

The Role of Birdwatching as a Sustainable Tourism Strategy: A Literature Review

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Abstract: The purpose of this article is to examine the conceptualisation and evolution of birdwatching as an activity of nature tourism, drawing upon existing literature. A bibliometric analysis was conducted. The Scopus database was used, resulting in the selection of 47 relevant studies. This study identifies the key components (factors, drivers, and future research) necessary for fostering development of birdwatching as a sustainable strategy. The present study initiated with the existing literature on Nature-based tourism as defined by the UNWTO (World Tourism Organization) classification, starting with the theoretical proposals. The analysis focused on renowned journals on the topic, according to the Scimago Journal & Country Rank (SJR), from 2020 to 2023. The findings show that studies on Nature-based tourism and birdwatching published in the last four years are mainly related to conservation, ecotourism and ecosystems. The results of the present research show varied information with respect to approaches towards birdwatching, the opportunities and the challenges.

Keywords: Nature tourism; Birdwatching; Ornithological tourism; Ecotourism; Sustainability.

El rol del avistamiento de aves como estrategia del turismo sostenible: un análisis de la literatura

Resumen: El propósito de este artículo es examinar la conceptualización y evolución del avistamiento de aves como una actividad de turismo natural, basándose en la literatura existente. Se realizó un análisis bibliométrico utilizando la base de datos Scopus, lo que resultó en la selección de 47 estudios relevantes. Este estudio identifica los componentes clave (factores, impulsores e investigaciones futuras) necesarios para fomentar el desarrollo de la observación de aves como una estrategia sostenible. El estudio actual comienza con la literatura existente sobre el turismo basado en la naturaleza siguiendo la clasificación de la OMT (Organización Mundial del Turismo), comenzando con las propuestas teóricas. El análisis se centró en revistas reconocidas en el tema, según el Índice de Países y Revistas Scimago (SJR), desde 2020 hasta 2023. Los hallazgos muestran que los estudios sobre turismo basado en la naturaleza y observación de aves publicados en los últimos cuatro años están principalmente relacionados con la conservación, el ecoturismo y el ecosistema. Los resultados de la presente investigación muestran información variada sobre enfoques de observación de aves, oportunidades y desafíos analizados a lo largo del tiempo.

Palabras clave: Turismo de naturaleza; Observación de aves; Aviturismo; Ecoturismo; Sostenibilidad.

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1. Introduction

Tourism is global industry that has developed and increased during last decades, competing with worldwide tourism destinations. Tourism has growth due to transportation services, globalization, and facilities for travelling long distances, among others (Zuñiga-Collazos, 2015). Nature-based tourism has been a fast-growing segment in the international tourism market. The main characteristics of some destinations falls in their human-made attractions such as their cultural or historical background. Nature destinations are recognized for their natural assets including lakes, mountains and forests, beaches and natural environment. The impact of the sector is popular topic in research and is now receiving increasing attention among scholars and academics, understanding that tourism sector could strengthen the national economy, but also has to be careful of protecting natural resources.

Nature-based tourism has grown progressively in natural protected areas where there are human settlements, rural and peripheral areas, and it is estimated to be a rapidly expanding sector, especially on the natural destinations with great diversity on flora and fauna. Although interests vary, the most popular activities in Latin America are to travel areas and observe nature, birds (birdwatching) and other animals, photograph nature, climb, or visit mountainous areas, including, river tours with kayaking, among other modalities with all kinds of combinations of activities to do (Harrill et al., 2023).

Tourism, when undertaken in rural settings, can have a significant impact on the social, environmental, and economic balance. This equilibrium is often maintained by the small-scale nature of local businesses, a low population density, and the high environmental quality of the ecosystems. Therefore, it is crucial to carefully plan the development of tourism in rural areas to prevent it from becoming a high-impact activity that could harm natural zones, its diversity, the authenticity and sustainability of local rural economies (Di-Clemente et al., 2020). In the realm of tourism, policymakers often focus on promoting its growth by creating favorable conditions, but this approach can result in tourism having a notable impact on the environment, as well as on social and cultural structures and dynamics (Afthanorhan et al., 2017)

The research problem addressed in this study centers on the increasing relevance of sustainable tourism activities in the research domain. The project contributes to understanding the evolution of sustainable tourism concepts and how they can be approached as strategies to create local community impact. The study objective is to analyze and evaluate the sustainable tourism activity of birdwatching, focusing on its future in terms of work clusters and research lines. Key findings indicate that birdwatchers value habitat quality and biodiversity over infrastructure, suggesting that tourism development should prioritize environmental conservation. The study concludes that integrating birdwatching with local community involvement and environmental education can foster sustainable tourism practices and support biodiversity conservation. Also contributes to the understanding of how birdwatching can be both an attractive tourism activity and a means to promote environmental sustainability.

In order to analyze the progress of nature based- tourism, it has been realized a literature review of the 4 years (2020-2023). This paper aims to analyze the evolution of this kind of tourism from pandemic to now. Consequently, the authors have been able to verify publications in recognized journals in JCR about the research on this topic. The study used the electronic database Scopus. The present article includes different sections; starts presenting some of the main definitions of the nature-based tourism (NBT). Secondly, such conceptualization allows identifying the types of NBT. Thirdly, the authors examine the concept using a bibliometric technique. Fourth, the authors analyze drivers and main question that leads to future research. Finally, comprehending the concept, the authors present conclusions.

2. Literature Review

According to Konu (2015), the idea of developing Nature-based tourism is allowed tourist to enjoy different nature-based activities while local stakeholders increase economic benefits and create new entrepreneurs on the area. Over the past years the academics have studied NBT focusing on market or tourism segmentation (Wanga et al., 2018), travel behavior -norms and planning- (Kim & Thapa, 2018), tourism benefit (Palacio, 1997), planning, development, policy and impacts (Zhang & Chang, 2016) travel motivations (Meric & Hunt, 1998). Below, in Table 1, some of the proposed definitions for nature-based tourism (NBT) are presented.

Table 1: Conceptualization of Nature-based tourism

Proposal	Authors	Year
Nature-based tourism is frequently used synonymously with terms such as eco, sustainable, green, alternative and responsible tourism.	Priskin	2001
The authors define “ecotourism or nature-based tourism activities respond to people’s desire to participate in tours with different aims such as relaxation, discovery, learning and escaping to nature, and getting away from the routine of everyday life” (p.199).	Alaeddinogu & Can	2011
This kind of tourism is based on the natural environment of the destination. Its main concern is about the sustainable development of tourism products associated with nature and respecting the environment.	Perez et al.,	2013
The authors defined as “leisure travel undertaken largely or solely for the purpose of enjoying natural attractions and engaging in a variety of outdoor activities” (p.1)	Tyrväinena et al.,	2014
The authors understand NBT as a form of enjoy nature-based adventure tourism and wildlife potentials on the destination.	Tirasattayapitak et al.,	2015
“Nature tourism is used and defined as, leisure travels beyond ordinary visit to conventional tourism spots, but to the countryside of the place with natural or cultural value. That experiences and activities are nature-oriented with minimal impacts” (p.88). The authors consider ecotourism as an example of NBT.	Chiu et al.,	2016
NBT is defined as an environmental or ecological tourism. It may be considered as ecotourism.	Margaryan & Stensland	2017
NBT experience providers relate their products to natural resources through several dimensions, thereby making connections with physical (e.g., access and facilitation), social (e.g., risk and volume management), and cultural (e.g., connection to place) aspects of the experience scape.	Fossgard & Fredman	2019

According to Kim & Thapa (2018), Nature-based tourism should balance locals needs (economics and socials) and environmental sustainability; based on the above this kind of tourism should focus on the application of tourism principles for environmental maintenance and teaching responsible behaviors during tourist’s visits, understanding the influence to the behavior on the natural diversity and environment. Nature-based tourism implicates both local stakeholders and tourist participations on the biodiversity conservation efforts; also, locals may play an important role as promoters of the area (Divinagracia, et al., 2012; Chiu et al., 2016).

Based on the definition of Nature-based tourism, some authors have also identified negative consequences because of the visits. According to Perez-Jorge et al. (2017) destinations based on NBT may experience threats for nature population and some disturbance to the natural environment, which implicates the development of a sustainable management (including monitoring the nature demographic population), and the establishment of operator guidelines. For the authors Rahayuningsih et al. (2016) NBT should be well de-signed and planned as a vital requisite for tourism development. Without the correct management, the destination can lose focus and become vulnerable to negative impacts, especially environmental.

2.1. Types of nature-based tourism: Classification

One of the most recognized activities is ecotourism that allows visitors to enjoy natural areas, while conserving the natural environment and sustainability of the community; this type of tourism may involve education and interpretation (Hunt & Harbor, 2019). The characteristics involve a high pro-environmental attitude during visits (reducing negative impacts to natural environment, protecting natural areas), considering the relevance on conserving environment and affecting positively (economically and socially) to local communities. Ecotourism generally implicates a small group of tourists manage through small local companies. The tourism activity contributes as an economic alternative to conservation of biodiversity, and especially as an income source for maintaining protected areas. See table 2 for classification:

Table 2: Classification of nature-based tourism

Classification	Definition	Year	Author
Rural Tourism: in nature	The rural tourism refers to an activity where the tourist experiences different products related to nature-base activities, lifestyle, culture, agriculture and sightseeing.	2019	UNWTO
Adventure tourism: about nature	“Adventure tourism is a type of tourism which usually takes place in destinations with specific geographic features and landscape and tends to be associated with a physical activity, cultural exchange, interaction and engagement with nature. This experience may involve some kind of real or perceived risk and may require significant physical and/or mental effort” (UNWTO, 2019, p.36).	2019	UNWTO
Ecotourism: for nature	“Ecotourism is a type of nature-based tourism activity in which the visitor’s essential motivation is to observe, learn, discover, experience and appreciate biological and cultural diversity with a responsible attitude to protect the integrity of the ecosystem and enhance the well-being of the local community” (UNWTO, 2019, p.32).	2019	UNWTO
Mountain tourism	“Mountain tourism is a type of tourism activity which takes place in a defined and limited geographical space such as hills or mountains with distinctive characteristics and attributes that are inherent to a specific landscape, topography, climate, biodiversity (flora and fauna) and local community” (UNWTO, 2019, p.50).	2019	UNWTO

Other classification is rural tourism activities, which allows tourist to experience in non-urban rural areas where it can be found low population, culture and traditional lifestyles, and landscapes dominated by biodiversity and agriculture. This type of tourism follows the principle of sustainability, looking for a balance between actual needs and future generations (Divinagracia et al., 2012). Also, may involve activities as birdwatching (birds observation), ethnotourism (cultural visits to indigenous people, visits to communities in natural attractions), agrotourism (visits to agricultural zones for learning about farmers society and its techniques), mystic tours (culturally live legends and rituals), wildlife safaris, rural photography, ecoarchaeology (visits to archeological zones) (García-Jiménez et al., 2022).

3. Methods

The present analysis of nature-based tourism focused on birdwatching literature began with the identification of articles using a search protocol (see fig. 1) with “ecotourism AND birdwatching” (15 articles), “Nature tourism AND birdwatching” (2 articles), “birdwatching and tourism” (31 articles), “avitourism” (13 articles) as keywords. This search yielded a total 61 articles over the 2020-2023 period, however 14 articles were deleted as being repeated. This approach allowed the capture of the multifaceted nature of the concept topic in relation to other areas of the tourism domain. In adherence to the bibliometric practice, articles were tagged when the search term appeared in either the title, keywords or abstract. As a rule, only published articles in journals were selected (written in English) from Scopus. Book reviews, conferences papers, editorials and notes were excluded (See table 3). This use of a designated search term has established precedence in co-citation studies examining specific aspects of the literature (Schildt et al., 2006). A co-occurrence analysis is carried out using the Vosviewer System and data coding from Atlas TI.

Figure 1: Literature search strategy.

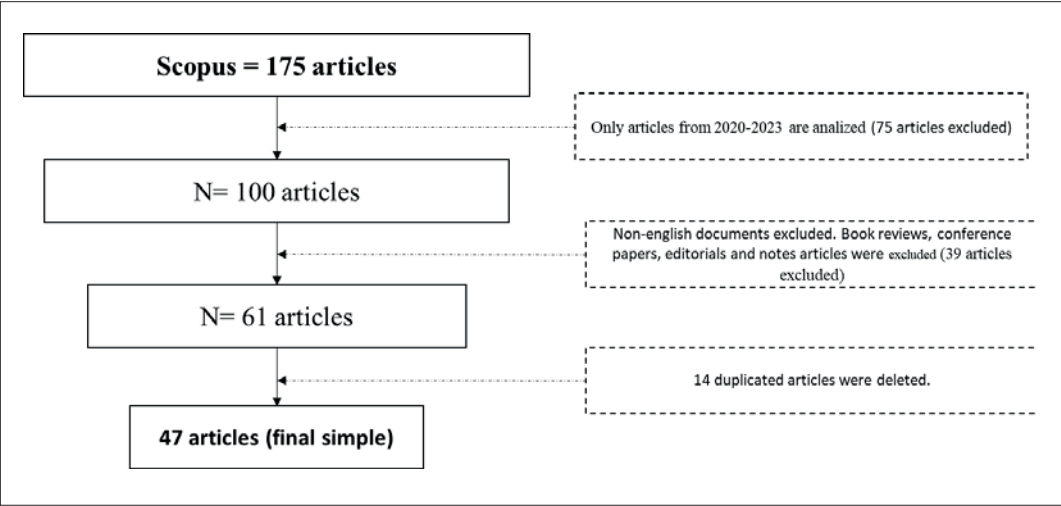


Table 3: Articles characteristics.

Articles Characteristics	N=47	%
Year of publication		
2020	8	17%
2021	10	21%
2022	12	26%
2023	17	36%
Most 5 cited authors		
Ghermandi A., Camacho-Valdez V., Trejo-Espinosa H.	82	37%
Dileep Kumar M., Govindarajo N.S., Khen M.H.S.	15	7%
Echeverri A., Smith J.R., MacArthur-Waltz D., Lauck K.S., Anderson C.B., Vargas R.M., Quesada I.A., Wood S.A., Chaplin-Kramer R., Daily G.C.	14	6%
Morán-Ordóñez A., Hermoso V., Martínez-Salinas A.	14	6%
Su K., Ren J., Qin Y., Hou Y., Wen Y.	13	6%
Total	224	
Citation per year		
2020	129	24%
2021	28	29%
2022	53	26%
2023	14	21%
Total	224	100%

3. Results

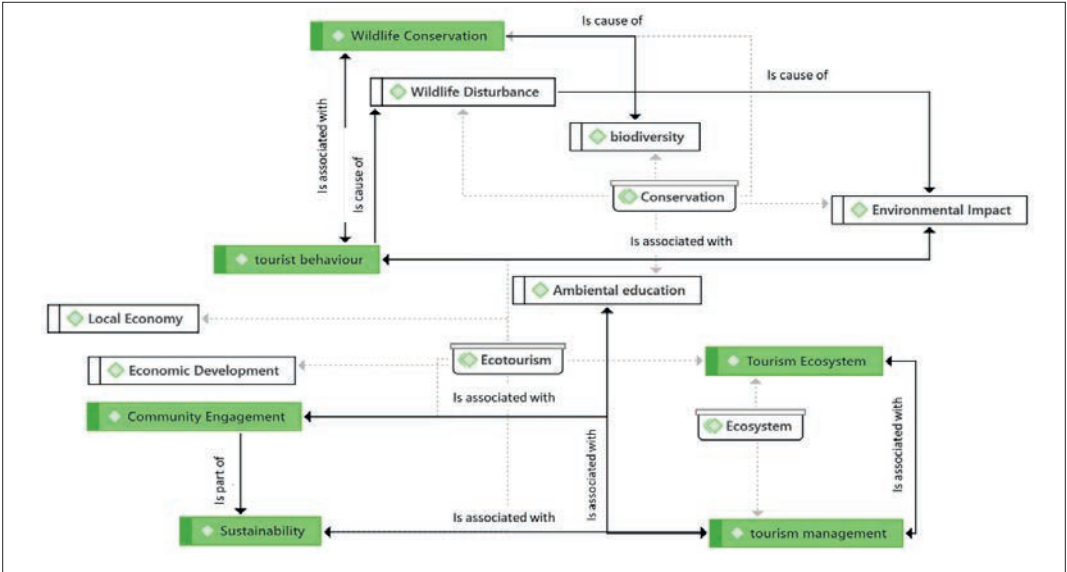
The co-occurrence analysis of the keywords (Figure 2) in the reviewed studies showed that the most frequently repeated terms include, those related to birdwatching, ecotourism, avitourism, bird, human,

Table 4: Cluster Analysis

Keyword cluster	Authors	Main Research Perspectives
Cluster 1: conservation Animal, Biodiversity, Birds, Conservation, Conservation of natural, Ecosystem, Environmental protection, Human, Nonhuman, Species conservation, Tourism	(Aas et al., 2023; Alexandrino et al., 2022; Conradie & Zyl, 2021; González Barahona et al., 2021; Iswandaru et al., 2023; John & Kiwango, 2021; Koki, 2021; Kruger & Viljoen, 2023; Luzuriaga-Aveiga & Cisneros-Heredia, 2022; Maniatis et al., 2020; Morán-Ordóñez et al., 2022; Mosisa et al., 2023; Ortega-Álvarez & Calderón-Parra, 2021; Pahlad & Procheş, 2021; Qiao et al., 2023; Rurangwa & Whittaker, 2020; Sánchez-Rivero et al., 2020; Ghermandi et al., 2020; Silva et al., 2022; Stocco & Pranovi, 2023; Su et al., 2020; Tan et al., 2023; Xu et al., 2023; Zheng et al., 2022)	From a conservation perspective, sustainability is a fundamental concept when considering the development of tourism involving wildlife, due to the impact it can have on the habitat. Discussions have arisen regarding the artificial feeding of birds and how this can generate both positive and negative effects. It is recommended to promote environmental education through intervention programs among the population, especially with young people, to encourage the biodiversity of birds, their habitats, and, consequently, birdwatching tourism in destinations.
Cluster 2: Ecotourism Avitourism, Birding, Birdwatching, China, Destination loyalty, Ecotourism, Recreational activity, Sustainable development, Tourism management, Tourism destination	(Dileep Kumar et al., 2020; Dybsand et al., 2023; Echeverri et al., 2022; Harrill et al., 2023; Janeczko et al., 2021; Lestari et al., 2023; Liu et al., 2021; Minic, 2022; Mokhli et al., 2023; Mokhter et al., 2022; Randler et al., 2023; Ren et al., 2022; Rolim et al., 2021; Schwoerer & Dawson, 2022; Stemmer (formerly Jathe) et al., 2022; Trisić et al., 2023)	As a tourist activity, birdwatching has been gaining increasing relevance, especially with a deeper understanding of the characteristics of the activity that are linked to environmental conservation and sustainability. Natural features, such as the characteristics and behaviors of birds, become part of the tourist attractions, creating an appeal that promotes the development of ecotourism through biodiversity conservation. Birdwatchers highly value the observation of endemic or migratory birds, and the potential of conservation campaigns should be explored in future long-term initiatives. Over time, birdwatching is recognized as an activity that generates economic development, in addition to acknowledging the role of the community in supporting habitat preservation.
Cluster 3: Ecosystem Ecosystem service, Tourism destination, Ecotourism, Biodiversity, Natural Ecosystem	(Boruah et al., 2021; Callaghan et al., 2020; García-Jiménez et al., 2022; Ghermandi et al., 2020; Pease et al., 2023; Stocco & Pranovi, 2023)	There is a connection between infrastructure investments and biodiversity conservation for the economic success of tourism. It emphasizes the importance of understanding visitor patterns and benefits for sustainable destination management. The articles underscore the significance of bird diversity, promoting ecotourism, local economic development, and job opportunities. Challenges, such as the need for optimal support for avitourism in conservation areas, are mentioned, alongside the importance of infrastructure development for future birdwatching activities. The study supports the role of emotions in influencing recommendations, emphasizing the need for positioning strategies based on emotional connections. Managing birdwatching activities requires understanding enthusiasts' attitudes, and long-term conservation strategies, including ecotourism in protected areas, are recommended.

The studies underscore the integral connection between ecotourism, bird biodiversity, and environmental conservation (see Figure 3). Emphasizing the importance of minimizing negative impacts on wildlife. Emotional connections formed during bird encounters can stimulate reflections on environmental challenges, highlighting the potential of birdwatching as an ecotourism activity. The significance of quantifying biodiversity values for informed land development decisions is reiterated. Encouragingly, birdwatching, with its focus on typical bird characteristics and habitats, emerges as a key attraction, promoting ecotourism development and contributing to local economic growth. The study emphasizes the need for environmental education, especially among the youth, to foster bird biodiversity, habitats, and avitourism. Furthermore, avitourism is recognized as a contributor to environmental conservation, education, and local community engagement. The call for long-term strategies, such as implementing ecotourism in protected areas, reflects a commitment to sustaining birdwatching activities while preserving bird habitats. Ultimately, the studies analyzed advocated for a comprehensive approach, blending economic development with ecological preservation, to harness the potential of birdwatching as a sustainable and enriching ecotourism activity (see Table 5).

Figure 3: Cluster Analysis Network



Based on the cluster identification, a coding process of the analyzed texts is carried out, among which the main study topics analyzed during the period from 2020 to 2023 are identified, which are addressed in the following table:

Table 5: Main Coded Analysis Themes

Codification	Comments and analysis
Wildlife Conservation / Disturbance	Tourists' immersive experience with birds in their natural environment is characterized by a non-intrusive approach, elicits emotional responses that may trigger contemplation on environmental challenges and the importance of nature conservation. The studies emphasize the dual impact of feeding wild birds through feeders, acknowledging both positive and negative effects. Additionally, the identification of typical bird characteristics, habitats, and seasonal patterns can transform birdwatching into compelling attractions for travelers and nature enthusiasts, contributing to the advancement of ecotourism initiatives and the preservation of bird diversity. The studies underscore the high value placed by birdwatchers on observing vagrant birds, suggesting potential for conservation campaigns related to long-staying vagrant bird occurrences. Finally, the growing acknowledgment of rural and indigenous communities as key participants in both wildlife ecotourism and biological monitoring programs highlights the need for collaborative efforts to promote sustainable practices and biodiversity conservation.
Environmental education	Encouraging the promotion of birdwatching in a tourism destination involves advocating for an intervention program focused on environmental education among the community, being the young people the most attractive group. This initiative aims to enhance awareness and understanding of bird biodiversity and their habitats as a requirement for development of tourism activity.
Biodiversity	It is crucial to accurately quantify biodiversity values and integrate them into forthcoming land development decisions. Furthermore, given the significant appreciation among birdwatchers for observing birds, there is potential for conservation campaigns to be explored during extended occurrences of birds in the future.
Community Engagement	Promoting a fervent interest in birds among the residents, a tourism destination is heralded as a strategy to generate widespread support for the preservation of bird habitats. To foster bird biodiversity, safeguard bird habitats, and promote avitourism in the destination, it is recommended to implement an environmental education intervention program targeted at the youth. Avitourism plays a vital role in environmental conservation by cultivating education and awareness about the environment, as well as encouraging the active involvement of local communities in the ecotourism industry.

Economic development / Local development	The destination that boasts a diverse bird population, are established as ideal ecotourism destinations that holds the potential to stimulate local economic growth and create employment opportunities. The profound emotional impact of these bird encounters can spark contemplation on environmental challenges and the need for nature conservation.
Ecotourism	Bird watching emerges as a compelling ecotourism activity, drawing in travelers and nature enthusiasts alike. The distinctive characteristics of birds, coupled with insights into their habitats and seasonal appearances, contribute to the creation of captivating bird-watching experiences. These experiences, in turn, serve as appealing attractions for travelers and nature enthusiasts, actively contributing to the development of ecotourism and fostering initiatives aimed at preserving the diversity of bird species.
Environmental impact	Tourists and destinations are prioritizing non-intrusive interactions with the environment to reduce environmental impacts that affects habitats and biodiversity. Additionally, the studies are exploring both the positive and negative effects associated with feeding wild birds using feeders and human interactions.
Sustainability	To enhance the sustainability of wildlife viewing tourism, there is a need for a deeper comprehension of tourist behavior that could potentially disturb and have adverse effects on wildlife, particularly birds. The tourists' purpose should be to appreciate birds in their natural environment while ensuring minimal impact. An understanding of the spatial patterns of visitation and the benefits derived by various types of visitors, whether drawn to natural or cultural heritage, holds significant implications for the sustainable management of these destinations.
Tourism Ecosystem	For tourism to yield economic revenue, investments in infrastructure should be complemented by effective biodiversity conservation efforts. It is crucial to comprehend the spatial patterns of visitation and the benefits received by diverse categories of tourists, whether attracted to natural or cultural heritage. Ecological birdwatching tourism, as an integral component of ecotourism, is an ecological product. Recognizing its recreational value is essential for enhancing human well-being and realizing the local advantages derived from ecosystem services in areas dedicated to biodiversity conservation, particularly in the case of bird species.
Tourism Management	The identification of typical bird characteristics, their habitats, and seasonal appearances can lead to the creation of compelling bird-watching attractions. These become engaging points of interest for travelers and nature enthusiasts, fostering the development of ecotourism and initiatives aimed at preserving bird diversity. The region's abundant bird biodiversity establishes it as an ideal ecotourism destination, with the potential to stimulate local economic development and job opportunities. In destinations surrounding conservation areas, optimal support is necessary to foster the development of avitourism, aiming to enhance welfare and curb illegal practices like bird hunting. To facilitate future birdwatching activities, the development of robust infrastructure enabling interaction with observation objects is imperative. The studies underscore the substantial impact of emotions and affections in increasing intentions of recommendation. Therefore, managers should formulate positioning strategies that leverage emotional connections to enhance the overall birdwatching experience. Managing this nature-based activity requires understanding birdwatchers' attitudes and behavior towards the natural environment.
Tourism behavior	Bird watching stands out as an appealing ecotourism activity for both travelers and nature enthusiasts. Birdwatching holds significant value among birdwatchers, and there is potential for conservation campaigns to be explored. Further insight into this specific subgroup of wildlife tourism participants can be gained through research on the motivations of birdwatchers and the intricate relationships between motivation, satisfaction, and destination loyalty. Despite the popularity of birdwatching, the precise motivations driving birders have not been thoroughly investigated. This gap in understanding calls for more comprehensive research to delve into the intricacies of what motivates individuals engaging in birdwatching activities.

4. Discussion

Over the last years, new forms of tourism have raised; birdwatching is a type of activity that has grown recently, based on the principles of economic development for rural areas and natural community conservation. The destinations characterized by great diversity of wildlife and species, has defined some sites or hotspots to be able to enjoy sighting using the specific characteristics of the landscape and the physical-natural features.

This kind of tourism tends to attract a tourist niche, which is characterized by the interest of birds; the attractiveness of the destination may vary with the bird community, the number of rare species, and the time-window to see bird population. Natural destinations have found in this type of tourism an interesting door to a viable tourism sector, which is raising constantly and getting more popularity among tourist seeking for new experiences (Ren et al., 2022) while enjoy and take care of the environment (Vas, 2017). Finally, birding can also provide positive economic benefits even for a single site or small community.

The literature on birdwatching tourism encompasses various themes, including the relationship between bird species rarity and recreational value, birdwatchers' preferences, and the economic and environmental

impacts of this activity. Studies by Booth et al. (2011) explored how the rarity of bird species influences tourists' willingness to travel long distances. Collins-Kreiner et al. (2013) found a correlation between the number of birds and the number of tourists in Agamon-Hula Park, although a higher influx of tourists could reduce bird presence. Guimaraes et al. (2015) identified that birdwatchers value habitat diversity and quality more than infrastructure. Vas (2017) studied birdwatching blogs in five English-speaking countries, identifying seven subpopulations of birdwatchers. McFadden et al. (2017) examined the responses of wintering waterbirds to the regular passage of a small boat dedicated to birdwatching tours in northern Spain.

Maldonado et al. (2018) estimated the economic benefits of birdwatching in Colombia, highlighting the involvement of local communities in important birdwatching areas. Santos et al. (2019) proposed a birdwatching potential index to measure the attractiveness of birdwatching hotspots, considering environmental conditions. Slater et al. (2019) explored the motivations of birdwatchers and bird photographers, finding that the latter are motivated by documenting species and sharing knowledge. Stemmer et al. (2022) conducted a choice experiment with birdwatchers in Varanger, Norway, identifying destination attributes that influence tourists' preferences. This comprehensive review highlights key factors influencing birdwatching tourism, from species rarity to habitat quality and the economic impact on local communities. Understanding these elements is crucial for developing sustainable tourism strategies that balance ecological preservation with economic benefits.

Birdwatching is a type of tourism recognized for the variety of birds and quality of the habitats, requiring little equipment and physical ability to enroll. In addition, is an activity related to sustainable principles as environmental conservation, ecotourism, nature-based tourism, reducing negative impacts of leisure, among others; Trend that are attracting to more green and environmental-friendly tourists. The following table (see table 6) analyzes the future research and drives of knowledge for natural based tourism focused on birdwatching:

Table 6: Assessment of literature knowledge

Related topic or Approach	Future research	Contribution to knowledge	Drivers and questions	Supporting Authors
Sustainability and policy	Creating models to generate comprehensive statistics that consider the spatial distribution of values and pressures, which can assist in detailed planning and the formulation of future projections	Measuring the value of nature for tourism has substantial consequences for policies related to the sustainable management of natural resources and development	Identifying needs of an integrated ecosystem supporting sustainable activities. How to build an ecosystem around the sustainable development of nature-based tourism activity? What should be the parameters of public policy for sustainable management of the activity?	(Spalding et al., 2023; Perez et al., 2013)
	Caution should be exercised when applying the results to contexts that vary in terms of factors such as regulations for nature access, land ownership arrangements, traditions of sustainable practices, consumption habits, nature tourism variations, population density, and the size of natural areas.	The fusion of various sustainability strategies employed by tourism entrepreneurs and other stakeholders can impede the progress of nature tourism product development	Growth-oriented development approaches have dominated much of sustainable tourism development, which has been accused of prioritising economic development over social and environmental sustainability. Drivers that can lead tourism towards sustainability include regulatory instruments, environmental policies, management measures and technological developments	(Sørensen & Grindsted, 2021)
	More research is needed on the various aspects of decision-making when choosing between nature conservation and tourism development	Socioeconomic circumstances play a crucial role in influencing nature-based tourism. It underscores the significance of fostering local collaboration and assistance to preserve natural resources	Natural resources and policy management as a strategic factor influencing natural based tourism and local activities. How to involve the local community in the development of public policy for the conservation of natural resources in balance with tourist activity?	(Zorlu & Dede, 2023)

New approaches for the tourism activity	Prospective planning demands careful consideration and research to cultivate a more responsible and ethical approach to tourism practices and wildlife observation. Given the potential prolongation of current economic and energy challenges, it is imperative to prioritize the development of a robust nature-based tourism sector and engage with local communities effectively.	The pandemic has created a chance to reconsider the approach to nature-based tourism. Nature-based tourism (NBT) has been a favored strategy for developing nations to attain economic growth without harming their natural resources. COVID-19 has inflicted significant economic hardships on regions reliant on tourism. Reinvigorating NBT is essential for the economic resurgence of these areas and can also contribute to addressing global mental health concerns.	Expanding the range of tourism offerings, evaluating visitor management, enhancing infrastructure, and establishing a robust foundation for nature-based tourism resilience. How to manage the destination development strategy towards a more resilient and sustainable tourism activity? Public institutions and private companies to improve their tourist offerings, benefit the destination and develop a more effective marketing strategy.	(Cheng et al., 2022; Perera et al., 2023) (Carvache-Franco et al., 2019)
	Additional empirical research is necessary to refine the components and structure for a more comprehensive analysis of social media usage within the context of environmental behaviors. To enhance the inclusivity of the birdwatching community or industry, upcoming research endeavors might contemplate gathering data from visitors at a broader range of birdwatching locations	Highlight the opportunities social media may provide to promote environmentally responsible behavior.	As the use of social media becomes prevalent, nature-based activities like birdwatching are being widely discussed online	(Conti & Lexhagen, 2020; Ma et al., 2021)
	Using larger sample sizes in quantitative survey research can provide additional support for understanding how tourism influences engagement, immersion, and reflection through these eudaimonic pathways	Stimulates environmentally friendly actions, uncovers novel avenues for enhancing our comprehension of how the features of nature-based activities can be adjusted, embraced, and expanded to encourage pro-environmental conduct	There is growing evidence that these forms of travel have disproportionately positive effects on reflection, personal meaning, and pro-environmental outcomes in relation to other forms of tourism.	(Hunt & Harbor, 2019)
Human-wildlife interactions	Previous research on positive human-wildlife interactions, which encompasses emotional connections with nature for the sake of biodiversity conservation, has been rather limited.	The diversity of bird species has even been linked to overall life satisfaction on a continental scale. Prior studies have demonstrated the beneficial impacts on individuals when they take pleasure in observing and engaging with birds	Biodiversity and satisfaction in tourism activity. How to balance human interaction with the natural conservation of the tourist area?	(García-Jiménez et al., 2022)

Preferences and characteristics of the birdwatching tourist	There are chances for enhancing characteristics and tiers associated with guiding preferences and other facets of nature-based attractions. The utilization of big data offers an opportunity to strengthen existing field-based participatory methods	The primary factors influencing the selection of a birding destination are rooted in the inherent characteristics of the natural landscapes and ecosystems. Exceptional birding opportunities and breathtaking scenery have a more significant influence on the choice of a birding destination. For highly dedicated birders, factors like bird diversity and birding support services take precedence. However, less dedicated birders may require a broader range of amenities and non-birding activities	Tourist activities and preferences of natural based destinations. What is the profile of the bird watching tourist? How are the preferences and needs of the tourist articulated with the offer and capacity of the destinations?	(Kim et al., 2019; Stemmer et al., 2022) (Slater et al., 2019)
	Evaluate the connections between natural resources and the provision of nature-based tourism by considering the perspective of emerging activities.	Unveiled intriguing findings about how nature-based tourism service providers structure their offerings, the essence of their products, and how this essence can be integrated with other product components to create a holistic nature-based tourism experience.	How NBT companies work with product innovation and how natural resources contribute to and influence such processes?	(Fossgard & Fredman, 2019)

Nature-based tourism is often characterized by intense and immersive encounters with the natural world through various activities, making natural resources a critical aspect of the service provided. Unlike human-made environments like hotels, restaurants, and theme parks, natural resources and their associated settings, including wildlife sightings, weather conditions, and landscape features, are not controllable and therefore vulnerable to human impact. If these physical elements undergo changes, the service provider must take measures to minimize any negative impact on the tourists' experience. Natural resources in nature are not only essential for the activities themselves but also for the overall nature-based tourism experience.

6. Conclusions

In conclusion, the findings underscore the profound impact of immersive birdwatching experiences on tourists within their natural environment. The emphasis on a non-intrusive approach not only elicits emotional responses but also triggers contemplation on environmental challenges, emphasizing the crucial importance of nature conservation. The study acknowledges the dual impact of feeding wild birds through feeders, recognizing both positive and negative effects, thereby highlighting the need for responsible wildlife interactions. Moreover, the identification of typical bird characteristics, habitats, and seasonal patterns plays a pivotal role in transforming birdwatching into engaging attractions. This contributes significantly to the advancement of ecotourism initiatives and the preservation of bird diversity.

Additionally, the growing acknowledgment of rural and indigenous communities as key participants in wildlife ecotourism and biological monitoring programs emphasizes the need for collaborative efforts to promote sustainable practices and biodiversity conservation. Encouraging birdwatching in tourism destinations is recommended through an intervention program focused on environmental education,

particularly targeting the youth. This aims to enhance awareness of bird biodiversity and habitat conservation, essential components of responsible tourism development.

Destinations boasting diverse bird populations hold great potential to stimulate local economic growth and create job opportunities. The distinctive characteristics of birds contribute significantly to the development of captivating bird-watching experiences, actively promoting ecotourism. Prioritizing non-intrusive interactions between tourists and the environment is crucial for minimizing environmental impacts on habitats and biodiversity. To maximize economic revenue, investments in tourism infrastructure must align with effective biodiversity conservation efforts. Comprehending spatial visitation patterns and benefits received by diverse tourist categories is essential for sustainable destination management. Ecological birdwatching tourism, recognized as an ecological product, contributes not only to enhancing human well-being but also to realizing local benefits from ecosystem services, particularly in areas dedicated to biodiversity conservation.

The study emphasizes the need for further research to delve into the intricacies of the motivations driving individuals engaged in birdwatching activities, ensuring a more nuanced comprehension of this nature-based tourism experience.

The theoretical contribution of this study lies in its comprehensive analysis of sustainable tourism, particularly birdwatching, as an activity that intertwines environmental conservation with local community development. This research enhances the existing body of knowledge by elucidating how sustainable tourism practices can be integrated into broader environmental and economic frameworks. By examining the motivations and behaviors of birdwatchers, as well as the importance of habitat quality and biodiversity, the study offers insights into the complex dynamics of nature-based tourism. It advances the theoretical understanding of how sustainable tourism can be leveraged to promote environmental stewardship and community resilience.

In the practical realm, this study's findings are highly applicable to the tourism sector, especially in regions where nature-based tourism forms a significant part of the economy. By demonstrating that birdwatchers prioritize environmental quality over infrastructure, the study suggests that tourism development should focus on preserving natural habitats and biodiversity. This approach not only attracts environmentally conscious tourists but also supports long-term sustainability goals. The study's emphasis on local community involvement and environmental education provides a strategic framework for developing tourism initiatives that benefit both the environment and the local population. These insights can guide policymakers and tourism managers in creating effective, sustainable tourism strategies that align with conservation objectives and community well-being.

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