accessible tourist destinations is weighed.

On the other hand, there are aspects in which special attention should be paid. In this sense, there are physical barriers, the preparation of tourism staff for the care of people with disabilities, the collaboration and coordination between the different actors from an active participation, the adaptation of infrastructures and services to the needs of people with disabilities and the quality of services.

This study contributes to the existing literature on tourism and accessibility by focusing specifically on rural tourist destinations. The conclusions support the importance of considering accessibility as a fundamental factor in the planning and development of tourist destinations, and highlight the need to include specific measures to ensure accessibility in rural environments.

The study has significant implications for rural tourism practice and planning. Stakeholders, such as local governments, tourism authorities and entrepreneurs, must take concrete steps to improve accessibility in rural tourist destinations. This involves financial investments and coordinated efforts to adapt existing infrastructure, provide adapted services, and ensure accessibility in information and communication.

Among the main limitations of this study are that the sample is not representative of all rural tourist destinations, which implies caution when generalizing the results. In addition, while the perception of different local actors was explored, it is also necessary to consider the actual experience of visitors with disabilities. These limitations highlight the need for future research to address these issues and expand knowledge related to accessibility in rural tourist destinations.

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REFERENCES

Arada Clavería, A. M., & Macías Reyes, R. (2019). El patrimonio escultórico de Rafael Ferrero en el contexto escultórico tunero. Revista Didasc@lia: Didáctica y Educación, 10(3), 90. https://openurl.ebsco.com/EPDB%3Agcd%3A1%3A14619905/detailv2?sid=ebsco%3Aplink%3Ascholar&id=ebsco%3Agcd%3A141622034&crl=c

Barrientos Guzmán, T., & Sandoval Hormazabal, M. (2019, 2019-12). El turismo accesible en Chile: articulación y pertinencia de la oferta. Revista cartográfica(99), 125-145. https://doi.org/10.35424/rcarto.i99.589

Benedetto, G. (2023). Enabling a sustainable rural-tourism: The challenge of accessibility. BIO Web of Conferences

Bravo Sánchez, Y., Partido Santanach, D., Pérez Campdesuñer, R., & Leyva Marrero, A. (2009). El despliegue de la función calidad en el diseño de productos turísticos con atractivos rurales. TURyDES, 2(5).

Campozano-Figueroa, F. J. (2023). Beneficios del "turismo para todos" en Ecuador. Un estudio de caso. Revista Científica Arbitrada de Investigación en Comunicación, Marketing y Empresa REICOMUNICAR. ISSN 2737-6354., 6(12), 233-253. https://core.ac.uk/download/578776965.pdf

Candó Gámez, Y. D. (2012). La artesanía como una práctica cultural configuradora de procesos socioculturales: la cestería en Las Tunas en la actualidad. Didáctica y Educación, 3(5), 85–98. https://revistas.ult.edu.cu/index.php/didascalia/article/view/128

Castanho, R. A., Couto, G., Pimentel, P., Carvalho, C., Sousa, Á., & da Graça Batista, M. (2021). Analysing the Public Administration and Deci-

sion-Makers Perceptions Regarding the Potential of Rural Tourism Development in the Azores Region. International Journal of Sustainable Development and Planning, 16(4), 603-614. https://doi.org/10.18280/ijsdp.160401

Castañeda Torres, S., Ussa Garzón, J. E., & Rodríguez Miranda, J. P. (2020). Modelo conceptual para la creación de valor en el turismo rural comunitario. Revista Espacios, 41(47), 176-190. https://doi.org/10.48082/espacios-a20v41n47p13

Castellano Montesdeoca, E. (2020, 2020-12). Turismo accesible en la isla de Gran Canaria: situación actual [Accessible Tourism on the island of Gran Canaria: current situation]. Trascender, contabilidad y gestión, 5(15), 2-26. https://doi.org/10.36791/tcg.v0i14.85

Chin, C. H., Wong, W. P. M., & Wahap, D. Z. B. A. A. (2022). Effects of destination appeal and tourism infrastructure on rural tourism destination competitiveness and revisit intention: A study in Bario Kelabit Highland. Pakistan Journal of Commerce and Social Sciences (PJCSS), 16(3), 366-386. http://hdl.handle.net/10419/266380

Del Espino Hidalgo, B., Rodríguez Díaz, V., González-Campos-Baeza, Y., & Santana Falcón, I. (2022). Indicadores de accesibilidad para la evaluación del patrimonio cultural como recurso de desarrollo en áreas rurales de Huelva. ACE: Architecture, City and Environment, 17(50), 11375. https://doi.org/10.5821/ace.17.50.11375

Díaz-Pompa, F., Leyva-Fernández, L. d. l. C., Ortiz Pérez, O. L., & Sierra Mulet, Y. (2020). El turismo rural sostenible en Holguín. Estudio prospectivo panorama 2030. El Periplo Sustentable(38), 174-193. http://rperiplo.uaemex.mx/

Du, X., Wang, Z., & Wang, Y. (2023). The Spatial Mechanism and Predication of Rural Tourism Development in China: A Random Forest Regression Analysis. Int. J. Geo-Inf., 12(321). https://doi.org/10.3390/ijgi12080321

Fuente-Robles, Y. M. D. L., Muñoz-de-Dios, M. D., Mudarra-Fernández, A. B., & Ricoy-Cano, A. J. (2020). Understanding stakeholder attitudes, needs and trends in accessible tourism: A systematic review of qualitative studies. Sustainability, 12(24), 10507. https://www.mdpi.com/2071-1050/12/24/10507

Galarza Justillo, J. J. (2021). Análisis de la accesibilidad del complejo agro turístico Mango Tour para la mejora de la experiencia turística del turista con discapacidad [Grado, Universidad Técnica De Babahoyo]. Babahoyo-Los Ríos-Ecuador.

Gaona Suarez, N. L., Rogel Montesdeoca, M. D., & Calle IÑIguez, M. P. (2020). Análisis del grado de accesibilidad visual en los atractivos turísticos del cantón Machala (Ecuador). Revista Espacios, 41(50). https://doi.org/10.48082/espacios-a20v41n50p22

Granda Maldonado, S., Sánchez Ruiz, J., Castro Iturralde, G., Beltrami, M., & Carrasco, M. (2021, 2021-08). Accesibilidad en los establecimientos hoteleros: caso de estudio Loja, Ecuador [Accessibility in hotel establishments: case study Loja, Ecuador]. Conrado, 17(81), 436-442. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1990-86442021000400436&lang=pt

Gunawijaya, J., & Pratiwi, A. (2016). Destination Development for Rural Tourism Area in Wanayasa, Purwakarta, West Java, Indonesia. E-Journal of Tourism, 3(2), 88-95. https://ojs.unud.ac.id/index.php/eot/article/view/24003

Ibanescu, B. C., Eva, M., & Gheorghiu, A. (2020). Questioning the Role of Tourism as an Engine for Resilience: The Role of Accessibility and Economic Performance. Sustainability, 12, 5527. https://doi.org/10.3390/su12145527

Jurado-Almonte, J. M. (2014). El turismo accesible en Andalucía. Un producto turístico emergente. Revista de Estudios Andaluces(31), 1-34. https://institucional.us.es/revistas/andaluces/31/art_1.pdf

Kumar, S., Valeri, M., & Shekhar. (2022). Understanding the relationship among factors influencing rural tourism: a hierarchical approach. Journal of Organizational Change Management, 35(2), 385-407. https://doi.org/10.1108/JOCM-01-2021-0006

Ladu, M., Battino, S., Balletto, G., & Amaro García, A. (2023). Green Infrastructure and Slow Tourism: A Methodological Approach for Mining Heritage Accessibility in the Sulcis-Iglesiente Bioregion (Sardinia, Italy). Sustainability, 15, 4665. https://doi.org/10.3390/su15054665

Leyva Fernández, L. d. I. C., Díaz-Pompa, F., Morales Flores, E., & Ortiz Pérez, O. L. (2017). Políticas públicas para el turismo sostenible en Holguín (Cuba) y Puebla (México). Una comparación de estudios de caso. Retos de la Dirección, 11(1), 130-146.

Orama Gómez, M. (2014). Propuesta de diseño del circuito turístico: Cultura, historia y tradición en el Oriente Cubano [Tesis de Grado, Universidad de Holguín]. Holguín. https://repositorio.uho.edu.cu/handle/uho/5357

Orjuela Yusty, A. (2020). Condiciones de accesibilidad territorial ofrecidas por la red de rutas turísticas que hacen parte del Paisaje Cultural Cafetero [Magister, Universidad Nacional de Colombia]. Manizales, Colombia.

Partido Santanach, D., de Miguel Guzmán, M., Betancourt Partido, D., & Bravo Sánchez, Y. (2009). Procedimiento para incorporar atractivos culturales a productos turísticos territoriales. TURyDES, 2(5). https://www.eumed.net/rev/turydes/05/sgps.htm

Porto, N., & Rucci, A. C. (2019, 2019-10-01). Accesibilidad en turismo: Diagnóstico, voluntad política y acciones [Accessibility In Tourism: Diagnosis, Political Will And Actions]. Estudios y perspectivas en turismo, 28(4), 1032-1062. http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S1851-17322019000400010&lang=pt

Posada, C. (2003). La décima cantada en el Caribe y la fuerza de los procesos de identidad. Revista de Literaturas Populares, III(2), 141-154.

Мантас, Ю., & Айсте Барбора, У. (2020). ACCESSIBILITY OF RURAL TOURISM SERVICES FOR THE DISABLED IN LITHUANIA. Scientific Cooperation Center "Interactive plus". https://doi.org/10.21661/r-551747

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Research paper

Gastronomy and coastal tourism: A symbiotic bond shaping tourist experiences in the La Serena-Coquimbo conurbation (Chile)

Gastronomía y turismo costero: Un vínculo simbiótico que configura las experiencias turísticas en la conurbación La Serena-Coquimbo (Chile)

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ABSTRACT

Coastal areas play a vital role in society, creating a favorable environment for a wide range of social, cultural and economic activities, including culinary recreational opportunities. This study analyzes the experiences of visitors to bars and restaurants on the coast of the conurbation of La Serena and Coquimbo, the fourth most populated metropolitan area in Chile and one of the main sun and beach tourist destinations in the country. The data, collected through a survey of 536 visitors, were analyzed using descriptive and multivariate statistical methods. It was revealed that tourists exhibit high satisfaction and loyalty, with key determining factors being the beauty of the establishments, the quality of the service and the gastronomic offer. In addition, it was found that the probability of satisfaction increases for frequent visitors to the area, women, people with lower incomes and with a post-secondary education, and those motivated to escape from routine or meet with family or friends. It is concluded that effectively managing the link between gastronomy and coastal tourism is crucial to position the area as a top-level tourist destination.

Keywords: *Gastronomy, Coastline, Bars and restaurants, Tourist satisfaction, La Serena-Coquimbo Conurbation*

RESUMEN

Las zonas costeras desempeñan un papel vital en la sociedad, creando un entorno favorable para una amplia gama de actividades sociales, culturales y económicas, incluidas oportunidades recreativas culinarias. Este estudio analiza las experiencias de los visitantes de bares y restaurantes en la costa de la conurbación de La Serena y Coquimbo, la cuarta área metropolitana más poblada de Chile y uno de los principales destinos turísticos de sol y playa del país. Los datos, recogidos mediante una encuesta a 536 visitantes, fueron analizados usando métodos estadísticos descriptivos y multivariados. Se reveló que los turistas exhiben alta satisfacción y lealtad, siendo factores determinantes clave la belleza de los establecimientos, la calidad del servicio y la oferta gastronómica. Además, se encontró que la probabilidad de satisfacción aumenta para los visitantes frecuentes de la zona, las mujeres, las personas de menores ingresos y con educación superior y aquellos motivados por escapar de la rutina o reunirse con familiares o amigos. Se concluye que gestionar eficazmente el vínculo entre gastronomía y turismo costero es crucial para posicionar la zona como un destino turístico de primer nivel.

Palabras clave: Gastronomía, Borde costero, Bares y restaurantes, Satisfacción del turista, Conurbación La Serena-Coquimbo

INTRODUCTION

In recent decades, tourism has captured growing attention in academic literature, particularly in the realm of sun and beach tourism, which emerges as one of the most prominent sectors along the coasts of numerous countries worldwide (Carvache-Franco et al., 2018; Padilla et al., 2019). In this context, food has not only gained relevance as a fundamental element of tourism but has also established itself as an integral part of a destination's cultural heritage (Aydın, 2020).

With the growing recognition of gastronomy as an added value in tourist destinations, ensuring customer satisfaction with their culinary experience becomes an unavoidable priority (Kido et al., 2018), especially considering that it has become the main travel motivator in several tourist destinations (Tsai & Wang, 2017) and a distinctive feature in the marketing of a tourist attraction (Sio et al., 2024). Therefore, gastronomy constitutes a crucial element that influences the traveler's experience, satisfaction, and loyalty (Durmaz et al., 2022).

In the realm of culinary tourism, it is widely believed that the visitor's level of satisfaction with their culinary experience has a significant impact on the likelihood of their return and promotion of the establishments and sites they have visited (Ali et al., 2020; Björk & Kauppinen-Räisänen, 2017; Ji et al., 2016). Recent evidence has highlighted the importance of gastronomy as a valuable source of satisfaction for tourists in their destination (Erkmen, 2019; Toudert & Bringas-Rábago, 2021; Widjaja et al., 2020). This has led to a growing emphasis on food as a primary tourist offering to attract more visitors (Mohapatra & Nath Biswas, 2017; Yentür & Demir, 2022).

However, despite the recognized importance of gastronomy in the tourism experience, there is a general paucity of research on the implications of culinary tourism on destination image (Sio et al., 2024), and particularly, little is known about the visitor experience in these types of establishments. This becomes more critical when considering that in tourism studies, satisfaction becomes more complex when the research setting relates to tourists' food choices (Ji et al., 2016).

The La Serena-Coquimbo conurbation, located in the Coquimbo Region, Chile (See Figure 1), stands out as the main urban center in the North and the fourth largest urban agglomeration in Chile, with a population of 448,784 (Instituto Nacional de Estadísticas, 2019). These municipalities concentrate about 60% of the regional population and offer a wide range of services and facilities, playing a crucial role as a connection point between the northern region of the country and the capital. In addition, they have direct access to the ocean through the port of Coquimbo and are located relative proximity to Argentina via the Elqui Valley and the Agua Negra Pass (Castillo, 2022).

Figure 1. Map of the La Serena-Coquimbo Conurbation

Source: Adapted from educarchile (May 10, 2024).

The coastlines of La Serena and Coquimbo in Chile are a privileged tourist destination that blends the beauty of the sea with a diverse gastronomic offer. Stretching for approximately 40 kilometers, its coastline stands out as one of the main sun and beach tourist destinations in the country. The bars and restaurants in the area are essential elements of this experience, as they not only satisfy the palates of visitors but also form part of the local landscape and culture. These establishments offer a window into the region's identity, where the flavors of the sea merge with local culinary tradition, creating a unique sensory experience.

Within this context, the present study aims to analyze the visitor experience in the bars and restaurants along the coastline of La Serena and Coquimbo, Chile. The hypothesis is proposed that the service and quality of these establishments are determining factors in traveler satisfaction with the destination. Additionally, it is assumed that there are personal, behavioral, and motivational characteristics of visitors that affect their likelihood of satisfaction with the destination.

To achieve this objective, various aspects were examined, including the visitor profile, travel motivations, service and customer care, and interaction with the natural environment. It is expected that this research will contribute new knowledge to an area that has been largely unexplored until now: the tourist experience in bars and restaurants located on the Chilean coast. In addition, the results obtained could be used to improve the quality of gastronomic services offered in this area, benefiting both tourists and the local community. Finally, this study could contribute to a deeper understanding of the interrelationship between tourism, gastronomy, and the environment, thus promoting the sustainable development of the tourist destination.

The article is structured into four sections following this introduction. First, the research methodology employed in the study is detailed. Then, the main findings are summarized. Subsequently, the most relevant findings are discussed. Finally, the conclusions of the study are presented.

METHODOLOGY

The research employed a quantitative approach, a non-experimental design, a descriptive type, and a cross-sectional scope. The study sample consisted of 536 subjects selected using a non-probability convenience sampling. The sample size was computed based on an infinite universe (N>100,000), a heterogeneity of 50%, a confidence level of 95%, and an approximate margin of error of 4.2%.

The data collection technique was a survey. The questionnaire was administered in person and online to visitors to the La Serena-Coquimbo coastal strip during the months of April and May 2023. The research addressed various questions related to the characteristics, behavior, motivation, preferences, satisfaction, and loyalty of visitors. The instrument consisted of polytomous questions about the respondent's profile (gender, age, education, etc.) and three 5-point Likert-type scales on satisfaction and loyalty (1=strongly disagree to 5=strongly agree), motivations for the visit (1=not at all important to 5=very important), and satisfaction attributes (1=not at all important to 5=very important).

The data were analyzed using frequency tables and graphs (absolute and relative), measures of central tendency and dispersion, and association tests for categorical variables (chi-square test). Additionally, the reliability of the instrument's scale (Likert) was measured using Cronbach's alpha coefficient, which yielded satisfactory results (α>.7) for both the motivation scale (α=.8), the attribute rating scale (α=.89) and the satisfaction scale applied (α=.96).

Finally, a multivariate analysis was conducted using binary logistic regression to identify the variables (tourist characteristics, visit motivations, and establishment attributes) that increase the likelihood of visitor satisfaction with the coastal strip's bars and restaurants. This technique is employed in situations where the probability of occurrence of a dichotomous dependent variable needs to be explained through a set of predictor variables of different nature. The applied model established visitor satisfaction as the dependent variable. The mathematical equation used was as follows:

$$\hat{p}_i = \left(\frac{e^{\hat{b}_0+\hat{b}_1 x_{1i}+\hat{b}_2 x_{2i}+\cdots+\hat{b}_k x_{ki}}}{1-e^{\hat{b}_0+\hat{b}_1 x_{1i}+\hat{b}_2 x_{2i}+\cdots+\hat{b}_k x_{ki}}} \right) \quad (1)$$

In the formula, pi represents the probability that the i-th individual is satisfied. The explanatory variables of the model (dichotomous) correspond to six tourist profile variables (gender, age, education, city of residence, income, and occupation), seven behavioral variables (frequency of visit, number of visits, type of companion, number of companions, use of Instagram, spending level, and information source), nine motivational variables (novelty, disconnection, economics, gastronomy, tourist reputation, meeting with family/friends, events, geographic proximity, and business), and nine value attributes (beauty of the place, quality of gastronomy, conservation of the coastal area, quality of service, value for money, care and cleanliness of the area, citizen safety, complementary events offering, and access to parking).

It should be noted that the Likert scale scores were dichotomized into "essential" and "non-essential," where the values of strongly agree (5) are equivalent to "essential"

(coded as 1) and any other value is equivalent to "non-essential" (coded as 0). Additionally, the respondents' profile variables were incorporated to complement the analysis, with the specific coding presented in the results table.

All statistical analyses were conducted using the IBM SPSS Statistics and Minitab software.

RESULTS

Visitor profile

The majority of the respondents are female (55%), are between the ages of 18 and 39 (74%), hold a technical or university degree (57%), have an income of less than USD 1335 (53%), are employed (47%), and reside in the city of La Serena (60%). See Table 1.

Table 1.Visitor sociodemographic characteristics

Variable	Segment	%
Gender	Male	42.2
	Female	55.4
	Other	2.4
Age	18-29 years old	54.7
	30-39 years old	19.8
	40-49 years old	13.6
	50-59 years old	8.2
	60 years or older	3.7
Income level	Less than USD 445	16.0
	USD 445 to USD 890	22.9
	USD 890 to USD 1335	13.6
	USD 1335 to USD 2225	10.3
	USD 2225 or more	7.1
	No income	30.0
City of residence	Coquimbo	27.1
	La Serena	59.9
	Other	13.1
Education level	Primary	2.4
	High school	37.5
	Technical or Professional	31.9
	University degree	25.4
	Postgraduate	2.8
Occupation or profession	Student	39.2
	Worker	46.5
	Homeowner	7.1
	Business owner	3.5
	Other	3.7

Source: Author's own survey data.

Table 2 shows that the majority of patrons at bars and restaurants along the La Serena and Coquimbo coastline visit monthly (43%), every two month (15%), or weekly (15%). On average, each visitor spends between USD 11 and USD 56 (84%), with an average expenditure of USD 54. Notably, around half of the respondents spent less than USD 26 on their last visit to an establishment in the area.

Regarding the traveler's companions, visitors often frequent these establishments with family members (37%), friends (36%), or couples (23%). Visits typically involve groups of 4 people (29%), 3 people (23%), or 5 or more people (24%).

When it comes to information sources, most tourists rely on recommendations from friends or family (42%), followed by social media reviews (31%) and previous experience (16%). In contrast, traditional media outlets like television, radio, and newspapers were not utilized at all (1%). Additionally, visitors highlighted their preference for various digital platforms to gather information (81%), with Instagram being the most popular (61%), followed by online search engines (11%) and Facebook (8%). However, 19% indicated that they don't use any internet sources for information.

Table 2. Guest Behavior

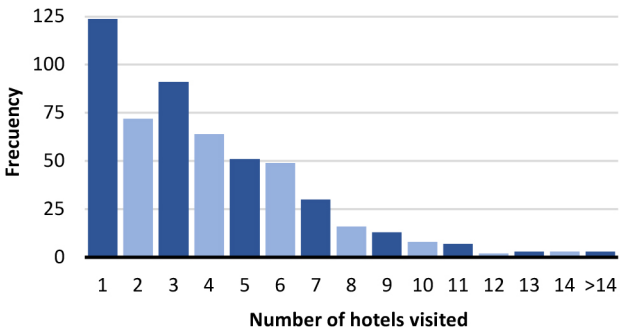
Variable	Segment	%
Visit frequency	More than once a week	2.6
	Once a week	15.1
	Once a month	42.5
	Every two months	15.3
	Every three months	8.2
	Twice a year or less	16.2
Spending per visit (per person)	Less than USD 11	4.1
	USD 11 to USD 22	41.2
	USD 22 to USD 56	42.4
	USD 56 to USD 111	10.1
	USD 111 or more	2.2
Preferred Platform	Instagram	55.8
	WhatsApp	22.4
	Facebook	11.8
	TikTok	4.7
	Twitter	2.1
	Other	3.4
Information source	Friends or family	42.4
	Social media	30.6
	Previous experience	16.4

	Internet information	4.1
	Other	1.5
	None	5.0
Type of companion	Alone	2.2
	Family	36.9
	Friends	35.8
	Couple	22.8
	Colleagues	2.2
Number of companions	0	1.9
	1	8.6
	2	12.7
	3	23.3
	4	29.3
	5 or more	24.3

Source: Author's own survey data.

Tourists were also asked about the number bars and restaurants along the La Serena and Coquimbo coastline they had visited, revealing that most had frequented at least three establishments. See Figure 2.

Figure 2. Total number of establishments visited



Source: Author's own survey data.

The application of the chi-square independence test between behavioral variables and visitor sociodemographic characteristics revealed several statistically significant associations of interest.

First, it was found that the visitor's spending level is dependent on age (p<.001) and socioeconomic aspects such as education (p<.001), occupation or profession (p<.001), and income (p<.001). It was observed that adults between the ages of 30 and 49, with higher education (undergraduate or postgraduate), who work as entrepreneurs or professionals (dependent or independent) and have high incomes, are the ones who spend the most.

Furthermore, a significant relationship was found between the type of travel companion and the traveler's age (p=.013) and income level (p<.001). In terms of age, it was observed that younger travelers (under 30 years old) tend to travel with friends, while middle-aged adults (over 40 years old) prefer to travel with family, and older adults (60 years old or older) opt to travel with their couple or alone. In terms of income, those with higher incomes (USD 2225 or more) tend to travel with family and partner, while those with lower incomes (less than USD 1335) are more likely to travel with friends or alone.

Finally, it was observed that information resource preferences vary significantly based on the visitor's age (p<.001). The Instagram platform is preferred by younger individuals (under 40 years old), while Facebook and online search engines are generally more widely used by those aged 40 and over.

Motivations to visit the coastline

The main motivations for visiting the La Serena and Coquimbo coastline are meeting with family or friends (84%), breaking away from routine (76%), savoring the gastronomy (63%), enjoying affordable dining establishments (61%), and capitalizing on the tourism reputation of the area (58%). See Table 3.

The analysis of independence tests between visitor motivations and profiles revealed several statistically significant associations, detailed in Table 3. Specifically, it is noteworthy that women are more inclined to visit the area due to their desire to explore new dining sites and their affordability pricing. Furthermore, it is observed that younger individuals exhibit a heightened interest in discovering novel establishments, whereas adults aged 30 to 59 do so due to their proximity to their residences. Moreover, individuals with lower incomes and those possessing university, technical, or professional education are motivated to visit more economical establishments. Conversely, both women and people with lower incomes are the most motivated groups to visit the area to participate in scheduled events. Finally, it is adults in the 30 to 60 age range, along with those with high incomes (over USD 1335), who primarily travel for business purposes.

Table 3. Motivations to visit the La Serena and Coquimbo Coastline (%)

Motivations	1	2	3	4	5	Chi-Square Test (p) Gender	Age	Education	Income
Discover new dining establishments	5.0	9.3	31.5	32.5	21.6	.044*	.032*	.362	.366
Break away from the routine	3.0	4.1	17.2	38.2	37.5	.077	.511	.191	.832
Enjoy affordable dining establishments	4.7	6.3	27.6	35.8	25.6	.028*	.202	.004**	.001**
Taste the gastronomy	3.0	7.5	26.9	33.8	28.9	.274	.204	.631	.314
Capitalize on tourism reputation area	6.9	8.0	27.4	35.1	22.6	.415	.641	.364	.082
Convene with family or friends	1.9	3.4	10.4	34.5	49.8	.617	.208	.554	.271
Attend scheduled events	20.5	19.2	27.2	20.3	12.7	.008**	.068	.591	.025*
Enjoy the proximity to my home	18.7	15.7	26.9	22.9	15.9	.784	.024*	.392	.000***
Conduct business	53.9	17.4	13.1	9.1	6.5	.260	.019*	.061	.000***

Source: Author's own survey data.
Note: Respondents were asked to indicate the importance of each motivation when taking a tourist trip. The importance levels are measured on a five-point Likert scale (1 = not at all important, 2 = not very important, 3 = neutral, 4 = important, 5 = very important). Significance level: *p<.05, **p<.01, ***p<.001.

Valued attributes of bars and restaurants

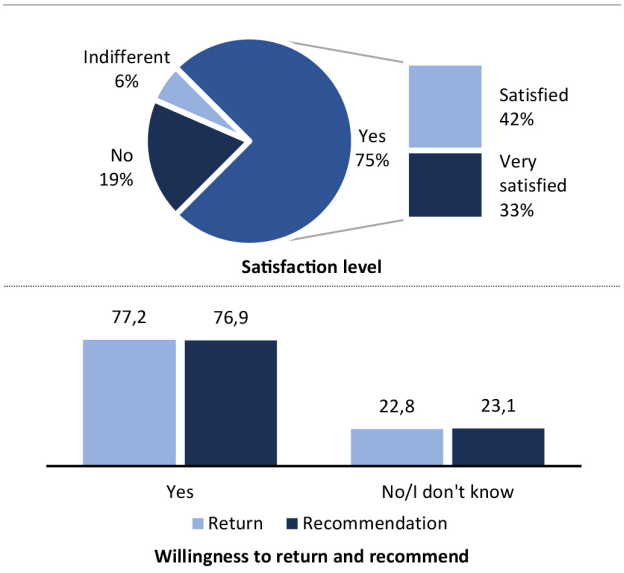
The most valued attributes of bars and restaurants along the La Serena-Coquimbo coastline are primarily: the beauty and decoration of the establishments (82%), the attention and quality of service offered (80%), and the diversity and quality of the cuisine (79%). Conversely, the least valued attributes are parking access (40%), complementary event offerings (48%), and public safety (48%).

The examination of attribute ratings according to visitor profiles revealed several statistically significant associations, detailed in Table 4. Particularly noteworthy is that younger visitors (under 40 years old) place special value on the cleanliness and upkeep of the area. Similarly, those with lower educational levels (without college degrees) tend to appreciate the diversity and quality of local gastronomy more. Furthermore, it was observed that public safety and parking accessibility are more highly valued by individuals with lower levels of education.

Visitor satisfaction and loyalty level

The majority of visitors to bars and restaurants along the coastline report satisfaction with the service received (75%). The results indicate that 1 out of 3 people are completely satisfied, while only 2 out of 10 express dissatisfactions. Additionally, visitor loyalty was analyzed in terms of their willingness to return and recommend establishments in the area. The results were favorable, as the majority expressed their intention to return to the last visited venue (77%) and to recommend establishments in the conurbation (77%). See Figure 3.

Figure 3. Visitor satisfaction and loyalty level



Source: Author's own survey data.

The analysis of the relationship between visitor satisfaction level and sociodemographic characteristics revealed only one statistically significant association with income level (p=.004). Particularly, it was observed that satisfaction decreases as visitor income increases. For instance, when grouping income levels into three increasing categories - less than USD 890, between USD 890 and USD 2225, and USD 2225 or more - satisfaction levels are 77%, 75%, and 70%, respectively. These results suggest that visitors with lower incomes tend to be more satisfied with their experience than those with higher incomes.

Table 4. Customer-Preferred Coastal Bar and Restaurant Attributes (%)

						Chi-Square Test (p)			
Attribute	**1**	**2**	**3**	**4**	**5**	**Gender**	**Age**	**Education**	**Income**
Beauty/decoration	1.1	1.1	16.0	49.1	32.6	.700	.639	.064	.768
Diversity and quality of gastronomy	0.6	2.2	18.1	45.3	33.8	.320	.734	.035*	.144
Conservation of the coastal area	1.5	6.5	27.8	41.0	23.1	.068	.096	.237	.046*
Attention and quality of establishments	0.9	2.8	16.6	48.7	31.0	.094	.886	.193	.608
Quality-price ratio of establishments	1.9	4.5	28.9	45.3	19.4	.145	.543	.172	.813
Care and cleanliness of the area	1.5	4.5	26.9	42.5	24.6	.768	.011*	.565	.253
Public safety	5.4	11.4	34.9	33.0	15.3	.095	.172	.034*	.149
Complementary event offerings	6.9	8.8	36.4	34.1	13.8	.355	.093	.338	.744
Parking access	13.1	15.7	31.0	23.7	16.6	.117	.238	.033*	.500

Source: Author's own survey data.
Note: Respondents were asked to indicate the importance of each motivation when taking a tourist trip. The importance levels are measured on a five-point Likert scale (1 = not at all important, 2 = not very important, 3 = neutral, 4 = important, 5 = very important). Significance level: *p<.05.

Visitor satisfaction estimation model

The results presented in Table 5 reveal multiple personal characteristics and motivations, as well as place attributes that influence visitor satisfaction along the coastline of the conurbation.

The findings indicate that bars and restaurants which effectively highlight and communicate elements such as service quality (p<.001) and the beauty of their facilities (p<.01) are the ones that generate higher levels of satisfaction. Additionally, these places seem to especially satisfy those seeking to disconnect from routine (p<.001) and spend time with family and friends (p<.1).

Regarding tourists' profiles, it's notable that individuals who tend to experience higher satisfaction with coastal establishments are typically female (p<.05), have higher education levels (p<.05), lower incomes (p<.1), have visited multiple venues (p<.05), and are regular patrons of the area (p<.05). Conversely, those who are employed (p<.05) and primarily use Instagram as their main social media platform (p<.01) tend to report lower levels of satisfaction. Particularly, the results reveal that the likelihood of satisfaction increases when the visitor has higher education (1.8 times more), is female (1.8 times more), has a monthly income below USD 445 (1.7 times more), is a frequent diner (3.8 times more), and has visited more than two venues in the area (1.6 times more). Additionally, it's observed that the likelihood of satisfaction increases when the visitor's main motivations are escaping routine (2.8 times more) and/or spending time with loved ones (1.8 times more). Similarly, customer satisfaction is significantly boosted by the quality of service offered (6.6 times more) and the attractive decoration of their facilities (2 times more).

Finally, it's worth noting that the selected final model achieved an adjustment of 38.5%, according to the Nagelkerke's R-squared coefficient, and was considered adequate based on the results of the Hosmer-Lemeshow goodness-of-fit test (p= .704). The overall percentage of correct predictions by the model was 78%.

DISCUSSION

The results of this study provide a comprehensive insight into the profile, preferences, and experiences of visitors to bars and restaurants along the coastline of La Serena-Coquimbo. These findings are particularly relevant for understanding the tourism and gastronomic dynamics of this coastal region, as well as similar sun and beach destinations.

Firstly, a predominant visitor profile stands out: a young individual (under 40 years old), professional, residing in La Serena, with moderate income, and a strong female presence (Araya-Pizarro & Álvarez Cortés, 2020). These characteristics suggest a target audience with specific influences that may affect their preferences and behaviors during their visit to these establishments.

Table 5. Predictors of visitor satisfaction with bars and restaurants

Variables	B	Wald	Sig.	Exp(B)	95% C.I. for Exp(B)	
					Lower	Upper
Gender (female=1)	0.582	6.427	.011**	1.790	1.141	2.807
Education (graduate/postgraduate=1)	0.579	5.442	.020**	1.785	1.097	2.905
Occupation (worker=0)	0.751	6.652	.010**	2.118	1.197	3.747
Income (Less than USD 445=1)	0.544	3.679	.055*	1.723	0.988	3.006
Social media (Instagram=0)	0.695	8.573	.003***	2.004	1.258	3.192
Visits per week (more than one=1)	1.335	4.162	.041**	3.798	1.054	13.689
Establishments visited (more than two=1)	0.479	3.938	.047**	1.614	1.006	2.589
Motivation 1 (break away from the routine=1)	1.045	18.116	.000***	2.844	1.758	4.602
Motivation 2 (convene with family/friends=1)	0.444	3.313	.069*	1.559	0.966	2.516
Attribute 1 (facility decoration=1)	0.674	7.438	.006***	1.961	1.209	3.182
Attribute 2 (service quality=1)	1.886	53.765	.000***	6.596	3.984	10.921
Constant	-4.437	78.102	.000***	0.012		
Hosmer and Lemeshow Test	.704					
Cox & Snell R Square	.277					
Nagelkerke R Square	.385					
Global Percentage	.780					

Source: Author's' own survey data.
Note: Significance level *p < .1, **p < .05, ***p < .01.

The analysis of visitor behavior unveils significant patterns. Overall, it's been observed that users spend an average of $54 per visit, frequenting establishments monthly and typically attending with friends or family in groups of 4 or 5 individuals. This information proves valuable for owners and managers when crafting strategies to attract and retain various customer segments.

The influence of personal recommendations and the use of digital platforms to obtain information about establishments in the area highlights the importance of word of mouth and social media in visitors' decisions, especially Instagram (Mattei, 2024). It is proven that social networks can influence both the development of gastronomy and tourism itself (Vukolic et al., 2022). Additionally, the relationship between the visitor's age and their online search preferences underscores the importance of strengthening the online presence of the sector and adopting social media strategies to improve interaction with potential visitors. These digital marketing initiatives can drive market engagement and increase business competitiveness (Kelson et al., 2024).

The results of the association tests between behavioral and sociodemographic variables of tourists offer valuable insights into consumption patterns and preferences in the context of coastal tourism. Findings indicate that visitors' spending levels are closely linked to factors such as age, education, employment status, and income (Orden-Mejía & Moreno-Manzo, 2024; Phan et al., 2024). It is confirmed that adults (aged 30 to 49), with higher education and high incomes, are the ones who spend the most during their visit to coastal venues. This trend may be related to their purchasing power and willingness to invest in leisure and entertainment experiences.

The influence of age and income is also reflected in companion preferences during visits. Adults under 30 and those with lower incomes tend to prefer the company of friends, while adults over 40 and visitors with higher incomes opt to go out with family members. In this context, there are studies highlighting how travel companions influence the selection of gastronomic preferences (Liu et al., 2021). Similarly, the preference for certain information resources exhibits an age-related trend. The Instagram platform is predominantly used by younger people, while Facebook and online search engines are more popular among those aged 40 or older. These findings suggest that motivations and social dynamics vary according to life stages, which may have important implications for designing effective communication strategies (advertising and promotion) targeted at different sociodemographic groups.

The examination of tourists' motivations reveals that the

coastal shoreline of the La Serena-Coquimbo conurbation is positioned as an ideal tourist destination for family outings, where visitors can disconnect from their routine and enjoy local gastronomy at affordable prices, in an area renowned for its fame and prestige. In this regard, statistical association tests revealed that the desire to explore new bars and restaurants is influenced by both gender and age. It is interesting to note that women and younger individuals show a greater inclination to explore new establishments, while men and older individuals are more averse to novelty. In this context, studies verify the significant influence of neophilic (preference for the new) and neophobic (aversion to the unknown) tendencies on tourists' acceptance of local cuisine (Baah et al., 2019).

On the other hand, it was found that the search for budget-friendly establishments is closely related to gender, education, and income. Women show a greater tendency to enjoy places with more accessible prices, which may reflect an economic sensitivity and a search for value in their consumption decisions. Additionally, the results indicate that those with undergraduate studies (technical, professional, and university degrees) and those with lower incomes also prefer more economical establishments, suggesting financial awareness and adaptation to their available resources. It is worth mentioning that the higher sensitivity of women towards price has already been confirmed in other tourism areas such as hospitality (Herjanto et al., 2020; Hong et al., 2020).

The high satisfaction and loyalty reported by the majority of visitors reflect the perceived quality of the gastronomic experience on the coast of the conurbation. However, it is important to highlight the discrepancies found in income levels. It is observed that as the visitor's income increases, the level of satisfaction tends to decrease. This pattern suggests that those with higher incomes may have higher expectations or be more critical in their evaluation of the tourism experience. Conversely, those with lower incomes may be more inclined to feel satisfied with an experience that fits their expectations and budget. In this regard, studies have found that travelers with higher incomes approach the tourism experience with a more critical focus (Akinci & Aksoy, 2019; Torres-Sovero et al., 2012). This underscores the importance of understanding the diverse expectations of the population and offering high-quality experiences that can meet the expectations of visitors, regardless of their income level.

The findings suggest that visitors primarily value the ambiance of establishments, the service provided, and the quality of the gastronomy (Araya-Pizarro & Álvarez Cortés, 2020; Bertan, 2020). In the realm of dining, it is recognized that the perception of food, service, and physical environment positively influences diner satisfaction (Bae et al., 2018), which also relates to customer retention (Ranaweera & Prabhu, 2003). From this perspective, it is worth emphasizing that gastronomic identity is considered a strategic resource for destinations, as food consumption influences identity, culinary heritage, and collective memory (Mariano-Juárez et al., 2023). Therefore, developing a destination differentiation strategy focused on presenting distinctive gastronomic products would be crucial for success and competitiveness in the tourism market (Seyitoğlu & Ivanov, 2020).

On the other hand, the least valued attributes, such as parking access, complementary event offerings, and public safety, suggest areas for improvement for establishments in the region. This could involve implementing strategies to address these concerns and enrich the overall visitor experience. At this juncture, it is crucial to highlight the role of safety in tourism, recognized as an essential element in tourists' destination choices (Wendt & Bógdał-Brzezińska, 2024).

The predictive model identified several factors that significantly influence the likelihood of satisfaction among visitors to bars and restaurants in the studied area. Firstly, it was found that visitors with higher levels of education have a significantly greater probability of experiencing satisfaction. This suggests that education may influence customers' expectations and perceptions, as well as their ability to appreciate and evaluate the gastronomic experience.

Furthermore, the research revealed that the female gender is associated with a higher likelihood of satisfaction. This difference may be related to discrepancies in preferences, expectations, or individual experiences during visits to gastronomic establishments.

The relationship between monthly income and satisfaction is also noteworthy, as visitors with lower incomes have a significantly higher probability of being satisfied. This could suggest that visitors with lower incomes may be more sensitive to perceived value and be more satisfied with experiences that fit within their budget.

Another important finding is the influence of visitor beha-

vior on their satisfaction. It was found that frequent diners and those who have visited more than two establishments in the area have a much higher probability of being satisfied. This suggests that familiarity with the area and previous experience can positively contribute to customer satisfaction.

Additionally, visitor motivations play a significant role in their satisfaction. Specifically, those seeking to brake away from routine or gather with loved ones have a much higher likelihood of being satisfied. These findings highlight the importance of understanding customers' underlying motivations to design gastronomic experiences that meet their emotional and social needs.

Finally, it is confirmed that service quality and the aesthetics of the facilities are critical factors in increasing customer satisfaction. Establishments that excel in these aspects have a significantly higher probability of satisfying their customers, highlighting the importance of investing in staff training and the design and upkeep of attractive spaces. In this regard, food can add value to the tourist experience, especially to travelers seeking unique experiences. Thus, the perception of authenticity in a restaurant has a positive impact on satisfaction and the intention to return to a destination (DiPietro & Levitt, 2017).

Together, these findings provide valuable insights for stakeholders involved in the management and promotion of the gastronomic and tourism offerings on the coast of La Serena and Coquimbo, highlighting key areas for future research and the development of improvement strategies.

CONCLUSIONS

The study aimed to analyze visitors' experiences at bars and restaurants along the coastline of La Serena and Coquimbo. Several conclusions were drawn from the results, highlighting the complexity of visitors' behaviors and preferences in this area. This has significant implications for designing strategies to develop and promote sun and beach tourist destinations.

A specific target audience with distinct socio-demographic, behavioral, and motivational characteristics that influence their preferences and actions during their visits to gastronomic establishments has been identified. The traveler profile comprises young adult females who are actively employed, residing in La Serena city, with moderate monthly incomes. Behavior-wise, they visit monthly, often with close companions, with an average expenditure of $54 per visit. They utilize digital platforms, particularly Instagram, for information and heavily rely on recommendations from friends and family. The main reasons for visiting establishments in the area notably include the importance of gastronomic quality and affordable prices.

High levels of satisfaction, coupled with the willingness to revisit and recommend the area, indicate its positive potential. Visitors appreciate aspects such as the beauty and decoration of the establishment, the attention and quality of service, and the diversity and quality of the gastronomy. However, areas for improvement are identified in aspects such as parking access, the complementary offering of events, and public safety.

The likelihood of satisfaction increases for visitors with higher education levels, female gender, lower monthly income, frequent visitation, and motivations to disconnect from routine or meet with loved ones. Additionally, the beauty of the venues, the quality of service, and the gastronomic offering are also associated with higher satisfaction.

Based on these findings, the study provides specific improvement opportunities for the development of the coastal area of the La Serena-Coquimbo conurbation: 1) Targeting young professional women as a focal segment, 2) Strengthening online presence and encouraging the use of social media, particularly Instagram, 3) Tailoring communication strategies to different age groups, 4) Providing a wide variety of gastronomic options at affordable prices, 5) Creating suitable spaces and activities for family groups, 6) Improving parking access, event offerings, and public safety, and 7) Enhancing attention and service quality, as well as the beauty and decoration of the establishments.

Finally, based on the limitations of the research, it is suggested to replicate the study in different seasons of the year to confirm or identify possible disparities among the different types of visitors to the coastal area of the La Serena-Coquimbo conurbation. Additionally, given the findings obtained, it would be interesting to delve deeper into the analysis of the attributes of food and the culinary experience that influence the preferences of visitors to the sector. In this regard, it is considered relevant to use a stratified sampling approach focused on the highlighted characteristics of the socio-demographic and motivational profile of the visitors.

REFERENCES

Akinci, S., & Aksoy, S. (2019). The impact of service recovery evaluation on word-of-mouth intention: A moderated mediation model of overall satisfaction, household income and gender. Tourism Management Perspectives, 31(2019), 184–194. https://doi.org/10.1016/j.tmp.2019.05.002

Ali, M., Puah, C. H., Ayob, N., & Raza, S. A. (2020). Factors influencing tourist's satisfaction, loyalty and word of mouth in selection of local foods in Pakistan. British Food Journal, 122(6), 2021–2043. https://doi.org/10.1108/BFJ-11-2018-0728

Araya-Pizarro, S., & Álvarez Cortés, M. (2020). Characterization of the national and foreign tourist who visits the city of La Serena, Chile. Revista Interamericana de Ambiente y Turismo, 16(1), 49–65. https://doi.org/10.4067/s0718-235x2020000100049

Aydın, A. (2020). The Strategic Process of Integrating Gastronomy and Tourism: The Case of Cappodocia. Journal of Culinary Science and Technology, 18(5), 347–370. https://doi.org/10.1080/15428052.2019.1616022

Baah, N. G., Bondzi-Simpson, A., & Ayeh, J. K. (2019). How neophilia drives international tourists' acceptance of local cuisine. Current Issues in Tourism, 23(18), 2302–2318. https://doi.org/10.1080/13683500.2019.1619676

Bae, S., Slevitch, L., & Tomas, S. (2018). The effects of restaurant attributes on satisfaction and return patronage intentions: Evidence from solo diners' experiences in the United States. Cogent Business and Management, 5(1), 1–16. https://doi.org/10.1080/23311975.2018.1493903

Bertan, S. (2020). Impact of restaurants in the development of gastronomic tourism. International Journal of Gastronomy and Food Science, 21(April), 100232. https://doi.org/10.1016/j.ijgfs.2020.100232

Björk, P., & Kauppinen-Räisänen, H. (2017). Interested in eating and drinking? How food affects travel satisfaction and the overall holiday experience. Scandinavian Journal of Hospitality and Tourism, 17(1), 9–26. https://doi.org/10.1080/15022250.2016.1215871

Carvache-Franco, M., Carvache-Franco, W., Macas, C., & Orden, M. (2018). Motivaciones, Valoración y Satisfacción del Turista en un destino de Sol y Playa de Ecuador. Revista Espacios, 39(13), 3–16.

Castillo, P. (2022). Metropolización de La Serena-Coquimbo. Efectos sobre la forma urbana barrial, las prácticas y las percepciones de nuevos y viejos residentes [Pontificia Universidad Católica de Chile]. https://estudiosurbanos.uc.cl/wp-content/uploads/2022/12/TESIS-PCR.pdf

DiPietro, R. B., & Levitt, J. (2017). Restaurant Authenticity: Factors That Influence Perception, Satisfaction and Return Intentions at Regional American-Style Restaurants. International Journal of Hospitality and Tourism Administration, 20(1), 101–127. https://doi.org/10.1080/15256480.2017.1359734

Durmaz, Y., Çayırağası, F., & Çopuroğlu, F. (2022). The mediating role of destination satisfaction between the perception of gastronomy tourism and consumer behavior during COVID-19. International Journal of Gastronomy and Food Science, 28. https://doi.org/10.1016/j.ijgfs.2022.100525

Educarchile. (May 10, 2024). Mapa división político administrativa Cuarta Región. Fundación Chile y Ministerio de Educación de Chile. https://centroderecursos.educarchile.cl/handle/20.500.12246/39311

Erkmen, E. (2019). Managing restaurant attributes for destination satisfaction: What goes beyond food? Administrative Sciences, 9(1). https://doi.org/10.3390/admsci9010019

Herjanto, H., Chilicki, A., Anantamongkolkul, C., & McGuinness, E. (2020). Hotel Selection Criteria of Solo Traveling Females. ASEAN Journal on Hospitality and Tourism, 18(2), 58–73. https://doi.org/10.5614/ajht.2020.18.2.01

Hong, J., Repetti, T., Erdem, M., & Henthorne, T. (2020). Effect of guest demographics on perception of hotel room price. Journal of Hospitality and Tourism Insights, 3(1), 3–16. https://doi.org/10.1108/JHTI-01-2019-0014

Instituto Nacional de Estadísticas. (2019). Análisis del Censo de Población y Vivienda 2017. Región de Coquimbo. Instituto Nacional de Estadísticas. https://regiones.ine.cl/documentos/default-source/region-iv/estadisticas-r4/análisis-demográficos/analisis-censo-2017---región-de-coquimbo.pdf

Ji, M., Wong, I. K. A., Eves, A., & Scarles, C. (2016). Food-related personality traits and the moderating role of novelty-seeking in food satisfaction and travel outcomes. Tourism Management, 57, 387–396. https://doi.org/10.1016/j.tourman.2016.06.003

Keelson, S. A., Bruce, E., Egala, S. B., Amoah, J., & Bashiru Jibril, A. (2024). Driving forces of social media and its impact on tourists' destination decisions: a uses and gratification theory. Cogent Social Sciences, 10(1). https://doi.org/10.1080/23311886.2024.2318878

Kido, M. T., Díaz, I., & Kido, A. (2018). La satisfacción del comensal como elemento clave del binomio gastronomía-turismo en Tijuana. Estudios Sociales, 51(28), 1–25. https://doi.org/10.24836/es.v28i51.499

Liu, B., Wang, Y., Katsumata, S., Li, Y., Gao, W., & Li, X. (2021). National Culture and Culinary Exploration: Japan Evidence of Heterogenous Moderating Roles of Social Facilitation. Frontiers in Psychology, 12(November), 1–21. https://doi.org/10.3389/fpsyg.2021.784005

Mariano-Juárez, L., Medina, F. X., & Conde-Caballero, D. (2023). Popular cuisines at foodie tables. Social class, distinction, and food transformation and incorporation in contemporary gastronomies. International Journal of Gastronomy and Food Science, 33, 1–4. https://doi.org/10.1016/j.ijgfs.2023.100791

Mattei, E. (2024). Approaching tourism communication with empirical multimodality: exploratory analysis of Instagram and website photography through data-driven labeling. Frontiers in Communication, 9. https://doi.org/10.3389/fcomm.2024.1355406

Mohapatra, P., & Nath Biswas, S. (2017). Gastronomy and its impact on Tourism: A Case study on Regional Cuisine of Coastal Odisha, India. Journal Homepage: International Journal of Research in Social Sciences, 7(6), 2249–2496.

Orden-Mejía, M., & Moreno-Manzo, J. (2024). Examining consumer experience in a gourmet food hall: Impacts on satisfaction and behavioural intentions. International Journal of Gastronomy and Food Science, 35(October 2023), 100890. https://doi.org/10.1016/j.ijgfs.2024.100890

Padilla, A., Linzán, J., & Villao, D. (2019). Sol, Playa y Gastronomía como recursos turísticos: perfil del turista del Balneario de Salinas Provincia de Santa Elena. Revista Científica y Tecnológica UPSE, 6(1), 42–46. https://doi.org/10.26423/rctu.v6i1.432

Phan, K. T., Chen, S. H., Lee, J. M., & Pham, C. Van. (2024). Expenditure decisions of international tourists to

Taiwan: application of the Heckman two-stage approach. Cogent Social Sciences, 10(1), 1–15. https://doi.org/10.1080/23311886.2024.2318870

Ranaweera, C., & Prabhu, J. (2003). On the relative importance of customer satisfaction and trust as determinants of customer retention and positive word of mouth. Journal of Targeting, Measurement and Analysis for Marketing, 12(1), 82–90. https://doi.org/10.1057/palgrave.jt.5740100

Seyitoğlu, F., & Ivanov, S. (2020). A conceptual study of the strategic role of gastronomy in tourism destinations. International Journal of Gastronomy and Food Science, 21, 100230. https://doi.org/10.1016/j.ijgfs.2020.100230

Sio, K. P., Fraser, B., & Fredline, L. (2024). A Contemporary systematic literature review of gastronomy tourism and destination image. Tourism Recreation Research, 49(2), 312–328. https://doi.org/10.1080/02508281.2021.1997491

Torres-Sovero, C., González, J. A., Martín-López, B., & Kirkby, C. A. (2012). Social-ecological factors influencing tourist satisfaction in three ecotourism lodges in the southeastern Peruvian Amazon. Tourism Management, 33(3), 545–552. https://doi.org/10.1016/j.tourman.2011.06.008

Toudert, D., & Bringas-Rábago, N. L. (2021). Interest in food, food quality, satisfaction, and outcomes in a border context: Gender, country of residence and born moderation. International Journal of Gastronomy and Food Science, 25(March). https://doi.org/10.1016/j.ijgfs.2021.100394

Tsai, C. T. S., & Wang, Y. C. (2017). Experiential value in branding food tourism. Journal of Destination Marketing and Management, 6(1), 56–65. https://doi.org/10.1016/j.jdmm.2016.02.003

Vukolic, D., Gajić, T., & Penic, M. (2022). The effect of social networks on the development of gastronomy – the way forward to the development of gastronomy tourism in Serbia. Journal of Tourism Futures, 1–16. https://doi.org/10.1108/JTF-01-2022-0034

Wendt, J. A., & Bógdał-Brzezińska, A. (2024). Security and Securitization as Topics in Sustainability and Tourism Research. Sustainability (Switzerland), 16(2), 1–15. https://doi.org/10.3390/su16020905

Widjaja, D. C., Jokom, R., Kristanti, M., & Wijaya, S. (2020). Tourist behavioural intentions towards gastronomy destination: evidence from international tourists in Indonesia. Anatolia, 31(3), 376–392. https://doi.org/10.1080/13032917.2020.1732433

Yentür, F., & Demir, C. (2022). Understandıng Travel Agencies Attitudes Towards Gastronomy Tourism and Food Tours: The Case of Izmir Turkey. International Journal of Contemporary Economics and Administrative Sciences, 12(2), 674–688. https://doi.org/10.5281/zenodo.7513705

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Research paper

Presence of heavy metals in the Jalpan de Serra reservoir, Querétaro, México

Presencia de metales pesados en el embalse Jalpan de Serra, Querétaro, México.

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ABSTRACT

The study was conducted at the Jalpan de Serra dam, Querétaro, Mexico. In a mountain watershed with a history of artisanal mining activity in the upper part, runoff feeds the reservoir, transporting mining tailings. The Jalpan dam has been used for drinking water supply, agricultural irrigation activities and recreational purposes as a Ramsar site. The reason for the study has been the relevance and social impact of the reservoir sediments as a source of diffuse pollution. The objective was to determine the concentration of arsenic, cadmium and lead in the sediment and to evaluate the level of risk to human health and the environment. The methodology consists of the analysis by atomic absorption carried out in three sites sampled in the superficial layer of 10 cm depth, samples obtained with a PVC tube of 7 cm diameter, identified, preserved for transfer and digested with nitric acid. The results show mean arsenic concentrations of 4.278 mg/kg, cadmium 0.323 mg/kg and lead 4.873 mg/kg. In conclusion, the sediment analyzed does not represent a risk to human health or the environment of the reservoir according to NOM-147-SEMARNAT/SSA1-2004. This investigation demonstrates the lack of a policy or standard that establishes permissible limits for heavy metals in sediment.

Keywords: *Heavy metal, polluted sediments, mining tailings transport, water erosion.*

RESUMEN

El estudio ha sido realizado en la presa Jalpan de Serra, Querétaro, México. En una cuenca de montaña con antecedentes de actividad minera artesanal en la parte alta, la escorrentía alimenta el embalse, transportando relaves mineros. La presa Jalpan se ha empleado para abastecimiento de agua de consumo humano, actividades de riego agrícola y fines recreativos como sitio Ramsar. El motivo de estudio ha sido la relevancia e impacto social que tienen los sedimentos del embalse como fuente de contaminación difusa. El objetivo ha sido conocer la concentración de arsénico, cadmio y plomo en el sedimento y evaluar el nivel de riesgo para la salud humana y del ambiente. La metodología consiste en el análisis por absorción atómica realizada en tres sitios muestreados en la capa superficial de 10 cm de profundidad, muestras obtenidas con un tubo de PVC de 7 cm de diámetro, identificadas, conservadas para su traslado y digeridas con ácido nítrico. Los resultados muestran concentraciones medias en arsénico de 4.278 mg/kg, cadmio 0.323 mg/kg y plomo 4.873 mg/kg. En conclusión, el sedimento analizado no representa riesgo para la salud humana o entorno del embalse según la norma NOM-147-SEMARNAT/SSA1-2004. Esta investigación evidencia la falta de una política o norma que establezca los límites permisibles de metales pesados en sedimentos.

Palabras clave: Metales pesados, sedimentos contaminados, embalse, erosión hídrica.

INTRODUCTION

Water erosion

Water erosion is the process by which soil is lost under the action of water, affecting soil fertility, and consists of three stages; soil detachment, transport and sedimentation (Ares & Varni, 2016). Erosion begins at the moment of contact of the water drop on the soil and the magnitude of the phenomenon depends on the size and speed of precipitation (Pizarro et al., 2010).

The variables that make erosion possible are: climate, vegetation, leaf litter, soil type, topography, flow velocity and land use. Water fall factors, precipitation temperature and storm intensity influence the main climate variable, and in the case of land use, the most problematic human activity in sediments is mining, due to its contribution of toxic elements to water bodies (Brea & Balocchi, 2010).

Heavy metals commonly found in reservoirs

A study of metal and arsenic contamination in sediment has been carried out in three different dams; La Boquilla, Las Virgenes and El Granero in Chihuahua, Mexico, in each of the dams two samples have been extracted, randomly, in the four seasons of the year, using a PVC tube of 7 cm in diameter and one meter long, and each sample with 1. 5 kg of surface sediment (0-10 cm), for which one kilogram was used to obtain organic matter, measure pH, salinity and clay, and the remaining 0.5 kg was digested with concentrated nitric acid and hydrochloric acid in a 1:3 ratio, dried, crushed and homogenized, and analyzed for metals, As by atomic absorption spectrophotometer and Cu, Pb and Zn by optical plasma spectrophotometer. The concentrations observed for As and Pb did not change from one dam to another ($P>0.05$), Cu and Zn varied between dams ($P<0.05$), and for Cu and Pb they varied between seasons. The concentration ranges for each of the metals were for As from 13.25 to 18.05 mg kg-1, for Cu from 3.36 to 5.64 mg kg-1, for Zn from 105.54 to 130.66 mg kg-1, in the three dams the parameters were below the permissible limit, however, Pb exceeded the limit of 50 mg kg-1 recommended by the regulations (Hernandez et al., 2008).

Sepúlveda, (2015) conducted a biochemical study in the Suata reservoir, Venezuela, to determine heavy metals in sediment, water and fish. He extracted two sediment samples; one at the dam and the other at the tail of the reservoir, with a separation of 3,270 m distance, using the surface layer of the sediment (0-10cm) were identified with date, coordinates and depth. The sediment was sieved, dried and pulverized, then digested with nitric acid and hydrofluoric acid, entered twice in the microwave oven, and at the end of the digestion, it was neutralized with 20 ml of 5% boric acid, The metals Ca, Mg, Al and Si were analyzed by Atomic Absorption Spectrophotometer, and Cd, Cr, Cu, Ni, Pb, Zn, Co, V, Mn, Fe and Ti were analyzed by Atomic Emission Spectroscopy with Inductively Coupled Plasma. The results indicated that Mn and Zn with very high risk in contamination, Ni, Cd and Cr with medium risk, range obtained through the Risk Assessment Code (RAC).

The analysis of heavy metals in the Cerrillos de Ponce reservoir, Puerto Rico (Ortiz, 2019) was performed to know the presence and concentration of heavy metals, through a simple sampling in water from three sites within the reservoir. The sampled points were at the beginning, in the middle and at the outlet (zone A, B and C) during nine months, by means of the plasma induction method coupled by optical spectroscopy emission, where, silver (Ag), arsenic (As), chromium (Cr), lead (Pb), vanadium (V), cadmium (Cd) and zinc (Zn), exceeded the limit of permissible values established by the World Health Organization (WHO) and the U.S. Agency for Toxic Substances and Disease Registry. This study proved that the water level of the reservoir does have an impact on the concentration of heavy metals that exceed the limits of the applied standards.

Toxicology of heavy metals

Arsenic (As) is naturally present in the air, water and soil, and by anthropogenic action in some foods, in dyes used in glass and ceramics, in metallurgy, mining, in the manufacture and use of insecticides, herbicides and fungicides. It is of grayish color of soft metallic aspect and it is easy to dissolve, by its characteristic without flavor, in the antiquity, it was used as a powerful poison, added in the drinks or foods of the victim; in small but constant doses, they cause weakness of the living being that consumes them. To measure the level of arsenic intoxication, four clinical forms are established; 1. Over-acute intoxication (evolves in hours).2. Acute intoxication (weeks): abundant vomiting, diarrhea, abdominal pain, burning sensation in the stomach, odor in breath and mouth fluids, headache, weakness and dizziness; if not treated in time, it causes re-

nal, hepatic and cardiac damage.3. Subacute intoxication and 4. Chronic intoxication: constant intake of arsenic: digestive and nutritional disorders; (thinning, fatigue, lack of appetite, nausea, vomiting, diarrhea), catarrhal disorders (runny nose, headache and bronchial secretion), skin disorders (tanned tone with white spots, palmar and plantar hyperkeratosis that can evolve to epidermoid carcinoma, appearance of white lines on the nails) and neurological disorders (signs of "foot drop" and "claw hand") (Hernandez, 2018).

Lead (Pb) is a gray, soft heavy metal found in the earth's crust, mainly, in galena ores in the form of sulfide associated with other metals such as silver, copper, zinc, iron and antimony. It can be found in gasoline, manufacture and use of paints, pesticides, lead-soldered packaging, tableware and ceramics.

Long-term low-dose exposure through air, water or food causes chronic poisoning. The non-toxic blood concentration for an adult can be up to 10 µg/dl and in children measures should be taken when the concentration is 10 -14 µg/dl.

Ingestion may be by the respiratory route where metal fume or dust is absorbed by the lungs and concentrations retained in the body vary depending on particle size. Dietary intake: adults can absorb up to 30% of the proportion ingested, in the case of children, they absorb up to 50%.

Lead present in the blood is distributed to bones, teeth, liver, lungs, brain, spleen, kidney and has the capacity to cross the placenta. The means of disposal of some of the ingested lead is through feces and urine. Due to its similarity with calcium, lead interferes in several metabolic pathways in the mitochondria and interference with calcium in endothelial cells in brain capillaries produces a disruption in the intercellular junctions of the blood-brain barrier leading to brain edema. Renal alterations, intestinal alterations such as anorexia, constipation, vomiting and colicky pain may also occur. Reproductive health is affected by infertility in both sexes, spontaneous abortions, premature births and congenital anomalies (Ferrer, 2003).

Cadmium (Cd) has the characteristic of corrosion resistance and is therefore used for electroplating and coating of other metals, such as screws, locknuts, various aircraft parts and motor vehicles. Cadmium compounds can also be used as plastic stabilizers and pigments. In cell phones and other small devices it is present in rechargeable batteries.

Other uses of the compounds are: yellow and red pigments in plastics and dyes, colorants in pyrotechnics, photographic films, textile dyes and printing, manufacture of private mirrors, coating of electronic vacuum tubes, electroplating, glass hardening, among others.

Cadmium can be metabolized and accumulated through intestinal absorption. People with low iron reserves have the capacity to absorb up to 20% of the administered dose. By the pulmonary route through inhalation of tobacco smoke or exposure to cadmium in the environment. Metallothionein is a low molecular weight protein resulting from the ingestion of cadmium that has been lodged in the liver, this protein contributes to prevent cadmium ions from exerting their toxic effect, however, it is thought that renal failure is related to the decrease in the production of metallothionein. Importantly, some of the cadmium that enters the human body is excreted in the urine; however, the process of cadmium excretion is slow. The retention period of Cd varies from 7 to 30 years, allowing its accumulation and health effects.

Two levels of cadmium toxicity are considered; Acute: in concentrations higher than 1 mg/m3 in air, with symptoms of chemical pneumonitis and/or pulmonary edema, starting with flu or fever in a period of 1 to 8 hours after exposure. Food poisoning at concentrations greater than 15 mg/L with symptoms of nausea, vomiting, abdominal pain, diarrhea. The main sources of contamination in food are pots or pans with cadmium-based coatings or welds in hot or cold beverage machines. Chronic toxicity: mainly in occupational exposure to cadmium fumes or dust, affecting the respiratory tract, renal lesions and anemia. In very high concentrations, yellow stains on teeth and loss of sense of smell may be observed. In 1993 the International Agency for Research on Cancer (IARC) determined that cadmium should be considered carcinogenic to humans. (Nordberg, 2017).

Characteristics of the Jalpan de Serra Dam, Queretaro, Mexico.

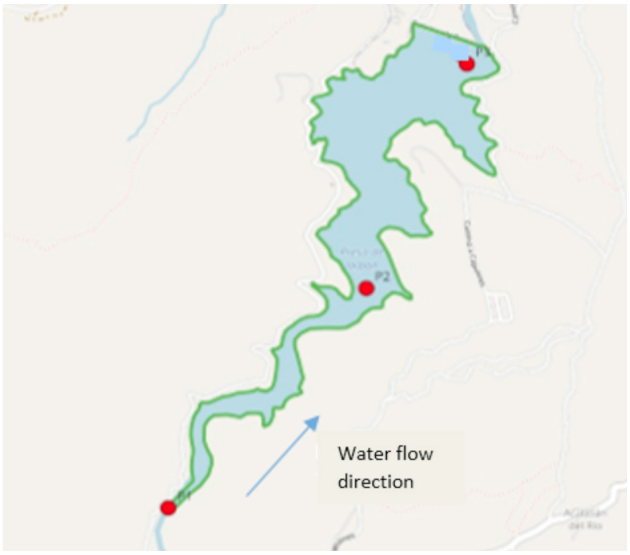
The Jalpan de Serra dam, Querétaro, Mexico, was built in the Jalpan riverbed in the 1970s, with a capacity of eight million cubic meters, in an area of 68 ha. Since its construction it has served as the main source of supply for agricultural, domestic, small-scale fishing, and recreational activities (Ramsar, 2003). The reservoir is fed by runoff from the upper parts of the basin, which is considered a mountain basin. The upper part of the basin has been used for years for artisanal mi-

ning, where tailings dams are usually located near the main riverbeds, and sediments have been exposed to transport by precipitation runoff. The average slope of the basin is 30%, which indicates that sediments are easily transported. Given the morphological characteristics, land use, and anthropogenic activities, it is possible that sediments with heavy metals are deposited in the Jalpan dam reservoir. The contaminating elements present in the sediments can be incorporated into the water chain and, consequently, into the trophic chain and bioaccumulation in living beings can cause irreversible damage due to intoxication. From the above, the present work aims to analyze the sediment of the reservoir to know the quality of water and soil in relation to the presence of heavy metals. Under this objective, a biochemical study is carried out in sediments to determine the concentrations of heavy metals in the Jalpan Dam reservoir, characterization of the basin and graphic representation of the pollutants in the reservoir.

METHODOLOGY

Based on the bibliography consulted, three sampling points were defined, one at the beginning of the dam, the middle point and at the end of the dam, near the curtain as shown in Figure 1 and their respective geographic locations in Table 1. Samples were extracted at a depth of 10 cm, using a 7 cm diameter PVC pipe (Figure 2). The samples were extracted during the dry season in order to reach points of greater depth.

Figure 1: Location of sites to be sampled within the reservoir.



Source: Own elaboration.

Table 1: Geographical location of sampled sites.

No. Sample	Description	Coordinates	
		X	Y
1	Start of reservoir	18.5908	-99.484615
2	Midpoint	21.195539	-99.475791
3	Near curtain	21.205375	-99.471275

Source: Own elaboration.

Figure 2: Sample extraction.

Source: Own elaboration

The characteristics of the sample extraction site were as follows:

Sample 1: at the beginning of the reservoir with abundance of organic matter and vegetation and presence of flowing water (Figure 2). Sample 2: middle point of the reservoir with fine sediment, low presence of vegetation cover and low concentration of organic matter, saturated sediment near the water at rest (Figure 2.1).

Sample 3: very close to the outlet point of the reservoir (curtain) fine sediment and presence of sand in saturation, without organic matter or vegetation (Figure 2.3).

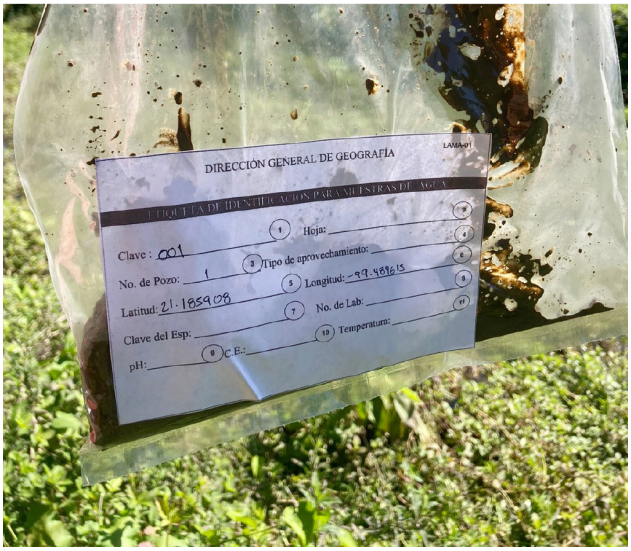
Figure 2.1: Sample 2

Figure 2.3: Sample 3

Source: Own elaboration

Each sample was labeled with its respective geographic location and sample number (Figure 3).

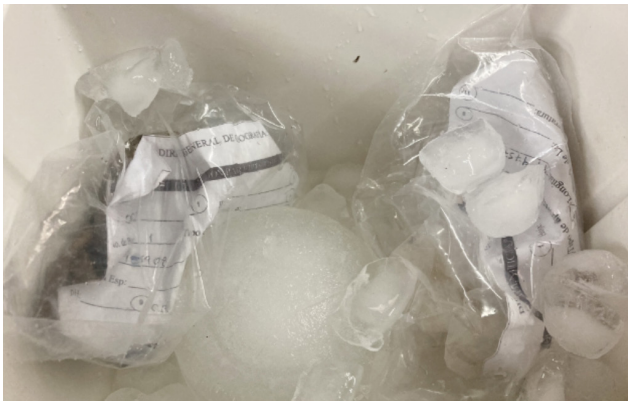
Figure 3: Labeling and identification of samples.



Source: Prepared by the authors.

The samples were placed in a cooler with ice to keep them at a temperature of approximately 4°C for transport and preservation (Figure 4).

Figure 4: Sample preservation.



Source: Own elaboration.

The samples were placed in the drying oven, each sample placed in a container and identified at a temperature of 35°C to achieve evaporation of the liquid (Figure 5).

Figure 5: Oven drying of samples.

Source: Own elaboration.

After drying, they were crushed with the help of the mortar and stored in the desiccator to remove all moisture (Figure 6).

Figure 6: Shredding and moisture extraction.

Source: Own elaboration.

Once the sample was dry, crushed and homogenized, the quarting method was used to select 2 g of sediment for digestion. The digestion was carried out with nitric acid, hydrochloric acid, and was calibrated to 100 mL with ultrapure water (Figure 7).

Figure 7: Digestion of samples.

Source: Own elaboration.

After digestion, the samples were sent to the laboratory for reading in the Atomic Absorption Spectrophotometer (Figure 8).

Figure 8: Atomic Absorption Spectrophotometer.

Source: Own elaboration.

RESULTS:

Analyzed samples were obtained the values of the concentrations of arsenic, lead and cadmium metals representative of the surface layer of 10 cm depth of the reservoir in the three points sampled in the dry season, is illustrated in Table 2.

Table 2: As, Pb and Cd concentrations results

Sample	Results in mg/kg		
	Arsenic	Lead	Cadmium
1	4.233	3.383	0.342
2	4.234	6.311	0.339
3	4.368	4.925	0.287

Source: Own elaboration.

It can be observed that arsenic has a homogeneous behavior in the reservoir, with a coincidence of 96.93% between point one and point three, which show the limits of greatest difference of 0.134 mg/kg between them. This indicates that the distribution of arsenic within the reservoir does not have a specific point where the concentration is a red spot or indicative of excess accumulation of the contaminant.

Lead was found in higher concentration in the sample obtained at the midpoint of the reservoir and in lower amount in sample one which was obtained at the beginning of the dam, with a difference of 2,928 mg/kg, that is, sample one represents 53.61% of the concentration of sample two.

In comparison with Cadmium, which was found in lower quantity at point three (outlet) and in the rest of the points it was found in similar concentrations.

DISCUSSION

It is important to mention that, in order to evaluate the permissible limits of metal concentrations in sediments of inland waters, in Mexico there is no specific law that dictates the maximum or minimum concentrations, it can be compared with NOM-147-SEMARNAT/SSA1-2004, Table 3 shows the permissible limits for the metals analyzed.

Table 3: Heavy metal concentrations for agricultural land use.

Total reference concentrations per soil type	
Contaminant	Agricultural use (mg/kg)
Arsenic	22
Cadmium	37
Lead	400

Source: Own elaboration with information from NOM-147-SEMARNAT/SSA1-2004

On the other hand, Table 4 shows the limits established in the Canadian Environmental Quality Guidelines (CEQG) for sediments of inland water bodies divided into two: the Interim Sediment Quality Guidelines (ISQG) in which it is expected that there will be no negative biological effects on the environment, otherwise the Probable Effect Level (PEL).

Table 4. Permissible limits for metals in sediments established by the Mexican (NOM) and Canadian (CEQG) standards.

Norm		As	Cd	Pb
NOM		22	37	400
CEQG		5.9	0.6	35
ISQG	PEL	17	3.5	91.3

Source: own elaboration with information from (LAINO GUANES, AND OTHERS, 2015).

The phytoremediation study by Jara Peña, et al. (2014) found that lead can be absorbed by plant roots, mainly by Fuertesimalva echinata. That is, the presence of plant cover influences the concentration of heavy metals, due to the fact that some plants have the function of bioremediation of the soil where they are found.

CONCLUSION

Finally, it can be concluded that the concentrations of arsenic, cadmium and lead found in the sediment layer at a depth of 10 cm in the Jalpan Dam do not exceed the permissible limits in the applied regulations, that it is safe to use the analyzed layer for agricultural purposes (in case of de-silting) because it does not represent a risk to human health or to the flora and fauna that inhabit it. In future studies, a more exhaustive analysis can be carried out by strata at greater depth. With respect to the vegetation found in the study area, two predominant plant species, Acmella caulirhiza and Phyla lanceolata (Michx.) Greene, were identified, indicating an opportunity to carry out analyses to determine their phytoremediation capacity.

REFERENCES

Jara Peña, E., Gómez, J., Montoya, H., Chanco, M., Mariano, M., & Cano, N. (2014). Phytoremediation capacity of five high andean species from soils contaminated with heavy metals. Revista Peruana de Biología, 145-154.

Ares, M. G., & Varni, M. (30 de AGOSTO de 2016). ¿Qué es la erosión hídrica y cómo la estudiamos en el IHLLA? Obtenido de UNICEN: https://www.unicen.edu.ar/content/%C2%BFqu%C3%A9-es-la-erosi%C3%B3n-h%C3%ADdrica-y-c%C3%B3mo-la-estudiamos-en-el-ihlla

Brea, J. D., & Balocchi, F. (2010). Documento Técnico N° 22: Procesos de erosión – sedimentación. UNESCO.

Ferrer, A. (2003). Intoxicación por metales. In Anales del sistema sanitario de Navarra (Vol. 26,). Gobierno de Navarra. Departamento de Salud., pp. 141-153.

Hernández, P. M. (2018). Efectos Toxicológicos: Arsénico. VISIÓN CRIMINOLÓGICA-CRIMINALÍSTICA.

Hernández-Garcia, Y., Sosa-Cerecedo, M., Moreno, M., Alcalá, J., & Puga, S. (2008). Evaluación de la contaminación por metales pesados y arsénico en. Revista Latinoamericana de Recursos Naturales, 4(2), 1-6. doi:https://revista.itson.edu.mx/index.php/rlrn/article/view/109

Laino Guanes, R. M., Bello Mendoza, R., González Espinosa, M., Ramírez Marcial, N., Jiménez Otárola, F., & Musálem Castillejos, K. (2015).). Metal concentrations in water and sediments in the upper Grijalva river basin, Mexico-Guatemala border. Tecnología y ciencias del agua, 6(4), 61-74.

Nordberg, G. &. (2017). Metales: Propiedades químicas y toxicidad productos químicos. Recuperado de http://www. insht. es/InshtWeb/Contenidos/Documentacion/TextosOnline/EnciclopediaOI T, 2, 63.

Ortiz, A. J. (2019). Heavy metal analysis at the Cerrillos de Ponce Reservoir, Puerto Rico. Interamerican Journal of Environment & Tourism.

Pizarro, R., Morales, C., Vega , L., Valdés, R., Olivares, C., & Baloc, F. (2010). EVALUACIÓN DE LA EROSIÓN HÍDRICA SUPERFICIAL EN ZONAS ÁRIDAS Y SEMIÁRIDAS DE CHILE CENTRAL. AquaLac, 2(2), 1-11. doi:https://doi.org/10.29104/phi-aqualac/2010-v2-2-01

Ramsar. (17 de septiembre de 2003). Rmsar.org. Obtenido de Convencion de Ramsar: https://rsis.ramsar.org/RISapp/files/RISrep/MX1352RIS.pdf

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Research paper

Wastewater treatment design using the Imhoff tank in a rural area, Peru

Diseño de tratamiento de aguas residuales mediante el tanque Imhoff en una zona rural, Perú

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ABSTRACT

The work shows the use of wastewater by farmers for agricultural activities, its lack of treatment generates unhealthiness problems. Under this perspective, the objective of the research was to design the wastewater treatment system in the rural area of the La Pampa neighborhood of the Auquimarca annex. It is a purposeful investigation, using the Gauge Method to analyze gravity discharges and the Triangular Weir Method to determine the flow of wastewater. The composition of the wastewater for the treatment system was verified, including: hydrogen potential, resulting in 8.4 (acidic pH < 7, and basic medium pH > 7 alkaline), as a product of the study it is recommended to implement the design of treatment, based on the Imhoff tank sizing.

Keywords: *environment, treatment design sewage water, gauging method, landfill method.*

RESUMEN

El trabajo muestra el uso de aguas residuales por campesinos para actividades agrícolas, su tratamiento nulo genera problemas de insalubridad. Bajo esta mirada el objetivo de la investigación fue diseñar el sistema de tratamiento de aguas residuales en la zona rural del barrio la Pampa del anexo de Auquimarca. Es una investigación propositiva, empleando el Método de aforo para analizar las descargas por gravedad y Método del Vertedero-Triangular para determinar el caudal del agua residual. Se verificó la composición del agua residual para el sistema de tratamiento entre ellos: potencial de hidrógeno, dando como resultado 8.4 (acido pH < 7, y medio básico pH > 7 alcalino), como producto del estudio se recomienda implementar el diseño de tratamiento, tomando como base el dimensionamiento de tanque Imhoff.

Palabras clave: medio ambiente, diseño de tratamiento aguas residuales, método de aforo, método del vertedero.

INTRODUCTION

Wastewater is a global problem; it contributes to nitrogen and phosphorus pollution. These elements act as nutrients and can suppress the proliferation of algae that can be harmful and are characterized by consuming large amounts of oxygen in aquatic ecosystems. The discharge of domestic, industrial and agricultural wastewater and the discharge of water due to excess rain and the congestion of wastewater in sewers, often without cause, cause contamination of receiving water bodies, reducing the quality of surface waters. and underground, putting the health of the population and the integrity of ecosystems at risk. "Water pollution has caused a negative impact on public health, proliferating gastrointestinal diseases" and "causing between 1 and 4 million premature deaths globally in 2019" (Fuller et al., 2022). Cited by (Farfán et al.,2022).

Peru is not immune to this reality, "rural areas are those that have fewer economic resources, which is why the discharge of wastewater is more frequent, affecting the entire ecosystem that surrounds it" (Bryan et al., 2020) , in Ecuador, "the production of wastewater is considered a problem that has been addressed in an ineffective manner due to the absence of sufficient physical infrastructure to treat it, which is why it is considered that 90% of this water is They discharge into freshwater sources without receiving treatment" Montero et al., 2020 cited by (Humanante et al., 2022).

The problem addressed is similar in many countries, the result of the research produces alternative solutions, (Gómez et al., 2022) state that, "it has been found that the reintegration or reuse of these waters is possible in hydrothermal liquefaction technology. leading to a reduction in the volume of wastewater, which is reflected as an environmental and economic advantage." Pervious concrete (PC) is considered a solution to reduce the effects of heat islands, runoff problems and concentrations of contaminants present in water. The results indicate efficiency in the absorption of total phosphorus, total ammonia, nitrate, solids totals and turbidity. Therefore, the use of CP associated with 10% TiO2 can add efficiency to the sanitary wastewater treatment process by maintaining good mechanical and hydraulic behavior (Melo et al., 2022).

The La Pampa neighborhood of the Auquimarca annex of the Chilca District, is in a process of population growth, this implies the need to build sewer and storm drain networks, in times of rain they suffer a significant collapse, causing the drains to overflow in homes and in the streets, generating pollution in the environment, the deterioration and wear of the pavement, as well as the non-treatment of waste water due to the lack of treatment plants in the Junín region. The problems detected are of vital importance to resolve since the lack of maintenance in sewage networks negatively influences the health of the population, in addition to affecting the environment.

There is a need to improve health in the neighborhood, it is necessary to expand and improve sewage networks, as well as the provision of treatment systems, in order to reduce the contamination of wastewater, which is used to irrigate crops, generating contamination in them and reducing the increase in diseases. bacteriological in the study area.

Everything stated allows us to propose the following objective. Design the wastewater treatment system in the La Pampa neighborhood of the Annex of Auquimarca, this design of a treatment system can improve the quality of wastewater in the La Pampa neighborhood of the Annex of Auquimarca, in this way avoiding contamination of the environment and the health of the inhabitants and its proper use in agriculture.

MATERIAL AND METHODS

Wastewater

The term wastewater is used to refer to the varied content of liquids and dense remains that come from the supply system of a city that has undergone changes due to the action of various routines in activities carried out by domestic workers, industries, businesses., farmers,

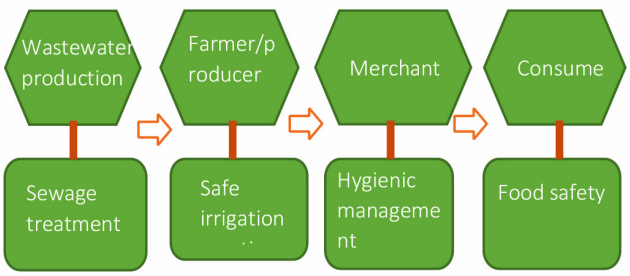
ranchers, etc. The residual water at the time of discharge is impossible to be used, as it is dumped into various receiving bodies, but with the lack of preliminary treatment it causes changes in both the terrestrial and aquatic environment, even harming human health. "Man has used water not only for his consumption but also, over time, for his activity and well-being, converting used water into a vehicle or vector for waste. This is where the name "was-

tewater" arises" (Trapote, 2011) cited by (Palacios, 2023). "Water pollution has become a global problem where toxic substances of organic and inorganic origin impact public health and the sustainability of ecosystems" (Contreras and Bejarano, 2022).

Form of wastewater collection

The collection of wastewaters will have a provision for the rejection of agricultural irrigation and green areas such as parks and gardens. "Wastewater collected in communities and municipalities must be conveyed, ultimately, to receiving water bodies or to the land itself." It adds what contaminant content the wastewater has and at what level they should be eliminated in order to protect the environment" (Palacios,2023). The reuse of wastewater requires the adoption of measures to protect public health. The main purpose of the treatment of wastewater for the purposes of reuse or regeneration of water is the considerable reduction of pathogenic microorganisms, in addition to the elimination of bad odors or other substances that could have a negative effect on the practice of its use. In the case of agricultural irrigation, suspended solids that can clog the nozzles of sprinklers and drippers. According to the WHO and UNICEF, the study on Management of Internal Processes and Environmental Management in Wastewater Treatment Plants is not exempt from control problems to mitigate the problem of environmental pollution and damage to health, with risk in the presence of viruses and bacteria (Pérez et al.,2022).

Fig 1. Wastewater uses for agriculture



Source: self-made
Imhoff tank design

The Imhoff tank is a primary treatment unit whose purpose is the removal of suspended solids, for communities of up to 5,000 inhabitants. The Imhoff Tank offers an advantage for the treatment of domestic wastewater, since it integrates the sedimentation of water and the digestion of settled sludge in the same unit, for this reason it is also called double-chamber tanks (Mucha, 2020), he adds "This alternative is suitable if there are not large areas of land to be able to build a domestic wastewater treatment system, the Imhoff Tank must be installed away from the population, due to the bad odors it produces. "Imhoff tanks have a very simple operation and do not require mechanical parts, however, for their correct use it is necessary that the wastewater go through the preliminary treatment processes of screening and sand removal" (Leyva,2022).

Imhoff tank parameters

A parameter is a component of a system, it allows you to divide it and access its evaluation of any component such as performance, extension or condition that leads to its measurement. "The design parameters determine the basic elements for the progress of the hydraulic design of the Imhoff tank system in the evacuation of wastewater" (Indacochea,2023).

Table 1. Imhoff Tank Parameters

Suspended solids	Reduce 40% - 50%
Biochemical Oxygen Demand (BOD_5)	Reduce 25% - 40%
Chemical Oxygen Demand (COD)	Reduce 40% - 60%

Source: Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), Martín and Hernández (2014).

Table 2. Wastewater parameters with the LM P

Parameter	Unit	effluent lmp for discharged into bodies of water
Biochemical Oxygen Demand	Mg/L	100
Chemical Demand for Oxygen	Mg/L	200
pH	UNIT	6.5 – 8.5
Total solids in Suspension	ml/L	150
Temperature	°C	<35
Fats and oils	Mg/L	twenty
Settleable solids	Mg/L	twenty

Source: Ministry of the Environment DS N° 003-2010

Table 3. Parameters of wastewater in the Chemical Laboratory - UNCP

Tests	Results
Hydrogen Potential (PH)	8.4
Electric conductivity	1200µ/cm
Turbidity	358.0 NTU
Temperature	16.0°C
Total Suspended Solids	296.0 mg/l
Dissolved oxygen	0.0 m/l
Biochemical Demand for Oxygen (BOD 5)	366.0 m/l
Chemical Oxygen Demand (COD)	813.0 m/l

Source: UNCP Chemical Analysis Laboratory Results

Table 4. Parameters carried out in the Chemistry laboratory - UNCP

Sample	Total coliforms	Fecal coliforms
	nmp/100ml	nmp/100ml
	24 hrs / 37°c	24 hrs / 37°c
Residual water	$2.4\ x\ 10^{7}$	$9.3\ x\ 10^{7}$

Source: UNCP Chemical Analysis Laboratory Results

Solution against water leaks

According to Álvarez and Arias (2022). "The applications of filtration processes are very extensive, found in many areas of human activity, both in domestic and industrial life." The current situation of the land where this study will be projected has the presence of a water table - water for the design of our treatment system, the measures to be taken for its present solution are: The water will be evacuated by means of motor pumps, conducted through pipes or sleeves towards the Mantaro River in order to obtain a stable soil for the construction of the proposed system.

Surface drainage system

It is proposed for the purposes of avoiding areas and adequate evacuation of surface runoff into a river "sustainable drainage systems involve managing stormwater as close as possible to its source, reducing runoff, firstly, through infiltration and, when That is not possible, through retention, temporarily storing said water and later discharging it in a controlled manner" (Hidalgo et al., 2022).
Waterproofing System

Evidence of the presence of water in the land planned for construction, after its extraction, a waterproofing system is proposed for the treatment system as proposed, a waterproofing screen composed of cement injections is recommended. The permeability in this stratum will project a value close to 10-5 cm/s. That is, they are materials that can be waterproofed with the use of cement commonly used for conventional construction (Portland type MS) but it is also advisable to add clays (bentonite). To make this treatment effective, the type of cement must be much more ground.

Waterproof Screen

To prepare the design of the waterproofing screen, the results of the permeability tests will have to be considered, in addition to laboratory and field tests, all of this with the purpose of guaranteeing the good operability of the system under construction. The construction of an injection screen is based on the assumption that, during this work, a cylindrical affectation volume is formed around the construction, which represents the injection screen. Impermeable bentonite-cement screens, also called soft, plastic or self-hardening mud , constitute barriers to the passage of groundwater of similar construction to that of diaphragm walls (Cañizo et al ., 1976).

Use of geosynthetics

The use of geosynthetics for the waterproofing of the structure allows the creation of an impermeable barrier in soils susceptible to destabilization, in structures with water circulation in which the waterproof function prevails. Used for buried structures, they are installed inside the soil, crossing the failure surface and capable of resisting bending and shear forces. "The geosynthetics industry incorporates a high degree of polymers as the main manufacturing material, in order to ensure correct deformation and resistance to the stresses that its product will face" (Norambuena et al., 2009).

Geosynthetics dlt drain twenty . The same as the previous geosynthetics, but with the particularity that its resistance is 400 Kn/m2, El DREN 20 is a nodular drainage sheet, used as a drainage layer and waterproofing protection in tunnels and deep constructions.

Geotextile of bentonite . Formed by two geotextiles sewn together and encapsulating bentonite, this geosynthetic is an innovative and highly waterproofing product. Bento-

nite is a clay material of volcanic origin that expands when it comes into contact with water. Its main function is to waterproof underground extensions.

Wastewater treatment

In a wastewater treatment system, physical, chemical and biological procedures occur. Its consideration in the biochemical changes where the processes that occur in the environment (river, lake, soil, etc.) occur, in an examined manner within the tank or reactor at higher speed.

Process that arises in a domestic wastewater treatment system, starting from pretreatment, primary and secondary treatments, then detailing the tertiary treatments. According to (Mera et al., 2022). The primary treatment consists of a physical process that involves the sedimentation of particles, with the aim of removing grease and sand; and a chemical process is intended to correct the pH of the wastewater; The secondary treatment is a biological process that seeks to reduce the organic loads of the effluents by carrying out the degradation of the organic compounds of the first stage. In the tertiary treatment, they add disinfection and nutrient control, achieving the possibility that these waters are used for agricultural purposes, irrigation in green areas, firefighting systems, among others.

Imhoff Tank

"The Imhoff tank offers advantages for the treatment of domestic wastewater, since it integrates the sedimentation of water and the digestion of settled sludge in the same unit, for which reason it is also called double-chamber tanks" (Leyva,2022). The typical Imhoff tank is rectangular in shape and is divided into three compartments: sedimentation chamber, sludge digestion chamber, and scum accumulation and ventilation area. The Imhoff tank removes 40% to 50% of suspended solids and reduces BOD by 25 to 40%. The sludge accumulated in the Imhoff tank digester is periodically extracted and taken to drying beds (Jabo, 2017).

Likewise, Vela (2018) maintains that "the typical Imhoff tank is rectangular in shape and is divided into three compartments: Sedimentation chamber, Sludge digestion chamber, and Ventilation and cream accumulation area."

- Sedimentation chamber

The behavior for the upper chamber in the tank that receives the black water was sized in order to give an estimated retention time, in relation to the average flow of the black water, the depth in the chamber has a pair of converging slabs where it has a angle of 50° to 60° in reference to the horizontal so that the solid settles and slides into the digestion compartment through the slot, at the entrance it varies from 0.15 to 0.20 m. so that the digestion gas does not enter the sedimentation chamber, inducing turbulence and solid transport to the upper zone. The chamber has a baffle at its inlet for the purpose of uniform distribution to the tributary, which will in turn establish a cream outlet in the tributary.

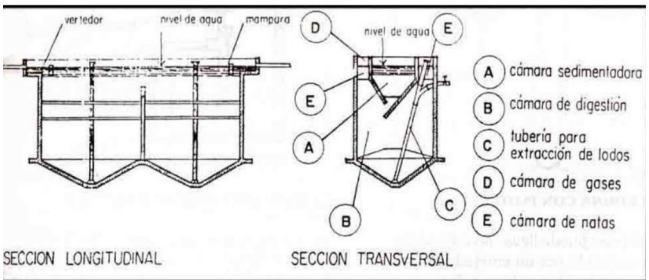
- Digestion chamber:

The interior compartment for the sedimentable solid tank has anaerobic digestion, the compartment will be sized to accumulate sludge during the course of assimilation in relation to the temperature. The depth in the chamber does not have to exceed 50 centimeters, and the digested sludge is removed in the troughs in the middle by a 20-centimeter tube. The diameter, using the hydrostatic head, for this purpose the discharge line is located in a dimension of 1.80 meters to 2.0 meters below the water level of the sedimentation chamber. The pipeline must be equipped by the cleaning line formed in a pressurized water line to fluidize the sludge at the beginning for its extraction operations if relevant. The ascending gases and particles, which are inevitably produced in the digestion process, are diverted towards the cream chamber or ventilation area (Pan American Health Organization, 2005).

- Cream chamber or sludge digestion:

During the digestion, certain solids rise, creating cream and fat that are released into the atmosphere through the chamber. Its minimum width in the chamber will supposedly be 1.0 meter.

Fig 2. Imhoff tank and its parts



Source: Pan American Health Organization, 2005

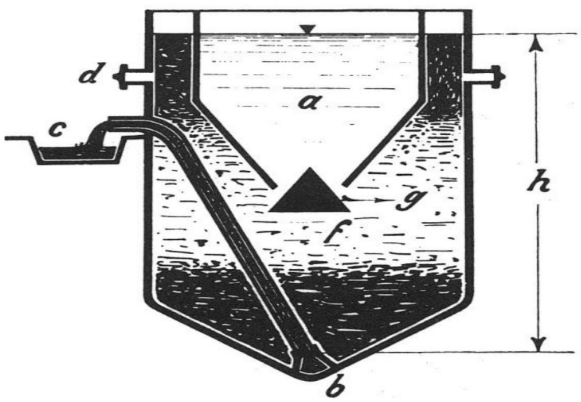
Imhoff tank process

The wastewater enters the sedimentation chamber, in which the sediments are stirred and run down the oblique walls. For the material, it begins to film the arrival inside where it circulates through the overlapping stripe, where it enters the chamber in assimilation. The overlap derives from the material removed during the assimilation, through the cream chamber or ventilation point. The winds derived from assimilation climb through the gas storms, due to the cautious walls paralyzing their progress through the sedimentation chamber. Non-controllable natural factors are represented by meteorological phenomena and variables intrinsic to local conditions, such as wind, temperature, solar radiation, precipitation and evaporation (Sánchez and Matsumoto, 2012).

Imhoff tank operation

The operation of the Imhoff Tank can be seen in the following diagram. The water passes through the sewage systems, enters from chamber a, the solid goes down gently and reaches zone f. In zone f, anaerobic reactions originate, that is, without the mediation of oxygen. The sludge is placed in the space in the lower part of zone f in which it lasts about thirty days, more or less, or until it is well assimilated and is usually isolated through the oblique conduit bc and transferred to the drying pools. of mud the water emerges through the loopholes d and goes to the subsequent part of the process. "They work through an anaerobic degradation process that removes the organic load of microorganisms in order to comply with the regulations of each country regarding its discharge parameters" (Campo, 2022). (See attached diagram)

Fig 3. Imhoff Tank Operation



Source: Pan American Health Organization, 2005

RESULTS

It started with obtaining samples of the residual water, which consists of 2 bottles (samples) with residual water to then be taken to the laboratory for the analysis of the physical, chemical and bacteriological characteristics at the study point of the Auquimarca neighborhood annex. Pampa in the District of Chilca, carrying out previous observations at the study point or area in search of elementary notes and information in preparation for its design.

The search obtained is the amount of current population, the determination of the wastewater flow in the study area, the location of the place where the wastewater final disposal area is located. The main disadvantages that wastewater causes to the population and the consequences that they cause to the environment were investigated.

Sampling Phase

A significant point is the completion of field work, which was to locate the wastewater discharge point in the Auquimarca annex of the Pampa neighborhood. It began with taking samples at the discharge point, to analyze the physical, chemical and bacteriological parameters of the wastewater, it was taken to a specialized laboratory. These were collected in transparent containers for physical and chemical analyzes such as suspended solids, BOD, COD, and a sterilized 250-millimeter glass container for bacteriological analysis.

In turn, initial flow parameters were taken (m 3 /s), the determination of the discharges was made in 5 measurement stages over a period of 24 hours a day, taking the first sample from 8:00 a.m. tomorrow and culminating the sampling phase at 4:00 in the afternoon. The coordinates and altitude of the sampling point were taken with a GPS.

Information Analysis RNE was used as a guideline, this action consisted of comparing the data obtained from field work, whether the. Water quality was between the LMP or if these data exceeded the parameters.

The results of the samples were taken and what parameters they were in, a methodology was used so that the information would help determine which technology would reduce the level of contamination, the purpose is to reach the parameters.

As mentioned above, a comparative table was constructed where the values obtained from the physicochemical and microbiological analysis of wastewater were established, in relation to the discharge of the maximum permissible limit. For which the level of contaminant removal of each technology was established, in order to test the selected alternatives which, have the advantages for greater efficiency of the technique.

Wastewater sample collection

For this process, sterilized bottles designated by the laboratory for the respective analyzes were used. The samples were extracted in the Chica District, Auquimarca Annex, La Pampa neighborhood, with reference to the side of the community bridge, the two samples were collected at 8:30 am in the respective bottles and then taken to the laboratory for the physical and chemical study. and bacteriological of the study sample.

Table 5. Materials and equipment Wastewater sampling.

Materials	Equipment
Packaging (sterilized jars)	Gloves
Rubber boots	Photographic camera
Face mask	Helmet
Note book	

Source: self-made

a) Laboratory phase

The collected samples were taken to the laboratory, for the development of the physical, chemical and bacteriological characterization in the laboratories at the National University of Central Peru – Huancayo.

b) Physical-chemical analysis
In this analysis, the hydrogen potential (pH), electrical conductivity, turbidity, temperature, total suspended solids, diluted oxygen, biochemical oxygen demand (BOD) and chemical oxygen demand (COD) were determined.

c) Bacteriological analysis
In this analysis, the multiple tube method (NMP) was used in the analysis of total and fecal coliforms. In which culture media such as X-GAL Chromogenic Substrate (total coliforms) and Fluorogenic mug substrate (fecal coliforms) were used.

d) Determination of flow

Volumetric Method - Capacity

$$Q = \frac{V}{T}$$

Data collection was carried out on 2 days of the week, Tuesday and Wednesday, as described:

Table 6. Flow measurement day 1

Hour	Volume (gal)	Time (s)	Flow rate (lt/s)
08:00 am	55	17.84	11,670
10:00 am	55	18.16	11,465
12:00 pm	55	17.94	11,605
02:00 pm	55	16.7	12,467
04:00 pm	55	16.92	12,305
Average Flow Rate (Q 1)		11,902 lt/s	

Source: self-made

The flow measurement in 1 day of field study was carried out by taking the data at an interval of every 2 hours starting from 08:00 am to 04:00 pm, using a cylinder with a volume of 55 gallons equivalent. at 208,197 lt, in turn in each interval the 5 times it took to fill the cylinder with residual water were taken and a specific flow rate was determined in each interval, the highest flow being at 2 in the afternoon with 12,467 lt/s and lowest flow at 10 in the morning with 11,465 lt/s and to finish, an average was found for a final flow on the day of 11,902 lt/s.

Table 7. Flow measurement day 2

Hour	Volume (gal)	Time (s)	Flow rate (lt/s)
08:00 am	55	18.65	11,163
10:00 am	55	19.11	10,895
12:00 pm	55	16.86	12,349
02:00 pm	55	17.56	11,856
04:00 pm	55	18.25	11,408
Average Flow	11,534 lt/s		

Source: Own production

The flow measurement on the 2nd day was carried out by taking the data at an interval of every 2 hours starting from 08:00 am to 04:00 pm, using a cylinder with a volume of 55 gallons equivalent to 208,197 lt. In turn, in each interval, the 5 times it took to fill the cylinder with residual water were taken and a specific flow rate was determined

in each interval, with the highest flow rate at 12 noon with 12,349 lt/s and the lowest flow rate 10 in the morning with 10,895 lt/s and to finish, the average was found for a final flow rate for the day of 11,534 lt/s.

Weir Method – Triangular Theoretical Flow

$$Q = \frac{8}{15}\sqrt{2g}(\text{tg}\,\frac{\theta}{2})h^{\frac{5}{2}}$$

Real Flow: It is multiplied by a discharge coefficient (Cd)

$$Q = \frac{8}{15}cd\sqrt{2g}(\text{tg}\,\frac{\theta}{2})h^{\frac{5}{2}}$$

Where the discharge coefficient values are:

Angle θ	CD
15°	0.52 – 0.75
30°	0.59 – 0.72
45°	0.59 – 0.69
60°	0.50 – 0.54
90°	0.50 – 0.60

For our calculation we obtained the following data in the field:

- θ = 90°
- Cd= in relation to the angle of the triangular weir
- h= For height, 5 data were taken at different times on a given day

Table 8. Measurement of triangular weir heights

Hour	Height (h) - cm
08:00 am	0.15
10:00 am	0.16
12:00 pm	0.16
02:00 pm	0.15
04:00 pm	0.14
Average heights	0.152

Source: Own production

Table 8 shows the results of the triangular spillway, the measurements were every 2 hours starting from 8 in the morning until 4 in the afternoon, we sought to determine the 5 heights to the water sheet (h) in each period of time, being the one with the highest height at 10 in the morning and at 12 noon with 16 cm respectively, while the lowest height was at 4 in the afternoon with 14 cm. Once the heights were established, an average of them was calculated in the equation of the flow.

With the average height obtained in the field, the flow calculation is determined:

Theoretical Flow:

$$Q = \frac{8}{15}\sqrt{2g}(\text{tg}\,\frac{\theta}{2})h^{\frac{5}{2}}$$

$$Q = \frac{8}{15}\sqrt{2\text{x}9.81}(\text{tg}\,\frac{90}{2})0{,}152^{\frac{5}{2}}$$

Q = 0.0213 actual flow

It is multiplied by a discharge coefficient (Cd)

$$Q = \frac{8}{15}cd\sqrt{2g}(\text{tg}\,\frac{\theta}{2})h^{\frac{5}{2}}$$

Since the spillway is triangular in shape, the angle is 90°, therefore, according to its discharge coefficient (cd) it is:
Angle θ = 90° and Cd= 0.50 - 0.60 Cd= 0.55
Q = 11,705 lt/s
The following flow rate will be used for the work:
Flow rate (q)=11.72 lt/s

Parameters evaluated in the laboratory - physical and chemical analyses.

Table 9. Parameters performed in the wastewater laboratory

essays	Methods	Results
Hydrogen Potential (PH)	MS – 4500 – H + – B – Electrometric	8.4
Electric conductivity	M.S. – 2510 – B – Laboratory method	1200 µs/cm
Turbidity	MS – 2130 – B – Nephelometric	358 NTU
Temperature	MS – 2550 – B – Laboratory method	16°C
Total Suspended Solids	MS – 2540 – D – Dried at 103°C – 105°C	296 mg/l
Dissolved oxygen	MS – 4500 – 0 2 – G– Oximeter Membrane Electrode Method	0.0 mg/l
Biochemical Oxygen Demand (BOD_5)	MS – 5210 – B rod 5 days – Respirometer	366 mg/l
Chemical Demand for Oxygen (COD)	MS – 4500 – 0 2 – G- Oximeter Membrane Electrode Method	813 mg/l

Source: UNCP Chemical Analysis Laboratory Results

DISCUSSION

The study aims to design a waste treatment system in Auquimarca-Pampa using the Imhoff tank to reduce water pollution caused by desalination. It focuses on agricultural areas contaminated by soil and used for human and animal consumption. The design of the treatment plant will improve the quality of excess water and reduce environmental pollution. Similar studies such as Arocutipa agree that the treatment plant reduces water pollution caused by the discharge of excess water directly to the body's receptor. Both investigations are supported by theories of waste treatment, which include primary treatments that prepare excess water, remove contaminants, reduce turbidity and reunify the water, and secondary treatments that include continuous biochemical and aerobiological treatment.

Analysis and recommendation. The treatment design is based on the Imhoff dimension and the RNE 0S 090 "Plant for wastewater treatment" standard. Currently, there is no plant to treat these rivers as farmers use them to irrigate crops, which poses health risks. Physical, chemical and bacterial characterization will be carried out to determine if the water is treated and suitable for its intended use. To evaluate the effectiveness of the system, examination and testing in the laboratory is recommended. The program will monitor the treatment process and detail operation and maintenance procedures.

Costs of this and other alternatives

The budget for the implementation of the design, from planning to completion is S/. 100,000 soles, the budget must be assumed by the Regional Government with allocation to the budget for the execution of municipal works.

CONCLUSIONS

The design of the treatment system is through the Imhoff tank, allowing the pollution of wastewater from the La Pampa neighborhood to be reduced. In accordance with the provisions of Standard OS 090 "Wastewater Treatment Plant" of the National Building Regulations.

The wastewater flow rate was determined using two methods, the first using the gauging method and the second using a triangular weir. For the first method, it was determined by measuring the flow rate for two days, obtaining an average of 11.72 lt/ s. For the second method, a flow rate was determined according to the average of hourly variations, obtaining an average of 11,705 lt/s. Having both data using the developed methods, an average final flow rate of 11.72 lt/s was obtained in the Pampa neighborhood.

The estimated future population, taking into account the current population of the neighborhood and not knowing the real population of this neighborhood due to

lack of information from the institutions in charge of specifying it through specific censuses, the alternative is taken to find the current population with a proportional mathematical model, which allows us to get closer to the size of the population, this information was used to estimate the future population applying the geometric method with a growth rate of 1.6%. In a design period of 20 years, it is 724 inhabitants.

The composition of the wastewater for the treatment system was verified, including: hydrogen potential, resulting in 8.4 (being acidic pH <7, and in a basic medium and when pH >7 is alkaline), For our study our PH results It is alkaline, as for the electrical conductivity of the waste water, it varies from 1200 µs/cm, the turbidity determined was 358.0 NTU. The Temperature according to evaluation is 16.0 °C, complying with the Maximum Permissible Limits (LMP), the total suspended solids reached a value of 296.0 mg/l. the dissolved oxygen value is 0.0 mg/l. The biochemical oxygen demand (BOD 5) is 366 mg/l. As established in the laboratory with a 94 ml sample in its analysis using the standardized method (MS), chemical oxygen demand (COD) gave a value of 813.0 mg/l.

REFERENCES

Álvarez-Monier, Emilio, & Árias-Lafargue, Telvia. (2022). Preliminary study of the efficiency of primary filtration in the parenteral serum plant. Chemical Technology, 42 (3), 543-557. Epub September 26, 2022. Retrieved on June 26, 2023, from http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2224-61852022000300543&lng=es&tlng=es

Bryan, E., Chong, A., Paul, K., Rimarachín, G., Paul, J., Rafael, I., ... & Muñoz, T. (2022) Technological alternatives for the treatment of Domestic wastewater. A systematic review of the literature.

Cañizo, I.; Eraso, a.; Aguado, j. (1976). Bentonite-cement and its applications. Public Works Magazine, 123(3130):67-76.

Campo Usuga, J.F. (2022). State of the art of septic systems for wastewater treatment in rural areas.

Contreras Fajardo, ON, & Bejarano Ricaurte, JA (2022). Review of the removal of chromium vi in wastewater, from ligninolytic fungi.

Humanante Cabrera, Juan José, Moreno Alcivar, Lucrecia Cristina, Grijalva-Endara, Ana, Tinedo, Ricardo Williams Saldoya, & Tomalá, Joan Alberto Suárez.

(2022). Removal efficiency and impact of the wastewater treatment system in the urban and rural sector of the Province of Santa Elena. Mangrove, 19 (2), 177-187. Epub June 15, 2022. https://dx.doi.org/10.17268/manglar.2022.022

Farfán, SWU, Rivera, RJC, Sánchez, RNL, Ramírez, SP, & Avila, JCS (2022). Public policies and environmental quality management for the decontamination of rivers. Ciencia Latina Multidisciplinary Scientific Magazine, 6 (6), 927-952.

Gómez, Elkin A., Ocampo, David, & Rios, Luis A. (2022). Reuse of liquid waste generated in the hydrothermal liquefaction of microalgae from the cement industry. Information Technology, 33 (6), 103-112. https://dx.doi.org/10.4067/S0718-07642022000600103

Hidalgo Monroy, Gianina, Vásquez Ávila, Sebastián, & Araya, Felipe. (2022). Qualitative analysis of social sustainability of urban drainage systems in Chile. Sustainable Habitat Magazine, 12 (1), 44-57. https://dx.doi.org/10.22320/07190700.2022.12.01.03

Indacochea Parrales, HE (2023). *Hydraulic Design of an Imhoff Tank for the Treatment of Domestic Wastewater of the Population of the El Anegado Parish Canton Jipijapa Manabí Province* (Bachelor's thesis, Jipijapa-Unesum).

Jabo, S. N. (2017). Wastewater treatment in the Imhoff tank to reduce pollution in the Sicacate stream in the Montero district. Piura-Peru: National University of Piura.

Leyva Milla, RM (2022). Efficiency of the Imhoff tank and dormunt settler in the removal of the mass load depending on the COD of domestic wastewater adapted to high Andean climates, Marcará–2019.

Melo Prudencio de Araújo, W., Barreto Sandoval, G., de Souza Picanço, M., Zoe Correa, C., & Negrão Macêdo, A. (2022). Pervious concrete (PC) with addition of TiO2 used in sanitary sewage treatment. Construction Engineering Magazine, 37 (3), 345-362. https://dx.doi.org/10.7764/ric.00039.21

Mera, GP, Barzola, MS, Allaica, JCM, & Soriano, FR (2022). Review of methods for purifying wastewater derived from production processes. 593 digital Publisher CEIT, 7 (4), 496-506

Palacios Ledesma, JA (2023). Design of a wastewater treatment plant based on artificial wetlands for the La Victoria community located in the rural parish of Pablo Arenas-Ecuador.

Pérez, Alberto Cieza, Alarcón, Marcelino Callao, & Paico, Jessica Rojas. (2022). Management of internal processes for environmental management in a wastewater treatment plant. Alfa Journal of Research in Agronomic and Veterinary Sciences, 6 (16), 48-59. Epub March 30, 2022. https://doi.org/10.33996/revista alfa.v6i16.149

Mucha Sernaqué, LJ (2020). Design of a wastewater treatment system from the Auquimarca-Pampa annex

Norambuena-Contreras, José, Zamora Barraza, David, Castro-Fresno, Daniel, & Vega-Zamanillo, Ángel. (2009). Thermal analysis of geosynthetics used in pavement rehabilitation. I will engineer. Chilean Engineering Magazine, 17 (1), 95-100. https://dx.doi.org/10.4067/S0718-33052009000100010

Mera, GP, Barzola, MS, Allaica, JCM, & Soriano, FR (2022). Review of methods for purifying wastewater derived from production processes. 593 digital Publisher CEIT, 7 (4), 496-506.

Vela Ríos, IM (2018). Efficiency of a scaled Imhoff-HA Tank, to improve the quality of municipal wastewater in the district of Habana, Moyobamba.

PAHO (2005). Pan American Health Organization, guide for the design of septic tanks, Imhoff tanks and stabilization ponds. Retrieved from: http://www.bvsde.paho.org/tecapro/documentos/sanea/163esp-diseno-ti.pdf

Sánchez Ortiz, Iván Andrés, & Matsumoto, Tsunao. (2012). Evaluation of the performance of the ILHA Solteira (SP) urban wastewater treatment plant by primary facultative lagoons. Engineering and Development, 30 (2), 199-222. Retrieved June 29, 2023, from http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0122-34612012000200005&lng=en&tlng=es.

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Research paper

On the way to sustainable energy management in tourism: Findings from a Bibliometric Study

Hacia una Gestión Sostenible de la Energía en el Turismo: Evidencias desde un Estudio Bibliométrico

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ABSTRACT

Energy management in the tourism sector is essential to promote sustainable and efficient practices to reduce operating costs, mitigate environmental impact and improve the competitiveness of tourism enterprises. Despite the importance of this topic, there is a lack of bibliometric studies on energy management in the tourism sector. Therefore, the aim of this research is to map the scientific production related to this topic. To carry out this study, the bibliometric method was employed using the R package Bibliometrix to analyse indicators of productivity, impact and collaboration, extracted from the SCOPUS database. As results, a total of 201 articles published between 1977 and 2024 were identified, highlighting authors such as Acosta A, Burnett J and Park S for their prolific production and significant contributions to the field. Topics such as "Energy Management", "Energy Efficiency", "Energy Consumption" and "Sustainability" emerge as relevant and trending research topics. Furthermore, guidelines are proposed to improve energy efficiency in the tourism sector, such as the implementation of renewable energies and alternative sources such as solar, wind and biomass, as well as the adoption of intelligent energy management systems. It is concluded that future lines of research should be directed towards the use of deep learning algorithms for autonomous energy management systems in microgrids, as well as the development of systems based on the ISO 50001 standard.

Keywords: *Bibliometric study, Bibliometrix, Energy management, Tourism*

RESUMEN

La gestión energética en el sector turístico es esencial para fomentar prácticas sostenibles y eficientes que permitan reducir costos operativos, mitigar el impacto ambiental y mejorar la competitividad de las empresas turísticas. A pesar de la importancia de este tema, se observa una carencia de estudios bibliométricos sobre la gestión de la energía en el sector turístico. Por lo tanto, el objetivo de esta investigación es realizar un mapeo de la producción científica relacionada con esta temática. Para llevar a cabo este estudio, se empleó el método bibliométrico utilizando el paquete de R Bibliometrix para analizar indicadores de productividad, impacto y colaboración, extraídos de la base de datos SCOPUS. Como resultados se identificaron un total de 201 artículos publicados entre 1977 y 2024, destacando autores como Acosta A, Burnett J y Park S por su prolífica producción y contribuciones significativas al campo. Temas como "Energy Management", "Energy Efficiency", "Energy Consumption" y "Sustainability" emergen como relevantes y en tendencia en las investigaciones. Además, se proponen directrices para mejorar la eficiencia energética en el sector turístico, como la implementación de energías renovables y fuentes alternativas como la solar, eólica y biomasa, así como la adopción de sistemas inteligentes de gestión de energía. Se concluyes que las futuras líneas de investigación deben estar dirigidas hacia el uso de algoritmos de aprendizaje profundo para sistemas autónomos de gestión de energía en microrredes, así como en el desarrollo de sistemas basados en la norma ISO 50001.

Palabras clave: Estudio bibliométrico, Bibliometrix, Gestión energética, Turismo

INTRODUCTION

The tourism industry is a crucial pillar of the global economy, contributing significantly to the economic growth and sustainable development of various regions (Hussain et al., 2024). Therefore, energy management is a vital aspect that promotes sustainability and efficiency in this sector (Torres-Sainz et al., 2022). Efficient energy use not only reduces operating costs for tourism businesses but also positively impacts carbon emissions reduction and natural resource conservation in tourism destinations (Alhawamdeh et al., 2023).

Several studies have emphasized the significance of sustainable energy use and environmental management in tourism destinations (Abbas et al., 2024; Stankov et al., 2023; Suanpang et al., 2022). The recreation and tourism industries have observed the adoption of energy-saving devices, such as energy-efficient light bulbs and solar-powered vehicles (Wang et al., 2024). Autonomous energy management systems have been proposed for effective energy management in microgrids in remote tourist areas (Luna et al., 2023). The use of modern technologies, such as the Internet of Things (IoT), can contribute to sustainable energy management in tourism destinations (Tiwari et al., 2022). Energy management systems based on the ISO 50001 standard have been proposed for the hotel industry to reduce energy-related expenses and demonstrate social responsibility (Ochoa et al., 2018; Rajić et al., 2022; Iturralde Carrera et al., 2023).

Research has shown that managers in the tourism industry still lack sufficient knowledge regarding energy issues and their impact on tourism. For instance, Ali et al. (2008) found that some hotels have installed energy-saving equipment. However, it has been observed that managers of one-star hotels are not willing to make such changes in their establishments. In contrast, hotels with ratings ranging from 2 to 5 stars have demonstrated a strong commitment to reducing energy consumption by implementing various measures.

However, it is noteworthy that there is a lack of comprehensive bibliometric studies on energy management in the tourism industry. Only two studies were found that approached energy management in tourism from a bibliometric perspective. He et al. (2022) conducted a comprehensive bibliometric review of the scientific literature on energy performance optimization of smart city components. However, the study is limited to smart cities and does not address other approaches in the tourism sector. It is important to note that other relevant research has been published outside the scope of this study.

On the other hand, Swati and Ruby's (2023) research primarily focuses on corporate sustainability, leaving the study of environmental sustainability in tourism SMEs in an early stage. They do address secondary issues such as water and energy management, as well as circular economy. While energy management is closely related to sustainability, it is not the main focus of their research, which solely concentrates on tourism SMEs.

This knowledge gap highlights the need for a comprehensive study that maps and critically analyzes existing research in the field of energy management in tourism.

The lack of bibliometric studies on energy management in tourism provides a unique opportunity to conduct an in-depth investigation and analysis of the current state of knowledge in this area. The main objective of this research is to provide a comprehensive overview of the research conducted to date on energy management in the tourism context. This will allow for the identification of emerging trends, key areas of interest, prominent authors, and works of major impact. Furthermore, our study aims to contribute to the definition of future research directions in this interdisciplinary field by analyzing the existing scientific literature. The significance of this research is its potential to enhance the theoretical and empirical foundation of energy management in tourism. It serves as a guide for researchers, academics, industry practitioners, and policymakers interested in sustainability and energy efficiency in the tourism sector.

METHODS

The research employed the bibliometric analysis method. Scopus was chosen as the database due to its extensive collection of citations and abstracts of peer-reviewed literature. The search was conducted in March 2024 using the following search filter: title, abstract, or author keywords: 'Energy management' AND (tourism OR hotels OR restaurants).

The time frame was not restricted to ensure a larger pool of articles. To obtain only 'Article' type documents, a filter was applied. Relevant references were downloaded in .ris and .csv format, and a library was created in the Zotero bibliographic manager with the search results. The R pac-

kage bibliometrix was used to process the .csv file and determine bibliometric indicators of productivity, impact, co-citations, collaboration, and keyword analysis.

Productivity and impact are two important measures of research activity. Productivity refers to the number of works published by an author, research group, or institution in a given period of time. Impact, on the other hand, measures the repercussion and visibility of an academic work through citations received by other authors in their publications, indicating their influence in the scientific community (Li et al., 2024).

Co-citations are used to identify the frequency with which two papers are cited together, indicating a relationship of similarity of topics or authorship between them. However, collaboration analysis aims to identify the interaction between different authors, institutions, or countries in the production of knowledge. This allows for the identification of collaboration networks and the influence of cooperation in research (Kuhn et al., 2024).

This document measures global and local citations. Global citations are determined by the number of citations received in the database where the search was conducted, in this case, Scopus. Local citations are determined by the number of citations a document receives from the analyzed data's included documents (Aria & Cuccurullo, 2017). Global citation considers citations from a global perspective across disciplines, while local citation focuses only on citations within a specific discipline.

To measure the impact factors of journals, three different metrics are evaluated: h-index, g-index, and m-index. The h-index takes into account the number of papers from each source and the number of citations of each paper (Serrano-Leyva et al., 2022). The g-index is a measure of scientific productivity based on an author's publication history. It is calculated similarly to the h-index but is more complex and allows for differentiation between authors with similar h-indices. The m-index is defined as h/n, where h is the h-index and n is the number of years since the author's or journal's first publication (Díaz-Pompa et al., 2022; Serrano-Leyva et al., 2021).

In addition to examining the graphs generated by Bibliometrix, we conducted a thorough analysis of the corresponding data tables to enhance our understanding and interpretation of the information. These tables contain fundamental indicators for network analysis, such as Node (representing articles or research), Cluster (thematic grouping), Betweenness Centrality (a measurement of the importance of a node in controlling information flow), Closeness Centrality (the speed of communication between a node and others), and PageRank Centrality (the relative importance of a node based on connections).

On the other hand, relevant indicators were considered for the thematic map, including occurrences (frequency of keyword usage), words (keywords used in research), cluster (thematic categorization), cluster label (thematic grouping label), and the indexes of betweenness centrality, closeness centrality, and PageRank centrality. These indicators help to assess the importance and relevance of keywords and topics within the identified thematic network. Examining these indicators in a detailed and academic manner contributes to a comprehensive understanding of the knowledge structure present in research. This allows for the identification of trends, crucial areas of interest, and the ranking of the relevance of nodes and keywords in the field of energy management in the tourism sector.

RESULTS AND DISCUSION

General results

Table 1 summarizes the results of the bibliometric analysis.

Table 1: General information

DESCRIPTION	RESULTS
MAIN INFORMATION ABOUT DATA	
Timespan	1977:2024
Sources (Journals, Books, etc)	109
Documents	201
Annual Growth Rate %	3,89
Document Average Age	11,7
Average citations per doc	25,69
DOCUMENT CONTENTS	
Keywords Plus (ID)	1550
Author's Keywords (DE)	633
AUTHORS	
Authors	658
Authors of single-authored docs	29
AUTHORS COLLABORATION	
Single-authored docs	31
Co-Authors per Doc	3,51
International co-authorships %	28,86
DOCUMENT TYPES	
article	201

The research on energy management in tourism covers a period from 1977 to 2024 and is based on a representative sample of 109 sources, including academic journals and specialized books. A total of 201 documents were analyzed, indicating an average annual growth of 3.89% and a growing interest in this field over time. On average, the research is 11.7 years old, suggesting a continuity in the production of knowledge on this subject.

The analyzed academic literature shows a solid average of 25.69 citations per paper, indicating a significant level of influence and relevance. The documents contain a wealth of information, with 1550 keywords plus (id) and 633 authors' keywords (de), suggesting a diversity and breadth of topics addressed. On the other hand, the study identified a total of 658 authors, with 29 of them having worked individually on document creation. Collaboration among authors is notable, with an average of 3.51 coauthors per paper and 28.86% of international collaborations, highlighting the interdisciplinary and global nature of research in this field.

Productivity indexes

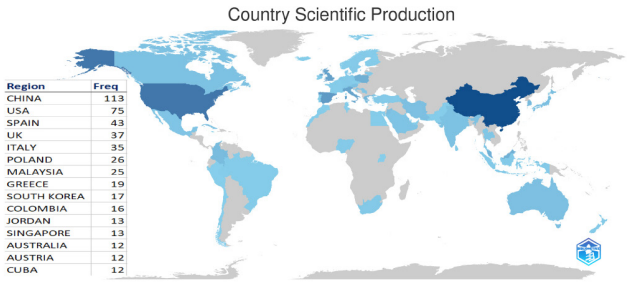
Figure 1 shows the annual productivity of articles in the studied field from 1977 to 2024. The number of publications fluctuates significantly over the years.

Figure 1: Annual productivity

Academic production in the field studied has evolved over time, with periods of greater and lesser research activity, reflecting the increasing importance and interest in studying Energy Management in Tourism.

Figure 2 provides an overview of productivity by country in scientific articles addressing energy management in the tourism sector, showing the distribution of academic production at the international level.

Figure 2: Country Productivity

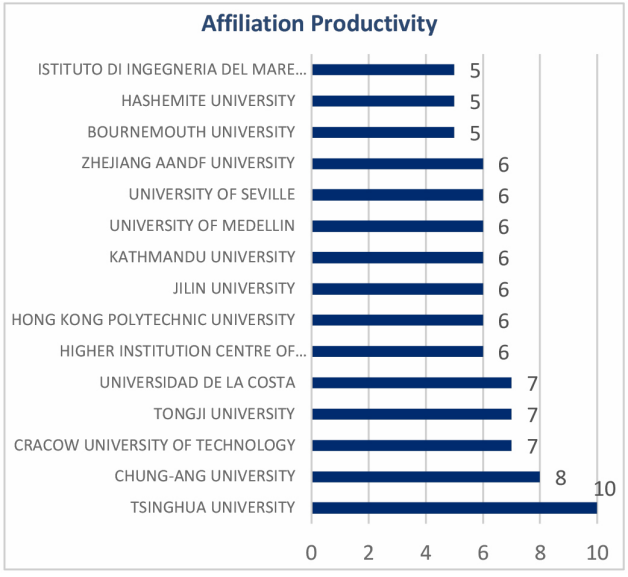


China leads with 113 publications, followed by the United States with 75, Spain with 43, and the United Kingdom with 37. Several countries have made significant contributions to the generation of knowledge at the intersection of energy management and tourism.

The World Tourism Organization (OMT), based in Madrid, Spain, promotes sustainable tourism development globally. Similarly, the International Energy Agency (IEA), located in Paris, France, focuses on energy policies and sustainable technologies. These organizations are relevant to the high scientific production in the field studied.

Figure 3 presents a detailed analysis of the productivity of scientific articles on energy management in the tourism sector, highlighting the academic institutions and organizations involved in research in this field. It is noteworthy that a diverse range of affiliations is observed, with several global institutions having a prominent presence.

Figure 3: Affiliation Productivity



Notably, Tsinghua University has 10 publications, Chung-Ang University has 8, and La Costa University has 7. Several institutions have made an equal number of contributions, reflecting an equal distribution in academic production in this field. However, it is worth noting that some institutions have made multiple contributions, which may indicate a strong commitment to research in energy management in tourism.

Figure 4 provides a detailed overview of productivity by journals in scientific articles addressing energy management in the tourism sector, highlighting the main sources of knowledge in this specific field. Among the most productive journals are "Energies" with 12 articles, "Energy and Buildings" and "Sustainability" with 11 articles each, followed by "Applied Energy" with 9 articles. These are sources to be considered for the socialization of scientific research results that address these topics. In addition, the identification of these sources is useful for researchers in this area to keep themselves informed and updated on high impact research.

Figure 4: Sources Productivity

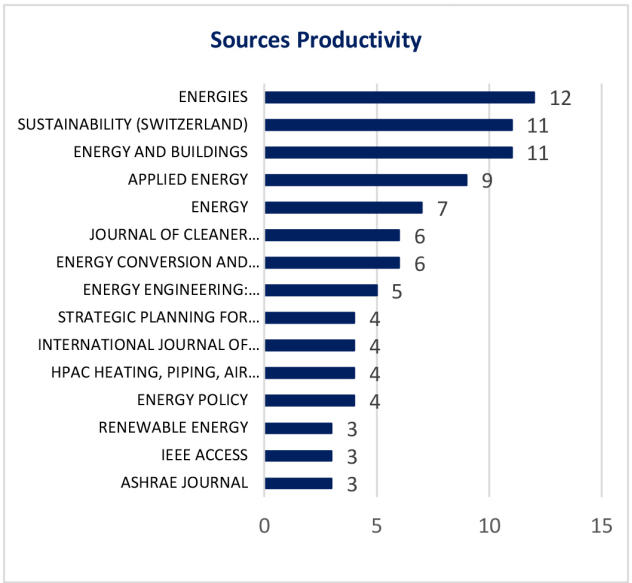
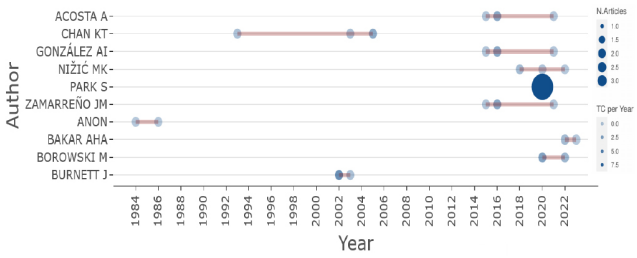


Figure 5 presents a detailed analysis of productivity by authors and citations over time, revealing the contribution and influence of authors in the field of study over different years. The data presented highlights interesting patterns in the scientific production and receipt of citations by the mentioned authors.

Figure 5: Author productivity and citations over time

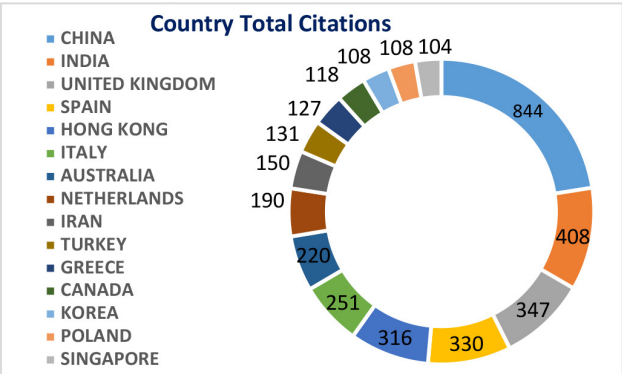


One relevant aspect of the figure is the productivity of authors, such as Acosta A, Burnett J, and Park S, who have maintained a continuous presence in the scientific literature throughout the years analyzed, with variations in the number of citations received at different times. For instance, Park S showed a significant productivity trend in 2020, receiving 45 citations, which highlights their influence during that period. These authors are recognized for their high research productivity and the quality of their work, as evidenced by the number of citations they have received. As a result, they are considered to be leading experts in the field.

Impact indexes

The analysis of citations related to energy management in the tourism sector by country provides valuable insight into the distribution of scientific production and citation reception across different regions of the world. This is illustrated in Figure 6.

Figure 6: Country Total Citations



China has the highest number of citations with 844, followed by India with 408 and the United Kingdom with 347. These data reflect the quality, relevance, and scope of the research conducted, motivating the scientific com-

munity to maintain high standards of excellence in the production of knowledge in the area of energy management in tourism.

Table 6 presents bibliometric metrics, including the h-index, g-index, and m-index, for various sources related to research on energy management in the tourism sector. These indices measure the productivity and impact of publications from each source in the field of study.

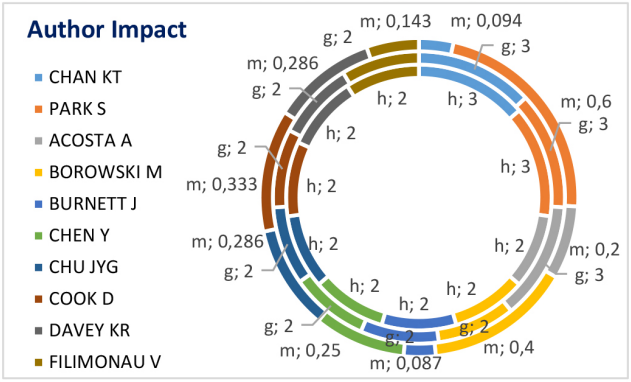
Table 2: Source Impact

Source	h_index	g_index	m_index
ENERGY AND BUILDINGS	11	11	0,5
APPLIED ENERGY	7	9	0,189
ENERGIES	6	12	0,462
ENERGY CONVERSION AND MANAGEMENT	6	6	0,25
JOURNAL OF CLEANER PRODUCTION	6	6	0,429
ENERGY	5	7	0,119
ENERGY POLICY	4	4	0,182
SUSTAINABILITY (SWITZERLAND)	4	8	0,364
IEEE ACCESS	3	3	0,375
RENEWABLE ENERGY	3	3	0,103
SUSTAINABLE CITIES AND SOCIETY	3	3	0,333

When interpreting this data, it is evident that journals such as 'Energy and Buildings', 'Applied Energy', and 'Energies' have relatively high h and g indexes, indicating significant influence in the scientific community. In contrast, 'Renewable Energy' and 'IEEE Access' have lower indexes compared to the previous ones. This information serves as a reference for researchers and professionals interested in accessing quality and relevant publications in sustainable energy management in the tourism sector.

Figure 7 presents metrics for the authors, allowing for identification of those with the greatest impact in this field.

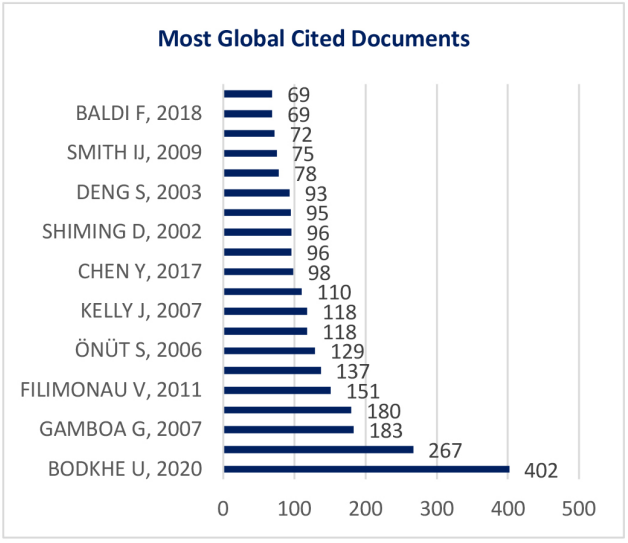
Figure 7: Author Impact (h index; g index; m index)



Regarding influence, the authors who stand out are Park S, Gonzalez AI, Nižić MK, Liu X, Suanpang P, Jermsittiparsert K, and Wang Q-C. These researchers have achieved a higher level of productivity and relevance in their publications compared to other authors. This is reflected in their high h and g indices, which indicate their impact and significant contribution to the scientific literature related to energy management in the tourism sector. This information is important for the academic community interested in this topic. It allows them to identify the most influential authors whose research could be relevant for their own work and future projects in this specific field of study.

Figure 8 shows the most cited global documents, which can help identify research with the greatest impact in this field.

Figure 8: Most Global Cited Documents



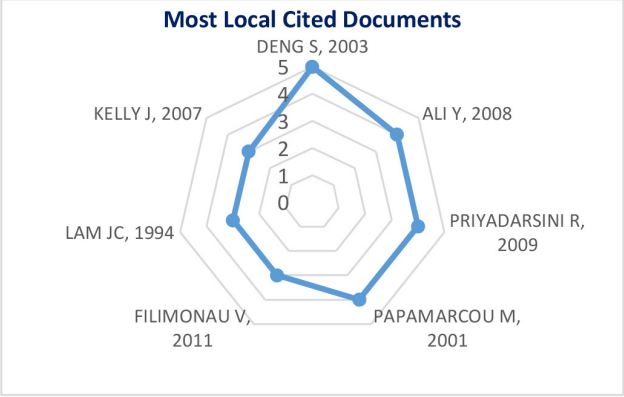
Two highly influential research studies are Bodkhe et al. (2020) and Zhou et al. (2013). Bodkhe et al. (2020) explores the application of Blockchain in Industry 4.0 in the tourism sector, including energy management. Zhou et al. (2013) proposes a two-stage stochastic programmed model for the optimal design of a power distribution system. On the other hand, Gamboa & Munda (2007) propose a social multi-criteria evaluation (SMCE) as a general framework to address the problem of the location of wind farms due to their potential impact on tourism or their visual impact, as well as NIMBY (Never In My Back-Yard) behavior. The SMCE integrates the socio-economic and technical dimensions into a coherent framework, making it a strong approach with 183 citations. Reinders et al. (2003) assessed the average energy demand of households in 11 EU Member States by investigating both direct energy needs (electricity, natural gas, gasoline, etc.) and indirect energy needs, i.e., energy embodied in consumer goods and services. They found that indirect energy consumption can vary significantly from one state to another in the consumption classes of 'food, beverages and tobacco', 'leisure and culture', 'housing', and 'hotels, cafes and restaurants'.

These studies have received a high number of global citations, indicating their relevance and significant contribution to the academic literature on energy management in the tourism sector.

Analyzing Figure 9, which presents the most cited local papers, identifies the research with the greatest impact at the local level. One of the most cited studies is Deng (2003), with five citations. The paper presents a case study analyzing electrical load profiles recorded in a Hong Kong hotel over a 12-month period to identify potential energy-saving opportunities. The study uses regression analysis to correlate water and energy consumption data with various hotel operational and background parameters to identify explanatory indicators of water and energy consumption. Ali et al. (2008) present data on energy consumption in Jordan's tourist accommodation sector. The study found that lighting in the main building and outdoor areas of hotels, as well as air conditioning, consume more electricity than other departments.

Similarly, Priyadarsini et al. (2009) conducted a study on the energy performance of hotel buildings in Singapore. They collected data on energy consumption and other relevant information from 29 quality hotels through a national survey. The results revealed that three-star hotels differ from higher category establishments in their energy use. In another study, Papamarcou and Kalogirou (2001) presented a feasibility study of a cogeneration system for a hotel application. The economic analysis indicates that the system generates an annual net savings of approximately 26,500 Cy£, with a capital investment of 85,000 Cy£. The payback period of the system is 3.2 years, which is satisfactory. The last three papers each contain four quotes.

Figure 9: Most Local Cited Documents

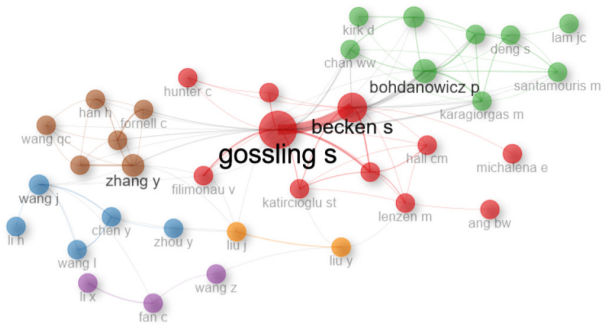


These investigations are important for the foundations of future studies in energy management in the tourism sector. They provide valuable insights, relevant results, and in-depth analyses that will serve as a foundation for further research. Researchers must consider and build on these key works to advance knowledge and innovation in this specific topic.

Co-citations index

Figure 10 shows the network of co-citations between authors, highlighting the significance of specific researchers in the field of energy management in the tourism sector.

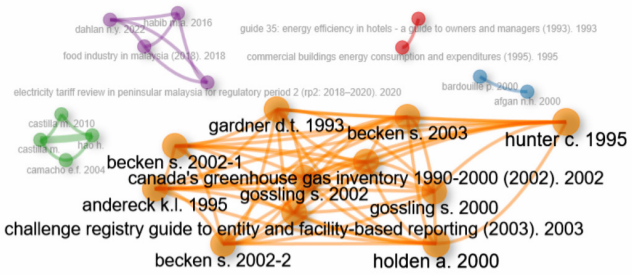
Figure 10: Authors Co-Citations Network



Authors such as Gossling S, whose high value of Betweenness indicates his central role in the interconnection of the network, being crucial for the linkage between other authors, stand out. Becken S and Filimonau V also emerge as relevant figures, being significantly cited in the network. These authors hold a central position in the co-citation network, indicating their influence and key role in expanding knowledge in the field of energy management in the tourism sector.

The analysis of the co-citation network between papers is shown in Figure 11, revealing the importance and centrality of certain research in the field of study.

Figure 11: Document Co-Citations Network



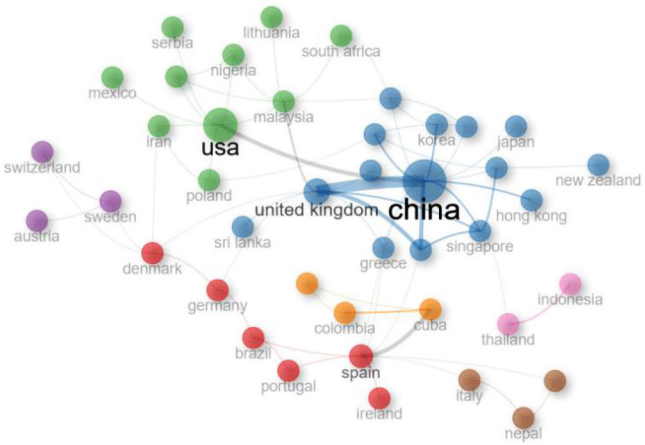
The 'Electricity Tariff Review in Peninsular Malaysia for Regulatory Period 2 of 2020' is one of the most prominent documents. These reviews are conducted regularly to analyze factors such as generation, distribution, transmission costs, energy policies, and market conditions to determine necessary adjustments in electricity tariffs. The main objective of this review is to ensure a balance between the costs of electricity supply and the tariff charged to users, creating a sustainable and efficient electricity system.

Additionally, two important papers on the web are 'Food Industry in Malaysia' from 2018 and 'Habib M.A.' from 2016. These papers demonstrate a high level of brokerage and closeness in the network, indicating that they have been widely referenced and are connected to other papers in a significant way. Furthermore, these articles have a high PageRank, indicating their significance and impact in the field of study.

Collaboration index

Figure 12 presents an analysis of the network of collaboration between countries, providing a detailed view of the relevance of each country in this specific area.

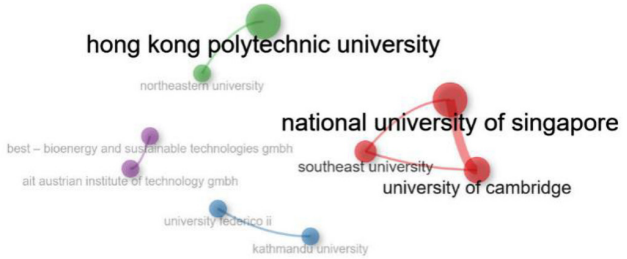
Figure 12: International cooperation



Spain, China, and the United Kingdom are among the most relevant countries in this network. Spain plays a central role in international collaboration in this field, particularly in intermediation. The United Kingdom also has a high level of closeness in the network, indicating a close connection with other countries in terms of collaboration. This may be due to the influence of the OMT and IEA, which are located on the European continent. These countries provide a strong foundation of knowledge and experience in energy management within the tourism sector. Their research and best practices should be consulted as a fundamental reference for future studies in this field.

Figure 13 analysis of the collaboration network between institutions provides crucial information on the most relevant entities in this field.

Figure 13: Institutional collaborations

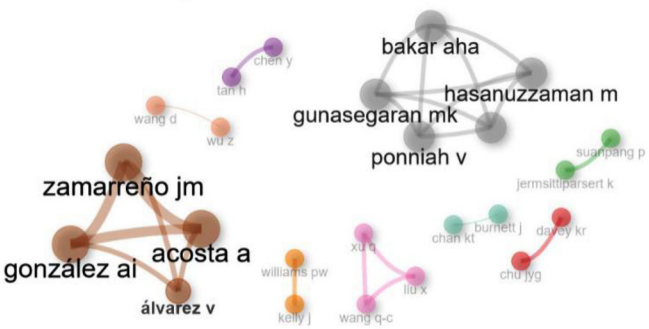


The University of Cambridge and the National University of Singapore are two of the most relevant institutions in the international collaborative network of energy management research in the tourism sector. The University of Cambridge and the National University of Singapore are two of the most relevant institutions in the international

collaborative network of energy management research in the tourism sector. They are located in the same cluster with a high level of proximity metrics and a prominent PageRank. The University of Cambridge and the National University of Singapore are two of the most relevant institutions in the international collaborative network of energy management research in the tourism sector. These institutions represent crucial points of connection and have significant influence. These institutions are recognized as leading centers of knowledge and excellence in energy management within the tourism sector. Their research and collaborations serve as a fundamental guide for future studies in this area.

Figure 14 presents an analysis of the collaboration network between authors in research on energy management in the tourism sector, highlighting the significance of certain authors in this field.

Figure 14: Author collaboration



Notable authors in the field of energy management research in the tourism sector include Chu JYG, Davey KR, Gruber JK, Prodanović M, Jermsittiparsert K, Suanpang P, Chen Y, Tan H, Kelly J, and Williams PW. These authors have a high PageRank, indicating significant influence on the international collaborative network. Although they do not stand out on measures such as betweenness or closeness, their work is widely referenced and has a significant impact on the field.

Additionally, the network includes authors such as Acosta A, González AI, Zamarreño JM, Álvarez V, Liu X, Wang QC, Xu Q, Bakar AHA, Gunasegaran MK, Hasanuzzaman M, Ponniah V, Tan C, Chan KT, Burnett J, Wang D, and Wu Z, who have a significant PageRank level. This places them as crucial contributors to energy management research in the tourism industry.

Keyword analysis

Figure 14 shows the analysis of the most frequent keywords used in research on energy management in the tourism sector, revealing recurrent and relevant themes in this field of study.

Figure 15: Most Frequent Words

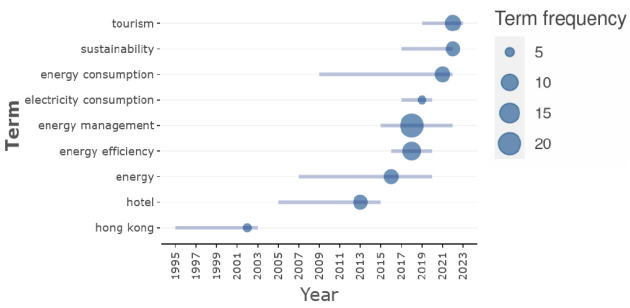
Commonly used terms in this context include 'energy management', 'energy efficiency', 'tourism', 'energy consumption', 'hotel', and 'sustainability', among others.

The frequency of terms such as 'energy management' and 'energy efficiency' in the tourism sector is due to their crucial role in optimizing energy use. This optimization is fundamental to the sustainability and profitability of operations in hotels, resorts, and other tourism establishments. These issues highlight the significance of decreasing energy consumption, optimizing energy resource efficiency, and efficiently managing energy systems in the sector to minimize costs and environmental impact.

The use of words related to sustainability, such as 'sustainability' and 'renewable energy,' indicates a growing emphasis on implementing sustainable energy practices in tourism. Recurring themes in the tourism sector include hotel energy management, energy efficiency in commercial buildings, and the importance of effective energy management strategies in the hotel industry. These aspects reflect the concern for environmental sustainability and energy efficiency.

Figure 16 displays the analysis of trending keywords. The figure illustrates the temporal evolution of the relevance of certain topics over the years.

Figure 16: Trend Topics

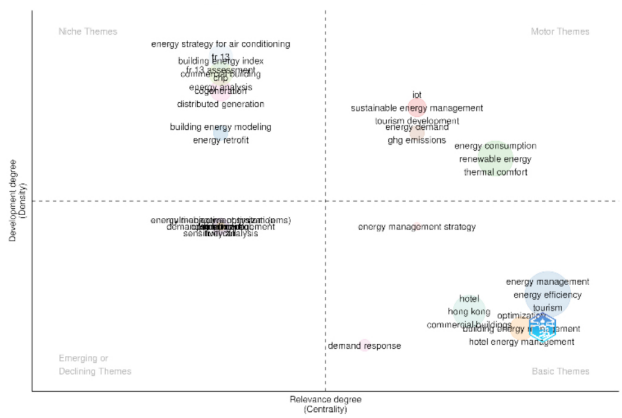


The analysis shows that 'energy management' has become a prominent topic recently, with 24 occurrences between 2015 and 2022. This indicates that energy management has become a central and growing topic of interest in tourism research in recent years, possibly due to the increasing awareness of the importance of energy efficiency and sustainability in the hospitality and tourism industry.

The trend also shows significant presence of other keywords such as 'energy efficiency', 'tourism', and 'sustainability', reflecting the increasing attention to energy efficiency, the impact of tourism on energy management, and sustainability considerations in the tourism sector. The temporal evolution of these keywords indicates that topics such as energy efficiency and sustainability have gained importance in research related to energy management in the tourism sector over the years analyzed.

Figure 17 presents the analysis of the thematic map, which reveals important aspects for understanding trends, gaps, and future lines of research in this field.

Figure 17: ThematicMap



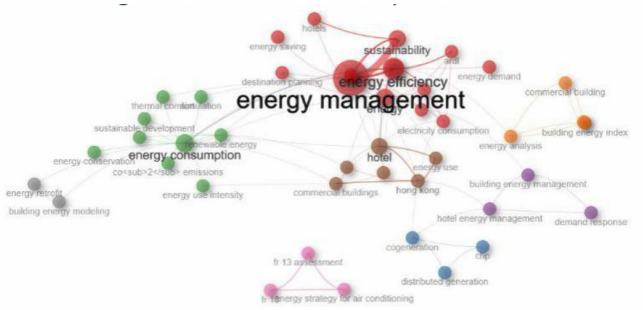
The tourism industry continues to prioritize energy efficiency, energy management, and sustainability, as evidenced by the prevalence of topics such as 'Energy Management', 'Energy Efficiency', 'Tourism', 'Energy Consumption', and 'Sustainability' in research.

The absence of keywords such as "Destination Planning", "Energy Saving", "Sensitivity Analysis" suggests areas where research could be deepened to address aspects such as tourism destination planning, energy saving strategies and sensitivity analysis in energy management in the tourism sector. "Energy Management" and "Energy Efficiency" emerge as driving themes, underlining the importance of efficient energy management in the tourism sector to achieve sustainability and resource optimization.

The analysis reveals that there is a growing interest in clean technologies and specific approaches to energy management in buildings, as evidenced by the emerging themes of 'Renewable Energy' and 'Building Energy Management'. However, the themes of 'CHP' and 'Cogeneration' appear to be losing relevance, indicating a possible shift in research focus to other areas. Important cross-cutting themes in energy management for the tourism sector include 'Optimization' and 'Multi-objective Optimization', which indicate that efficiency and optimization are key factors to consider.

The correlation analysis of keywords, as depicted in Figure 18, offers valuable insights into current trends, identified gaps, potential future research directions, as well as unexplored areas or those that could benefit from alternative approaches.

Figure 18: Co-ocurrencia de palabras clave

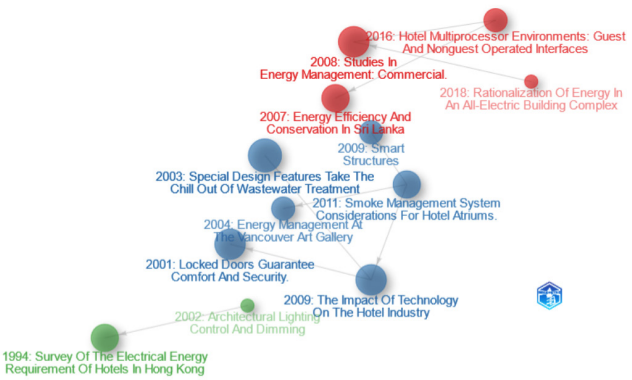


Some keywords, such as 'Building Energy Index', 'Demand Response', and 'Distributed Generation', present low or zero correlation values. This suggests possible underdeveloped areas in tourism energy management research

that may require further attention to fill possible gaps. Possible areas for future research in the tourism sector include 'Support Vector Regression', 'Energy Strategy for Air Conditioning', and 'Energy Retrofit'. These topics offer opportunities to explore innovative approaches to energy management.

The historiographic network analysis of research on energy management in the tourism sector, as shown in Figure 15, illustrates the evolution and interconnectedness of key topics addressed in academic studies on this specific field. Each node in the network, representing an article or research, is linked by keywords that reflect fundamental aspects of energy management in hotels and tourism buildings.

Figure 19: Historiograph Network



The figure displays the interrelation of topics such as 'Energy Management', 'Electricity Consumption', 'Hotels', 'Energy Efficiency', and 'CO2 Emissions'. These topics emphasize the significance of energy efficiency, sustainability, and effective resource management in the tourism sector. The density of connections between nodes indicates the centrality and relevance of specific topics in the historical research network, highlighting established areas of study that are of significant interest to the academic community.

The historiographic network also reflects the evolution of concepts such as 'Energy Retrofit', 'Carbon Footprint Analysis', and 'Renewable Energy Resources'. This shows how research has progressed towards more comprehensive and sustainable approaches to energy management in hotels and resorts. The existence of clusters within the network indicates the presence of groups of correlated topics that may suggest specific areas of specialization or thematic lines of research within the field of energy management in the tourism sector.

Future research directions, limitations, and trending topics.

The analysis of keywords and articles reveals that current and future trends in energy management in tourism involve the use of deep reinforcement learning algorithms for autonomous energy management systems in microgrids, as well as the development of ISO 50001-based energy management systems for the hospitality industry. Research is being conducted on the use of Q-learning for microgrids in the tourism industry to achieve efficient energy management.

Additionally, comprehensive energy monitoring, forecasting, and evaluation systems are being developed for hotels. These systems take into account factors such as building cooling and heating methods, weather parameters, and staff activity patterns. Additionally, studies are being conducted to create energy-saving strategies and management techniques for resort buildings. This includes considering factors such as energy utilization methods and the hygrothermal environment.

Current constraints in the hotel industry include a lack of knowledge and awareness among managers regarding the impact of energy on tourism. Furthermore, there is a shortage of comprehensive energy monitoring, forecasting, and evaluation systems for hotels, which hinders the ability to accurately predict and manage energy consumption. Additionally, accounting and finance departments have limited contributions towards advancing energy conservation practices in hotels. There is a lack of research on energy management and its accounting implications in the hotel industry, especially in developing countries. Additionally, there is a need for guidance on reducing resources and promoting sustainability-oriented innovation in tourism accommodations. These limitations emphasize the importance of continuing education for managers, the development of comprehensive energy management systems, and further research in the field of energy management in tourism.

Guidelines for Energy Management in the Tourism Sector

The specialized literature has identified several actions to promote efficient energy use and improve energy management in the tourism sector. These guidelines represent

a set of key strategies with the main objective of promoting sustainable and efficient practices in operating tourism facilities. Proposed measures include:
1. Implementation of renewable energies and alternative energy sources, such as solar, wind and biomass.
2. Implementation of intelligent energy management systems: Hotels are investing in intelligent systems that optimize energy consumption through artificial intelligence algorithms to regulate systems such as heating, ventilation and air conditioning (HVAC).
3. Promotion of energy efficiency as a factor of competitiveness and added value in the tourism sector.
4. Integration of energy management in the tourism value chain, including productive, agro-industrial and social aspects.
5. Development of technological tools and solutions to monitor and optimize energy consumption in tourism facilities.
6. Adoption of public policies and regulations that promote energy efficiency in the tourism sector.
7. Upgrading to GPON fiber optic networks: Upgrading to fiber optic networks can reduce costs and improve energy efficiency by avoiding the cooling costs associated with copper cabling.
8. Water savings: Do not underestimate water consumption, as it can represent a significant cost; implementing measures to reduce water consumption also contributes to improving energy efficiency.
9. Staff training and guest awareness: Training staff on the importance of energy efficiency and promoting sustainable practices among guests can make a significant difference in efforts to improve energy efficiency, as can integrating energy efficiency into companies' marketing and communication plans to increase awareness of the importance of sustainability.
10. Energy audit: Prior to any energy conservation initiative, it is critical to conduct an energy audit to identify areas of improvement and energy waste.
11. Implement green building principles in hotels and resorts, such as efficient insulation, solar panels, natural lighting and energy-saving appliances.
12. Optimize energy use by adopting efficient technologies, such as LED lighting, efficient climates, and automatic control systems.
13. Replacing older equipment with more efficient versions, especially in the area of air conditioning and refrigeration.
14. Demonstrate commitment to energy efficiency and sustainability through certifications and quality marks.
15. Establish responsible purchasing policies for energy-efficient equipment and appliances.

These guidelines aim to promote more sustainable and efficient practices in the tourism sector, contributing to the reduction of environmental impact and the promotion of responsible and balanced tourism.

CONCLUSIONS

From a productivity standpoint, there has been a significant increase in academic production. China leads in the publication of articles in this field, followed by the United States, Spain, and the United Kingdom. Notable contributions have been made by institutions such as Tsinghua University, Chung-Ang University, and La Costa University. The most productive journals in the field are 'Energies', 'Energy and Buildings', 'Sustainability', and 'Applied Energy'. This information may be useful for researchers and tourism managers seeking to establish strategic alliances with these countries, universities, and authors for collaboration, grant opportunities, and project applications. Additionally, these journals are the primary sources of high-quality scientific information.

In the field of energy management in tourism, China has received the highest number of citations, followed by India and the United Kingdom. Journals such as 'Energy and Buildings', 'Applied Energy', and 'Energies' have high h and g indices, indicating significant influence in the scientific community. In contrast, journals like 'Renewable Energy' and 'IEEE Access' exhibit lower indices. Noteworthy authors in this field, such as Park S, Gonzalez Ai, Nižić Mk, Liu X, Suanpang P, Jermsittiparsert K, and Wang Q-C, stand out for their influence and relevance, as reflected in their high h and g indices. The most globally cited papers include Bodkhe et al. (2020), Zhou et al. (2013), and Gamboa & Munda (2007), indicating their significant impact on scientific literature.

For researchers, this data serves as a guide to research trends and the most relevant topics in energy management in tourism. It allows for the identification of the most influential authors and the most cited publications in the field, which can guide future research and collaborations. It allows for the identification of the most influential authors and the most cited publications in the field, which can guide future research and collaborations. It allows for the identification of the most influential authors and the

most cited publications in the field, which can guide future research and collaborations. For tourism managers, this information can serve as a reference when selecting energy efficiency strategies based on scientific evidence and evaluating the quality and relevance of information sources in this field.

Regarding collaborations between countries, noteworthy active participation is observed from Spain, China, and the United Kingdom, which provides evidence of significant international cooperation in the development of research in this field. As for collaborations between institutions, the University of Cambridge and the National University of Singapore stand out for their joint contribution to scientific production in energy management in tourism. Finally, the authors who collaborate the most in this field include Chu JYG, Davey KR, Gruber JK, Prodanović M, Jermsittiparsert K, Suanpang P, Chen Y, Tan H, Kelly J, and Williams PW. Their joint work promotes the advancement and consolidation of knowledge.

The analysis includes current trends, possible future lines of development, and limitations identified in the field of energy management in tourism. Guidelines have been proposed to promote efficient and sustainable energy consumption in the tourism sector. It is important to address energy consumption in this sector. These guidelines include implementing renewable energies, using smart technologies, and raising awareness on energy efficiency.

This information is useful for both tourism managers and researchers in the field. It provides a framework for improving energy management in their facilities, which can lead to long-term economic savings, reduced environmental impact, and increased competitiveness. The guidelines for implementing energy efficiency measures are clear and practical. For researchers, this information provides guidance on the most relevant and promising areas of research in the field of energy management in tourism. It allows them to identify gaps in knowledge and innovative approaches for future studies.

REFERENCES

Abbas, J., Mamirkulova, G., Al-Sulaiti, I., Al-Sulaiti, K. I., & Dar, I. B. (2024). Mega-infrastructure development, tourism sustainability and quality of life assessment at world heritage sites: Catering to COVID-19 challenges. Kybernetes. Scopus. https://doi.org/10.1108/K-07-2023-1345

Alhawamdeh, H., Al-Saad, S. A., Almasarweh, M. S., Al-Hamad, A. A.-S. A., Bani Ahmad, A. Y. A., & Ayasrah, F. T. M. (2023). The Role of Energy Management Practices in Sustainable Tourism Development: A Case Study of Jerash, Jordan. International Journal of Energy Economics and Policy, 13(6), 321–333. Scopus. https://doi.org/10.32479/ijeep.14724

Ali, Y., Mustafa, M., Al-Mashaqbah, S., Mashal, K., & Mohsen, M. (2008). Potential of energy savings in the hotel sector in Jordan. Energy Conversion and Management, 49(11), 3391–3397. Scopus. https://doi.org/10.1016/j.enconman.2007.09.036

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of Informetrics, 11(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

Bodkhe, U., Tanwar, S., Parekh, K., Khanpara, P., Tyagi, S., Kumar, N., & Alazab, M. (2020). Blockchain for Industry 4.0: A comprehensive review. IEEE Access, 8, 79764–79800. Scopus. https://doi.org/10.1109/ACCESS.2020.2988579

Deng, S. (2003). Energy and water uses and their performance explanatory indicators in hotels in Hong Kong. Energy and Buildings, 35(8), 775–784. Scopus. https://doi.org/10.1016/S0378-7788(02)00238-4

Díaz-Pompa, F., Serrano-Leyva, B., Feria-Veláz-

quez, F. F., & Cruz-Aguilera, N. (2022). BIBLIOMETRIC STUDY ABOUT CULTURAL TOURISM IN SCOPUS. FUTURE RESEARCHS LINES. Bibliotecas, Anales de Investigacion, 18(3). Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85143119670&partnerID=40&md5=dce710a63de86e7e5371dbe171fb9da2

Gamboa, G., & Munda, G. (2007). The problem of windfarm location: A social multi-criteria evaluation framework. Energy Policy, 35(3), 1564–1583. Scopus. https://doi.org/10.1016/j.enpol.2006.04.021

Hussain, S., Ullah, A., Khan, N. U., Syed, A. A., & Han, H. (2024). Tourism, transport energy consumption, and the carbon dioxide emission nexus for the USA: Evidence from wavelet coherence and spectral causality approaches. International Journal of Sustainable Transportation, 18(2), 168–183. Scopus. https://doi.org/10.1080/15568318.2023.2259337

Iturralde Carrera, L. A., Álvarez González, A. L., Rodríguez-Reséndiz, J., & Álvarez-Alvarado, J. M. (2023). Selection of the Energy Performance Indicator for Hotels Based on ISO 50001: A Case Study. Sustainability (Switzerland), 15(2). Scopus. https://doi.org/10.3390/su15021568

Kuhn, V. R., Gadotti dos Anjos, S. J., & Krause, R. W. (2024). Innovation and creativity in gastronomic tourism: A bibliometric analysis. International Journal of Gastronomy and Food Science, 35. Scopus. https://doi.org/10.1016/j.ijgfs.2023.100813

Li, Z., Huo, M., Huo, T., & Luo, H. (2024). Digital tourism research: A bibliometric visualisation review (2002–2023) and research agenda. Tourism Review, 79(2), 273–289. Scopus. https://doi.org/10.1108/TR-03-2023-0176

Luna, M., La Tona, G., Accetta, A., Pucci, M., Pietra, A., & Di Piazza, M. C. (2023). Optimal Management of Battery and Fuel Cell-Based Decentralized Generation in DC Shipboard Microgrids. Energies, 16(4). Scopus. https://doi.org/10.3390/en16041682

Ochoa, G. V., Cardenas, Y., & Meriño, L. (2018). Application of equivalent occupation method as a tool for energy management in hotel sector. International Journal of Energy Economics and Policy, 8(5), 187–192. Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053011963&partnerID=40&md5=7f62910d3d6ef0946c347747a4c17f00

Papamarcou, M., & Kalogirou, S. (2001). Financial appraisal of a combined heat and power system for a hotel in Cyprus. Energy Conversion and Management, 42(6), 689–708. Scopus. https://doi.org/10.1016/S0196-8904(00)00101-1

Priyadarsini, R., Xuchao, W., & Eang, L. S. (2009). A study on energy performance of hotel buildings in Singapore. Energy and Buildings, 41(12), 1319–1324. Scopus. https://doi.org/10.1016/j.enbuild.2009.07.028

Rajić, M. N., Maksimović, R. M., & Milosavljević, P. (2022). Energy Management Model for Sustainable Development in Hotels within WB6. Sustainability (Switzerland), 14(24). Scopus. https://doi.org/10.3390/su142416787

Reinders, A. H. M. E., Vringer, K., & Blok, K. (2003). The direct and indirect energy requirement of households in the European Union. Energy Policy, 31(2), 139–153. Scopus. https://doi.org/10.1016/S0301-4215(02)00019-8

Serrano-Leyva, B., Díaz-Pomp, F., Feria-Velázquez, F. F., & Richards, G. (2021). Bibliometric study of creative tourism, tendencies and future lines of research. Biblios, 82, 64–86. Scopus. https://doi.org/10.5195/biblios.2021.979

Serrano-Leyva, B., Díaz-Pompa, F., Feria-Velázquez, F. F., Serrano-Leyva, B., Díaz-Pompa, F., & Feria-Velázquez, F. F. (2022). Innovation and creativity in the tourist offer: Challenges and perspectives for Holguin tourism destination, Cuba. Revista Interamericana de Ambiente y Turismo, 18(2), 236–247. https://doi.org/10.4067/S0718-235X2022000200236

Stankov, U., Vujičić, M. D., & Carmer, A. B. (2023). Impacts of energy communities on tourism: Benefits and functions towards green transition. Tourism Review. Scopus. https://doi.org/10.1108/TR-05-2023-0347

Suanpang, P., Jamjuntr, P., Jermsittiparsert, K., & Kaewyong, P. (2022). Autonomous Energy Management by Applying Deep Q-Learning to Enhance Sustainability in Smart Tourism Cities. Energies, 15(5). Scopus. https://doi.org/10.3390/en15051906

Swati, N., & Ruby, C. (2023). Sustainable Tourism with Small and Medium Enterprises: A Bibliometric Analysis and Literature Review. In Mishra P., Mishra P., Sharma A., Khanra S., Kundu S.K., & Mishra S.K. (Eds.), Springer Proc. Bus. Econ. (pp. 391–403). Springer Nature; Scopus. https://doi.org/10.1007/978-981-99-0197-5_25

Tiwari, S., Rosak-Szyrocka, J., & Żywiołek, J. (2022). Internet of Things as a Sustainable Energy Management Solution at Tourism Destinations in India. Energies, 15(7). Scopus. https://doi.org/10.3390/en15072433

Torres-Sainz, R., Trinchet-Varela, C. A., & Pérez-Vallejo, L. M. (2022). Mapping of the scientific production on maintenance management in hotels in Scopus. Revista Interamericana de Ambiente y Turismo, 18, 195–206. http://www.scielo.cl/scielo.php?script=sci_arttext&pid=S0718-235X2022000200195&nrm=iso

Wang, D., Mei, L., Xiao, F., Song, C., Qi, C., & Song, S. (2024). Energy management strategy for fuel cell electric vehicles based on scalable reinforcement learning in novel environment. International Journal of Hydrogen Energy, 59, 668–678. Scopus. https://doi.org/10.1016/j.ijhydene.2024.01.335

Zhou, Z., Zhang, J., Liu, P., Li, Z., Georgiadis, M. C., & Pistikopoulos, E. N. (2013). A two-stage stochastic programming model for the optimal design of distributed energy systems. Applied Energy, 103, 135–144. Scopus. https://doi.org/10.1016/j.apenergy.2012.09.019

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Research paper

Proposal for recreation management improvements at the Brisas Guardalavaca hotel

Propuesta de mejoras de la gestión de recreación en el hotel Brisas Guardalavaca

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ABSTRACT

The animation process, as one of the key areas within the hotel, plays a fundamental role in the general operation of the installation. That said, it is essential to plan and carry out recreational and cultural activities from a creative, efficient and innovative approach. For this reason, the general objective of this scientific article is to propose activities within the framework of creative tourism to complement the animation program of the Brisas Guardalavaca hotel. The methodology used contains dissimilar investigative tools and techniques such as observation, rain of ideas, the checklist, the identification of strengths and weaknesses, among others. In addition, some bibliometric tools were used to support the study and the Science Direct database of Scopus was used. The results show some difficulties in the hotel animation process, despite its positive image and good condition in general. Likewise, various activities were proposed to meet the needs of children, the elderly, the newly married, the disabled, etc. As conclusions, the importance of perfecting and updating the recreation plans of an entity is recognized, being according to the new client needs and in harmony with the changing environment to reach high levels of satisfaction.

Keywords: *activities, Brisas Guardalavaca, creative tourism, tourism animation, tourism recreation.*

RESUMEN

El proceso de Animación, como una de las áreas claves dentro del hotel, juega un papel fundamental en el funcionamiento general de la instalación. Dicho esto, resulta imprescindible planificar y llevar a cabo las actividades recreativas y culturales desde un enfoque creativo, eficiente e innovador. Por tal razón, el objetivo general del presente artículo científico consiste en proponer actividades en el marco del turismo creativo para complementar el programa de animación del hotel Brisas Guardalavaca. La metodología empleada contiene disímiles herramientas y técnicas investigativas como la observación, la lluvia de ideas, la lista de chequeo, la identificación de fortalezas y debilidades, entre otras. Además se emplearon algunas herramientas bibliométricos para apoyar el estudio y se hizo uso de la base de datos Science Direct de Scopus. Los resultados muestran algunas dificultades en el proceso de Animación del hotel, a pesar de su imagen positiva y buen estado en general. Asimismo, fueron propuestas diversas actividades en aras de satisfacer las necesidades de los niños, las personas de la tercera edad, los recién casados, los discapacitados, etc. Como conclusiones se reconoce la importancia de perfeccionar y actualizar los planes de recreación de una entidad, estando a acorde a las nuevas necesidades de los clientes y en armonía con el entorno cambiente para alcanzar altos niveles de satisfacción.

Palabras clave: *actividades, animación turística, Brisas Guardalavaca, recreación turística, turismo creativo.*

INTRODUCTION

Recreation plays a fundamental role in the travel experience of visitors. According to the Royal Spanish Academy (RAE), recreation consists of the "action and effect of recreating or recreating; diversion, pastime, recreation". (RAE, 2021b) Regarding the term adapted to the tourism field, the World Tourism Organization (UNWTO) states that tourist recreation refers to "all those activities that are carried out during the free time of tourists and whose purpose is the satisfaction of their needs for recreation, rest and fun". (UNWTO, 1998b) For his part, González (2019) adds that "tourist recreation is defined as the set of activities that tourists carry out during their free time, in order to have fun, rest and enjoy their surroundings".

These definitions address important issues related to recreation in the Tourism sector, such as the free time of visitors, the satisfaction of their leisure and recreation needs, the enjoyment of the stay and the environment, etc. In the case of the UNWTO definition, despite its age, it is assertive and applicable to the current context. Tourist recreation can be understood as a means for sustainable development, since it can contribute to economic growth, the conservation of cultural and natural heritage, and the social well-being of the receiving communities. (Sánchez and García, 2020) In addition to this, tourist recreation can be classified into two types: active recreation, which involves physical and sports activities; and passive recreation, which refers to more relaxing and contemplative activities. (Vargas and Lopez, 2018)

Within the hotel and tourism sector in general, the concept of recreation is closely intertwined with tourist animation. For the RAE, animation consists of "the action and effect of animating or giving life to something, especially an inanimate object". (RAE, 2021a) By taking this definition to the tourism field, it could be interpreted as the action carried out by the entertainer to transmit emotions, moods, physical and mental activity to the consumers of tourist entertainment. According to the UNWTO, the latter is defined as "a set of activities aimed at entertaining, entertaining and making the stay of tourists in a certain destination more pleasant, through the development of entertainment programs and shows". (WTO, 1998a) García and Sánchez (2019) , stated that "tourist entertainment refers to leisure and entertainment activities offered to tourists with the aim of improving their vacation experience and encouraging their participation in the social life of the tourist destination." (García and Sánchez, 2019) These authors were more inclusive and their definition has greater depth, since they addressed highly relevant aspects such as the social life of the tourist destination.

Tourist animation can be considered as a tool for the differentiation and competitiveness of tourist destinations, since it helps to create a positive and attractive image of them. (Perez and Rodriguez, 2020).

It can be classified into two types: daytime entertainment, which takes place during the day and is aimed at the whole family; and the night entertainment, which takes place at night and is focused on an adult audience. (Ruiz and Gomez, 2018) .

Having said this, tourist entertainment needs, like the rest of the key processes in the sector, the creativity of managers, the application of new technologies and the analysis of national and international trends. In this sense, creative tourism plays a fundamental role, contributing creativity, co-creativity and innovation to the entertainment programs of the various hotel and non-hotel entities. The World Tourism Organization defines creative tourism as "a type of tourism that is based on the active participation of tourists in cultural experiences that allow them to develop their creativity and artistic abilities". (UNWTO, 2014) This type of tourism focuses on offering cultural and creative activities that allow tourists to interact with the local community and learn about their customs and traditions. Richards and Wilson (2019) state that "creative tourism refers to those trips whose main objective is participation in cultural and creative activities, such as art workshops, cooking courses or visits to museums and art galleries". This definition even refers to some of the most common activities carried out by consumers of creative tourism. This modality can be considered as a form of sustainable tourism, since it promotes the preservation and promotion of local culture and fosters the economic development of the receiving communities. (López and Fernández, 2020) Creative tourism can be classified into different categories, such as gastronomic tourism, literary tourism, musical tourism, artistic tourism, among others. (Munar, 2018).

In the case of the Hotel Brisas Guardalavaca, located on the northern coast of Holguin, it is recognized for the excellence of its recreational activities and the high

quality of its internal clients. In this way, various researchers have shown interest in the management of the hotel Animation process, and have made their contributions to contribute to the improvement of this process. Thus, Ricardo (2009) , proposes a system of activities to promote sociocultural animation at the Hotel Brisas Guardalavaca. Rodríguez (2018), analyzes customer satisfaction in the facility, studying the Animation process as an essential part of the hotel's success. Hernández-Santana (2021), for his part, studies and diagnoses sociocultural animation in the entity.

In these investigations, despite the fact that in general the good functioning of the hotel's tourist animation was verified, some gaps were also found that give way to the design of new proposals to complement this key process. That said, it was determined that the entertainment program at the Hotel Brisas Guardalavaca is designed to operate in a one-week cycle, not in accordance with MINTUR standards. On the other hand, the non-existence of a program of activities for the beach and for the wedding segment was detected. Likewise, it is necessary to integrate other artistic manifestations such as literature, theater, photography, plastic arts and cinema into socio-cultural activities. There are no activities specifically designed for disabled customers, that is, there is no specialized care for them. In addition, there are activities that lack scripts and technical sheets, only those related to the shows are elaborated. In addition to this, the resources for the awards are scarce and in most cases they do not reach the client. (Hernandez-Santana, 2021)

MATERIALS AND METHODS

As part of the literature review, and with the intention of deepening the study on the topics addressed, the authors resorted to a bibliometric analysis on the behavior of scientific production in the Science Direct database of Scopus. Thus, the investigations related to tourist recreation initially, and then to creative tourism were analyzed. In the case of the first search, the thematic descriptor "tourism recreation" was used, obtaining a total of 16 articles published in the last ten years (from 2013 onwards). In this way, it was possible to analyze the productivity by years, the most prolific authors on the subject and the most productive journals.

Regarding productivity by years, the most productive turned out to be 2019 and 2021, with 3 articles each. On the other hand, the years 2013, 2015 and 2023 had 2 publications each, and in 2016, 2017, 2018 and 2019, 1 article was published each year. The foregoing indicates that there was little interest in the subject of tourist recreation, further ratified by the little systematization by the authors. That said, it was not possible to highlight the most prolific author, since there was only one publication per author. Among the scholars on this subject are Catherine Pickering, Massimo Picardo, Uma Sankar Panda, Umesh Pranavam Ayyappan Pillai, Ana Alice Santos, among others.

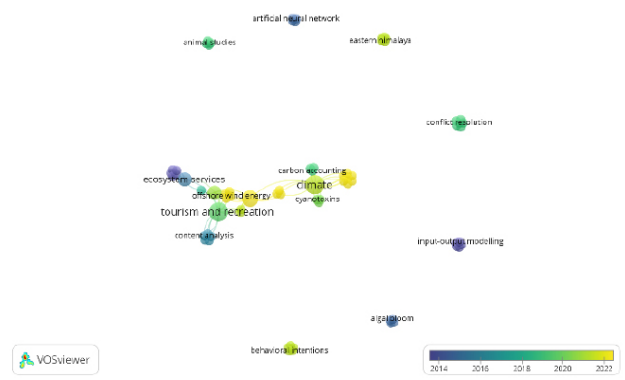
The most productive magazine was Tourism Management Perspectives, with 2 publications. Likewise, among those that made a single publication are: Procedia Engineerin, Ocean & Coastal Management, NJAS - Wageningen Journal of Life Sciences, Trends in Environmental Analytical Chemistry, etc.

Similarly, in the case of the search on creative tourism, the thematic descriptor "creative tourism" was used, obtaining a total of 19 articles published in the last ten years (from 2013 onwards). That being said, the most productive year was 2021, with 4 articles published. It is worth mentioning that in the years 2015 and 2019, 3 articles were published each year. In 2014, 2017 and 2020, 2 articles were published per year, and in 2013, 2016 and 2022, a single article each year.

The most prolific authors are Ding-Bang Luh, Siow-Kian Tan, Gunjan Saxena, David Ross, and Shiann-Far Kung with 2 articles each. Regarding the magazines, the most productive were Tourism Management and Annals of Tourism Research, with 6 articles each. While they published a single article: Land Use Policy; Proceeds Computer Science; Tourism Management Perspectives; Journal of Destination Marketing & Management; City, Culture and Society; Journal of Open Innovation: Technology, Market, and Complexity; and Journal of Hospitality and Tourism Management.

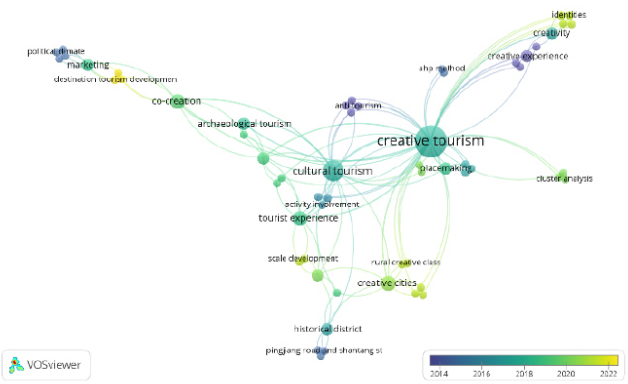
The articles obtained in both searches were processed (independently) using the VOSviewer software, in order to know the main keywords and the evolution of the themes over time (Fig. 1 and 2).

Figure 1. VOSviewer map of the theme "tourist recreation"



Source: prepared by the authors

Figure 2. VOSviewer map of the theme "creative tourism"



Source: prepared by the authors

For the selection of a methodology according to the present investigation, the authors carried out a search of the main methodologies used recently in the design of entertainment programs in Sol y Playa hotels at a national and international level. Thus, the research by Rodríguez-Pérez et al. (2018) , where a methodology based on observation and survey is presented to design a tourist entertainment plan at the Club Amigo Atlántico hotel, in Guardalavaca. Similarly, the article by García-Cifuentes et al. (2017) , where they provide a methodology based on observation and brainstorming to design an entertainment plan in Sol y Playa hotels in Colombia. For their part, Sánchez-Pérez et al. (2017) , propose a methodology based on observation and survey to design a tourist entertainment plan in Sun and Beach hotels in Mexico. Likewise, Vargas-González et al. (2016) , apply a methodology based on observation and the SWOT matrix to design an entertainment plan in Sun and Beach hotels on the Pacific coast of Costa Rica.

After analyzing the methodologies studied, the authors decided to base the article on the research of Rodríguez-Pérez et al. (2018) , due to the similarity between the hotels under study in both works. In the same way, it is a methodology with a high degree of relevance and applicability, framed in the situation of the country destination and in the Holguín province, and it would even be applied in the same tourist pole in which the present investigation is carried out. In addition to this, the Club Amigo Atlántico and Brisas Guardalavaca hotels share the same chain, operating under the service standards of the Cubanacán Group.

This methodology was developed in 6 steps, which are described below:

1. Review of the existing literature on tourist animation and its importance in customer satisfaction in hotels and tourist resorts.

2. Carrying out surveys to the guests of the Hotel Club Amigo Atlántico Guardalavaca to find out their preferences and expectations regarding the entertainment activities offered.

3. Interviews with hotel staff, including those in charge of animation, to obtain information about the hotel's resources and limitations regarding the implementation of a tourist entertainment plan.

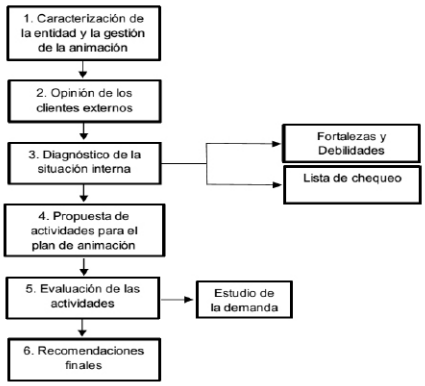
4. Design of a tourist entertainment plan that includes sports, cultural and recreational activities for different age groups and tourist preferences.

5. Evaluation and selection of the most appropriate entertainment activities for the hotel and its guests.

6. Recommendations for the implementation of the animation plan, including the training of the personnel and the periodic evaluation of the quality of the service.

Once this methodology had been studied, the authors decided to make some modifications to focus it on the Brisas Guardalavaca hotel and meet the objectives pursued in this research (Fig.3).

Figure 3. Adaptation of the methodology of Rodríguez-Pérez et al. (2018)



Source: prepared by the authors

RESULTS AND DISCUSION

Step 1. Characterization of the entity and the management of the Animation.

The Brisas Guardalavaca hotel is recognized as one of the most excellent family hotels in the eastern Cuban region. It is located in the Guardalavaca tourist pole, surrounding the coastal zone of the Banes municipality, belonging to the Holguín province. Founded on November 26, 1994, it has been operating for almost three decades, during which time it has remained the favorite of the national and international public. Belonging to the Cubanacán SA hotel chain, it operates under the All-Inclusive modality and holds the four-star category. It is aimed at Sun and Beach Tourism, and has 437 rooms; 231 of them are in the Hotel area, and 206 belong to its nine Villas. Likewise, it has 2 swimming pools, 2 buffet restaurants, 5 a la carte (one Italian, one Creole, one international, a tavern and one specialized in seafood), 1 barbecue and 8 bars where national and international drinks are offered. It also has a disco and karaoke, currency exchange, sauna, 2 public jacuzzis, international telephone service, children's club, gym, games room, medical services and internet.

Regarding the management of tourist entertainment in the hotel, in general there is a positive public opinion about the recreational and cultural activities that take place in the facility. The entertainment and recreation activities are designed, organized and developed in accordance with the provisions of the Operating Manual for Tourist Entertainment and Sustainable Development of the Cubanacán Group. (Cubanacán, 2013) The Animation team is in charge of entertainment and the transmission of national and local cultural values to clients, through scheduled activities. They are structured into three main sessions: daytime, nighttime, and for children.

As for the entertainment program, it is prepared taking into account the study of the market segments that most frequently visit the hotel, with a high component of Caribbean culture. Its essential meaning consists of close contact with customers, through all activities and processes, thus achieving their satisfaction and repeat business. The shows that take place in the hotel are linked to the Caribbean and Cuban idiosyncrasies, mainly with themes of costumbrista, peasant and folklore theater, which does not exclude the presentation of international shows. Participation activities, musical and variety shows, Play Back Show, among other options are included. In case the weather conditions are unfavorable, as part of the Emerging Animation Program, the rain program is carried out, which is made up of activities in the games room and in the lobby, as well as Spanish classes, karaoke and other indoor hobbies. (Cubanacan, 2013).

Step 2. Opinion of external customers

As a result of the search carried out on the TripAdvisor opinion site, it was obtained that the hotel deserves a rating of Very Good (4 out of 5), resulting in its location (4.5 points) being the best rated attribute, followed by cleanliness, service and value for money, with 4.0 points each. 5,071 comments about the installation have been registered on this specialized site (up to the date of consultation: January 17, 2023), of which 1,636 are excellent (32.26% of the total), 2,096 are very good (41.33% of the total), 757 normal (14.92% of the total), 347 bad (6.84% of the total), and 235 lousy (4.63% of the total).

Among the main strengths of the hotel highlighted by customers in the main social networks of the facility, such as Facebook and Instagram, are the beauty of Guardalavaca beach, the good treatment of the facility staff, and the excellent recreational and cultural activities. that are done However, specifically regarding the Animation process in the hotel, there are some negative opinions from clients. When reviewing the Book of Complaints and Suggestions, a complaint was registered for room 216, dated 2/2/2022, related to the loud and annoying volume of the animation music. Likewise, in the Survey Summary for

the month of February 2022, opinions were found such as "a lot of noise during children's games by the animation team", "I would like to listen to music in the places where we recreate, for example in the Lobby, even if it is short, and in the disco that is music for all ages", or "I suggest Cuban recorded music".

Step 3. Diagnosis of the internal situation

For the analysis of the internal situation of Animation at the Brisas Guardalavaca hotel, it was decided to define the main strengths and weaknesses of the area (Table 1), taking into account the consulted bibliography and the opinions of the installation's clients on social networks.

Table 1: Strengths and weaknesses

Strengths	weaknesses
Good image and positioning within the family segment	Poor animation program loop
service experience	Lack of a program of activities for the beach and for the wedding segment
Audio and lighting equipment required for the development of recreational activities	Little integration of socio -cultural activities with other artistic manifestations such as literature, theater, photography, plastic arts and cinema.
Comfort of recreational facilities: 8 bars, disco and karaoke, games room, gym, etc.	There are no activities specifically designed for disabled customers
Excellent reputation for activities on holidays, special dates	Lack of scripts and technical sheets
Existence of the Patio de los Artistas: integration of the Restoration process with tourist entertainment	Scarce resources for awards
Theme facilities within the hotel, such as the Bucanero lounge, El Guayabero restaurant, etc.	

Source: prepared by the authors

With the intention of complementing the information obtained, a Checklist was prepared based on the requirements of the Operational Manual of Animation of the Cubanacán Group (Table 2).

Table 2: Check list

General requirements	Yeah	No	Observations
Animation is carried out in the installation	X		
There is an Animation manager at the facility	X		
There is a policy of animation in the installation, based on the national policy	X		
They have the operating manual of the chain	X		
Meets the requirements established by the chain		X	Various activities planned for the segment Wed dings and Honeymoons, For Children, etc., are not carried out.
There are entertainment programs	X		The entertainment program only has the planning of a 7-day cycle
They have prepared the technical sheets and the scripts of the activities		X	Only the technical sheets of the shows are available
There are emerging programs	X		
Studies of the markets that arrive at the hotel are carried out at the time of scheduling activities		X	Market research is outdated
The Animation Program is renewed periodically		X	
There are activities aimed at learning about the cultural values of the area where the hotel is located.	X		
Presence of graphic and written propaganda (posters, banners, posters, murals, others), for the dissemination of animation activities		X	There are no references and information on various scheduled activities
It has the support of the management for the realization and innovation of the animation in the installation	X		Although on some occasions bureaucratic obstacles limit the creative potential
The artistic talent coordinates and plans together with the direction what is going to be presented in the show	X		Sometimes there are problems with the coordination and remuneration of artistic talent

Source: prepared by the authors

After the development of the Checklist, it was determined that the internal situation of the Brisas Guardalavaca Hotel Animation process is favorable, although there are some deficiencies. In this way, it was determined that the animation program only has a 7-day schedule, only the technical sheets of the shows are prepared, sometimes there are bureaucratic problems as well as with the coordination and remuneration of artistic talent, among other difficulties.

Step 4. Proposal of activities for the animation plan

With the aim of complementing the current entertainment plan of the Brisas Guardalavaca hotel, and making use of the brainstorming subsequent to the review of the literature and the operational manuals, the authors propose a series of representative activities of creative tourism. They seek to give a creative and co-creative approach to the hotel's Animation process, in order to improve the general state of satisfaction of the facility's customers. That being said, it is proposed:

- Handicraft making workshop: Typical handicraft workshops of the region could be offered, such as making guano hats, palm weaving and macramé. Guests could learn and create their own pieces to take home as souvenirs.
- Traditional food tasting: You could organize a tasting of typical food from the region, such as the famous Holguin ajiaco, and teach guests how to prepare it. A visit to a local farm could also be arranged so guests can sample fresh, local foods.
- Dance classes: Traditional Cuban dance classes could be offered, such as Son, Bolero, Cha-cha-cha, and Salsa. Guests could learn the steps and enjoy local music.
- Visit to a tobacco workshop: Holguín is known for its

production of high-quality tobacco. A visit to a local tobacco workshop could be arranged so guests can learn about the production process and taste some of the region's finest cigars.
- Visit to a peasant fair, so that they get to know the local products and learn about the importance of agriculture.
- Craft workshop with recycled materials, to teach them to reuse objects and take care of the environment.

For children:
- Craft workshops: Craft workshops could be offered so that children can learn and create their own crafts typical of the region, such as making guano hats, themed cloth dolls, creating bracelets, etc.
- Traditional games: You could organize an afternoon of traditional Cuban games such as the wheel, the wheelbarrow, the spinning top, and the marble. Children could learn how these games are played and enjoy a fun afternoon at the hotel.
- Storytelling: A storytelling could be organized so that the children can listen to traditional Cuban stories and learn about the local culture.
- Games in the pool for children, such as races or an aquatic treasure hunt.
- Traditional music workshop, so that children learn to play typical instruments of the region.

For adolescents and young people:
- Night parties, in the sand, themed, etc.
- Participatory activities such as costume parties, cosplays, etc.
- Virtual workshops, programming classes, video games, and other activities that make use of new technologies.

For the elderly:
- Dance Classes: Traditional Cuban dance classes may be offered so older guests can learn and enjoy local music.
- Cooking workshop: A cooking workshop could be offered where older guests can learn to prepare typical dishes of the region and taste them afterwards.
- Workshop for making typical drinks of the region, such as chicha or guarapo, the Cuban mojito, etc.
- Weaving workshop, so that they learn to make crafts with wool or cotton.
- Home garden workshop, to teach them how to grow vegetables and aromatic plants.

For disabled:
- Craft Workshop: Craft workshops adapted to the needs of guests with disabilities could be offered so that they can learn and create their own pieces to take home as souvenirs.
- Tour in an adapted vehicle: A tour in an adapted vehicle could be arranged so that guests with disabilities can experience rural life and learn more about the local culture.
- Sensory games, such as texture or aroma games.
- Adapted Dance Classes: Adapted dance classes may be offered so guests with disabilities can learn and enjoy local music.
- Painting workshop, so that guests learn the typical painting techniques of the region and can make their own work of art.
- Board games adapted according to the specific needs of each client.
- Art therapy workshop, such as working with clay, cold ceramics, wood carvings, foami, origami, etc.
- Adapted water activities, such as swimming or hydrotherapy.

For weddings:
- Traditional Ceremony: A traditional Cuban wedding ceremony could be arranged for the bride and groom who want to experience the local culture.
- Traditional food banquet: A banquet of typical food from the region could be organized for the wedding guests.
- Visit to a local winery, so that guests learn about the wine production process and taste different varieties.
- Musical shows, such as live concerts or DJs.
- Theme activities, such as costume parties or gala dinners.
- Dance classes for the couple, such as waltz or bachata.

Step 5. Evaluation of activities

To evaluate the possible application of the planned activities, it is necessary to analyze the characteristics of the main markets that visit the Brisas Guardalavaca hotel. In this way, it was determined that the most important source markets for the hotel are Canada and the United Kingdom. Canada is the primary market, as Canadians flock to the facility year-round, accounting for approximately 45% of the hotel's total stays. The United Kingdom is in second place, since the influx of British clients is mainly during the summer, with 29% of the total number of clients. Tourists from other markets are also received, although to a lesser extent, such as Germany, the Netherlands, France, national tourists, among others. (Rodriguez, 2018)

In the case of Canadian tourists, who will be analyzed in depth as they are the majority in the hotel, they are identi-

fied by a high level of seasonality, a friendly character and prone to repeat visits. They come to a greater extent from the towns of Quebec, Alberta and Ontario. The main tour operators they use are: VATH, Sunwing, Hola Sun, TMR and West Jet. In general, they have medium purchasing power and show a preference for natural environments and spaces that represent Cuban culture and its characteristics. The hotel entertainment they prefer is passive and contemplative, through activities such as enjoying music, board games and bingo, and learning the language.

The most significant segments within the Canadian market are those made up of couples, since they are working middle-class people, aged between 45 and 60, who are motivated by the enjoyment of the sun and the beach; although they show interest in Cuban culture and families. Another of the subgroups are tourists between the ages of 25 and 44, mostly professionals or technicians who make their trip mainly motivated by the sun and beach modality, and show great interest in activities related to nature. Families with children prefer the activities on the beach and the hotel, the animation of the hotel with participatory activities, and the bus excursions. (Islazul, 2017; Rodríguez, 2018).

Once the general characteristics of the Canadian tourists who visit the Brisas Guardalavaca hotel have been analyzed, it is possible to determine the various leisure types that represent this customer segment. Thus, many belong to the Socio-Activos, since they enjoy activities that allow them to interact with other people, the local community, and develop social relationships. In the same way, some consider themselves Passive, because they enjoy activities that allow them to relax and rest. They like calm and peace, and often seek hobbies that allow them to disconnect from everyday life. Likewise, several clients fall within the category of E-restless, who are generally young people who enjoy activities that involve the use of technology and social networks. Finally, some tourists consider themselves Involved, since they enjoy activities that allow them to learn and develop personally. They like education and personal growth, and often look for activities that allow them to improve their skills or acquire new knowledge. (Rojek et al., 2019; Torkildsen, 2017).

Taking into account the analysis of the general characteristics of Canadian customers and the various leisure types to which they belong, it is possible to verify the suitability of the dissimilar activities planned in advance, such as crafts, themed parties, meetings and participation events. social, those that invite you to get to know the community and local customs, physical and digital games, artistic manifestations in all their extension, among others. Although these activities are ideal for satisfying the tastes and preferences of the Canadian market, they are still applicable and are to the liking of all external clients of the facility, thus contributing to raising the level of general consumer satisfaction.

Step 6. Final recommendations

For the future implementation of the proposed activities and the improvement of the entertainment plan of the Brisas Guardalavaca hotel, the authors propose to carry out market studies periodically, in order to keep the profiles of the main customer segments, their particularities, tastes and preferences updated. Likewise, it is necessary to ensure that the information on the recreational activities to be carried out in the hotel reaches real and potential clients in a timely manner, with the double objective of informing and marketing the entity's proposals.

In the same way, it is essential to have the scripts and technical sheets of all the activities that are intended to be carried out in the hotel, and to maintain a strict and prolonged control over time on actual compliance with them. In addition to this, the segmentation of customers who visit the entity plays a fundamental role, when it comes to providing specialized services, and planning activities of various kinds to satisfy the greatest number of consumers possible.

Regarding the proposed activities, it is suggested that they be implemented gradually, sporadically; in such a way that it is possible to evaluate its impact on customer satisfaction and its development in general by the Animation team. It is essential at all times to follow up on customer opinions at the facility, on social networks and opinion sites, guaranteeing permanent feedback with consumers and responding as soon as possible to any complaints and concerns that may arise. Likewise, it would be advisable to lengthen the planning cycle of entertainment programs (which is currently 7 days, falling below MINTUR standards), in order to avoid undue repetition of activities and loss of interest in part of customers with long stays.

In general, it is recommended to carry out an efficient control, evaluation and feedback of the proposed activi-

ties to be implemented and of the existing ones, in order to avoid deviations from the organizational objectives and customer disagreements. In this way, it will be possible to make dimensions or improvements to the animation plans in the future if necessary.

In the present investigation, the Animation process at the Brisas Guardalavaca hotel was diagnosed, reaching the conclusion that, despite having a favorable general state, there are some deficiencies in the process. That being said, the authors proposed some creative and co-creative activities to complement and refine the entity's animation plans. In the review of the literature related to these topics, various investigations were found. An example of this is Ricardo's thesis (2009) , where a system of activities derived from sociocultural animation was designed in order to improve the entertainment program of the Brisas Guardalavaca hotel. As in the present investigation, Ricardo (2009) , made a diagnosis of the Animation process of the installation, evidencing a series of problems that limit the development of sociocultural animation in the hotel. It was concluded that the Holguin destination has cultural attractions that represent and characterize it, and that can be integrated into the tourist offer to increase the customer satisfaction index. In the same way, a proposal of activities was elaborated that allowed to enrich and diversify the entertainment program of the Hotel Brisas Guardalavaca.

In the case of the research by Hernández-Santana (2021), an analysis is made on the behavior of entertainment at the Hotel Brisas Guardalavaca in order to characterize the entertainment program of the entity. Likewise, based on the theoretical considerations related to sociocultural animation, a proposal of activities was made with the aim of perfecting the animation program in the entity, responding to the demands of the clients and favoring their satisfaction index.

Once these investigations of objects of study similar to the present one have been analyzed, it is possible to establish comparisons and arrive at general conclusions. That said, the current work is highly relevant and novel, because, unlike previous articles, the Animation process was linked to the application of creative tourism. Thus, an approach related to the creation and co-creation of the experience was given to the proposal of activities carried out, in order to achieve the involvement of clients and the well-being of the local community. Likewise, this research sought to develop the creative capacities of consumers and their comprehensive general culture, personal growth and inclusiveness; all this in pursuit of achieving full satisfaction of customer needs.

CONCLUSIONS

After carrying out this research, and based on the development of the scientific tasks initially proposed, it is possible to reach dissimilar conclusions. Thus, for example, the review of the literature revealed that there is a vast conceptualization of tourism recreation/entertainment. Such is the case of creative tourism, a term that has been studied to a great extent by the main researchers in the tourism sector and published in the most recognized magazines. Likewise, the previous existence of various investigations similar to the current one was verified, and although some were out of date, they were also able to determine gaps in the Brisas Guardalavaca Hotel Animation process. In this article, the current state of the hotel and the work of its Animation team were diagnosed, concluding that in general, they enjoy a good image and a positive public opinion. However, as would be the objective of the investigation, some deficiencies were determined in which action could be taken to improve the animation plans that currently exist. That said, in terms of the proposed activities, they constitute an example of how essential creativity and innovation are in any area or process to be developed. They were planned with the intention of satisfying the diverse needs of various customer segments and complementing the work carried out by the entity's animators.

REFERENCES

Operational manual for Brisas hotels, (2013).

García-Cifuentes, LD, Gutiérrez-Pulido, AF, and Pineda-Sánchez, JP (2017). Design of an entertainment plan for Sun and Beach hotels in Colombia.

Garcia, A., and Sanchez, M. (2019). Tourist animation: definition, characteristics and benefits. Tourism Research Journal, 7 , 74-87.

González, J. (2019). Tourist recreation: definition, characteristics and types. Tourism Research Journal, 7 , 55-68.

Hernandez-Santana, C. (2021). Going through culture through the paths of tourism: sociocultural animation at the Hotel Brisas Guardalavaca, Holguín. Transdisciplinary Journal of Social and Technological Studies, 1 , 5-11.

Marketing Plan of the Islazul Holguín Hotel Complex, (2017).

López, M., and Fernández, J. (2020). Creative tourism and sustainability: a review of the literature. Steps: Tourism and Cultural Heritage Magazine, 18 , 75-88.

Munar, A. (2018). Creative tourism categories: a review of the literature. Tourism and Cultural Heritage Magazine, 16 , 26-36.

UNWTO. (1998a). Tourist Animation. In World Tourism Organization.

UNWTO. (1998b). Tourist Recreation. In World Tourism Organization .

UNWTO. (2014). Creative tourism: An opportunity for local development. In World Tourism Organization .

Pérez, J., and Rodríguez, M. (2020). Tourist entertainment as a marketing strategy for tourist destinations. Pasos: Tourism and Cultural Heritage Magazine, 18 , 119-130.

RAE. (2021a). Animation. In Dictionary of the Spanish Language . https://dle.rae.es/animaci%C3%B3n

RAE. (2021b). Recreation. In Dictionary of the Spanish Language . https://dle.rae.es/recreaci%C3%B3n

Ricardo, AG (2009). Proposal for a system of activities to promote socio-cultural animation at the Hotel Brisas Guardalavaca [Diploma work in the option of a Bachelor of Tourism, University of Holguín "Oscar Lucero Moya"].

Richards, G., & Wilson, J. (2019). Creative tourism: definition, characteristics and trends. Journal of Tourism Futures, 5 , 44-57.

Rodríguez-Pérez, N., González-Sánchez, A., and García-González, R. (2018). Design of a tourist entertainment plan for the Hotel Club Amigo Atlántico Guardalavaca in Cuba.

Rodriguez, EC (2018). Evaluation of customer satisfaction at the Brisas Guardalavaca hotel [Thesis presented as an option for the title of Industrial Engineer, Oscar Lucero Moya University].

Rojek, C., Shaw, SM, & Veal, AJ (2019). The Oxford handbook of leisure studies. Oxford University Press .

Ruiz, M., and Gomez, J. (2018). Types of tourist animation: a review of the literature. Types of tourist animation: a review of the literature, 16 , 85-92.

Sánchez-Pérez, RA, García-Pérez, MD, and Rodríguez-Hernández, CJ (2017). Methodology for the development of a tourist entertainment plan in Sun and Beach hotels in Mexico.

Sánchez, M., and García, A. (2020). Tourist recreation as a tool for sustainable development: review of the literature. Steps: Tourism and Cultural Heritage Magazine, 18 , 105-118.

Torkildsen, G. (2017). Leisure and recreation management. Routledge .

Vargas-González, GM, Araya-Solano, MA, & Sánchez-Méndez, JJ (2016). Design of an entertainment plan for Sun and Beach hotels on the Pacific coast of Costa Rica.

Vargas, J., and López, M. (2018). Types of tourist recreation: a review of the literature. Tourism and Cultural Heritage Magazine, 16 , 35-48.

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Literature Review

Methodological trends in the sustainability assessment of ecotourism projects worldwide. A review

Tendencias metodológicas de evaluación de sustentabilidad de proyectos ecoturísticos a nivel mundial. Una revisión.

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ABSTRACT

This study conducts a literature review to identify and analyse the different methodological trends that exist in the scientific field related to the sustainability assessment of ecotourism worldwide during the period 2012-2022. The methodology of the study includes an active and systematic search for publications related to sustainability assessment methodologies with a net focus on the term "ecotourism". The literature review was conducted in four electronic databases: Springer Link, Science Direct, Scopus and Taylor & Francis. The results were classified into quartiles and the most relevant components of approach were identified in the methodological trends of sustainability assessment in the identified publications, which include the use of geographic information systems, indexes or indicators, assessments of sustainability perceptions of local communities, and quantitative or qualitative methods. The research concludes by showing the distribution of publications at a global level, the classification of evaluation methods and techniques, and the geographical and chronological distribution of the identified publications, which indicates that environmental, economic and social evaluations are the most relevant components in the methodological trends of sustainability evaluation in ecotourism.

Keywords: *Ecotourism, sustainability, evaluation methodology, methodological trends, bibliographic review*

RESUMEN

Este estudio realiza una revisión bibliográfica mediante la cual se identifican y analizan las diferentes tendencias metodológicas existentes en el campo científico relacionadas con la evaluación de la sustentabilidad del ecoturismo a nivel mundial durante el periodo comprendido entre los años 2012 y 2022. La metodología del estudio incluye una búsqueda activa y sistemática de publicaciones relacionadas con métodos de evaluación de sustentabilidad con un enfoque neto en el término "ecoturismo". La revisión bibliográfica se llevó a cabo en cuatro bases de datos electrónicas: Springer Link, Science Direct, Scopus y Taylor & Francis. Los resultados se clasificaron mediante cuartiles y se identificaron los componentes de enfoque más relevantes en las tendencias metodológicas de evaluación de sustentabilidad trabajadas en las publicaciones identificadas, las cuales incluyen el uso de sistemas de información geográfica, índices o indicadores, evaluaciones de percepción de sustentabilidad por parte de comunidades locales, y métodos cuantitativos o cualitativos. La investigación concluye indicando la distribución de publicaciones a nivel global, la clasificación de métodos y técnicas de evaluación, y la distribución geográfica y cronológica de las publicaciones identificadas, indicando que las evaluaciones ambientales, económicas y sociales son los componentes más relevantes en las tendencias metodológicas de evaluación de sustentabilidad ecoturística.

Palabras clave: Ecoturismo, sustentabilidad, metodología de evaluación, tendencias metodológicas, revisión bibliográfica

INTRODUCTION

The economic activity of ecotourism has its origins in the 1990s and has shown a steady growth since the first decade of the 21st century, with an increase of about 300% faster than the tourism sector in general (Ospina Díaz et al., 2013). As a result of people's constant search for experiences of direct contact with nature, as well as concern for the environment through its protection and conservation, ecotourism has become one of the fastest growing economic sectors worldwide in recent years (Batabyal, 2016).

This dynamic generates a number of positive impacts, including a balance between the demands of tourists, conservation and the needs of local communities, such as employment opportunities, new skills, income generation, among others (Amalu et al., 2017); and the generation of negative impacts, such as those described by Krüger (2005) in his review of 251 case studies, where ecotourism did not generate enough income to avoid the use of land for consumptive activities, such as the conversion of forests to agriculture or pastures, with a very low impact on conservation practices in general. Based on the above, there is a need for literature studies that describe exercises in the formulation and application of sustainability assessment methodologies, which usually do not have the same specificity and rigour applied to other types of economic activities (Oliveros Ocampo & Beltrán Vargas, 2018).

It is essential to highlight the need to carry out a research on the different methodologies that allow assessing the relevance of the sustainability character of ecotourism projects, based on the identification of descriptive methods, quantitative or qualitative in nature, within the framework of good ecotourism practices (Oliveros Ocampo & Beltrán Vargas, 2018). In this way, from the three dimensions of sustainable development: environmental, economic and social (Ministerio de Comercio, 2020), in the search for economic growth, improve the living conditions of the inhabitants of a given territory and promote the protection and conservation of the environment and, in particular, natural resources, minimising damage to ecosystems and addressing the potential and limitations of the environment and its physical natural, built and social components (Pérez Colmenares, 2018). To this end, we intend to carry out a bibliographic research based on the review of scientific publications in databases worldwide that describe an overview of methodological trends applied to the sustainability assessment of ecotourism projects over the last decade.

The aim of this review article is to identify and analyse the different methodological trends in the scientific field related to the evaluation of the sustainability of ecotourism projects or activities worldwide over the last ten years, based on a literature search in specialised databases. In addition, the distribution of publications at a global level will be analysed, based on the classification of available methods, indices or indicators, models or evaluation techniques. Finally, the geographical and chronological distribution of the previously identified publications will be studied in order to identify a trend with respect to the articles related to the initial review.

Conceptually relevant elements

The concept of ecotourism is generally associated with an activity in which public authorities, the tourism industry, tourists and local populations work together to allow tourists to visit genuine areas where nature is studied and enjoyed and where there is no exploitation of its resources, while at the same time contributing to sustainable development (Ospina Díaz et al., 2013). Ecotourism contributes to the conservation of the environment and its population, based on four relevant aspects: travelling to unspoiled natural environments, internalizing the experience gained in natural environments and in contact with local communities, stimulating the conservation of natural resources and educating about the environmental and cultural values of the places visited (Martínez Quintana, 2017).

On the other hand, the term 'sustainable' or 'sustainability' should not be considered as a static concept, as it depends on the dynamics of technology development and the characteristics of the resources and environment to which it refers (Salinas Chávez & La O Osorio, 2006). Much of the existing literature on sustainable ecotourism is based on case studies or empirical analysis. Similarly, there are no theoretical studies on the term ecotourism that highlight the dynamics that make its concept sustainable, which implies making decisions in time and reflects a high degree of uncertainty (Batabyal, 2016).

Existing methodologies

In different databases of scientific publications, it is possible to identify sustainability assessment methodologies of ecotourism projects or activities worldwide, based on

methods using GIS geographical information systems (Omarzadeh et al., 2022), using methodologies based on a set of indices or indicators (Leka et al., 2022), sustainability perception assessments by local communities (Lee & Jan, 2019), or simply by using quantitative (Fassoulas et al., 2012), or qualitative methods (Barbieri, 2013) that make comparisons between sub-classifications of ecotourism or similar activities. Some of the postulates focused at the Latin American level regarding the evaluation of the sustainability of ecotourism projects relate specifically to the formulation of evaluation indicators, such as the case of Camacho-Ruiz et al., (2016), who advocate the need to build a system of indicators with generalities and specificities for the sustainable management of ecotourism, or the case of Zarazúa et al., (2015), who propose a methodology for the evaluation of rural spaces related to ecotourism for a specific case in the city of Chiapas, Mexico. Similarly, there is evidence of scientific articles related to the evaluation of the sustainability not only of the ecotourism aspect itself, but in a more general way of the macro aspect of tourism as an important economic activity.

MATERIALS AND METHODS

Bibliographic search system.

To develop the literature review, an active and systematic search methodology was used for publications related to sustainability assessment methodologies, with a net focus on the term "ecotourism", considering the possibility of including case studies related to the term "tourism", since sometimes the research starts from the general concept to clarify in more specific considerations and directly related to the concept of ecotourism. The search for bibliographical information was limited to the period between 2012 and 2022, with no further restriction in terms of geographical scope or language of research. A total of four electronic databases were used, corresponding to (I) Springer Link, (II) Science Direct, (III) Scopus and (IV) Taylor & Francis, as they have a wide catalogue of multidisciplinary scientific journals. This bibliographic review was also carried out, including all search fields related to title, keywords, summary or abstract, document content, among others, as well as considering publications related to scientific articles, books or parts thereof, conference proceedings and research reports, mainly.

The bibliographical search began with a first phase, in which scientific publications related to the key words "ecotourism sustainability assessment" and directly related to the objective of this research were identified. It should be noted that the search was carried out in English in order to avoid limiting the information to purely Spanish-speaking authors. Taking into account the time limit of the search, a total of 2236 publications were identified in the Springer Link database, 2619 in Science Direct, 253 in Scopus and 2038 in the Taylor & Francis database (see Table 1).

Subsequently, a second phase of consultation was carried out, including, in addition to the initial search terms, the English keywords reported by the Science Direct database, which allowed the identification of the main components on which most ecotourism sustainability assessment methodologies are based, such as (I) environmental, (II) economic and (III) socio-cultural, according to Salinas Chávez & La O Osorio, (2006). The data on the publications found for each of the databases used can be seen in Table 1.

A third phase of the literature review was carried out, this time considering as the most relevant descriptive terms those presented in the type of methodology described in the documents consulted, including (I) method, (II) model, (III) technique and (IV) index. The aim of this phase was the identification of the most relevant aspects of the methodological trends of sustainability assessment in the publications in question.

Finally, a fourth stage is established, which highlights the types of sustainability assessment methodologies used in the identified publications, based on the three theoretical-methodological proposals used worldwide, which emerged from the Earth Summit held in 1992 (Saldívar et al., 2002), which are based on (I) the Sustainable Development Index (SDI), (II) the Barometer of Sustainability (BS) and (III) the Environmental Sustainability Index (ESI), terms that were used in combination with the keywords initially used, resulting in much lower values than those found in the previous phases two and three.

Bibliographic analysis system

For the analysis of the information identified, a quartile classification method was used (Zafra Mejía et al., 2017), based on the definition of an index related to the data obtained in phases 1, 2, 3 and 4 of the literature review

methodology implemented, mainly those related to the frequency and relevance of the citations made for each publication, which in turn is reflected in the importance of these publications at the scientific level. The index used showed a general variation between 0 and 1, with quartiles defined as follows Q1 between 0.75 and 1.0, Q2 between 0.5 and 0.74, Q3 between 0.25 and 0.49 and Q4 between 0 and 0.24. The identified publications cited more frequently, on average for Phase 2, the terms "environmental assessment" (Q1=0.96) for the environmental component, "services" (Q1=0.79) for the economic component and "communities" (Q1=0.87) for the social component, as indicators of the focus of the scientific publications for each component.

With regard to phase 3, it can be seen that the term "method" (Q1=0.81) is the most frequently used term in the scientific publications consulted, but the term "model"

Table 1: Phases of literature review methodology

Phase	Key Word		Springer Link			Science Direct			Scopus			Taylor & Francis			Total DD	Average I	Average Q
			DD	I	Q	DD	I	Q	DD	I	Q	DD	I	Q			
1	Ecotourism sustainability assessment		2236	1	Q1	2619	1	Q1	253	1	Q1	2038	1	Q1	7146	1	Q1
2	Environmental	Environmental management	1109	0,50	Q2	2397	0,92	Q1	126	0,50	Q2	1956	0,96	Q1	5588	0,72	Q2
		Environmental assessment	2203	0,99	Q1	2478	0,95	Q1	234	0,92	Q1	2021	0,99	Q1	6936	0,96	Q1
		Ecology	1449	0,65	Q2	1113	0,42	Q3	134	0,53	Q2	1460	0,72	Q2	4156	0,58	Q2
		Ecosystems	1856	0,83	Q1	2127	0,81	Q1	124	0,49	Q3	1171	0,57	Q2	5278	0,68	Q2
		Biodiversity	1691	0,76	Q1	1858	0,71	Q2	94	0,37	Q3	1083	0,53	Q2	4726	0,59	Q2
	Economics	Tourism management	1707	0,76	Q1	1842	0,70	Q2	192	0,76	Q1	1671	0,82	Q1	5412	0,76	Q1
		Carrying capacity	1352	0,60	Q2	1312	0,50	Q3	48	0,19	Q4	790	0,39	Q3	3502	0,42	Q3
		Services	2041	0,91	Q1	2272	0,87	Q1	143	0,57	Q2	1696	0,83	Q1	6152	0,79	Q1
	Social/Cultural	Stakeholders	1576	0,70	Q2	1564	0,60	Q2	108	0,43	Q3	1190	0,58	Q2	4438	0,58	Q2
		Perception	1186	0,53	Q2	1215	0,46	Q3	140	0,55	Q2	1482	0,73	Q2	4023	0,57	Q2
		Communities	2065	0,92	Q1	2284	0,87	Q1	191	0,75	Q1	1855	0,91	Q1	6395	0,87	Q1
		Traditions	884	0,40	Q3	526	0,20	Q4	17	0,07	Q4	1399	0,69	Q2	2826	0,34	Q3
3	Method		1835	0,82	Q1	2325	0,89	Q1	179	0,71	Q3	1710	0,84	Q1	6049	0,81	Q1
	Model		1875	0,84	Q1	2105	0,80	Q1	174	0,69	Q3	1526	0,75	Q1	5680	0,77	Q1
	Technique		1277	0,57	Q2	1801	0,69	Q2	52	0,21	Q4	1290	0,63	Q2	4420	0,52	Q2
	Index		1113	0,50	Q2	1008	0,38	Q3	173	0,68	Q2	585	0,29	Q3	2879	0,46	Q3
4	Sustainable Development Index (SDI)		35	0,02	Q4	9	0,00	Q4	166	0,66	Q2	7	0,00	Q4	217	0,17	Q4
	Barometer of Sustainability (BS)		111	0,05	Q4	13	0,00	Q4	7	0,03	Q4	19	0,01	Q4	150	0,02	Q4
	Environmental Sustainability Index (ESI)		48	0,02	Q4	30	0,01	Q4	168	0,66	Q2	7	0,00	Q4	253	0,18	Q4

Source: Own elaboration of the authors of this work, 2024
Notes: DD: Detected documents; I: Index; Q: Quartile; Q1: 0,75 to 1,0; Q2: 0,5 to 0,74; Q3: 0,25 to 0,49; Q4: 0 to 0,24

(Q1=0.77) is one of the terms with the highest number of citations, almost as high as the term initially indicated. On the other hand, phase 4 shows very low citation values in comparison with phase 1 "Ecotourism Sustainability Assessment", since the three terms consulted are in the last quartile (Q4), the concepts "Environmental Sustainability Index (ESI)" (Q4=0.18) and "Sustainable Development Index (SDI)" (Q4=0.17) standing out (Saldívar et al., 2002).

Statistical analysis

The Shapiro-Wilk test (p-value < 0.001) was used to analysis of the normality of the data set, finding that the data examined on the sustainability components reported in the studies analysed did not follow a normal distribution (Razali y Wah, 2011), so non-parametric tests were chosen for further statistical analyses. Specifically, the Mann-Whitney U-test (Fay y Proschan, 2010) was used instead of the t-student test to assess differences between environmental, economic and socio-cultural components. At a 95% confidence level, statistically significant differences were found between the three components, with the environmental component being the most frequently addressed in the studies reviewed (Gössling et al., 2012), while socio-cultural aspects have received less

attention (Choi y Sirakaya, 2006). These findings highlight the need for a more holistic approach to assessing the sustainability of ecotourism that appropriately balances its environmental, economic and socio-cultural dimensions.

RESULTS AND DISCUSION

Methodologies for sustainability assessment: component analysis

The selection of the 2470 documents in the database used was based on the filtering of information related to the search terms of the first phase of Table 1 and their possible correlation with the terms broken down in the second phase of the same table, which consists of the environmental, economic and socio-cultural components. From this it was possible to establish the citation index (Q) and the order of importance of the main components after applying the proposed methodology, which were identified as follows: (I) environmental (Q3=0.46); (II) economic (Q4=0.2) and (III) socio-cultural (Q4=0.29), as shown in Table 2.

Table 2: Phase 2 results of literature review

Component	Subcomponent	DD	I	DD Total	I Total	C
Environmental	Environmental management	126	0,08	712	0,46	Q3
	Environmental assessment	234	0,15			
	Ecology	134	0,09			
	Ecosystems	124	0,08			
	Biodiversity	94	0,06			
Economics	Tourism management	192	0,12	383	0,2	Q4
	Carrying capacity	48	0,03			
	Services	143	0,09			
Socio-cultural	Stakeholders	108	0,07	456	0,29	Q4
	Perception	140	0,09			
	Communities	191	0,12			
	Traditions	17	0,01			
	Totals	155	1	1551	1	

Source: Own elaboration of the authors of this work, 2024.
Notes: DD: Detected documents; I: Index; Q: Quartile; Q1: 0,75 to 1,0; Q2: 0,5 to 0,74; Q3: 0,25 to 0,49; Q4: 0 to 0,24

By analysing the information contained in selected documents, it was possible to identify and classify each of them in a previously defined subcategory within each of the environmental, economic and socio-cultural components, according to the priority of citation. As noted by Ashok et al., (2017) through the proposal for the sustainability assessment of ecotourism at the operational level using a Principles-Criteria-Indicators-Verifiers scheme, commonly used in the assessment of forest and tourism sustainability, several of the selected articles reflect the use of methodologies that address the three components already mentioned, making it essential to identify each of the subcomponents specifically highlighted.

Environmental component

Within the documentary research carried out, it was possible to identify a series of subcomponents, framed within the environmental component, which follow the different approaches to the subject of sustainability assessment of ecotourism, according to the type of study carried out and based on the territory evaluated. Thus, the selected literature was classified by identifying the environmental management approach, among which the sustainability assessment model of ecological-urban systems based on emergence analysis by Pan et al., (2021), which establishes indicators based on emergence conditions considering ecosystem services to assess the sustainability performance of urban systems through a case study of Simao, China, stands out. As for the environmental assessment approach, where recent trends in the achievement of sustainability goals are assessed in a socio-ecological context, they lead to the definition of ecotourism as an opportunity to stimulate multifunctional and sustainable landscape management in relation to the non-productive benefits of the agricultural landscape, such as recreation and biodiversity (Bezáková & Bezák, 2022). The Ecology approach, which highlights the importance of considering the calculation of the Ecological Footprint in ecotourism processes, an environmental pillar of sustainability that informs stakeholders and citizens about the overall pressure of a territory on the biosphere (Galli et al., 2020). The ecosystem approach considers relevant aspects such as ecosystem-based disaster risk reduction (Eco-DRR) measures, which are gaining attention as creative solutions to reduce the vulnerability of communities to risks while providing multiple co-benefits (Chabba et al., 2022);; finally, a biodiversity-based approach such as sustainable production systems related to seaweed cultivation and its relationship with ecotourism and food for human consumption, as proposed by Pereira et al., (2021).

Economic component

In the economic component, approaches to tourism management were evaluated, highlighting documents related to the exploration of the first stages of large rural tourism development projects oriented towards sustainability, in countries without a great background in ecotourism, but with a good supply of resources and innovation capacity, such as Norway (Mwesiumo et al., 2022). In parallel, there is evidence of documents focused on highlighting the carrying capacity of ecotourism activities as a means to evaluate and constantly monitor the trajectory of tourism development in the coastal zones of Mediterranean islands, as proposed by Leka et al., (2022). Finally, the valuation of ecosystem services through the application of alternative approaches such as Bayesian networks to ecosystem service valuation, identifying key drivers of change and trade-offs between the potential of ecosystem services in different scenarios (Pham et al., 2021).

Socio-cultural component

Another component to be considered in sustainability assessment methodologies for ecotourism activities is the social and cultural aspects of the population living in or around the areas where these activities take place. Through the stakeholder approach, the results of a sustainability assessment are understood to reveal the views of stakeholders on sustainability issues related to a given project, as in the case of the Icelandic population on geothermal energy projects (Shortall et al., 2015). On the other hand, the importance of the perceptions of the inhabitants and visitors of areas with ecotourism activities, some papers assess the opinions of the general public on the importance of the fact that forests contribute to different ecosystem services, determine the public's need for information on the impact of ecotourism activities on ecosystems, and assess how responsibly the public believes these ecotourism projects act in relation to their impact on ecosystems (Ranacher et al., 2017). In turn, through the study of the community(s) and their traditions, it is possible to deduce the need for changes in the community's socio-ecological system itself through ecotourism activities in order to achieve sustainable management, such as the building of a strong sense of community identity, the evolution of community uses, customs, quality and lifestyles, and their collaboration with the scientific community (Pérez-Serrano et al., 2021).

Methodological approaches

Through the bibliographic consultation previously defined by the components of sustainable development, it was possible to identify, in parallel, the existence of different methodological approaches in relation to the type of methodology used by researchers to address the aspect of sustainability assessment of ecotourism from different aspects. In the case of publications with a "methodological" approach, an analysis of the attitudinal-behavioural gap in sustainable tourism stands out, linking holiday behaviour to environmental consequences (Juvan & Dolnicar, 2014). Using the concept of Resource Use Intensity (RUI), Gössling & Peeters (2015) assess the total global resource use of tourism, including fossil fuels, associated CO2 emissions, freshwater, land and food use as essential factors in assessing the impact of global ecotourism between 1900 and 2050. Asmelash & Kumar (2019) propose the use of the Delphi method based on 6 key performance criteria for progress towards sustainable ecotourism. Similarly, García-Melón et al. (2012) use a combined ANP-Delphi approach to evaluate sustainable tourism. In another case study of the Xinjiang Kanas tourism area, Xu et al., (2022) assess the sustainability of a tourism system based on emergent accounting and emergent ternary diagrams. Antić et al., (2022) evaluate five caves in the karst landscape of south-eastern Serbia using the M-GAM method, based on a type of geotourism evaluation where caves, paleoclimate and archaeology, among others, are considered as pillars of ecotourism activity. Finally, Kuščer & Mihalič (2019) propose to assess residents' attitudes towards overtourism using statistical tools based on social science.

Regarding the use of the term 'model', it was found that Trave et al. (2017) propose a marine wildlife valuation model (MWT) where they propose management measures in combination with appropriate ecotourism policies. Villanueva-Álvaro et al. (2017) propose a partial least squares (PLS) model in which they analyse the environmental impact of ecotourism in Spain. Winter tourism in the Dolomites in Italy is also approached from the perspective of management methods and tools to involve local stakeholders, foster creativity and adapt to climate change, among others (Bonzanigo et al., 2016). In Spain, Leco et al. (2013) study the attitudes and motivations of tourists towards the practice of agrotourism activities.

In terms of the use of 'techniques' to assess the sustainabi-

lity of ecotourism, D'Antonio et al. (2013) use visual surveys, among others, to assess visitor impacts in protected areas; Huang & Coelho (2017) propose a sustainability performance assessment focused on the protection of coral reefs by the tourism industry in the Coral Triangle region. In Brazil, a study is found directly on mangroves, where a socio-ecological assessment is conducted for environmental planning in coastal fishing areas (Santos et al., 2017). Finally, Roe et al. (2014) present a three-stage model that applies risk assessment principles to environmental sustainability assessment in the tourism and recreation sector.

Finally, the implementation of "index" within this literature review is found to be one of the most practical and cited tools worldwide, such as the case of Tanguay et al. (2013), who propose the use of sustainable tourism indicators (STI) for policy implementation and scientific recognition; the use of a composite indicator for the evaluation of tourism destinations in Cuba (Pérez et al., 2013); another type of composite indicator, by static and dynamic components, leading to a comprehensive assessment of sustainable tourism is one of the proposals of Blancas et al. (2016). The distribution of scientific publications by conceptual components related to this section is described in Table 3.

Table 3: Phase 3 results of literature review

Components	DD	I	I Total	Q
Method	179	0,115	0,31	Q3
Model	174	0,112	0,30	Q3
Technique	52	0,034	0,09	Q4
Index	173	0,112	0,30	Q3
Totals	*578*	*0,373*	*1*	

Source: Own elaboration of the authors of this work, 2024.
Notes: DD: Detected documents; I: Index; Q: Quartile; Q1: 0,75 to 1,0; Q2: 0,5 to 0,74; Q3: 0,25 to 0,49; Q4: 0 to 0,24

Theoretical and methodological proposals

Taking into account the proposals made at the Earth Summit, which define the Sustainable Development Index, the Sustainability Barometer and the Environmental Sustainability Index (Saldívar et al., 2002), there is evidence of publications that partially include some of the three approaches, since the proposals are mostly limited to the use of methods, indicators or models for assessing sustainability based on these concepts, but not specifically on the three theoretical aspects raised in this section. Therefore, the vast majority of the publications consulted include some of the concepts mentioned in Stage 3, but not directly any of the three theoretical-methodological approaches mentioned (see Table 4).

Table 4: Phase 4 results of literature review

Component	DD	I	I Total	Q
SDI	166	0,107	0,49	Q3
BS	7	0,005	0,02	Q4
ESI	168	0,108	0,49	Q3
Totals	*341*	*0,965*	*1*	

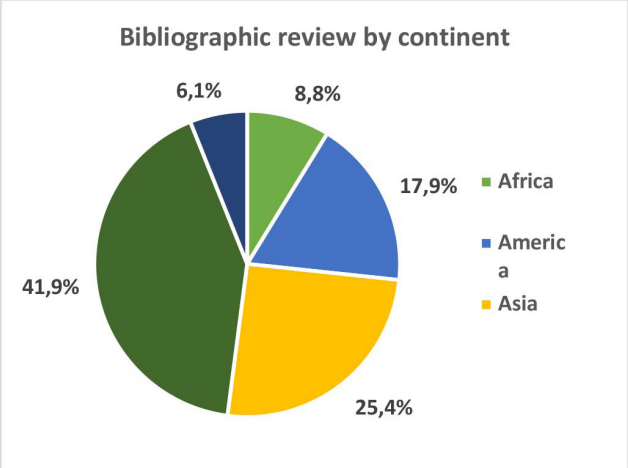
Source: Own elaboration of the authors of this work, 2024.
Notes: DD: Detected documents; I: Index; Q: Quartile; Q1: 0,75 to 1,0; Q2: 0,5 to 0,74; Q3: 0,25 to 0,49; Q4: 0 to 0,24

Geographical distribution analysis

Of the total number of documents analysed for each of the components between phases 2 and 4 of the bibliographic consultation (2470), it was determined that they have a geographical distribution mainly located in the countries of the old European continent, with 1034 documents (41.9%), 627 documents located in Asian countries (25.4%), 442 documents belonging to countries on the American continent (17.9%), 217 documents belonging to African countries (8.8%) and 150 documents published within the limits of the continent of Oceania (6.1%) (see figure 1). Of the total number of documents classified within the American continent, 186 (7.5%) correspond to documents from Latin American countries and, of these, 14 (0.6%) belong to documents reported at the Colombian level (see figure 2).

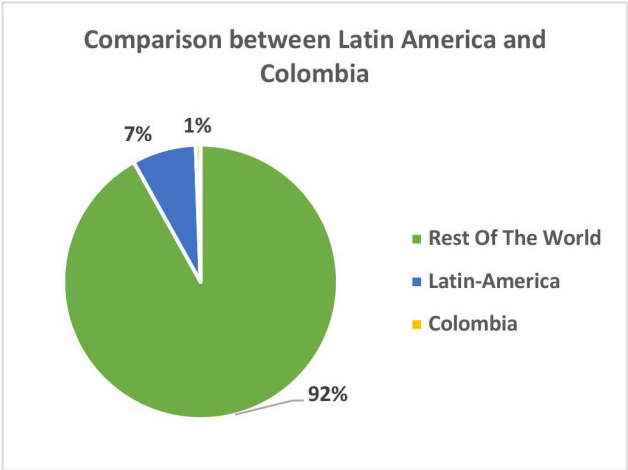
Thus, when assessing the sustainability of ecotourism, countries such as Spain and Italy lead the research carried out on the European continent, followed by China on the Asian continent and those carried out by American authors on the American continent. The contribution of Latin American countries to these research topics is relatively low compared to countries in the East or the African continent itself.

Figure 1. Continental distribution of publications



Source: *Own elaboration of the authors of this work, 2024.*

Figure 2. Latin-American distribution of publications

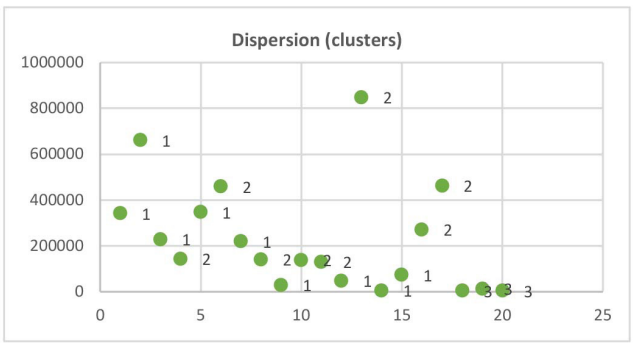


Source: *Own elaboration of the authors of this work, 2024.*

Multivariate statistical analysis

Multivariate statistical analysis allowed us to explore the relationships between the different components and criteria for assessing the sustainability of ecotourism identified in the literature review. Using techniques such as cluster analysis and hierarchical grouping, we sought to identify patterns, similarities and differences between the different aspects that make up a comprehensive sustainability assessment. The results of this analysis provide relevant information for the formulation of a robust and balanced assessment model that adequately incorporates the environmental, economic and socio-cultural components of ecotourism in the study area. The data set presented in Table 1 of this document was then used, where individual data were classified into homogeneous groups prior to a data normalisation process. In this case, cluster number 3, which corresponds to the values obtained for phase 4 of this research, represents the homogeneity of the data, considering that they belong to the same methodological theoretical approach based on Saldívar V. et al. (2002). For the other values distributed in clusters 1 and 2, homogeneity was not evident, which indicates a great variability in the data of publications by components, as evidenced in the different databases consulted in this research (see Figure 3).

Figure 3. Scatter plot



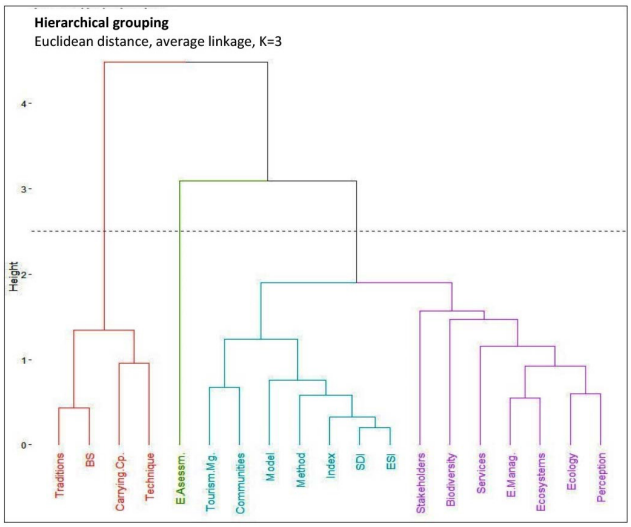
Source: *Own elaboration of the authors of this work, 2024.*

Considering the number of publications related to the evaluation of the sustainability of ecotourism in the Scopus database, the analysis of the components studied was carried out by geographical distribution, showing significant groupings between terms, since the publications deal with topics that can be well established within the different components described. For these data, the method of linkage averages allows a slightly better representation of the similarity between observations (see Figure 4).

As a result, 3 hierarchical clusters of similarity or distance emerged for the data evaluated, with those related to the aspects of techniques, carrying capacity, sustainability barometer and traditions standing out. This cluster brings together terms related to the socio-cultural component of sustainability, since it includes theoretical and methodological measurements together with cultural specificities and the carrying capacity of territories, i.e. the social component and the impact of human activity are directly involved in the various publications. Another cluster includes components related to tourism management, com-

munities and different methodological approaches to evaluation, such as models, indices and methods. In this case, the relationship between the components is discussed with a rather theoretical approach, as it is based on methodological approaches rather than on the characteristics of the components embedded in the sustainability assessment itself.

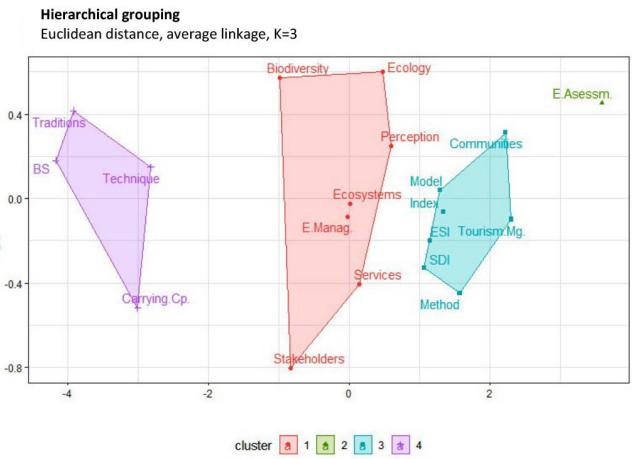
Figure 4. Cluster chart



Source: *Own elaboration of the authors of this work, 2024.*

A third cluster links a wide range of components, from biodiversity to the provision of services and the role of stakeholder perceptions, tending to move this cluster towards a more economic-environmental consideration than the others.

Figure 4. Cluster chart



Source: *Own elaboration of the authors of this work, 2024.*

The identification of an aspect outside the clusters, related to environmental assessment, stands out as an outlier in the statistical analysis, as it is present in most of the specific themes of the total number of publications consulted. In this way, it is possible to identify 3 clusters of average distribution, as well as an additional non-clustered cluster belonging to a single component (see Figure 5).

CONCLUSIONS

Through the identification of the different methodological trends in the evaluation of the sustainability of ecotourism projects or activities, it was possible to identify a number of key factors in the formulation of evaluation schemes or dynamics, which vary according to the component within which the document to be analysed is located, be it environmental, economic, socio-cultural or a mixture of several or all of them in concatenation. Sub-components have also been identified as important for the approach to sustainability assessment, which are directly related to the environmental component, from its management to the assessment itself, to aspects directly related to ecology, biodiversity and ecosystems. With regard to the economic component, aspects such as the carrying capacity of the areas, the services offered by ecotourism activities and the qualitative and quantitative value of tourists and residents of the areas under study were highlighted. With regard to the socio-cultural component, the role of the communities in the different stages of the approach to ecotourism projects or activities was highlighted, as well as their perception and receptivity to the traditions of the place and the interest of those involved in the different value scales.

The literature review then suggests that the methodological trends identified in phase 2 of the research are, in order, as follows: Environmental assessment (Q1=0.96), Communities (Q1=0.87), Services (Q1=0.79) and Tourism management (Q1=0.76), all of which fall within quartile 1, reflecting a higher number of citations or thematic approaches in the identified publications. As for phase 3, it was found that the terms Method (Q1=0.81) and Model (Q1=0.77) are the most used when proposing a methodological approach to assess the sustainability of ecotourism. In the case of the theoretical-methodological approaches proposed at the Earth Summit, it is evident that they are used very little in the related publications, especially the one related to the Barometer of Sustainability (BS), which was placed in quartile 4 (Q4=0.02).

The identification of variables for the analysis and evaluation of ecotourism activities in a given area depends on the type of activity to be evaluated and the geographical location of the area itself. The bibliographical review found articles from areas of recognised ecotourism, especially from tropical countries in the Americas, such as some African or Asian countries, as well as from countries with geographical and climatological conditions different from those of tropical countries, such as northern European countries like Norway and Iceland, among others. The results showed the following global distribution by continent Africa 9.6%, the Americas 19.6%, Asia 27.9%, Europe 45.8% and Oceania 6.7%. The countries where most research or scientific articles have been published on the evaluation of the sustainability of ecotourism are Spain, the United States and China.

The determination of the mechanism for approaching sustainability assessment, which can move between methodological approaches, the use of assessment indicators or indices, data and information management techniques, or the formulation of models that configure the above aspects or that result from the cohesion of several factors, will reflect the assessment trend that is relevant to each particular investigation. The agglomeration clusters reflect particular relationships between the components, but they do not show a representative homogeneity of the data, which indicates that each of the components evaluated has a specific niche of publications that are not usually directly related to other publications on similar topics. This means that the approaches to the central theme of sustainability assessment of ecotourism are very diverse and have many edges from which to approach their study, since no particular methodological trend stands out.

REFERENCES

Amalu, T. E., Otop, O. O., Duluora, E. I., Omeje, V. U., & Emeana, S. K. (2017). Socio-economic impacts of ecotourism attractions in Enugu state, Nigeria. Geojounal, 83, 1257–1269. https://doi.org/10.1007/s10708-017-9830-7

Antić, A., Marković, S. B., Marković, R. S., Cai, B., Nešić, D., Tomić, N., Mihailović, D., Plavšić, S., Radakovic, M. G., Radivojević, A., Sotirovski, D., Ćalić, J., Atanasijević, J., Gavrilov, M. B., Vukojević, D., & Hao, Q. (2022). Towards Sustainable Karst-Based Geotourism of the Mount Kalafat in Southeastern Serbia. Geoheritage, 14(1), 16. https://doi.org/10.1007/s12371-022-00651-6

Asmelash, A. G., & Kumar, S. (2019). Assessing progress of tourism sustainability: Developing and validating sustainability indicators. Tourism Management, 71, 67–83. https://doi.org/https://doi.org/10.1016/j.tourman.2018.09.020

Barbieri, C. (2013). Assessing the sustainability of agrotourism in the US: A comparison between agrotourism and other farm entrepreneurial ventures. Journal of Sustainable Tourism, 21(2), 252–270. https://doi.org/10.1080/09669582.2012.685174

Batabyal, A. A. (2016). Accessibility, vulnerability, and resilience in a stochastic model of sustainable ecotourism. Transportation Research Part D: Transport and Environment, 43, 71–81. https://doi.org/https://doi.org/10.1016/j.trd.2015.12.004

Bezáková, M., & Bezák, P. (2022). Which sustainability objectives are difficult to achieve? The mid-term evaluation of predicted scenarios in remote mountain agricultural landscapes in Slovakia. Land Use Policy, 115, 106020. https://doi.org/https://doi.org/10.1016/j.landusepol.2022.106020

Blancas, F. J., Lozano-Oyola, M., González, M., & Caballero, R. (2016). Sustainable tourism composite indicators: a dynamic evaluation to manage changes in sustainability. Journal of Sustainable Tourism, 24(10), 1403–1424. https://doi.org/10.1080/09669582.2015.1122014

Bonzanigo, L., Giupponi, C., & Balbi, S. (2016). Sustainable tourism planning and climate change adaptation in the Alps: a case study of winter tourism in mountain communities in the Dolomites. Journal of Sustainable Tourism, 24(4), 637–652. https://doi.org/10.1080/09669582.2015.1122013

Camacho-Ruiz, E., Carrillo, A., Tamara, R., Rioja-Paradela, M., & Espinoza-Medinilla, E. E. (2016). Sustainability Indicators for Ecotourism in Mexico: Current State. LiminaR. Estudios Sociales y Humanísticos, XIV(1), 156–168. http://www.scielo.org.mx/pdf/liminar/v14n1/v14n1a11.pdf

Chabba, M., Bhat, M. G., & Sarmiento, J. P. (2022). Risk-based benefit-cost analysis of ecosystem-based disaster risk reduction with considerations of co-benefits, equity, and sustainability. Ecological Economics, 198, 107462. https://doi.org/https://doi.org/10.1016/j.ecolecon.2022.107462

Choi, H. S. C., & Sirakaya, E. (2006). Sustainability indicators for managing community tourism. Tourism Management, 27(6), 1274–1289. https://doi.org/10.1016/J.TOURMAN.2005.05.018

D'Antonio, A., Monz, C., Newman, P., Lawson, S., & Taff, D. (2013). Enhancing the utility of visitor impact assessment in parks and protected areas: A combined social–ecological approach. Journal of Environmental Management, 124, 72–81. https://doi.org/https://doi.org/10.1016/j.jenvman.2013.03.036

Fassoulas, C., Mouriki, D., Dimitriou-Nikolakis, P., & Iliopoulos, G. (2012). Quantitative Assessment of Geotopes as an Effective Tool for Geoheritage Management. Geoheritage, 4(3), 177–193. https://doi.org/10.1007/s12371-011-0046-9

Fay, M. P., & Proschan, M. A. (2010). Wilcoxon-Mann-Whitney or t-test? On assumptions for hypothesis tests and multiple interpretations of decision rules. Statistics surveys, 4, 1.

Galli, A., Iha, K., Moreno Pires, S., Mancini, M. S., Alves, A., Zokai, G., Lin, D., Murthy, A., & Wackernagel, M. (2020). Assessing the Ecological Footprint and biocapacity of Portuguese cities: Critical results for environmental awareness and local management. Cities, 96, 102442. https://doi.org/https://doi.org/10.1016/j.cities.2019.102442

García-Melón, M., Gómez-Navarro, T., & Acuña-Dutra, S. (2012). A combined ANP-delphi approach to evaluate sustainable tourism. Environmental Impact Assessment Review, 34, 41–50. https://doi.org/https://doi.org/10.1016/j.eiar.2011.12.001

Gössling, S., & Peeters, P. (2015). Assessing tourism's global environmental impact 1900–2050. Journal of Sustainable Tourism, 23(5), 639–659. https://doi.org/10.1080/09669582.2015.1008500

Gössling, S., Scott, D., Hall, C. M., Ceron, J.-P., & Dubois, G. (2012). Consumer behaviour and demand response of tourists to climate change. Annals of Tourism Research, 39(1), 36–58.

Huang, Y., & Coelho, V. R. (2017). Sustainability performance assessment focusing on coral reef protection by the tourism industry in the Coral Triangle region. Tourism Management, 59, 510–527. https://doi.org/https://doi.org/10.1016/j.tourman.2016.09.008

Juvan, E., & Dolnicar, S. (2014). The attitude–behaviour gap in sustainable tourism. Annals of Tourism Research, 48, 76–95. https://doi.org/https://doi.org/10.1016/j.annals.2014.05.012

Krüger, O. (2005). The role of ecotourism in conservation: panacea or Pandora's box? Biodiversity and Conservation, 14(3), 579–600. https://doi.org/10.1007/s10531-004-3917-4

Kuščer, K., & Mihalič, T. (2019). Residents' attitudes towards overtourism from the perspective of tourism impacts and cooperation-The case of Ljubljana. Sustainability (Switzerland), 11(6). https://doi.org/10.3390/su10021823

Leco, F., Pérez, A., Hernández, J. M., & Campón, A. M. (2013). Rural tourists and their attitudes and motivations towards the practice of environmental activities such as agrotourism. International Journal of Environmental Research, 7(1), 255–264. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84880680396&partnerID=40&md5=1e3c7a3ffcb2ae0e7f84ce25b76d33de

Lee, T. H., & Jan, F.-H. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. Tourism Management, 70, 368–380. https://doi.org/10.1016/j.tourman.2018.09.003

Leka, A., Lagarias, A., Panagiotopoulou, M., & Stratigea, A. (2022). Development of a Tourism Carrying Capacity Index (TCCI) for sustainable management of coastal areas in Mediterranean islands – Case study Naxos, Greece. Ocean and Coastal Mana-

gement, 216. https://doi.org/10.1016/j.ocecoaman.2021.105978

Martínez Quintana, V. (2017). El turismo de naturaleza: un producto turístico sostenible. Arbor, 193(785 SE-Artículos), a396. https://doi.org/10.3989/arbor.2017.785n3002

Ministerio de Comercio, I. y T. (2020). Política de Turismo Sostenible: Unidos por la naturaleza. www.mincit.gov.co

Mwesiumo, D., Halfdanarson, J., & Shlopak, M. (2022). Navigating the early stages of a large sustainability-oriented rural tourism development project: Lessons from Træna, Norway. Tourism Management, 89, 104456. https://doi.org/https://doi.org/10.1016/j.tourman.2021.104456

Oliveros Ocampo, C. A., & Beltrán Vargas, J. E. (2018). Evaluación de la sustentabilidad de los prestadores de servicios turísticos del Parque Nacional Natural Tayrona en el departamento de Magdalena, Colombia. Cuadernos de Geografía: Revista Colombiana de Geografía, 27(1), 100–117. https://doi.org/10.15446/rcdg.v27n1.61589

Omarzadeh, D., Pourmoradian, S., Feizizadeh, B., Khallaghi, H., Sharifi, A., & Kamran, K. V. (2022). A GIS-based multiple ecotourism sustainability assessment of West Azerbaijan province, Iran. Journal of Environmental Planning and Management, 65(3), 490–513. https://doi.org/10.1080/09640568.2021.1887827

Ospina Díaz, M. R., Mora, R., & Romero Infante, J. A. (2013). Ecoturismo: diagnóstico y propuesta estratégica para la oferta de destinos ecoturísticos en Colombia por parte de las agencias de turismo localizadas en Bogotá, D.C. Cuadernos Latinoamericanos de Administración, IX, 7–28. http://www.redalyc.org/articulo.oa?id=409633955002

Pan, Y., Zhang, B., Wu, Y., & Tian, Y. (2021). Sustainability assessment of urban ecological-economic systems based on emergy analysis: A case study in Simao, China. Ecological Indicators, 121, 107157. https://doi.org/https://doi.org/10.1016/j.ecolind.2020.107157

Pereira, S. A., Kimpara, J. M., & Valenti, W. C. (2021). Sustainability of the seaweedHypnea pseudomusciformisfarming in the tropical Southwestern Atlantic. Ecological Indicators, 121, 107101. https://doi.org/https://doi.org/10.1016/j.ecolind.2020.107101

Pérez-Serrano, D., Cabirol, N., Martínez-Cervantes, C., & Rojas-Oropeza, M. (2021). Mesquite management in the Mezquital Valley: A sustainability assessment based on the view point of the Hñähñú indigenous community. Environmental and Sustainability Indicators, 10, 100113. https://doi.org/https://doi.org/10.1016/j.indic.2021.100113

Pérez Colmenares, S. del V. (2018). Modelo metodológico para evaluar el turismo en un programa territorial sostenible. Región funcional de Timotes, estado de Mérida, Venezuela. [Universidad Politécnica de Valencia]. https://riunet.upv.es/bitstream/handle/10251/111948/P%E9rez - MODELO METODOL%D3GICO PARA EVALUAR EL TURISMO EN UN PROGRAMA TERRITORIAL RURAL SOSTENIBLE.R....pdf;jsessionid=E76F60EC15F81F4ADF5AE34C847D7FF2?sequence=1

Pérez, V., Guerrero, F., González, M., Pérez, F., & Caballero, R. (2013). Composite indicator for the assessment of sustainability: The case of Cuban nature-based tourism destinations. Ecological Indicators, 29, 316–324. https://doi.org/https://doi.org/10.1016/j.ecolind.2012.12.027

Pham, H. V., Sperotto, A., Furlan, E., Torresan, S., Marcomini, A., & Critto, A. (2021). Integrating Bayesian Networks into ecosystem services assessment to support water management at the river basin scale. Ecosystem Services, 50, 101300. https://doi.org/https://doi.org/10.1016/j.ecoser.2021.101300

Ranacher, L., Lähtinen, K., Järvinen, E., & Toppinen, A. (2017). Perceptions of the general public on forest sector responsibility: A survey related to ecosystem services and forest sector business impacts in four European countries. Forest Policy and Economics, 78, 180–189. https://doi.org/https://doi.org/10.1016/j.forpol.2017.01.016

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of shapiro-wilk, kolmogorov-smirnov, lilliefors and anderson-darling tests. Journal of statistical modeling and analytics, 2(1), 21–33.

Roe, P., Hrymak, V., & Dimanche, F. (2014). Assessing environmental sustainability in tourism and recreation areas: a risk-assessment-based model. Journal of Sustainable Tourism, 22(2), 319–338. https://doi.org/10.1080/09669582.2013.815762

Saldívar, A., Barrera, A., Rosales, P., & Villaseñor, E. (2002). Tres metodologías para evaluar la su sustentabilidad: 10 años después de Río. En Investigación económica (Vol. 62, pp. 159–185). scielomx.

Salinas Chávez, E., & La O Osorio, J. A. (2006). Turismo y sustentabilidad: De la teoría a la práctica en Cuba. Cuadernos de Turismo, 0(17 SE-Artículos), 201–221. https://revistas.um.es/turismo/article/view/17931

Santos, L. C. M., Gasalla, M. A., Dahdouh-Guebas, F., & Bitencourt, M. D. (2017). Socio-ecological assessment for environmental planning in coastal fishery areas: A case study in Brazilian mangroves. Ocean & Coastal Management, 138, 60–69. https://doi.org/https://doi.org/10.1016/j.ocecoaman.2017.01.009

Shortall, R., Davidsdottir, B., & Axelsson, G. (2015). Development of a sustainability assessment framework for geothermal energy projects. Energy for Sustainable Development, 27, 28–45. https://doi.

org/https://doi.org/10.1016/j.esd.2015.02.004

Tanguay, G. A., Rajaonson, J., & Therrien, M.-C. (2013). Sustainable tourism indicators: Selection criteria for policy implementation and scientific recognition. Journal of Sustainable Tourism, 21(6), 862–879. https://doi.org/10.1080/09669582.2012.742531

Trave, C., Brunnschweiler, J., Sheaves, M., Diedrich, A., & Barnett, A. (2017). Are we killing them with kindness? Evaluation of sustainable marine wildlife tourism. Biological Conservation, 209, 211–222. https://doi.org/https://doi.org/10.1016/j.biocon.2017.02.020

Villanueva-Álvaro, J.-J., Mondéjar-Jiménez, J., & Sáez-Martínez, F.-J. (2017). Rural Tourism: Development, Management and Sustainability in Rural Establishments. En Sustainability (Vol. 9, Número 5). https://doi.org/10.3390/su9050818

Xu, X., Feng, C., Du, Y., Wang, Q., Zhang, G., & Huang, Y. (2022). Evaluating the sustainability of a tourism system based on emergy accounting and emergetic ternary diagrams: a case study of the Xinjiang Kanas tourism area. Environment, Development and Sustainability, 24(5), 6731–6787. https://doi.org/10.1007/s10668-021-01725-1

Zafra Mejía, C., Rondón, H., & Beltran Vargas, J. (2017). Acumulación de metales pesados en sedimentos viales urbanos: factores de interés en salud pública. Revista de la Facultad de Medicina, 65, 655–664. https://doi.org/10.15446/revfacmed.v65n4.57690

Zarazúa, J.-A., Mazabel, D., Moncayo-Estrada, R., & Rendón-Medel, R. (2015). Evaluación de la sustentabilidad en espacios rurales relacionados con el ecoturismo. Estudio de caso en la selva Lacandona, Chiapas, México. En Luna Azul (pp. 47–68). scieloco.

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