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Understanding Tourism's Environmental, Social, and Economic Impacts Through Systematic Literature Mapping

Abstract

Tourism is a burgeoning industry that drives economic development, supports conservation, and fosters cultural exchange; however, there are risks associated with mismanaged and unchecked tourism. Rapid recovery post-COVID-19 pandemic presents an opportunity to shift away from an unsustainable 'business-as-usual' approach while mitigating negative impacts and preparing the industry for the challenges of a changing climate. This research aims to increase our understanding of tourism's impacts, an essential step in guiding sustainable tourism management. We employ a systematic literature mapping methodology to synthesize 47 interdisciplinary works. Our results reveal 24 distinct impacts in six categories: Environmental, Social, Economic, Socio-economic-environmental, Socio-economic, and Socio-environmental. We present key themes intended to inform targeted management strategies and policy interventions. Environmental impacts, notably changes to biodiversity, were the most frequently documented concern. As such, we suggest an increased focus on the relationship between tourism and the environment and improved management and regulation to protect wildlife and communities impacted by tourism.

Keywords

biodiversity loss; sustainable tourism development; tourism impact management; systematic literature analysis

Introduction

Tourism is one of the most rapidly growing sectors; with nearly 1.5 billion international tourist arrivals, 2019 was the 10th consecutive year of growth (UNWTO, 2020). Tourism development is often associated with lucrative economic benefits that can incentivize the protection of natural spaces (van Beukering *et al.*, 2015; Twining-Ward *et al.*, 2018), contribute up to 50% of funding for protected area (PA) management (Buckley *et al.*, 2012), and play a key role in achieving many of the United Nations Sustainable Development Goals (SDGs) – particularly goals 1, 5 and 8, respectively addressing poverty, economic growth, and gender equality. In 2019, tourism accounted for 10.4% of global GDP creating many new jobs (WTTC, 2024), with women holding 54% of these jobs, while the global average for other sectors is 39% (UNWTO, 2019).

The tourism industry was projected to have another year of considerable growth in 2020; however, the COVID-19 pandemic had a substantial impact, with international tourism arrivals decreasing globally by 74% from 2019 to 2020, putting an estimated 100 million direct tourism-associated jobs at risk (UNWTO, 2021). The collapse of tourism revenue for PAs negatively impacted conservation management effectiveness and resources (IUCN, 2021). Post-COVID-19, recovery has been steady and swift with preliminary data indicating 2024 tourism arrivals reaching 99% of 2019, tourism receipts surpassing 2019 at USD 1.6 trillion, and many regions reporting arrival figures above pre-pandemic levels (UNWTO, 2025). While this speedy recovery helped alleviate the economic losses, there is still an opportunity to reset tourism, moving away from returning to a 'business-as-usual' scenario of mass over-tourism (MoT) for a more equitable and just system (Benjamin, Dillette and Alderman, 2020). Due to its notable economic contributions, tourism growth has historically remained unchecked, putting increasing pressure on the natural environment, with experts voicing concerns for decades, such as Cohen's (1978) early assessment that mass industrial tourism poses a significant threat to the natural environment that likely outweighs any short-term benefits. Gössling and Peeters (2015) classify tourism as a resource-intensive sector requiring ultimately putting tourism at odds with itself. Tourism accounts for 8% of global greenhouse gases (GHG), with emissions predicted to grow outpacing decarbonization efforts (Lenzen *et al.*, 2018). Furthermore, there is evidence that the economic benefits attributed to the sector may not be distributed equitably, improve the quality of life (QoL), or offer high-quality job opportunities in tourism-associated communities (Nopiyani and Wirawan, 2021).

To address tourism's historic shortcomings, there has been an international focus on sustainable tourism development, which the United Nations World Tourism Organization (UNWTO) defines as:

‘Tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, industry, the environment, and host communities.’

While the definition aims to guide tourism development in a direction that balances the three pillars of sustainability: the natural environment, social aspects, and the economy (Jenkins and Schröder, 2013; Purvis, Mao and Robinson, 2019), this movement has arguably fallen short of its intentions. Today, unsustainable MoT, defined as tourism operating at high intensity and low regulation, resulting in tourist activities operating above a region's sustainable carrying capacity (Weaver and Lawton, 1999) remains a concerning trend. Butler (2018) argues the term 'sustainable tourism' is misused in practice and has allowed for uncontrolled growth in environmentally sensitive regions. A similar conundrum has occurred in models of tourism operating under the guise of ecotourism (Das and Chatterjee, 2015).

Rethinking tourism

While tourism can certainly have positive impacts across all three pillars of sustainability, some of the most prominent figures in sustainable tourism discourse highlight a need for a new approach. Many cite the urgency to reach net-zero, issuing a call to action for research to inform policy and drive substantial, meaningful change (Higham, Font and Wu, 2022; Scott and Gössling, 2022b). Scott and Gössling (2022a) reflect that past tourism research has failed to prepare the sector for climate change and the net-zero shift necessary within the industry for self-preservation and reaching global targets. Others argue that tourism as an industry can't continue on a path of endless growth on a finite planet and should be managed within the broader context of sustainability (Higgins-Desbiolles, 2018), or move toward a more steady-state model (Hall, 2010a).

To align the industry with global conservation efforts and reach important targets, it would be beneficial to advance our understanding of tourism's global environmental, social, and economic impacts using a systematic literature mapping methodology, which is the aim of this study.

Existing systematic reviews cover the individual effects of tourism on the natural environment in

a specific destination (Zhong *et al.*, 2011), the economy (Comerio and Strozzi, 2019), socio-cultural well-being (Nopiyani and Wirawan, 2021), or research themes and trends in literature (Scott and Gössling, 2022a). Key research gap identified by Buckley (2011, 2012) indicate that tourism strongly focuses on economic aspects, with less attention given to social and environmental aspects and there is little cross-disciplinary work between tourism and environmental management. Hall and Lew (2009) published a book offering an overview of tourism's nuanced impacts considering management, however, no systematic review covering impacts across all three pillars of sustainability with a multi-disciplinary focus, considering recent literature was found at the time of this study. Systematic reviews can help direct and inform environmental management with evidence-based approaches (Pullin and Stewart, 2006). A global categorization of tourism's impacts from existing literature can help inform targeted management strategies and policy interventions to better align with international climate targets and ensure tourism solutions address relevant and urgent issues by mitigating negative impacts and maximizing benefits.

The methodology section of this study outlines the systematic literature mapping approach, leading to the presentation of results and key themes, which are considered in relation to existing literature.

Methodology

The mapping process in this study was guided by RepOrting standards for the Systematic Evidence Syntheses (ROSES) protocol (Haddaway *et al.*, 2018). Created to address certain shortcomings of PRISMA reporting guidelines created for medical meta-analysis; ROSES is better suited for the systematic reviews and mapping of environmental and conservation research as it appropriately accounts for inclusion of studies using mixed methods, qualitative studies, and mapping, common in these fields (Haddaway *et al.*, 2018); as well as in tourism research (Wilson and Hollinshead, 2015). An increasing number of environmental studies are relying on ROSES methodology in their systematic reviews (Sharma *et al.*, 2020; Shaffril, Samah and Mazuki, 2024) and it could be helpful for advancing systematic reviews in tourism research. Systematic mapping is a method of evidence synthesis included in ROSES guidelines and was determined to be the best approach for this research, as it allows researchers to understand the

scope of a topic following a broad open-frame question (CEE, 2020). While following the ROSES protocol, the aim is to inform and guide tourism management through answering and understanding an open frame question (i.e., what are tourism's impacts?).

The mapping process included the following recommended steps: (1) preliminary research and question development, (2) systematic search strategy, (3) screening and quality review, and (4) data abstraction (Pullin and Stewart 2006). Final database searches began on 21 November 2021 and lasted one month, with an initial search followed by weekly alerts, and a final Google Scholar database search to review recently published materials between 2023 and 2024 after the initial search ended.

(1;2) Question and search strategy

To identify impacts across the important pillars of sustainability in tourism the open-frame question, 'What are the negative environmental, social, and economic impacts from tourism?' and individual keywords were used to create Boolean search strings for three databases, including SCOPUS and Google Scholar for peer-reviewed articles and Google Search for grey literature. Relevant filters were applied, and initial screening parameters were defined (Table 1).

Table 1: Boolean search strings used for each database and the initial screening process to limit the number of titles screened. * is used to indicate all forms of a word.

Database	Search String	Filters & Initial Screening
SCOPUS	TITLE-ABS-KEY (("Touris*" OR "recreation*" OR "tourism industry") AND ("threat*" OR "disturbance*" OR "negative impact*") AND ("biodiversity" OR "protected area" OR "ecosystem" OR "socio-cultural" OR "enviro*" OR "human health" OR "natural resources" OR "economic"))	<ul style="list-style-type: none"> • 5,772 initial results • Reviewed first 2,000 titles sorted by relevance • SCOPUS only allows preview of 2,000 titles online • 2010-2022 • English results
Google Scholar	("Touris*" OR "recreation*" OR "tourism industry") AND ("threat*" OR "disturbance*" OR "impact*" OR "negative impact*") AND ("biodiversity" OR "protected area" OR "ecosystem" OR "socio-cultural" OR "enviro*" OR "human health")	<ul style="list-style-type: none"> • 152,000 initial results • Reviewed first 1,000 titles sorted by relevance • Stopped after 5 pages had no relevant titles • 2010-2022 • Updated search 2023-2024 • English results
Google Search	Social OR Economic OR Environmental AND Impacts Touris*	<ul style="list-style-type: none"> • 40 million initial results • Reviewed 150 titles based on relevance • Stopped after 5 pages had no relevant titles • 2010-2022 • English results

(3) Screening and eligibility

ROSES guidelines provided the screening, eligibility, and quality appraisal criteria for this body of work (Fig. 1). The papers selected for full-text screening had a title, abstract, or keywords that indicated a negative environmental, social, or economic impact with a strong link to the tourism industry. Due to a large number of results, only journals with a Q1 ranking by SCImago were selected in the final round, which is a method used filter results (Singh, Haddad and Chow, 2007). Gray literature was limited to documents published by official governing bodies,

conservation groups, academic institutes, or conference proceedings. The screened records were placed in a spreadsheet and annotated with notes documenting justifications for excluding articles. Sixty-one studies were retrieved for a full-text review (Fig. 1). During the full-text review, any study lacking pertinent data was excluded, which resulted in a total of 47 studies used for the final systematic literature mapping.

(4) Data abstraction

This step involved summarizing the general findings related to the adverse impacts of tourism from the 47 selected studies. An inductive approach was employed, allowing impact themes to emerge organically without a predetermined list. Next, the process involved identifying similar themes, consolidating them into specific impacts, and categorizing each as environmental, social, or economic. However, during this process we recognized the complexity of the impacts and issues in tourism and found some did not fit into one category alone. To provide a comprehensive understanding of tourism's multifaceted impacts, we identified three additional categories, socio-economic, socio-environmental, and socio-economic-environmental for a total of six, to represent the relationships between the dimensions and the interdependences in tourism when considering sustainable tourism.

The environmental category included impacts pertaining to the natural environment, species, or biodiversity. The social category included impacts on human health and well-being, lifestyle, cultures, traditions, beliefs, QoL, or community. The economic category included impacts related to the global economy or locally isolated economic events. Impacts at the intersection of categories affected variables across multiple domains; pollution, for instance, has social, environmental, and economic consequences. Several impacts and categories may be linked with single pieces of literature. A complete list of all negative impacts and the guidelines for identifying them is included in the supplementary material (Appendix A).

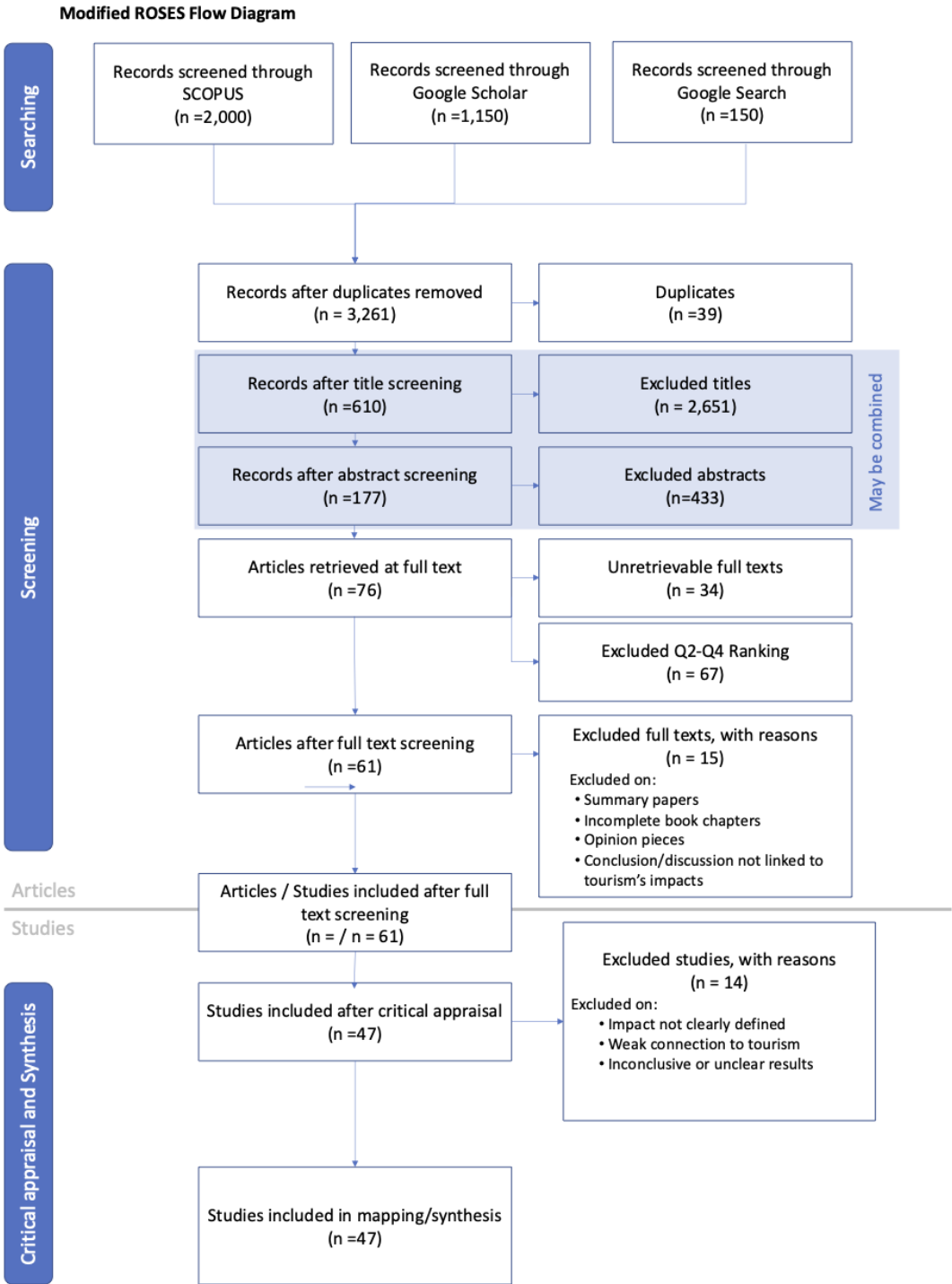


Fig. 1: Flowchart modified from the ROSES guidelines (Haddaway et al., 2018) shows the process and criteria for the systematic mapping process, starting with 3,350 studies and concluding with the final 47 studies used.

Results and Discussion

The findings of the literature mapping are presented in two stages. A descriptive analysis of publications, category distribution, and impacts is followed by a more thematic analysis of emerging themes. The findings from both analyses are interpreted within extant literature and relevant context throughout.

Descriptive Analysis

The literature mapping included publications from diverse disciplines. Non-tourism-associated literature was more likely to cover tourism's adverse impacts accounting for 26 of the 47 papers and had the greatest representation of environmental impacts. Conversely, 21 tourism-associated publications were included and covered more social and economic impacts. For a comprehensive overview of the literature refer to Table 2.

From the 47 pieces of literature, a total of 107 (n=107) instances of 24 individual impacts were identified. The 'Environmental' category was the largest with 53 examples appearing in the literature, with 'Changes in Biodiversity' as the most common, identified 16 times. The 'Socio-Economic-Environmental' was the second largest with 22 results and 'Solid Waste Generation' the most common impact occurring eight times. The 'Social' category followed with 13 results, which included 'Cultural Degradation' as the common occurring five times. The 'Socio-economic' category appeared in the literature eight times, with 'Economic Inequality' accounting for seven instances. 'Socio-environmental' was the second to last category with seven results and 'Intense Resource Use' occurring five times. The smallest category was 'Economic,' with four results, and 'Low Economic Resilience' accounting for two of these. Table 3 includes a breakdown of the categories and impacts, while Appendix B provides a complete tabular overview.

Table 2: A breakdown of the publications included in the study and the impacts they covered. ‘Other’ indicates the total of various publications that appeared only once. White rows are tourism literature; grey rows are non-tourism literature. ‘Count’ is the frequency in which each journal appeared in the study. The number of times a publication covered an impact in each category appears in the remaining columns.

Publisher/Journal Title	Journal Frequency Count	Environmental	Social	Economic	Socio-Economic-Environmental	Socio-Economic	Socio-Environmental
Annals of Tourism Research	2	1	1			1	
Biological Conservation	2	4					1
Current Issues in Tourism	3	3		1		1	
Journal of Environmental Management	3	4			1		
Journal of Sustainable Tourism	3	3	1		1	1	1
PloS One	3	6					
Tourism Economics	2	1		1			
Tourism Management	3	3	1	1	1	1	
UNWTO	2	4			4		2
Other tourism	6	1	5	1	5	1	1
Other non-tourism	18	23	5		10	3	2
Total tourism	21	16	8	4	11	5	4
Total non-tourism	26	37	5	0	11	3	3

Our findings reveal a preponderance of tourism publications examining ‘Social’ and ‘Economic’ impacts over ‘Environmental’ ones, consistent with prior research acknowledging that tourism tends to favor economic aspects (Hall, 2009; Buckley, 2011, 2012; Butler, 2018), while the number of publications on tourism’s economic impacts consistently growing (Liu, Kim and Song, 2022). Given the well-documented direct and indirect economic benefits of tourism (WTTC, 2024) it was unsurprising to see a low representation of negative economic impacts in our findings; however, the higher count of ‘Socio-Economic’ impacts, such as ‘Economic Inequality’ suggest the relationship between tourism and the economy is not always positive or equitable. The strong representation of the ‘Socio-Economic-Environmental’ category was covered equally by tourism and non-tourism associated journals, adding to the importance of interdisciplinary collaboration in tourism (Jenkins and Schröder, 2013).

Yet, our results indicate environmental impacts to be the most studied category, accounting 49% of the total (Table 3). Nearly a decade ago, Hall (2010a) argued that tourism’s relationship with biodiversity was potentially more significant than climate change, yet has historically received less attention, while the number of studies covering the relationship between tourism and climate change is increasing (Scott and Gössling, 2022a). It was therefore interesting that environmental topics especially ‘Changes in Biodiversity’ were most represented in our results, while ‘GHG Emissions’ were less represented.

These discrepancies warrant further examination. Our results could signal a shift in research priorities to focus more on biodiversity since emerging critiques of these research gap appeared in discourse. Shahbaz *et al.* (2021) does show the relationship between tourism and the environment is a rising trend across scientific articles, and a more recent study builds our understanding of tourism’s negative impacts on biodiversity in particular (Habibullah *et al.*, 2016). However, a dedicated literature review exploring research trends regarding tourism and biodiversity would be required to verify this. Additionally, these discrepancies may be attributed to the inclusions of interdisciplinary journals within our review and thus may differ from research solely considering tourism literature in isolation. These observations underscore the

importance for tourism managers to consider a broad spectrum of literature in tourism development and management approaches, particularly biodiversity and environmental topics, considering tourism relies on healthy biodiversity and ecosystems (UNWTO, 2010; van Beukering *et al.*, 2015).

Table 3: A summary of the categories and the identified impacts. The left category column lists the six broad categories. The impact column is the individual impacts identified within that category. Frequency is the number of times each impact occurred throughout the literature, and category total is the sum of the individual impacts for a total look at each category.

Category	Impact	Frequency	Category Total
Environmental	Changes in Biodiversity	16	53
	Environmental Degradation	13	
	Changes in Animal Behavior	9	
	Changes in Animal Physiology	4	
	Land-Use Changes	3	
	Economy > Environment	3	
	Vector for IAS	3	
	Animal Welfare	2	
Socio-Economic-Environmental	Solid Waste Generation	8	22
	Pollution	6	
	GHG Emissions	6	
	Decline in Ecosystem Services	2	
Social	Cultural Degradation	5	13
	Reduced QoL	3	
	Stakeholder conflict	3	
	Sex Trafficking	1	
	Human Exploitation	1	
Socio-Economic	Economic Inequality	7	8
	Gentrification	1	
Socio-Environmental	Intense Resource Use	5	7
	Human-Wildlife Conflict	2	
Economic	Low Economic Resilience	2	4
	Costs Outweigh Benefits	1	
	Corruption	1	

Summary of impacts and themes

Environmental Impacts

The literature reviewed demonstrates a broad range of negative environmental concerns stemming from tourism activities. For example, findings from Lv and Xu (2021) reveal the negative relationship between tourism and environmental performance, though there is a diminishing influence after a certain threshold. Heavy metal contamination near airports (Brtnický *et al.*, 2020), increased littering from tourists (Junaid and d’Hauteserre, 2017), and toxic ultraviolet filters from sunscreens entering marine systems (Sánchez-Quiles and Tovar-Sánchez, 2015) all contribute to decreasing environmental quality. Tourism-associated sites have a higher abundance and richness of invasive alien species (IAS) (Anderson *et al.*, 2015). Survey results indicate stakeholder’s concerns regarding tourism degrading the physical ecosystem, despite acknowledging economic benefits (Baloch *et al.*, 2023). The UNWTO summarizes general environmental impacts of the tourism industry, including the spread of IAS, land-use changes, and behaviour-altering disturbances to wildlife, all of which have implications for biodiversity loss (UNWTO, 2010).

Tourism activities involving wildlife or animal encounters present a range of environmental concerns particularly for biodiversity and animal welfare. An audit of wildlife-dependent tourism offers a summary of impacts, including behavioural and physiological changes in animals disturbed during critical life moments, and habitat degradation (INTOSIA WGEA, 2013). Captive animal experiences in Thailand may source animals from the wild with concerns for wild populations and were found to have severely inadequate welfare conditions for captive Asian elephants (*Elephas maximus*), Asian tigers (*Panthera tigris tigris*), and macaque species (Schmidt-Burbach, Ronfot and Srisangiam, 2015). Wildlife encounters in tourism are associated with increased wildlife consumption for food (bush meat), animal-product souvenirs, and using animals for exploitative entertainment (Rizzolo, 2021). Other consumptive forms of wildlife tourism, like trophy hunting, contribute to population declines of important ungulate species in

Kyrgyzstan (Nordbø, Turdumambetov and Gulcan, 2018). Provisioning of wildlife by tourists alters animal behaviour and physiology, such as changes to body size, habituation, increased stress levels, alopecia, and changes in life history patterns (Maréchal *et al.*, 2016; Penteriani *et al.*, 2017; Silva *et al.*, 2020). Boating excursions around wildlife cause disturbances and behavioural changes in marine protected areas, such as overall decline of breeding fitness, time off nest, stress levels, and impacts on population size of Ospreys (*Pandion haliaetus*) in Corsica (Monti *et al.*, 2018), and seasonal migration of bottlenose dolphins (*Tursiops aduncus*) from tourist areas in Kenya (Pérez-Jorge *et al.*, 2016). Considering tourism often relies on wildlife (Twining-Ward *et al.*, 2018) these impacts on wildlife must be considered and managed to reduce harm. Regulation and science-based guidelines could help reduce impacts on animal behaviour and physiology. For example, whale-watching tour operators that voluntarily operate under science-based whale-watching guidelines, called WhaleSENSE can increase awareness as a tool for conservation (Schuler and Pearson, 2019).

Developing infrastructure and facilities to support tourism contributes to environmental impacts. The number of sensitive species is lower around developed tourist facilities, contributing to an overall shift in biodiversity from wild to human-associated species and the introduction of IAS (Tolvanen and Kangas, 2016). The expansion of infrastructure in wild places to accommodate ecotourism has resulted in environmental degradation and declines of protected and culturally significant species, the elegant scops owl (*Otus elegans*), birdwing butterflies (*Ornithoptera meridionalis*), and coconut crabs (*Birgus latro*) on Orchid Island, Taiwan (Liu and Lu, 2014). Recreational tourism infrastructure causes habitat fragmentation and alters the behaviour of wild reindeer (*Rangifer tarandus*) by segregating herds (Gundersen *et al.*, 2019). Trail infrastructure also brings new human-associated impacts (e.g., trampling, harvesting plants), causing tourism to be listed as a greater threat to vascular plants in Australia than climate change (Rankin, Ballantyne and Pickering, 2015). The development of areas for tourism around scenic spots in contributes to changes in land-use in China's ecological function zones (Li *et al.*, 2023). Small-size dredging to develop the infrastructure needed to meet the demand for second-home tourism in Finland is altering soft-sediment marine biodiversity (Virtanen *et al.*, 2024). Conversely though, access to personal GPS enabling recreational tourists to go off-road in areas without adequate infrastructure to support tourism contributes to soil degradation and the destruction of

plants and animals in the Saudi Desert (Alrawaf *et al.*, 2023). Despite these notable impacts from infrastructure and facilities, developing capacity and sustainable infrastructure for tourism is arguable necessary to host increasing levels of tourism, and avoid the risks of inadequate infrastructure. The emerging trend of SMART tourism that uses data, information, and technology (Gretzel *et al.*, 2015) could be useful in developing tourism capacity to mitigate these impacts. The work of Mandić, (2019) outlines many ways in which technology, such as GIS, GPS, and information and communication technology can be used for trail planning, visitor monitoring, and the development of smart parks. GIS can be used to map the impacts of tourism development in sensitive ecosystems guiding infrastructure choices with evidence-based approaches (Chaplin and Brabyn, 2013).

The level and intensity of tourism activities, and how they are managed seems to matter. For example, a sudden influx of tourism brought by a new cable car alters the behaviour and herd size of critically endangered Ibex subspecies (*R. rupicapra tatrica*) in high mountain ecosystems (Pełksa and Ciach, 2015). In areas with high-intensity tourism, the abundance, richness, and diversity (Shannon-Wiener Index) of key species, such as *Scarabaeinae*, is lower compared to areas designated as low-intensity use (Noriega *et al.*, 2020). Cruise ports that fail to consider community stakeholders can result in environmental degradation (MacNeill and Wozniak, 2018). Tourism research tends to focus on economic aspects, with less consideration for socio-environmental implications (Buckley, 2012). This seems to be the case in practice as well with examples of tourism development prioritizing economic gains over conservation that contributes to environmental degradation threatening at-risk and endangered species in Volcanoes National Park, Rwanda (Munanura, Backman and Sabuhoro, 2013); and is associated with numerous environmental impacts in Thailand, such as declines in biodiversity, deterioration of the natural environment, and deforestation (Uddin *et al.*, 2023). As tourism continues to grow, ensuring sustainable levels and responsible growth is necessary. While, the concept of degrowth is rising in tourism discourse (Hall, 2009; Higgins-Desbiolles *et al.*, 2019), it is difficult to achieve in practice. Carrying capacity guidelines (Ly and Nguyen, 2017) and directing tourism away from biodiversity hotspots (Gundersen *et al.*, 2019) can help reduce tourism's impact on biodiversity.

Socio-Economic-Environmental Impacts

The UNWTO published two documents highlighting an overview of the tourism sector's significant contributions to emissions (5-12% of global GHG), solid waste generation (projected to increase by 251% by 2050), and pollution from sewage (UNWTO, 2010, 2012). Gössling and Peeters (2015) quantify tourism's emissions concluding it is at industry at odds with global emission reduction targets. Pollution from cruise ships is significant in variety and volume including air pollution, emissions, water pollution (grey and black water), hazardous waste, and solid waste generation (Caric, 2012). Airport traffic contributes to soil pollution (Brtnický *et al.*, 2020). Increasing levels of various types of pollution, emissions, littering and waste are noticed in areas with rising tourism activities (Junaid and d'Hautesserre, 2017; Alrawaf *et al.*, 2023; Baloch *et al.*, 2023; Uddin *et al.*, 2023) and tourists have been observed failing to use designated waste bins outside contributing to plastic bottle waste (Pandey *et al.*, 2023). Tourism destinations may struggle with the resources and means to adequately manage the rising levels of solid waste from tourism (Perkumienè *et al.*, 2023).

Several studies show a positive relationship between the levels of tourism, emissions, pollution, and waste, including a few that confirmed the Environmental Kuznets Curve (EKC) identifying thresholds in these relationships. Paramati, Alam and Chen (2017) found a positive relationship between inbound tourism and CO₂; the threshold in which this starts to diminish happens at a greater rate in developed economies. Tourism is a significant producer of solid waste, with arrivals and expenditure per tourist, significantly affecting levels supporting EKC (Arbulú, Lozano and Rey-Maqueira, 2015). There is a linear relationship between the number of cruise passengers and levels of air pollution (Ruiz-Guerra *et al.*, 2019), and a correlation between increasing tourism arrivals and higher levels of PM10 air pollution; with every 1% increase in tourist numbers, there is a 0.45% increase in PM10 levels (Saenz-de-Miera and Rosselló, 2014). Ecosystem services such as water yields and habitat quality can decrease around areas developed for tourism (Li *et al.*, 2023), and UV filters can accumulate across the marine food webs (Sánchez-Quiles and Tovar-Sánchez, 2015).

These socio-economic-environmental impacts, touching on all aspects of sustainability, translate into tangible costs, effects on ecosystem function and concern for and public health beyond those directly involved in tourism. They underscore the urgent need for a net-zero transition in the tourism sector (Higham, Font and Wu, 2022; Scott and Gössling, 2022b) and proactive, globally coordinated strategies managing tourism within the broader context of sustainability (Higgins-Desbiolles, 2018). Centring conversations about tourism on the global stage as seen in recent Conference of Parties including The Glasgow Declaration for Climate Action in Tourism are important to publicize the sector's dedication to emission reduction goals on a global stage (One Planet Network, 2025).

Social Impacts

Misaligned expectations between tourism's stakeholders can lead to various social impacts including conflict and cultural degradation. Overcrowding in urban areas and differing values increases stakeholder conflict, rising as the number of tourists increases relative to the number of residents (Postma and Schmuecker, 2017). Some stakeholders may feel tourism threatens their traditional culture (Baloch *et al.*, 2023). Indigenous guides altering traditional stories to appeal to Western tourists and engaging with culturally taboo species, creates inter-generational conflict (Liu and Lu, 2014). Tourists' demand for modern amenities can potentially alter the traditional lifestyles and culture in an emerging tourism destination (Junaid and d'Hautesserre, 2017). Marketing campaigns for destinations in developing economies may uphold colonial cultural stereotypes (Phillips *et al.*, 2021).

Tourism development failing to engage or consider the community can have adverse social impacts. Tourism revitalization and development that fails to address needs of residents contributes a shift in businesses catering to the needs of tourists, which can make securing necessities challenging (Santy Paulla and Wakhidah, 2020), and put additional pressure on the supply of goods and services available to residents (MacNeill and Wozniak, 2018) altering their QoL. Tourism activities occurring without the support of the locally impacted community may create conflict between residents and those engaged in tourism (Nordbø, Turdumambetov and Gulcan, 2018).

Poor regulation of tourism resulting in MoT at UNESCO sites contributes to degradation and commodification of the local culture it was designated to protect (Caust and Vecco, 2017). The hospitality and tourism industries, likely unconsciously as a result of poor regulation and general unawareness of these issues, are responsible for human rights violations such as human exploitation and sex trafficking, especially of minors (Carolin L., A. and W, 2015). In areas developed with high levels of transient vacation rentals, such as Airbnb, residents perceive more negative than positive impacts on their QoL, such as traffic congestion, rising costs, and loss of community (Jordan and Moore, 2018).

Tourism operating in these culturally sensitive areas should develop considering the existing cultural values and norms and with community involvement and government support (Liu and Lu, 2014). UNESCO identifies the important relationship of collaboration between tourism stakeholders and the World Heritage program in protecting these sites (UNESCO, 2025). Adaptive co-management practices can potentially be used to develop tourism more equitably, with a bottom-up approach by focusing on shared rights, responsibilities and communication (Islam, Ruhanen and Ritchie, 2018); collaborative and adaptive approaches in tourism can help facilitate more sustainable transformations in relation to Sustainable Development Goals (Liburd, Duedahl and Heape, 2022). Capacity limits to alleviate conflict and minimize cultural degradation (Caust and Vecco, 2017; Ly and Nguyen, 2017) and policies addressing resident's concerns could help foster better perceptions of tourism (Jordan and Moore, 2018).

Socio-Economic Impacts

There appears to be a global divide revealing inequity in tourism's socio-economic aspects. For example tourism development has little impact on economic inequality in developed economies, but in developing economies it worsens income inequality in an N-shaped Kuznets Curve, indicating tourism may not reduce economic inequality in the longer term (Chi, 2021).

Regarding tourism's contributions to waste, wealthier northern countries see a lower increase in waste levels as income increases compared to less economically developed countries (Arbulú, Lozano and Rey-Maqueira, 2015). Tourism experiences in developing economies are marketed to travellers glamorizing economic inequality, maintaining the status quo for lower-income

residents (Phillips *et al.*, 2021). The cultural degradation at UNESCO sites is likely more extreme in developing regions of Asia, than sites in developed regions (Caust and Vecco, 2017).

Tourism's socio-economic benefits are not always distributed fairly or equitably through communities. The economic distribution of benefits may not reach those not directly involved in tourism, or allow for equal employment opportunities (Junaid and d'Hautesserre, 2017). A select group of elites may retain most socio-economic benefits within tourism schemes (Nordbø, Turdumambetov and Gulcan, 2018), while cruise companies retain up to 50% of funds spent for onshore excursions (MacNeill and Wozniak, 2018) without distributing much wealth or additional benefits to the local community. Tourism revitalization that excludes the daily needs of lower-income residents displaces them, contributing to gentrification (Santy Paulla and Wakhidah, 2020).

To ensure tourism delivers the intended benefits and aids in the progress toward the SDG, it will be necessary for communities to retain and distribute enough revenue to mitigate and adapt to any negative impacts of tourism, which can be costly to manage (Caric, 2012). Managing tourism holistically, considering the costs and benefits across entire communities, and not just those directly engaged in tourism, could be key. Shifting the expected outcome from tourism models that benefit corporate profit and prioritize tourist rights to community rights, such as suggested by Higgins-Desbiolles *et al.* (2019), could minimize tourism development at the cost of social integrity.

Socio-Environmental Impacts

Tourism is a resource-intensive sector putting intense pressure on resources needed by tourism and residents. In a 'business-as-usual' scenario by 2050, resource extraction from tourism will likely increase significantly, putting the industry at odds with conservation targets (UNWTO, 2010, 2012; Gössling and Peeters, 2015). To meet the demand for tourism's needs, resource depletion in Pakistan is a cause for concern by many stakeholders (Baloch *et al.*, 2023); while resource depletion in Thailand is currently unsustainable with concerns for the future preservation of the industry itself (Uddin *et al.*, 2023).

The very definition of sustainable tourism recognizes the need for the industry to sustain the resources on which it relies for generations to come, yet these recent studies shed light on tourism's continued intensive use of resources, putting community needs and tourism's own future at risk. The regenerative tourism process allows for evolving tourism in a living system considering the infinite and ongoing needs of those impacted by tourism including resource needs (Bellato, Frantzeskaki and Nygaard, 2022).

Wildlife tourism contributes to increased conflict between humans and wildlife including disease transmission and safety concerns (INTOSIA WGEA, 2013). While unregulated bear-viewing, may result in increased levels of human-wildlife conflict and concerns for the safety of animals and people (Penteriani *et al.*, 2017), highlighting a need for enforcement, awareness, and regulation around wildlife to reduce conflict.

Economic Impacts

More reliance on tourism for economic benefits can contribute to lower economic resilience. For example, tourism-dependent regions may be less resilient to economic shocks and global crises (like pandemics), particularly Small Island Developing States (Gounder and Cox, 2021). Regions more dependent on international tourism arrivals are less resilient to similar shocks (Watson and Deller, 2021). Cruise ports can be more of an economic burden than a lucrative investment as managing pollution produced at these ports may be 6 to 7 times higher than the economic benefits (Caric, 2012). Additionally, poor management at cruise ports can result in economic corruption by governments (MacNeill and Wozniak, 2018).

Tourism-reliant economies could benefit from diversifying their economic interests away from tourism to create more resilient communities in the face of global crises (Gounder and Cox, 2021; Watson and Deller, 2021). This diversification should be done with caution and focus on environmentally sensitive economic interests to not sacrifice environmental integrity for short-term economic gains at the cost of environmental degradation (Munanura, Backman and Sabuhoro, 2013).

Concluding Remarks

Tourism's global significance, marked by its substantial contributions to GDP along with its role in conservation, and cultural exchange, is undeniable. However, the sector's rapid post-pandemic recovery presents a critical opportunity to manage its impacts. This study aimed to systematically identify and categorize the negative impacts of tourism across environmental, socio-cultural, and economic dimensions, providing a foundation for targeted management strategies and policy interventions. Through an analysis of 47 interdisciplinary works, we identified 24 distinct impacts, highlighting the complex and interconnected nature of tourism's influence.

Our findings revealed that environmental impacts, particularly changes in biodiversity and environmental degradation are frequently documented concerns. The research also revealed significant socio-economic-environmental impacts, such as solid waste generation and pollution, along with social impacts, including cultural degradation, and socio-economic inequality. These findings emphasize the interconnectedness sustainable tourism within the broader global sustainability discourse reaffirming the need for multi-disciplinary approaches in tourism and collaboration between environmental and tourism management and research.

While this study did not focus on specific interventions, the importance of proactive, evidence-based management, sustainable capacity building and monitoring are essential for safeguarding wildlife and environmental integrity. Furthermore, addressing tourism's social and economic impacts requires equitable, community-focused approaches that prioritize transparency, cultural sensitivity, and adaptive approaches. The resource-intensive nature of tourism and its potential to reduce economic resilience necessitate diversification strategies and a shift toward regenerative models that align tourism with global solutions.

This study was not without limitations. The reliance on Q1-ranked journals and specific databases may have introduced selection bias and limited the number of studies included. The broad scope of the research question may have limited in-depth analysis of specific impacts. Future research could address these limitations by expanding the literature search and employing

granular analytical techniques. Analyzing the existing literature for proposed solutions and management suggestions would further enhance destination management frameworks.

This systematic categorization of tourism's impacts contributes to the growing body of knowledge on the sector's global influence. By providing a comprehensive overview of negative impacts, this study serves as a valuable resource for tourism managers, policymakers, researchers, and communities, guiding them towards addressing critical challenges and fostering a more sustainable and equitable tourism future. While not aiming to diminish tourism's benefits, this study's focused examination of negative impacts is intended to guide management in maximizing benefits while minimizing impacts for safeguarding biodiversity and social well-being.

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