

Exploring willingness to pay for sustainability in tourism: A co-word analysis of the literature review

Sandra Monroy-Rodríguez^{1*}, Daniela Thiel-Ellul², Ana Fernández-Ardavín³

¹ Complutense University of Madrid, Spain. mmonro02@ucm.es

² Nebrija University, Spain. dthiel@nebrija.es

³ Nebrija University, Spain. afernandezardavin@nebrija.es

Meridia
Press

JBTM 2025,
Volume 1 (Issue
2): 1-17

ISSN (print):

3101-3260

ISSN (online):

3101-1950

Received: October
20, 2025

Revised:

November 3, 2025

Accepted:

November 10,
2025

Published:

November 20,
2025.



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Abstract

This study presents a comprehensive bibliometric and co-word analysis of academic literature on tourists' willingness to pay (WTP) for sustainability in tourism. Through a systematic review of 173 articles indexed in Web of Science and analyzed using SciMAT, we map the conceptual landscape of WTP, identifying dominant themes and research gaps. Results reveal that WTP is a motor theme, central to understanding financial support for conservation and sustainable practices, closely linked to biodiversity, consumer behaviour, and carbon emissions. Thematic clusters such as hybrid choice models and ecosystem services underscore the intersection of environmental, economic, and psychological dimensions in sustainable tourism. Our analysis shows that WTP is driven by socio-demographic factors, environmental awareness, and the perceived impact of contributions. While conservation fees and eco-labelling foster positive responses, behavioural barriers and limited trust in policy transparency can hinder engagement. Emerging and underdeveloped areas—including cultural events and psychological biases—suggest promising directions for future inquiry. We conclude by proposing a research agenda that integrates behavioural economics, environmental psychology, and digital innovation to deepen understanding of tourists' financial commitment to sustainability. This article contributes novel insights by combining bibliometric mapping with qualitative interpretation, offering a roadmap to advance sustainable tourism scholarship and practice.

Keywords: Willingness to Pay (WTP), Sustainable Tourism, Co-word Analysis, Environmental Awareness.

*Corresponding author: Sandra Monroy-Rodriguez, mmonro02@ucm.es

<https://doi.org/10.64976/jbtm.8>

1. Introduction

The concept of willingness to pay (WTP) for sustainability in tourism is essential for understanding tourists' financial commitment to environmentally and socially responsible practices. WTP not only influences the viability of conservation efforts but also plays a crucial role in shaping sustainable tourism policies. By identifying the key factors that drive tourists' financial engagement, policymakers and industry stakeholders can design more effective sustainability initiatives that align environmental goals with market expectations (Ezeh & Dube, 2024).

Studies indicate that income and education levels are significant predictors of WTP. Tourists with higher disposable income and greater educational attainment tend to exhibit a stronger willingness to financially support conservation initiatives (Lan et al., 2024; Pengwei & Ji, 2023). This suggests that targeted awareness campaigns and differentiated pricing strategies could enhance engagement among diverse tourist demographics.

A key driver of WTP is the extent of an individual's environmental awareness and concern for climate change. Tourists who prioritize sustainability and recognize the long-term benefits of conservation are more likely to contribute financially to eco-friendly initiatives (de Araújo et al., 2024). For instance, in Puerto Rico, households demonstrated a WTP to support biodiversity conservation, highlighting the direct link between awareness and financial support (Tavárez et al., 2024). Similarly, research on circular economy principles indicates that heightened environmental awareness leads to a more favourable evaluation of sustainable practices, reinforcing the importance of education in fostering pro-environmental behaviour (Godhino et al., 2024).

The payment context significantly influences tourists' willingness to contribute to sustainability efforts. Studies show that tourists exhibit higher WTP for conservation initiatives when they perceive a tangible benefit, such as cultural heritage preservation, rather than for generalized sustainability fees (Göktaş & Cetin, 2023). This suggests that framing sustainability contributions in a way that emphasizes direct impact can increase financial engagement.

One of the most widely studied financial mechanisms in sustainable tourism is the implementation of conservation fees. Studies suggest that tourists are generally receptive to such fees when they perceive them as directly contributing to environmental preservation (Pengwei & Ji, 2023). However, transparency in fund allocation and clear communication about conservation outcomes are critical to maintaining tourists' trust and willingness to contribute.

Despite the growing body of research on WTP, there remains a gap in comprehensive reviews that synthesize findings, highlight methodological diversity, and propose structured research agendas (Cavallin Toscani, et al. 2024). While factors such as environmental awareness, socio-economic characteristics, and conservation fees have been extensively studied, there is still limited exploration of behavioural biases, systemic barriers, and cultural influences on WTP. Additionally, more interdisciplinary approaches—such as combining behavioural economics with tourism studies—could provide deeper insights into how financial commitment to sustainability evolves across different contexts.

This study seeks to bridge this gap by conducting a systematic review and bibliometric analysis of WTP for sustainability in tourism. Specifically, it aims to:

- Identify the dominant research themes by addressing the question: What are the main topics of research on willingness to pay for sustainability in tourism?
- Outline a roadmap for future research by exploring: What areas could contribute to advancing knowledge on WTP for sustainability in tourism?

To achieve these goals, bibliometric techniques—particularly co-word analysis—are applied to uncover the conceptual structures of the field. A reflective analysis of the results will further identify emerging themes and research gaps that warrant further exploration.

By integrating WTP and sustainability in tourism through a mixed-method approach, this study contributes a novel perspective that combines bibliometric and qualitative analysis. The article follows a structured format: an introduction, a methodology section detailing data collection and analysis procedures, a results section showcasing strategic diagrams and thematic networks, and a discussion and conclusion section summarizing key insights. The final section proposes directions for further studies.

2. Methodology

This study employs a systematic review methodology to synthesize existing research, official reports, is based on the willingness to pay (WTP) for sustainability in tourism, and presents a comprehensive bibliometric analysis based on the academic literature available up to August 2025.

To analyze the selected literature, co-word analysis was employed, a bibliometric technique that maps relationships and structures within a research field by examining the co-occurrence of keywords in scientific documents (Callon et al., 1991). This analysis was conducted using the open-source tool SciMAT, which was selected over other bibliometric tools due to its ability to integrate performance analysis with science mapping in a longitudinal framework. Unlike software focused solely on citation metrics or co-authorship networks, SciMAT allows for a dynamic visualization of conceptual evolution, making it especially suitable for studies aiming to capture thematic development over time. Its built-in modules for data preprocessing, strategic diagram generation, and thematic network mapping make it a comprehensive tool for co-word analysis in emerging interdisciplinary fields such as sustainable Tourism (Cobo et al., 2011).

The methodological process began with the extraction of data from the Web of Science (WOS) database in August 2025. A structured search was conducted using keyword combinations related to "willingness to pay" and "sustainability in tourism", which initially returned a total of 173 relevant articles. After importing the bibliographic records, the dataset was cleaned by removing duplicates and standardizing entries to ensure consistency. Subsequently, a manual refinement process was carried out to group similar terms—such as synonyms, plurals, and spelling variations, thereby enhancing the accuracy of the keyword analysis. This refined dataset served as the foundation for the co-word analysis performed using SciMAT.

SciMAT generated a co-occurrence matrix, where the rows and columns represented keywords, and the cells indicated the frequency with which the terms co-occurred in documents. A minimum threshold was applied to highlight the most significant relationships. From this matrix, a co-word network was constructed, where the nodes represented keywords and the links indicated the strength of their co-occurrence.

Clustering algorithms identified thematic clusters, classified into four categories (Callon et al., 1991):

- Motor themes: Well-developed and central to the research field. They have high density and high centrality, indicating both strong internal development and strong connections to other themes.

- Basic themes: Fundamental topics that are widely connected to other themes but are underdeveloped internally. They are high in centrality but low in density.

- Emerging or declining themes: Topics with low density and low centrality. These may be new, underexplored themes that are just starting to gain attention, or older topics that are losing relevance within the field.

- Isolated themes: Well-developed internally (high density) but with few connections to other themes (low centrality), making them more peripheral in the research landscape.

These clusters were visualized in strategic diagrams, which represented themes according to two axes: centrality (relative importance) and density (level of internal development). The size of the nodes in the thematic network reflected the number of documents containing the keyword, while the thickness of the links indicated the strength of the associations between terms.

3. Results

3.1 Analysis of thematic centrality and density in sustainable tourism and WTP

The analysis of centrality and density of clusters generated by SciMAT (Table 1) offers a comprehensive view of thematic relevance and interconnectedness within the field of sustainable tourism research. Centrality measures the importance of a cluster within the broader conceptual network, while density reflects the strength of relationships among the concepts that form the cluster. These metrics are essential for identifying core themes and emerging areas of interest in sustainable tourism.

Table 1: Centrality and density measures for each cluster made by SciMAT

Cluster	Centrality	Centrality range	Density	Density range
Willingness To Pay	177.46	1	37.67	1
Biodiversity	116.47	0.95	33.48	0.95
Carbon emissions	53.91	0.45	26.58	0.9
Hybrid-Choice-Model	62.58	0.7	25.41	0.85

Consumers-behaviour	78.23	0.9	23.7	0.8
Economic-Values	42.72	0.25	14.33	0.75
Consumers	68.16	0.8	13.88	0.7
Data	39.6	0.2	12.65	0.65
Ecosystem-Services	63.96	0.75	12.13	0.6
Visitors	60.2	0.6	11.58	0.55
Competitiveness	33.24	0.1	10.49	0.5
Sustainability	72.41	0.85	9.25	0.45
Festival	37.87	0.15	9.25	0.4
Models	57.9	0.5	6.61	0.35
Attitudes	59.77	0.55	5.74	0.3
Fees	52.04	0.4	5.37	0.25
Adaptation	62.26	0.65	5.22	0.2
China	20.24	0.05	4.63	0.15
Knowledge	50.47	0.35	3.96	0.1
Bias	45.85	0.3	3.59	0.05

Source: own elaboration from SciMAT program.

Among the clusters analyzed, "Willingness to Pay" (WTP) stands out as the most prominent, with the highest centrality (177.46) and density (37.67). This indicates that WTP is not only a central topic in sustainable tourism but also a highly cohesive area of study. The importance of WTP is supported by recent research highlighting its critical role in understanding how tourists value and are willing to invest in sustainable tourism products and services. For instance, Fichter et al. (2023) explore how environmental attitudes influence WTP through a hybrid choice model that integrates latent constructs related to environmental concerns and individual preferences. This approach provides valuable insights into identifying key market segments and designing effective strategies to promote sustainable tourism offerings.

Given its pivotal role in aligning economic incentives with sustainability goals, WTP is a fundamental topic that requires further investigation. Understanding what drives tourists to financially support sustainable practices can help policymakers and businesses develop targeted interventions that enhance the economic viability of sustainability initiatives. Moreover, exploring WTP can provide valuable insights into the effectiveness of economic instruments such as green taxes, conservation fees, and eco-labelling in shaping consumer behaviour.

Another significant cluster is "Biodiversity", with centrality and density values of 116.47 and 33.48, respectively. This cluster underscores the critical relationship between biodiversity, ecosystem services, and sustainable tourism development. Biodiversity serves as a cornerstone for many tourism activities, particularly in protected areas where natural attractions drive visitor engagement. Saayman and Saayman (2017) emphasize the economic valuation of endangered species, such as rhinos, demonstrating how both use and non-use values contribute to conservation funding. Their study highlights the necessity of integrating conservation policies with tourism strategies to ensure long-term sustainability for destinations reliant on biodiversity.

Biodiversity loss is a major global challenge, and tourism can be both a driver of degradation and a tool for conservation. By examining this cluster in depth, we can better understand how sustainable tourism practices can contribute to biodiversity preservation while maintaining economic benefits for local communities. This research is particularly relevant in the context of nature-based tourism, ecotourism, and the role of protected areas in balancing conservation efforts with visitor experiences. Furthermore, understanding tourists' WTP for biodiversity conservation can inform funding mechanisms that support ecological protection and sustainable destination management.

The cluster "Carbon Emissions" also emerges as a relevant topic, with moderate centrality (53.91) but high density (26.58), indicating strong thematic cohesion. This cluster reflects growing interest in mitigating the environmental impact of tourism, particularly through carbon reduction initiatives. Babakhani et al. (2017) investigate marketing strategies to encourage carbon offsetting in tourism, demonstrating that visually engaging and persuasive messages can significantly enhance tourist participation in environmental mitigation programs. These findings are particularly pertinent as destinations increasingly prioritize environmental sustainability in their tourism management plans.

Tourism, particularly air travel, is a major contributor to global carbon emissions. Given the increasing urgency to address climate change, this cluster demands further analysis to explore how carbon reduction strategies can be effectively implemented in the tourism sector. Researching WTP for carbon offsetting, alternative transportation, and sustainable accommodation practices can help identify the most effective policies and incentives to encourage responsible travel. Moreover, an in-depth analysis of this topic can provide insights into the psychological and behavioural factors that influence tourists' willingness to engage in low-carbon tourism practices.

Another key cluster that requires further exploration is "Consumer Behaviour", which has a centrality of 78.23 and a density of 23.7. This cluster is essential for understanding the psychological, social, and economic factors that drive sustainable tourism choices. Consumer behaviour research examines how tourists perceive and react to sustainability initiatives, providing a deeper understanding of their motivations, barriers, and decision-making processes.

Investigating this cluster is crucial for developing effective communication strategies, marketing campaigns, and policy frameworks that encourage sustainable travel choices. For example, Pulido-Fernández and López-Sánchez (2016) highlight that tourists with high levels of "sustainable intelligence" are willing to pay more for destinations that adopt sustainable practices. However, their study also reveals that this willingness decreases when the price increase is perceived as excessive. This underscores the need for balanced pricing strategies that align sustainability with economic accessibility, ensuring that responsible tourism remains attractive to a broad audience.

Furthermore, the intersection between WTP and consumer behaviour is particularly relevant. Tourists' willingness to pay for sustainability does not always translate into actual financial commitments, highlighting the well-documented "attitude-behaviour gap". Researching this relationship can help bridge the gap between positive environmental intentions and concrete sustainable actions. This knowledge can then be applied to develop behavioural nudges, incentives, and educational campaigns that effectively promote sustainable tourism practices.

3.2 Thematic classification of research cluster

The thematic classification derived from the co-word analysis provides a structured overview of how different research topics are positioned within the field of willingness to pay (WTP) for sustainability in tourism. Based on Callon et al. (1991) framework, thematic clusters are grouped into four categories—motor, basic transverse, emerging or declining, and isolated according to their centrality (importance within the field) and density (internal development). Table 2 summarizes this classification, offering a comprehensive view of how each theme contributes to the overall research landscape.

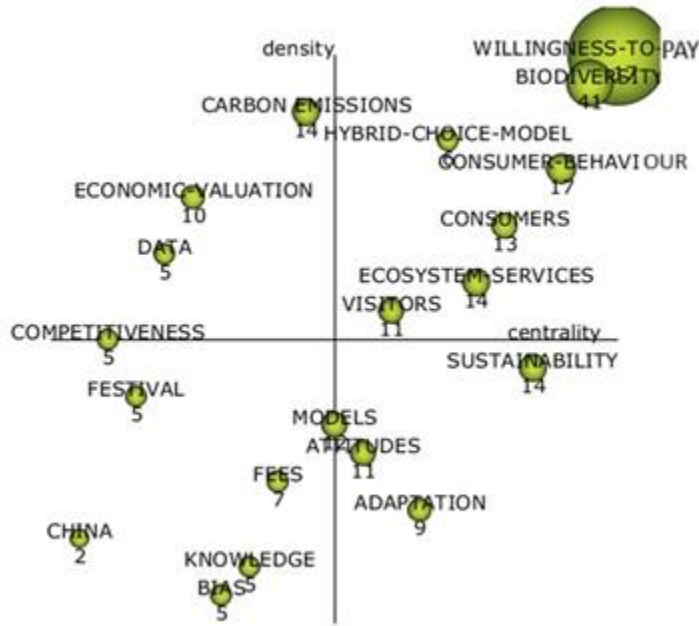
Table 2: Thematic clusters

Thematic cluster	Theme groups according to Callon et al. (1991)
Willingness to Pay Biodiversity Hybrid-Choice-Model Consumer-behaviour Consumers Ecosystems-Services Visitors	Motor themes
Sustainability Attitudes Adaptation Models	Basic Transverse themes
Festival Fees China Knowledge Bias	Emerging or declining themes
Competitiveness Carbon emissions Economic valuation Data	Isolated themes

Source: own elaboration from SciMAT program.

This classification of themes is visually represented in the strategic diagram (Figure 1), which illustrates the distribution of thematic cluster according to their centrality and density. The diagram highlights four quadrants, each of which reflects different levels of development and relevance within the field of WTP for sustainable tourism.

Figure 1: Strategic Diagram



Source: from SciMAT

In the upper-right quadrant, we find the motor themes—topics that are both well-developed and highly relevant to the field. Their strong internal consistency and extensive connections make them foundational to the research landscape. These themes serve not only as methodologically advanced clusters but also as conceptual anchors that shape the intellectual structure around WTP and sustainability.

The lower-left quadrant is composed of emerging or declining themes. These areas exhibit low centrality and low density, indicating they are either in the early stages of development or gradually diminishing in influence. Their peripheral position, however, does not preclude relevance; instead, they offer potential entry points for innovation or call for critical re-evaluation, depending on how scholarly attention evolves.

In the upper-left quadrant lie the well-developed but peripheral themes—highly structured and internally cohesive topics that have yet to establish strong connections with the core of the field. Although currently marginal, their analytical maturity offers an opportunity for integration into broader theoretical and empirical frameworks, especially through interdisciplinary collaboration.

Finally, the lower-right quadrant hosts basic and transversal themes. These are widely cited and conceptually significant, often serving as bridges across research areas, yet they remain underdeveloped in terms of methodological refinement. To realize their full potential, these themes require more rigorous conceptual framing and empirical elaboration to transition from general references to structured research agendas.

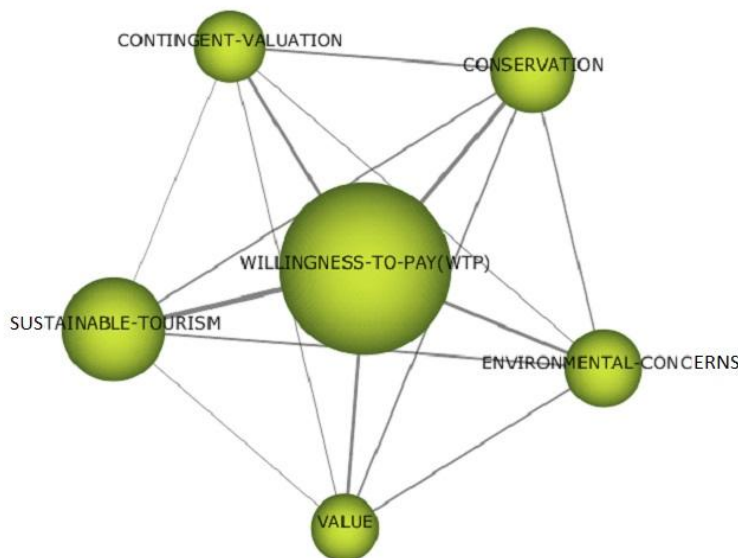
Taken together, the strategic diagram not only captures the current configuration of the field but also illuminates its internal dynamics and thematic asymmetries. It serves as a guide for identifying core strengths and areas of opportunity within the evolving discourse on WTP and sustainable tourism.

To deepen this understanding, the following section presents a detailed examination of the main thematic clusters identified through co-word analysis. Each cluster is explored in terms of its centrality and density, internal keyword relationships, and contribution to the conceptual development of the field. The clusters are introduced individually, starting with the most dominant motor theme—Willingness to Pay—followed by key areas such as Biodiversity, Consumer behaviour, and Carbon emissions.

3.3 Cluster Willingness to Pay

As mentioned, the "Willingness to Pay" (WTP) cluster (Figure 2) emerges as a motor theme in the study of sustainable tourism, reflecting its centrality and well-developed nature within the field. As a prominent node in thematic visualizations, its size and connections signify its importance and the extensive research dedicated to this topic. WTP is strongly linked to key concepts such as "sustainable tourism," "conservation," and "contingent valuation," forming an interconnected framework that emphasizes its relevance in promoting sustainability. These connections reveal how WTP acts as a mechanism to align economic contributions with environmental and social goals.

Figure 2. Cluster Willingness to pay



Source: from SciMAT.

The relationship between WTP and conservation is particularly notable, emphasizing how tourists' financial contributions can support initiatives that mitigate the environmental impacts of tourism, including biodiversity preservation and natural habitat conservation (Diez-Gutierrez & Babri, 2022; Bigerna et al., 2019). Similarly, the link between WTP and sustainable tourism reflects its role in funding practices and policies that ensure long-term, environmentally responsible tourism development. This

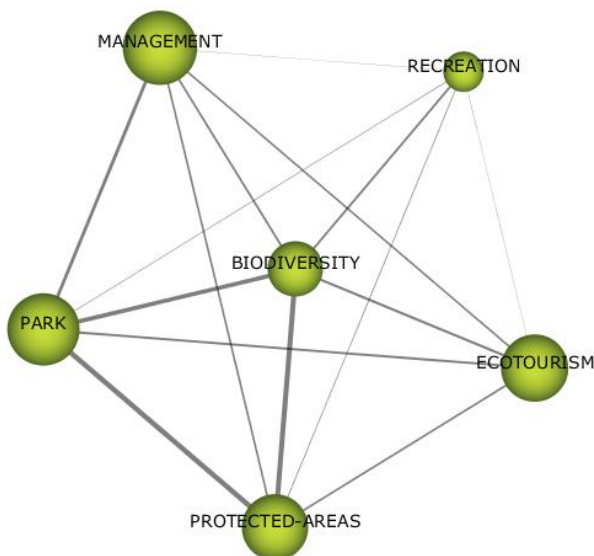
connection underscores the importance of financial support for initiatives that reduce negative impacts on ecosystems and promote sustainable practices across the tourism sector.

The methodological connection to "contingent valuation" demonstrates the use of robust tools to estimate WTP and identify non-market values relevant to sustainability goals (Pulido-Fernández, 2017 & López-Sánchez; Bai & Zhang, 2021).

3.4 Cluster Biodiversity

The biodiversity cluster highlights its foundational role in sustainable tourism and environmental conservation, forming an interconnected network of themes such as protected areas, parks, ecotourism, recreation, and management (Figure 3). These elements collectively emphasize biodiversity's centrality in preserving ecosystems while fostering sustainable tourism practices.

Figure 3: Biodiversity



Source: from SciMAT.

The strong links between biodiversity, protected areas, and parks illustrate their mutual dependency, with protected areas safeguarding biodiversity and enhancing their appeal as tourism destinations (Singh et al., 2020). Similarly, the connection between biodiversity and ecotourism underscores how the preservation of natural ecosystems attracts visitors while supporting conservation and community involvement (Samal & Dash, 2023). However, careful management is required to ensure that ecotourism's benefits do not lead to environmental degradation (Reddy & Wilkes, 2012).

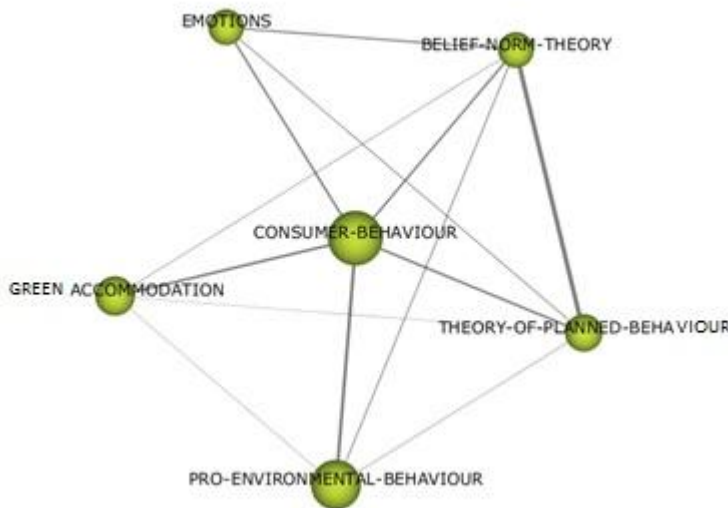
Management acts as a central node, balancing tourism development with conservation objectives through strategies such as visitor regulation and adaptive frameworks (Saayman & Saayman, 2017). Recreation plays a supporting role in this cluster, as activities like hiking and birdwatching depend on biodiversity to provide meaningful experiences. Nevertheless, sustainable practices in recreational activities are essential to minimize ecological impacts (Grilli et al., 2021).

This cluster underscores the interconnectedness of biodiversity with key themes, highlighting the need to strengthen relationships involving recreation and management. Integrating recreational activities into conservation frameworks and promoting sustainable ecotourism can enhance their positive impacts on biodiversity while contributing to long-term sustainability goals (Singh et al., 2020; Samal & Dash 2023).

3.5 Cluster Consumer Behaviour

The cluster centred on consumer behaviour reveals a complex interplay of psychological, social, and environmental factors that influence sustainable decision-making. Consumer behaviour emerges as a central theme, strongly connected to key components such as emotions, belief-norm theory, the theory of planned behaviour, pro-environmental behaviour, and green accommodation (Figure 4). These interconnections emphasize the pivotal role of understanding consumer behaviour to promote sustainable practices.

Figure 4: Consumer behaviour



Source: from SciMAT

The connection between consumer behaviour and emotions highlights the significant influence of affective factors like guilt, pride, and empathy in shaping sustainable choices. These emotions often bridge to belief-norm theory, which underscores the motivational role of deeply held personal norms in driving pro-environmental actions (Onwezen et al., 2013). Belief-norm theory itself serves as a critical node, interacting strongly with the theory of planned behaviour and providing a moral foundation for understanding sustainable consumer decisions (Han et al. 2016).

The theory of planned behaviour emerges as another central element, integrating attitudes, subjective norms, and perceived behavioural control to predict sustainable intentions. Its strong connection to consumer behaviour and belief-norm theory demonstrates its relevance in fostering environmentally responsible actions, such as choosing green accommodations or adopting eco-friendly practices (Ajzen, 2020; Steg et al., 2014).

Pro-environmental behaviour, though primarily focused on direct environmental actions like waste reduction or energy conservation, reflects its connection to consumer behaviour and the theory of planned behaviour. However, weaker links to green accommodation and belief-norm theory suggest a specialized rather than integrative role within the cluster (Vermeir & Verbeke, 2006).

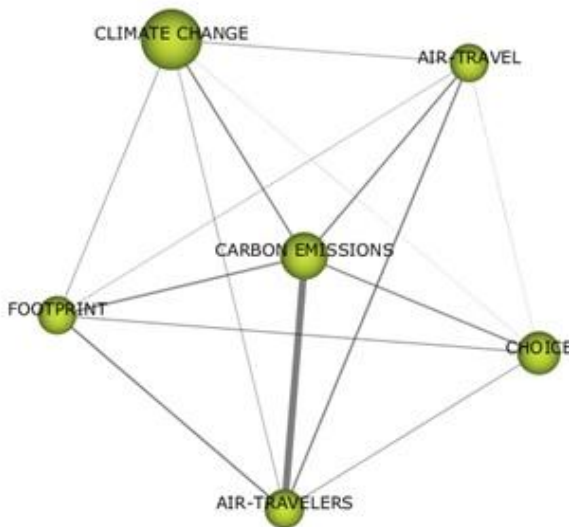
Green accommodation, while a peripheral node, connects significantly to consumer behaviour and the theory of planned behaviour, illustrating the growing importance of eco-friendly lodging choices in sustainable tourism. This connection highlights practical considerations such as certifications and sustainability practices in influencing decisions, with less emphasis on emotional or moral drivers (Rahman & Reynolds, 2016).

This cluster underscores the interconnected nature of psychological and behavioural theories with practical applications, highlighting consumer behaviour's centrality in advancing sustainable decision-making and guiding future strategies in sustainability research and practice

3.6 Carbon Emission

The Carbon Emissions cluster plays a central role in the literature on Willingness to Pay (WTP) for sustainability in tourism. This cluster is classified as well-developed, demonstrating strong internal coherence and significant influence across related themes such as Air Travelers, Footprint, Air Travel, Choice, and Climate Change (Figure 5).

Figure 5: Carbon emission



Source: from SciMAT

At the core of the cluster lies the robust connection between Carbon Emissions and Air Travelers, emphasizing the critical role of individual behaviour in mitigating tourism's environmental impact Babakhani et al. (2017). Another strong link exists between Carbon Emissions and Footprint, reflecting the measurable impact of tourism activities on the environment. Duff and Lenox (2021) emphasize the importance of quantifying tourism's ecological footprint as a foundation for sustainable decision-

making and policy development. This relationship highlights the necessity of transparent reporting mechanisms to foster accountability within the tourism sector.

The connections between Air Travel, Choice, and Climate Change illustrate moderate interdependencies within the cluster. For instance, Choi and Ritchie (2014) argue that consumer willingness to pay for carbon offset programs is shaped by the visibility and ease of offset options. Additionally, the relationship between Air Travel and Climate Change reflects the alignment of aviation practices with broader climate goals. Tyers (2018) underscores the significance of integrating aviation behaviours into climate mitigation frameworks, including the adoption of alternative fuels and emissions caps, to address the tourism sector's contribution to climate change.

Weaker, yet significant, links are observed between Choice and Climate Change, suggesting the indirect role of individual preferences in addressing global environmental challenge. For example, Crosby et al. (2024) argue that systemic changes in tourism infrastructure and consumer education are essential for promoting climate-conscious travel behaviours. These weaker connections highlight the potential cumulative impact of small-scale decisions, such as selecting eco-friendly travel options, on achieving broader sustainability objectives.

Moreover, the interplay between Air Travel, Choice, and Air Travelers demonstrates synergies in fostering sustainable travel practices. Babakhani et al. (2017) note that the connection between these elements is strengthened when consumers are presented with tangible and straightforward options for reducing their carbon footprint, such as offsetting programs and clear environmental benefits associated with their choices.

The Carbon Emissions cluster is pivotal in the discourse on sustainable tourism. Its strong connections to other themes emphasize the need for holistic strategies that integrate consumer behaviour, industry accountability, and policy measures. This cluster serves as a cornerstone for advancing sustainability in tourism, focusing on actionable solutions to mitigate its environmental impact effectively.

4. Discussion and Conclusion

This study provides a comprehensive exploration of the academic landscape surrounding willingness to pay (WTP) for sustainability in tourism, using co-word analysis as a method to reveal the field's conceptual structure. Based on 173 peer-reviewed articles indexed in Web of Science, the analysis aimed to fulfill two primary objectives: first, to identify the dominant themes in WTP-related research within tourism; and second, to offer a structured understanding of how these themes are interrelated and positioned within the broader discourse on sustainable tourism.

The findings confirm that WTP functions as the thematic nucleus of this body of literature, both conceptually and methodologically. The high centrality and density values associated with the WTP cluster indicate its deep integration into the field's intellectual fabric. This reflects sustained scholarly interest in how tourists' economic decisions can directly support sustainable practices, including environmental conservation, community well-being, and low-impact development. WTP thus operates not merely as a behavioural indicator, but as a critical link between market mechanisms and sustainability goals.

Closely associated with WTP, the cluster on biodiversity emerges as another central pillar of the research field. Its strong network connections—with themes such as protected areas, recreation, ecotourism, and management—suggest that biodiversity is not only a key beneficiary of tourists' financial contributions, but also a structuring element of sustainable tourism products. The coherence of this cluster points to a well-established recognition that conservation outcomes depend in part on effective financial engagement from tourists, and that such engagement is influenced by how biodiversity is framed within tourism experiences.

Another prominent cluster is carbon emissions, which exhibits moderate centrality but high internal cohesion. This suggests that while carbon-related issues may not be as widely interconnected as WTP or biodiversity, the body of work addressing tourism's contribution to climate change—particularly through air travel—has developed clear thematic boundaries. The robust internal structure of this cluster reflects an increasing precision in the way scholars assess tourists' carbon footprints, preferences for offsetting schemes, and attitudes toward mitigation efforts. The tangible and urgent nature of climate change has arguably contributed to the methodological and theoretical maturity of this cluster.

The theme of consumer behaviour further enriches the WTP discourse by introducing psychological, emotional, and cognitive dimensions to the analysis of sustainable choices. Although its density is slightly lower than the core clusters, consumer behaviour acts as a conceptual bridge, connecting economic willingness with deeper value structures and belief systems. Constructs such as the theory of planned behaviour, norm-activation theory, and emotional triggers (e.g., pride, guilt, empathy) feature prominently in this cluster. This reveals a shift in the literature from viewing tourists as purely rational agents to recognizing the nuanced drivers of sustainable consumption.

Despite the presence of well-developed and central clusters, the study also highlights thematic asymmetries within the field. For instance, the theme of sustainability, while frequently cited and broadly relevant, is characterized by high centrality but low density. This indicates a widespread but often superficial use of the term, lacking in conceptual refinement or methodological specificity. Sustainability is frequently referenced as a guiding principle, yet the diversity of interpretations and applications reduces its analytical coherence. This observation underscores the need for greater precision in how sustainability is framed and operationalized in studies of tourist behaviour and financial commitment.

Moreover, a number of themes—such as fees, festivals, China, and knowledge—appear on the periphery of the research network, with low centrality and density. While these clusters are less developed and less connected, their presence suggests thematic experimentation within the literature. For example, although conservation fees represent a practical application of WTP, the limited cohesion of this cluster reflects fragmented treatment across studies, perhaps due to contextual variability or inconsistent policy analysis. Likewise, cultural or regional dimensions (e.g., studies specific to China) remain largely isolated, pointing to a lack of integration with global theoretical frameworks.

The methodological dimension of the field is also visible in the Hybrid-Choice-Model cluster, which occupies a position of both conceptual depth and connectivity. This reflects a growing interest in combining qualitative insights with quantitative rigor to capture the latent variables that influence WTP. The presence of this theme signals the increasing sophistication of research tools employed to understand the complexity of tourists' financial decisions in the context of sustainability.

Taken together, the results of this co-word analysis reveal a research field that is mature in its core yet fragmented at its margins. The dominant themes—WTP, biodiversity, carbon emissions, and consumer behaviour—form a stable conceptual nucleus, supported by recurring theoretical frameworks and empirical validation. Around this core, however, orbit a range of less integrated topics suggest either emerging interests or conceptual dispersion.

This study not only confirms the centrality of WTP in sustainable tourism research but also elucidates the thematic architecture that supports and surrounds it. By mapping the field's internal structure, this research enhances our understanding of how economic, environmental, and psychological dimensions interact in shaping tourists' financial engagement with sustainability. The findings provide a critical reference point for scholars, practitioners, and policymakers seeking to align tourism development with environmental stewardship and responsible consumption. As such, WTP continues to stand as a vital lens through which the evolving relationship between tourism and sustainability can be examined, understood, and acted upon.

5. Future research and limitations

This analysis also highlights areas for future research. The relatively lower centrality and density of clusters such as "Festival" and "Fees" suggest opportunities to explore their connections with sustainability in greater depth. For instance, future studies could examine how festivals contribute to community engagement and environmental awareness, or how entrance fees can be optimized to balance visitor access with conservation funding. Additionally, the role of emerging technologies, such as digital platforms and smart tourism solutions, could be investigated to enhance the effectiveness of sustainability initiatives across all clusters.

The analysis of centrality and density of clusters generated by SciMAT provides a valuable framework for identifying thematic priorities and guiding future research in sustainable tourism. Key topics such as willingness to pay, biodiversity, and carbon emissions emerge as critical areas of focus, supported by recent studies that highlight their theoretical and practical significance (Fichter et al., 2023; Saayman & Saayman, 2017; Babakhani et al., 2017; López-Sánchez & Pulido-Fernández, 2016). By addressing these themes, researchers and practitioners can develop more effective strategies to promote sustainability, enhance tourist experiences, and ensure the long-term viability of tourism destinations.

Future research should address gaps in understanding the long-term impacts of WTP-driven policies on local communities and ecosystems. Moreover, interdisciplinary approaches that combine economic, social, and technological perspectives could provide holistic solutions to the challenges of sustainable tourism.

Although the analysis is based solely on Web of Science data and a manually curated keyword standardization process, this focused approach ensured the inclusion of high-quality sources and allowed for a more precise thematic mapping—while also opening avenues for future research to expand the scope across other databases and multilingual contexts.

Acknowledgements

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(Title, Abstract and Keywords in Spanish)

Explorando la disposición a pagar por la sostenibilidad en el turismo: Un análisis de coocurrencia de palabras en la revisión de la literatura

Sandra Moroy-Rodríguez^{1*} , Daniela Thiel-Ellul² , Ana Fernández-Ardavín³ 

¹ Universidad Complutense de Madrid, España. mmonro02@ucm.es

² Universidad Nebrija, España. dthiel@nebrija.es

³ Universidad Nebrija, España. afernandezardavin@nebrija.es

Publicado el 20 de noviembre de 2025.

Resumen

Este estudio presenta un análisis bibliométrico y de coocurrencia de palabras exhaustivo de la literatura académica sobre la disposición a pagar (DAP) de los turistas por la sostenibilidad en el turismo. Mediante una revisión sistemática de 173 artículos indexados en Web of Science y analizados con SciMAT, trazamos un mapa conceptual de la DAP, identificando temas dominantes y lagunas de investigación. Los resultados revelan que la DAP es un tema central, fundamental para comprender el apoyo financiero a la conservación y las prácticas sostenibles, estrechamente vinculado a la biodiversidad, el comportamiento del consumidor y las emisiones de carbono. Grupos temáticos como los modelos de elección híbrida y los servicios ecosistémicos subrayan la intersección de las dimensiones ambientales, económicas y psicológicas en el turismo sostenible. Nuestro análisis muestra que la DAP está impulsada por factores sociodemográficos, la conciencia ambiental y el impacto percibido de las contribuciones. Si bien las tasas de conservación y las ecoetiquetas fomentan respuestas positivas, las barreras conductuales y la limitada confianza en la transparencia de las políticas pueden obstaculizar la participación. Áreas emergentes y poco desarrolladas —como los eventos culturales y los sesgos psicológicos— sugieren direcciones prometedoras para futuras investigaciones. Concluimos proponiendo una agenda de investigación que integra la economía conductual, la psicología ambiental y la innovación digital para profundizar en la comprensión del compromiso financiero de los turistas con la sostenibilidad. Este artículo aporta nuevas perspectivas al combinar el mapeo bibliométrico con la interpretación cualitativa, ofreciendo una hoja de ruta para impulsar la investigación y la práctica del turismo sostenible.

Palabras clave: Disposición a pagar (DAP), Turismo sostenible, Análisis de coocurrencia de palabras, Conciencia ambiental.

<https://doi.org/10.64976/jbtm.8>