GeoJournal of Tourism and Geosites

Year XVI
2023 / no. 4 supplement
vol. 51

Editura Universității din Oradea

GTG

GeoJournal of Tourism and Geosites

Oradea University Press

ISSN 2065-1198, E-ISSN 2065-0817

The Journal is issued under aegis and with financial support of:

University of Oradea, Romania
Department of Geography, Tourism and Territorial Planning
Territorial Studies and Analysis Centre
1 University St., 410087, Oradea, Romania

Gdansk University of Physical Education and Sport, Poland
Faculty of Tourism and Recreation
ul. Kazimierza Górskiego 1, 80-336 Gdańsk, Poland

GTG
GeoJournal of Tourism and Geosites

Year XVI, no. 4 supplement, vol. 51

Oradea - Gdańsk
2023

PUBLICATION REQUIREMENTS OF ARTICLES IN THE GEOJOURNAL OF TOURISM AND GEOSITES

The Editorial Board goes trough each article, which in then submitted to two referees' judgment. Names of referees are confidential to the Editorial Board. Authors may be asked to make revisions to their manuscript. If substantial revision is required manuscripts may be re-reviewed before a decision to accept/publish is made. Final acceptance of manuscripts for publication is at the discretion of the Editors.

Authors alone are responsible for the opinions expressed in their papers.

The GeoJournal of Tourism and Geosites
is indexed in:

SCOPUS: http://www.scopus.com/

GEOBASE: https://www.elsevier.com/

INDEX COPERNICUS: http://journals.indexcopernicus.com/karta.php?action=masterlist&id=3947
IC Value: **134.41** - 2022; **134.64** - 2021; **132.41** - 2020; **121.20** - 2019; **121.25** - 2018; **109.97** - 2017; **88.82** - 2016; **84.53** - 2015; **68.79** - 2014; **6.59** - 2013; 2012; **4.84** - 2011; **4.83** - 2010; **4.15** - 2009; **3.91** - 2008

Review accredited by **C.N.C.S.I.S.,** "**C**" Categoryhttp://vechi.cncsis.ro/cenaposs/2008/Arhiva/reviste_cat_C_08.pdf

---

ULRICHSWEB – GLOBAL SERIALS DIRECTORY
http://www.ulrichsweb.com/ulrichsweb/ulrichsweb_news/uu/newTitles.asp?uuMonthlyFile=uu201003/new_titles.txt&Letter=G&navPage=9&

WORLDCAT: http://www.worldcat.org/search?q=GeoJournal+of+Tourism+and+Geosites&qt=owc_search

---

SCIPIO: http://www.scipio.ro/web/geojournal-of-tourism-and-geosites

---

EBSCO: http://www.ebscohost.com/titleLists/hjh-subject.pdf

HOSPITALITY & TOURISM COMPLETE: https://www.ebscohost.com/titleLists/hjh-coverage.xls

---

HOSPITALITY & TOURISM INDEX: https://www.ebscohost.com/titleLists/hoh-coverage.htm

---

CAB Abstracts: https://www.cabi.org/SerialsCited/1429.txt

ERIH PLUS: https://dbh.nsd.uib.no/publiseringskanaler/erihplus/periodical/info.action?id=495196

DOAJ - DIRECTORY OF OPEN ACCES JOURNALS: https://doaj.org/search

---

Price of journal:

Individual	10 €
Institutional	15 €
Annual subscription	20 €

Address of the Editorial Office:
University of Oradea Department of Geography,
Tourism and Territorial PlanningTerritorial Studies and Analysis Centre 1 Universităţii St.,
410087, Oradea, Romania, Phone/fax: +40 259 408 475 e-mail: gtg.uoradea@yahoo.com

On line version:
http://gtg.webhost.uoradea.ro

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

C O N T E N T S

* * * * * *

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1600-1609
DOI 10.30892/gtg.514 spl01-1156

ANALYSIS OF THE INTERACTION OF MICE TOURISM DEVELOPMENT FACTORS (THE CASE OF ASTANA CITY IN KAZAKHSTAN)

Bayana TAIPAKOVA*
Eurasian National University, Tourism Department, Astana, Republic of Kazakhstan, e-mail: naellerahat@gmail.com

Citation: Taipakova, B. (2023). ANALYSIS OF THE INTERACTION OF MICE TOURISM DEVELOPMENT FACTORS (THE CASE OF ASTANA CITY IN KAZAKHSTAN). GeoJournal of Tourism and Geosites, 51(4spl), 1600–1609. https://doi.org/10.30892/gtg.514spl01-1156

Abstract: The purpose of this study is to research whether some factors of the development of MICE tourism influence each other in the capital of Kazakhstan.The author conducted a survey and analyzed the interaction of the effectiveness of interaction between the authorized government body and private organizations, the level destination marketing of development and number of experienced specialists. This study used the method of one-phase analysis of variance (ANOVA analysis), as well as the method of analyzing contingency tables ($\chi 2$ test of independence (Pearson's chi-squared test) using the SPSS program. The study sample includes 50 respondents directly related to the development of tourism in Astana city. The results of this analysis indicate that the number of experienced professionals in the field of MICE tourism development significantly influences the level of marketing development of a destination with a p-value of $0.010 < 0.05$. The second result of the analysis showed that the number of experienced specialists in the field of MICE tourism development does not affect the effectiveness of interaction between the authorized state body and private organizations in the field of tourism with the p-value of $0.347 > 0.05$. The following result of the analysis suggests that the effectiveness of interaction between the authorized government body and private organizations in the field of tourism does not affect the level of development of destination marketing, while the independence criterion $\chi 2$ with p-value $0.958 > 0.05$.

Key words: MICE tourism, experienced specialists, destination marketing development, public private partnershi

* * * * * *

INTRODUCTION

The meetings, incentive travels, conferences, and exhibitions (MICE) sector is recognized as an important part of international tourism (Rogerson, 2015). Indeed, these events are strongly sought after to develop local industries (both tourism and non-tourism) and boost the national economy (Kim et al., 2022; Welthagen et al., 2022; Kourkouridis et al., 2023). Several studies have explained the interconnectedness to the globalised world which has resulted in MICE tourism being one of the most dynamic and leading aspects of global activities (Rogerson, 2015; Tichaawa, 2017; 2021; Draper and Neal, 2018). Accordingly, the sector has grown to be an important part of business operations with literature averring the attendance of MICE events to be related to information sharing, problem-solving, decision-making, participating in educational discussions, and sharing common interests (Becken and Hughey, 2022).

Being predominantly a MICE destination, Astana has good quality MICE facilities. The city has 113 MICE halls in hotel establishments, which can accommodate 12,287 participants. Additionally, Astana has 20 other facilities for MICE, exhibitions and events, which can accommodate 83,307 participants, of which 20% are pure MICE. For example, in 2016 About 20 major MICE events and 19 leisure events were held. Most MICE events are organized in March-May and September-November. MICE sites actually host many more events, but there are no official statistics regarding events, organizers and number of participants. 3 ICCA events were held in Astana in 2016, 6 confirmed ICCA events for 2017. and 1 for 2018. At the Palace of Peace and Reconciliation in 2016 160 events were held (70% private/corporate and 30% public), and the Independence Palace hosted 80 events (mostly political and government) in the same year.

Today Astana is at the beginning of the development of events and festivals. Most events are related to MICE, are governmental or political; and leisure events are mainly aimed at local residents. However, here are no statistics on the number of all business and leisure events held in the city. As for the management system of the tourism sector in the capital, over the past 20 years, it has been undergoing constant modifications and reorganizations. Basically, the main and governing body is the local state executive power represented by the Akimat of Astana city. At the level of the legislative branch, it is the Astana city Maslikhat, whose regulations have legal force within the capital.

Over the years, the function of tourism management at the state level belonged to different Departments of the Akimat - the State Institution “Department of Entrepreneurship and Industry”, the State Institution “Department of Tourism and Sports”, the State Institution “Department of Investments”, while the tourism department consisted of 2 to 4 people.

In 2015, the Astana Convention Bureau LLP of the Akimat of Astana was organized. The staff consisted of 41 people with the following departments: Department of Tourism Infrastructure Development (4 people), Department of International Cooperation and MICE Tourism (4 people), Department of Special Projects (5 people), Marketing Department (5 people), Department of Administration and Finance (7 people), as well as a management team of 4 people.

* Corresponding author

In addition, 11 people were employees of visitor centers located at the city airport, at the Astana-Baiterek monument, as well as at the Khan Shatyr entertainment center. The main activity of Astana Convention Bureau LLP was aimed at developing MICE tourism activities. The Bureau actively worked with representatives of the corporate sector and industry associations to attract and host international business events in the city. Though, the level of destination marketing development in Astana city according to the survey is at an average level with the indicator (50% of respondents) and 38% of respondents believe that the level of tourism marketing is low. According to Kim et al. (2022), the MICE sector represents the socio-economic and cultural aspects of the host destination and thus requires the support of key stakeholders, including governments, suppliers, and visitors. The MICE sector is established to be a tool for economic development and strengthening tourism destinations (An et al., 2021; Santos et al., 2022). Understandably, a significant portion of the MICE tourism research considers the role of government (at various levels) in the development of the MICE sector (see for example Weru and Njoroge, 2021; Mena-Navarro et al., 2022; Kourkouridis et al., 2023).

Thus, in our study we research whether some factors of the development of MICE tourism influence each other in the capital of Kazakhstan, such as the effectiveness of interaction between the authorized government body and private organizations, the level of development of destination marketing and the number of experienced specialists.

LITERATURE REVIEW

Key factors for the development of MICE tourism are of great importance, which need to be studied both separately and in dependence on each other. MICE means meetings, incentives, conferences or congresses, as well as conventions and exhibitions. Business tourism includes all aspects of the experience of travelers staying at least one night away from their permanent residence (Swarbrooke and Horner, 2001). MICE as a business travel can have the characteristics of any other type of travel. The World Tourism Organization (UNWTO) official definition of tourism suggests that people who travel for business or professional reasons are also considered tourists (Štetiš, 2011). The International Congress and Convention Association (ICCA) definition is "relatively more comprehensive and defines business tourism as "a series of activities aimed at providing accommodation and services to millions of delegates at meetings, congresses, exhibitions, business events and incentive trips." Accepting With all this taken into account, one comprehensive and complete definition of business tourism can be given, in which there are business reasons and participation in meetings, congresses, conventions, exhibitions, conferences and incentive trips, where business travelers enjoy the full range of tourism services and major tourism products within tourist destinations (Štetiš et al., 2014). Getz and Page (2015) describe MICE tourism as business events. The MICE sector requires conference centers and exhibition halls, including numerous small private parties and events held in restaurants, hotels or resorts. Sports also require special facilities, including sports parks, arenas and stadiums. Festivals and other cultural events are less dependent on infrastructure and can be held in parks, streets, theaters, concert halls and all other public or private venues. Entertainment events such as concerts are typically produced by the private sector and use many types of venues. The literature shows that the benefits obtained from MICE tourism are worthy of attention; this is the basis for business contacts. It facilitates access to new technologies, attracts high-spending visitors, generates high per capita income, strengthens international economic contacts, creates greater economic multiplier effects and competitiveness, and can occur outside the peak season (Lau et al., 2005; Lawrence and McCabe, 2001; Rogerson, 2005; Yoon et al., 2001). MICE delegates stay longer and consider themselves big spenders (Kim et al., 2003; Lee and Back, 2007). In addition, MICE contributes to community building, urban renewal and the growth of national identity (Getz, 2008). Kay (2005) emphasizes the profit criterion and motives behind the establishment of convention and exhibition centers; these include improvements to airports, the metro system, highways, redevelopment of the host city, parks, various urban renewal schemes, improvement of the municipality's financial position and the restoration of the devastated area near the city's convention center.

Stakeholder theory is based on three pillars: power, legitimacy and urgency (Freeman, 1994). Stakeholders are interested and motivated by profit expectations (Skidmore, 1975). Power is the ability of stakeholders to impose their will on a given relationship. A legitimate stakeholder is one whose actions are acceptable, appropriate, legal, and desirable from the community's perspective. Whereas, urgency is the degree to which a stakeholder believes that its actions are time sensitive and critical, requiring immediate attention (Etzioni, 1964; Parent and Deephousese, 2007; Suchman, 1995).

In this regard, stakeholders could be defined as individuals, groups, or organizations that are affected by the consequences and causes of problems (Bryson and Crosbyby, 1992). Stakeholder groups are classified first of all: city authorities, marketing organizations, competitors, tourist attraction enterprises, service companies, tourists, restaurants and hotels. And minor ones: the chamber of commerce, incentive planners, and community groups (Tkaczynski, 2009). Sautter and Leisen (1999) added other stakeholder groups: property owners, local businesses, coastal managers, and employees. Bushell (1999) mentioned the common desires and interests they have, such as participation in decision making and benefit sharing. In tourism planning, collaboration between different stakeholder groups can lead to potential benefits such as avoiding conflicts between stakeholders that lead to real costs, positively influencing the performance of stakeholders when they are involved in the decision-making process, and increasing the coordination of policies and strategies (Bramwell and Sharman, 1999). In the MICE sector, where success largely depends on close cooperation between parties, these changes are also detrimental in terms of intergroup dynamics and actually create a hostile industry environment (JungYoung Jeong, 2017). In the development of MICE tourism, the tourism destination management system and territory marketing are important. In this matter, the public–private partnership (PPP, 3P or P3) plays a special role.

In accordance with M. Porter's approach to globalization, the idea of PPP is formulated to strengthen trust between the state and business representatives at the regional level. It should also be noted that the intervention of external factors, such

as a pandemic, geopolitical problems (Ukraine - Russia) also have an impact on the development of MICE tourism. Similar to the rest of the world, Astana was severely affected by the pandemic, with the country's COVID-19 regulations stifling the entire tourism system (Rogerson and Rogerson, 2022). While government interventions and the focus on domestic tourism had helped reduce the impact of the pandemic, the MICE events sector was forced to not only pause operations but re -alter their structure to comply with regulations (Dragin-Jensen et al., 2022).

Bartis et al. (2021) point out that the sector was one of the most regulated tourism activities. In fact, from the very start, the (changing) regulations in place had restricted the hosting of in-person MICE events, as for the most part, the sector was limited to hosting events with only 50 and 100 persons (maximum) capacity (Lekgau and Tichaawa, 2022). There are five key determinants of the recovery of MICE tourism: change in focus of geographical markets, varied recovery of the different economic industries, limited airline access and connectivity, destination image and level of confidence of MICE attendees to travel (Lekgau, 2023). Regarding our research, we consider internal factors of the development of MICE tourism: the effectiveness of interaction between the authorized government body and private organizations, the level of development of destination marketing and the number of experienced specialists and how it influences each other.

MATERIALS AND METHODS

The research hypothesis is central to all research endeavors, "whether qualitative or quantitative, exploratory or explanatory. At its core, a research hypothesis defines what the researcher expects to find - it is a preliminary answer to the research question that guides the entire study." However, developing testable research hypotheses requires skill along with careful attention to how the proposed research method is to develop and test hypotheses (Creswell, 2014).

The research model proposed by the author includes the mutual influence of MICE tourism development factors in the capital of Kazakhstan, particularly the interaction of the effectiveness of interaction between the authorized government body and private organizations, the level destination marketing of development and number of experienced specialists (Figure 1). Within the framework of the development of business tourism, these factors are one of the important tools for improving the MICE tourism system in Astana city. Based on the formulation of the problem, goals and in accordance with the model created in this study, the following hypotheses can be formulated (Figure 2).

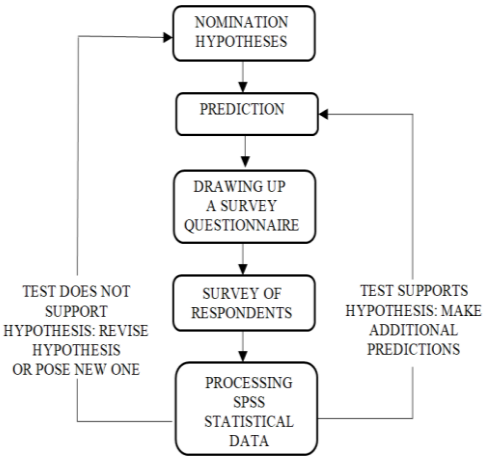


Figure 1. Flow chart of methodology steps

H1 - It is assumed that the number of experienced specialists in the field of MICE tourism development influences the level of destination marketing development.

H2 - It is assumed that the number of experienced specialists in the field of MICE tourism development affects the effectiveness of interaction between the authorized state body and private organizations in the field of tourism.

H3 - It is assumed that the effectiveness of interaction between the authorized government body and private organizations in the field of tourism affects the level of destination marketing development.

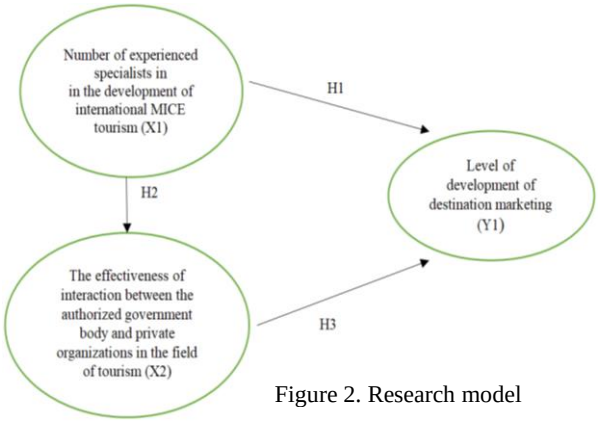


Figure 2. Research model

The empirical data of this study was collected through a paper-based survey in Astana. Specifically, a questionnaire was used to collect data to test the hypotheses. Tourism stakeholders representing travel agents, tour operators, restaurant owners, event organizers, hoteliers, government officials, and academics were interviewed as the study population. A total of 50 responses were collected from the survey and coded for analysis.The largest share fell on representatives of private organizations in the field of tourism 25 people - 50% (25), followed by persons representing bodies of state and quasi-state structures - (15 people, 30.0%), and persons representing the scientific field (5 doctoral students and 5 university teachers, 20%). In order to explore the connections between the key factors in the development of MICE tourism in the capital of Kazakhstan, special attention is paid to the effectiveness of interaction between the authorized government body and private organizations in the field of tourism, the level of development of destination marketing, and the frequency of international level MICE tourism events in the capital. This study used the method of one-phase analysis of variance (ANOVA analysis), as well as

Table 1. General coded data obtained through questionnaires

N	X1	Y1	N	X1	Y1	N	X1	Y1	N	X1	Y1
1	2	1	14	15	2	27	28	3	40	16	2
2	9	2	15	9	2	28	14	1	41	15	2
3	6	1	16	8	1	29	16	1	42	22	3
4	11	2	17	9	1	30	17	2	43	13	2
5	9	1	18	6	3	31	18	1	44	15	2
6	9	2	19	8	1	32	14	2	45	17	2
7	5	1	20	17	2	33	19	1	46	17	2
8	7	1	21	18	2	34	14	1	47	18	2
9	7	2	22	9	1	35	15	2	48	19	2
10	14	2	23	11	1	36	24	3	49	14	2
11	4	3	24	15	2	37	14	1	50	15	2
12	6	1	25	16	2	38	13	2			
13	7	1	26	10	1	39	10	3			

the method of analyzing contingency tables ($\chi 2$ test of independence (Pearson's chi-squared test) using the SPSS program. To test the first hypothesis (H1), the one-way analysis of variance (ANOVA) method was used.

H1 – It is assumed that the number of experienced specialists in the field of international MICE tourism development (X1) significantly influences the level of development of destination marketing (Y1). General coded data obtained through questionnaires are given in Table 1. The null hypothesis states that the number of experienced specialists in the field of international MICE tourism development does not affect the level of marketing development of the destination. Descriptive Statistics regarding number of experienced specialists are given in Table 2.

The hypothesis "The variances in the compared groups are equal" is tested. Test for homogeneity of variances are given in Table 3. The resulting significance is less than 0.05, which means that the null hypothesis maybe be rejected That there are variances not are equal. Criterion uniformity variances Levene's with significance 0.000 showed that the variances for each group are statistically different. ANOVA test regarding number of experienced specialists are given in Table 4.

Table 2. Descriptive Statistics regarding number of experienced specialists

	N	Average	Standard Difference	Standard Error Difference	95% confidence interval of Difference		Minimum	Maximum
					Lower	Upper		
low	19	10.11	4,593	1.054	7.89	12.32	2	19
medium	25	14.32	3.159	.632	13.02	15.62	7	19
high	6	15.67	10,231	4,177	4.93	26.40	4	28
Total	50	12.88	5.321	.752	11.37	14.39	2	28

Table 3. Test for homogeneity of variances

		Levene's statistics	df.1	df.2	Significance
number of experienced specialists	Based on average	19,809	2	47	.000
	Based on median	15,765	2	47	.000
	Based on median and with adjusted st.d.	15,765	2	43,429	.000
	Based on trimmed mean	19,549	2	47	.000

Table 4. ANOVA test regarding number of experienced specialists

	Sum of squares	df.	Mean square	F	Significance
Between groups	244,717	2	122,359	5,033	.010
Within groups	1142.563	47	24,310		
Total	1387.280	49			

Additionally, the null hypothesis can be rejected with an error probability of 0.01% (significance 0.010), That there is a null hypothesis not true and should be rejected. Therefore, it can be concluded that there is a relationship between the number of experienced specialists in the field of international MICE tourism development and the level of development of destination marketing, this can also be seen in the graph. According to the research results, the number of experienced specialists in the field of international MICE tourism development significantly influences the level of development of destination marketing (Figure 3). To test the second hypothesis (H2), the method of single-phase analysis of variance (ANOVA analysis) was used.

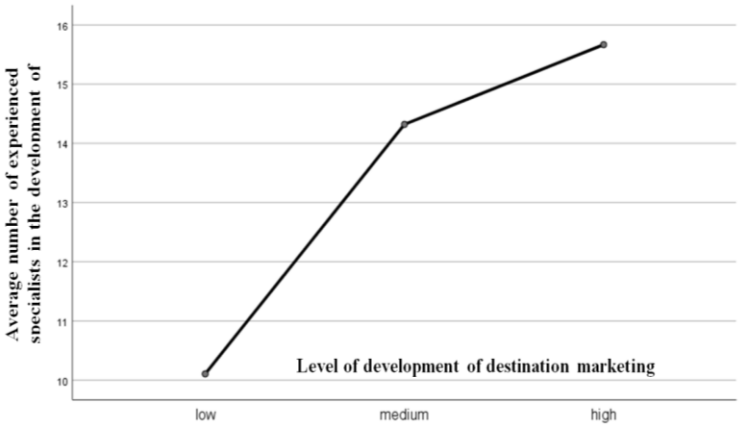


Figure 3. Overview of the relationship between the number of experienced specialists in the field of international MICE tourism development and the level of development of destination marketing

H2 - It is assumed that the number of experienced specialists in the field of MICE tourism development (X1) affects the effectiveness of interaction between the authorized state body and private organizations in the field of tourism (X2). General coded data obtained through questionnaires are given in Table 5. The null hypothesis states that the effectiveness of interaction between the authorized government body and private organizations in the field of tourism does not affect the number of experienced specialists in the field of MICE tourism development. Descriptive statistics are given in Table 6. Levene's test for homogeneity of variances with a significance of 0.048 is given in Table 7 showed that the variances for each group were not statistically different.

Table 5. General coded data obtained through questionnaires

N	X1	X2	N	X1	X2	N	X1	X2	N	X1	X2
1	2	4	14	15	9	27	28	9	40	16	3
2	9	8	15	9	2	28	14	4	41	15	5
3	6	10	16	8	8	29	16	1	42	22	9
4	11	1	17	9	2	30	17	4	43	13	9
5	9	5	18	6	4	31	18	5	44	15	3
6	9	2	19	8	4	32	14	8	45	17	10
7	5	9	20	17	3	33	19	3	46	17	8
8	7	4	21	18	6	34	14	9	47	18	3
9	7	3	22	9	2	35	15	8	48	19	3
10	14	9	23	11	8	36	24	3	49	14	10
11	4	10	24	15	9	37	14	3	50	15	9
12	6	3	25	16	4	38	13	4			
13	7	8	26	10	10	39	10	4			

Table 6. Descriptive statistics

	N	Average	Standard Deviation	Standard error	95% confidence interval for the mean		Minimum	Maximum
					Bottom line	Upper limit		
2	1	4.00	.	.	.	.	4	4
4	1	10.00	.	.	.	.	10	10
5	1	9.00	.	.	.	.	9	9
6	3	5.67	3,786	2,186	-3.74	15.07	3	10
7	3	5.00	2,646	1.528	-1.57	11.57	3	8
8	2	6.00	2.828	2,000	-19.41	31.41	4	8
9	6	3.50	2,510	1.025	.87	6.13	2	8
10	2	7.00	4,243	3,000	-31.12	45.12	4	10
11	2	4.50	4,950	3,500	-39.97	48.97	1	8
13	2	6.50	3.536	2,500	-25.27	38.27	4	9
14	6	7.17	2.927	1.195	4.10	10.24	3	10
15	6	7.17	2,563	1,046	4.48	9.86	3	9
16	3	2.67	1.528	.882	-1.13	6.46	1	4
17	4	6.25	3,304	1.652	.99	11.51	3	10
18	3	4.67	1.528	.882	.87	8.46	3	6
19	2	3.00	.000	.000	3.00	3.00	3	3
22	1	9.00	.	.	.	.	9	9
24	1	3.00	.	.	.	.	3	3
28	1	9.00	.	.	.	.	9	9
Total	50	5.68	2.952	.417	4.84	6.52	1	10

Table 7. Test for homogeneity of variances

		Levene's statistics	st.st.1	Art.St.2	Significance
The effectiveness of interaction between the authorized government body and private organizations in the field of tourism	Based on average	2,099	12	31	.048
	Based on median	.564	12	31	.853
	Based on median and with adjusted st.m.	.564	12	19,492	.845
	Based on trimmed mean	1.839	12	31	.085

Table 8. ANOVA test

	Sum of squares	st.sv. _	Middle square	F	Significance
Between groups	171,963	18	9,554	1.162	,347
Within groups	254,917	31	8,223		
Total	426,880	49			

Anova test data suggests that the null hypothesis cannot be rejected since the value is 0.347 is given in Table 8, which is greater than the value of 0.05, then there is a null hypothesis true and should not be rejected. Therefore, we can conclude that there is no connection between the number of experienced specialists in the field of international MICE tourism development and the effectiveness of interaction between the authorized government body and private organizations in the field of tourism, this can also be seen in the graph. Thus, based on the results of the analysis, we can conclude that the number of experienced specialists in the field of MICE tourism development does not affect to the effectiveness of interaction between the authorized government body and private organizations in the field of tourism (Figure 4). To test the third hypothesis (H3), the method of analyzing contingency tables was applied ($\chi 2$ test of independence (Pearson's Chi-square).

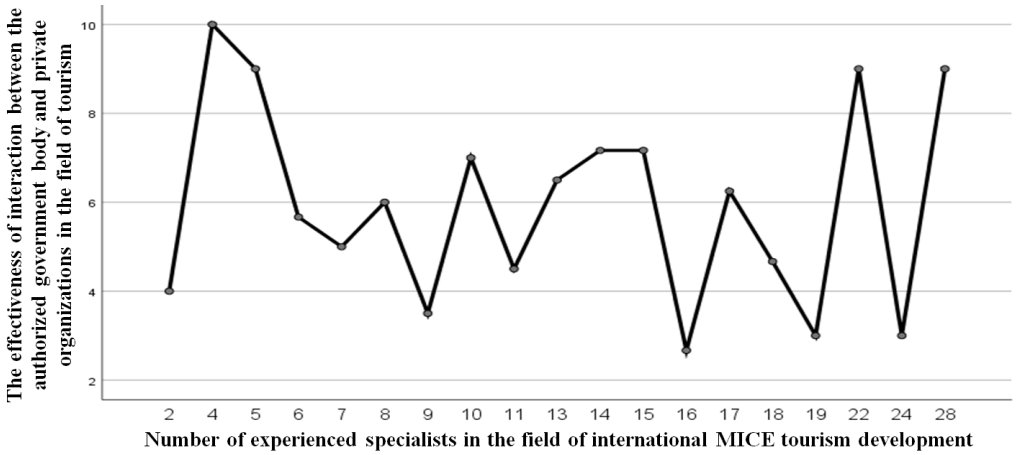


Figure 4. Overview of the influence of the number of experienced specialists in the field of international MICE tourism development to the effectiveness of interaction between the authorized government body and private organizations in the field of tourism

H3 - It is assumed that the effectiveness of interaction between the authorized government body and private organizations in the field of tourism (X2) (on a scale of 1-10) affects the level of development of destination marketing (Y1) (low -1, medium -2, high - 3). General coded data obtained through questionnaires are given in Table 9.

Table 9. General coded data obtained through questionnaires

N	X2	Y1	N	X2	Y1	N	X2	Y1	N	X2	Y1
1	4	1	14	9	2	27	9	3	40	1	2
2	8	2	15	2	2	28	4	1	41	2	2
3	10	1	16	8	1	29	1	1	42	9	3
4	1	2	17	2	1	30	4	2	43	2	2
5	5	1	18	1	3	31	2	1	44	3	2
6	2	2	19	4	1	32	8	2	45	10	2
7	9	1	20	3	2	33	3	1	46	2	2
8	4	1	21	6	2	34	3	1	47	3	2
9	3	2	22	2	1	35	2	2	48	3	2
10	9	2	23	8	1	36	3	3	49	10	2
11	10	3	24	1	2	37	1	1	50	2	2
12	3	1	25	4	2	38	4	2			
13	8	1	26	10	1	39	4	3			

Table 10. Summary report of observations

	Observations					
	Valid		Missed		Total	
	N	Interest	N	Interest	N	Interest
Level of marketing development * effectiveness of interaction between government agencies and private firms	50	100.0 %	0	0.0%	50	100.0%

Summary report of observations is given in Table 10. For a preliminary analysis of the influence of variables, let's consider the values of the adjusted remainder, in our case it does not go beyond the boundaries of the standardized remainder, therefore the hypothesis of the presence of a connection is not confirmed. Combination table level of marketing development and effectiveness of interaction between government agencies and private firms are given in Table 11.

Table 11. Combination table level of marketing development *effectiveness of interaction between government agencies and private firms

			Efficiency of interaction between government agencies and private firms									Total
			1	2	3	4	5	6	8	9	10	
Level of marketing develop-ment	short	Quantity	1	2	3	4	2	0	3	2	2	19
		Expected quantity	,8	1.5	3.8	3.4	1.1	,4	2.7	3.4	1.9	19.0
		% in level of marketing development	5.3%	10.5%	15.8%	21.1%	10.5%	0.0%	15.8%	10.5%	10.5%	100.0%
		% in the efficiency of interaction between government agencies and private firms	50.0%	50.0%	30.0%	44.4%	66.7%	0.0%	42.9%	22.2%	40.0%	38.0%
		% of total	2.0%	4.0%	6.0%	8.0%	4.0%	0.0%	6.0%	4.0%	4.0%	38.0%
		Remainder	,2	,5	-,8	,6	,9	-,4	,3	-1.4	,1	
		Standardized remainder	,3	,4	-,4	,3	,8	-.6	,2	-,8	,1	
		Adjusted balance	,4	,5	-.6	,4	1.1	-,8	,3	-1.1	,1	
	average	Quantity	1	2	6	3	1	1	4	5	2	25
		Expected quantity	1.0	2.0	5.0	4.5	1.5	,5	3.5	4.5	2.5	25.0
		% in level of marketing development	4.0%	8.0%	24.0%	12.0%	4.0%	4.0%	16.0%	20.0%	8.0%	100.0%
		% in the efficiency of interaction between government agencies and private firms	50.0%	50.0%	60.0%	33.3%	33.3%	100.0%	57.1%	55.6%	40.0%	50.0%
		% of total	2.0%	4.0%	12.0%	6.0%	2.0%	2.0%	8.0%	10.0%	4.0%	50.0%
		Remainder	.0	.0	1.0	-1.5	-,5	,5	,5	,5	-,5	
		Standardized remainder	.0	.0	,4	-.7	-,4	.7	,3	,2	-.3	
		Adjusted balance	.0	.0	.7	-1.1	-.6	1.0	,4	,4	-,5	
	high	Quantity	0	0	1	2	0	0	0	2	1	6
		Expected quantity	,2	,5	1.2	1.1	,4	,1	,8	1.1	,6	6.0
		% in level of marketing development	0.0%	0.0%	16.7%	33.3%	0.0%	0.0%	0.0%	33.3%	16.7%	100.0%
		% in the efficiency of interaction between government agencies and private firms	0.0%	0.0%	10.0%	22.2%	0.0%	0.0%	0.0%	22.2%	20.0%	12.0%
		% of total	0.0%	0.0%	2.0%	4.0%	0.0%	0.0%	0.0%	4.0%	2.0%	12.0%
		Remainder	-,2	-,5	-,2	,9	-,4	-,1	-,8	,9	,4	
		Standardized remainder	-,5	-.7	-,2	,9	-.6	-.3	-,9	,9	,5	
		Adjusted balance	-,5	-,8	-,2	1.0	-.7	-,4	-1.1	1.0	,6	
Total		Quantity	2	4	10	9	3	1	7	9	5	50
		Expected quantity	2.0	4.0	10.0	9.0	3.0	1.0	7.0	9.0	5.0	50.0
		% in level of marketing development	4.0%	8.0%	20.0%	18.0%	6.0%	2.0%	14.0%	18.0%	10.0%	100.0%
		% in the efficiency of interaction between government agencies and private firms	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of total	4.0%	8.0%	20.0%	18.0%	6.0%	2.0%	14.0%	18.0%	10.0%	100.0%

Table 12. Chi-square tests

	Meaning	St.St.	Asymptotic significance (2-sided)
Pearson's Chi-square	7.662a –	16	.958
Likelihood ratios	9,657	16	.884
Line-to-linear connection	.624	1	.430
Number of valid observations	50		
a. For a cell count of 26 (96.3%), a value less than 5 is assumed. The minimum expected number is .12.			

Also, the Pearson's Chi-square has a value of 7.662 is given in Table 12, and the significance is higher than 0.05 (0.958), which also confirms the lack of relationship between the variables. Goodman and Kruskal's Lambda and Tau coefficients are very small , which also indicates the absence of a connection; the values of the coefficients Phi and Cramer's V also indicate a low relationship between the variables, and the significance of 0.958 also confirms the hypothesis of the absence of a relationship are given in Table 13.

Table 13. Targeted and symmetrical measures

			Meaning	Asymptotic mean square error [a]	Approximate [Tb]	Approximate significance
Denomi-nation /denomi-nation	Lambda	Symmetrical	.062	.092	.652	.515
		Dependent variable level of marketing development	.080	,172	.448	.654
		Dependent variable: efficiency of interaction between government agencies and private firms	.050	.077	.635	.525
	Tau Goodman and Kruskal	Dependent variable level of marketing development	.071	.045		.975 [s]
		Dependent variable: efficiency of interaction between government agencies and private firms	.021	.013		.937 [s]
a. Without assuming a null hypothesis						
b. Using the asymptotic root mean square error under the null hypothesis						
c. Based on chi-square approximation						

		Meaning	Asymptotic mean square error [a]	Approximate [Tb]	Approximate significance
Denomination/ denomination	Fi	.391			.958
	Cramer's V	,277			.958
Interval/Interval	R Pearson	,113	,139	.787	.435 [s]
Ordinal/ordinal	Spearman correlation	,109	,139	.758	.452 [s]
Number of valid observations		50			
a. Without assuming a null hypothesis					
b. Using the asymptotic root mean square error under the null hypothesis					
c. Based on normal approximation					

Based on the results of the study, we can conclude that the effectiveness of interaction between authorized government bodies and private organizations in the field of tourism (on a scale of 1-10) does not affect the level of development of destination marketing (low -1, medium -2, high - 3) (Figure 5).

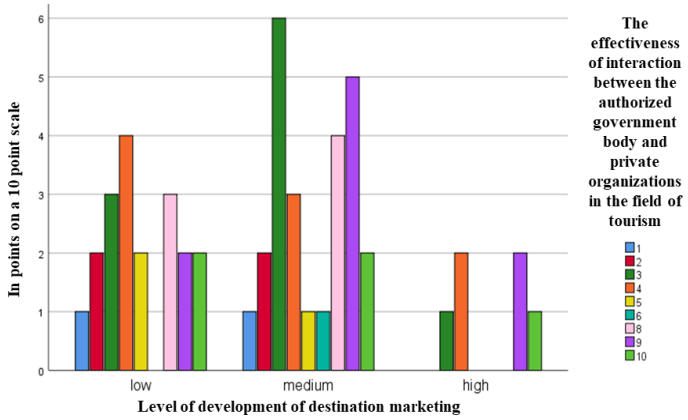


Figure 5. Review of the impact of the effectiveness of interaction between authorized government bodies and private organizations in the field of tourism on the level of development of destination marketing

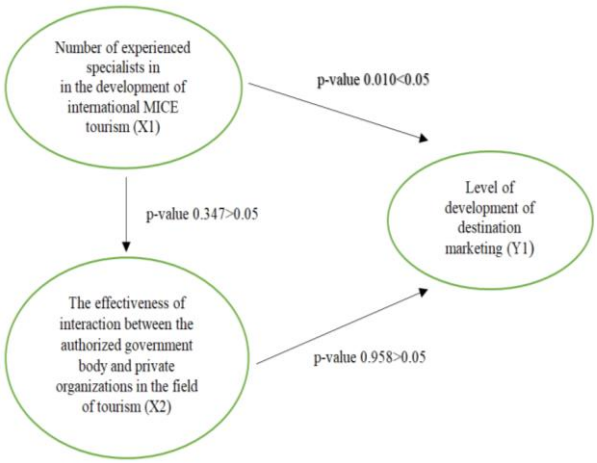


Figure 6. Research model

RESULTS AND DISCUSSIONS

The results of this analysis indicate that the number of experienced professionals in the field of MICE tourism development significantly influences the level of marketing development of a destination, with Levene's test for homogeneity of variances with a significance of 0.000 and a p-value of 0.010 < 0.05. The MICE market is developing under significant influence of the traditional tourism market. Realizing the rapid growth dynamics of the MICE segment

and the commercial prospects of working in this area, many tour operators began to create new specialized structural units: MICE departments and divisions. As practice shows, these departments turn out to be unsuited to providing flexible customer-oriented service aimed at building long-term, trusting relationships with each corporate customer.

The presence of a wide range of consumers does not require travel companies to provide an individual customer-oriented approach, introduce technological innovations and additional costs for advanced training. The impersonality and scale of the audience reduce the need to fight for each individual consumer and do not require travel companies to build loyalty programs and create additional competitive advantages.

It will take a long time to retrain travel sales managers into responsible travel managers and event coordinators. In this regard, there is a need to create a new area for training specialists in the field of event tourism and MICE technologies everywhere. Training programs in this promising area already exist in the country's leading universities. The second result of the analysis showed the number of experienced specialists in the field of MICE tourism development does not affect the effectiveness of interaction between the authorized government body and private organizations in the field of tourism, while Levene's test of homogeneity of variances with a significance of 0.048, and p-value 0.347 > 0.05.

Table 14. The hypothesized results

Research Hypothesis	P-value	Result
H1 - The number of experienced specialists in the field of MICE tourism development influences the level of destination marketing development.	0.010 < 0.05	Supported
H2 - The number of experienced specialists in the field of MICE tourism development affects the effectiveness of interaction between the authorized state body and private organizations in the field of tourism.	0.347 > 0.05	Not supported
H3 - The effectiveness of interaction between the authorized government body and private organizations in the field of tourism affects the level of destination marketing development.	0.958 > 0.05.	Not supported

There are four main determinants of national competitive advantage: factors; demand conditions such as firm strategy and structure and rivalry; related and supported industries. However, to achieve positive results, individual companies, business leaders and national governments must work together to understand the effectiveness and efficiency of the public-private partnership (PPP) approach and business project management. Local associations play an important role in establishing PPP, they act as intermediaries between the state and business. In this case, public-private partnership directly depends on the intention of the participants in the process themselves.

In addition, close communication with representatives of science is also necessary to develop a system of interaction between government and business. And finally, the last result of the analysis indicates that the effectiveness of interaction between the authorized government body and private organizations in the field of tourism does not affect the level of development of destination marketing, while the independence criterion $\chi 2$ is equal to 7.662, degree freedom 16, and p-value 0.958 > 0.05. Based on the results of the analysis, the effectiveness of PPP in Astana city does not affect the level of marketing. We assume that the root cause for this is a weak connection between the state and business and an uncoordinated joint policy in terms of promoting the destination and developing business tourism. This raises the question about the effectiveness of PPP in Astana city and the weak work of existing local associations (Figure 6). The common hypothesized results are given in Table 14.

CONCLUSIONS

a) Suggestions for interested parties. It is expected that stakeholders in the development of MICE tourism need increase the number of experienced specialists in the field of MICE tourism development through trainings (including the following sections: introduction to the international MICE market, funds and trends; specifics of international association markets and how to sell a city/association property; specifics of international corporate markets and how to sell destinations / corporate property; market research and lead generation; bidding methods; how to organize an inspection site and FAM trip; customer relationship management; sales and presentation skills; negotiation methods; participation fairs; working with intermediaries), and it is also necessary for specialists to undergo international CMP certification: Certified Meetings Professional, CSEP: Certified Special Events Professional, CMM Certification in Meeting Management, DMCP: Destination Management Certified Professional.

The MICE industry, especially international branded hotels, can join forces and contacts with government agencies in order to create faster outreach to corporate clients. This means that through already established networks, international hotels have connections around the world and it is possible to attract customers in key markets and grow business potential for Astana. It is necessary to introduce an “Ambassador” program in the MICE industry, which is associated with a person - a citizen of Kazakhstan, who is an internationally recognized person, has a certain status in an international association or international corporation and is willing to work with various government bodies and local stakeholders, both local and foreign to attract congresses and meetings in Astana. An “ambassador” can lead local associations and societies (president, general secretary), can be in certain positions in international associations (president, board members, committee members) or director of a local office (CEO, CFO) and actively work and contribute to attracting international congresses and meetings in the capital.

Representatives of government agencies need to gather individual people: tourism professionals, diplomats, politicians, businessmen, teachers, doctors (representatives of the academic and business environment), since they are on the list of the most important candidates for the role of representative of Astana. It is important to understand that the

role of the ambassador is based more on an informal basis (lobbying, opinion and decision leaders, etc.), while the government agency and the meeting industry takes care of all tender and logistics issues.

b) Suggestions for future researchers. It is expected that a future researcher can study the factors influencing the development of MICE in the capital, so that he can expand and detail other indicators.

Author Contributions: Conceptualization, B.T.; methodology, B.T.; software, B.T.; validation, B.T.; formal analysis, B.T.; investigation, B.T.; data curation, B.T.; writing - original draft preparation, B.T.; writing - review and editing, B.T.; visualization, B.T.; supervision, B.T.; project administration, B.T.. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

An, J., Kim, H., & Hur, D. (2021). Keeping the competitive edge of a convention and exhibition center in MICE Environment: identification of event attributes for long-run success. *Sustainability*, 13(9), 5030. https://doi.org/10.3390/su13095030

Bartis, H., Hufkie, B., & Moraladi, M. (2021). The economic impact of the COVID-19 pandemic on the business events sub-sector in South Africa: Mitigation strategies and innovations. African *Journal of Hospitality, Tourism and Leisure*, 10(1), 102-111. https://doi.org/10.46222/ajhtl.19770720- 89

Becken, S., & Hughey, K.F. (2021). Impacts of changes to business travel practices in response to the COVID-19 lockdown in New Zealand. *Journal of Sustainable Tourism*, 30(1), 108-127. https://doi.org/10.1080/09669582.2021.1894160

Bramwell, B., & Sharman, A. (1999). Collaboration in local tourism policymaking. *Annals of Tourism Research*, 26(2), 392–415. https://doi.org/10.1016/s0160-7383(98)00105-4

Bryson, J., & Crosby, B. (1992). *Leadership or the common good: Tackling public problems in a shared power world*. Jossey-Bass, San Francisco, 496.

Bushell, R. (1999). *Development of approaches and practice for sustainable use of biological resources*. Tourism prepared on behalf of WCPA for the SBSTTA 4 (agenda item 4.8) meeting for the Convention on Biological Diversity, Montreal 21–25 June, IUCN Gland, Switzerland.

Creswell, J. W. (2014). Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.). Thousand Oaks, CA: Sage Publications, Inc., 342 p.

Dragin-Jensen, C., Kwiatkowski, G., Lien, V.H., Ossowska, L., Janiszewska, D., Kloskowski, D., & Strzelecka, M. (2022). Event innovation in times of uncertainty. *International Journal of Event and Festival Management*, 13(4), 387-405. https://doi.org/ 10.1108/IJEFM-07-2021-0063

Draper, J., & Neal, J.A. (2018). Motivations to attend a non-traditional conference: Are there differences based on attendee demographics and employment characteristics? *Journal of Convention & Event Tourism*, 19(4-5), 347-373. https://doi.org/10.1080/15470148.2018.1496504

Etzioni, A. (1964). *Modern organizations*. Englewood Cliffs, NJ: Prentice Hall, 120 p.

Freeman, E. (1994). The politics of stakeholder theory: Some future directions. *Business Ethics Quarterly*, 4(4), 409–421. https:// doi.org/10.2307/3857340

Getz, D., & Page, S.J. (2016). Progress and prospects for event tourism research. *Tourism Management*, 52(52), 593–631. https:// doi.org/10.1016/j.tourman.2015.03.007

JungYoung Jeong. (2017). A Study on the Scope of Compensation for Damage About Commercial Building Lease Premium. *Journal of Humanities and Social Sciences*. https://doi.org/10.22143/HSS21.8.6.63

Kay, A. L.(2005). China's Convention and Exhibition Center Boom. *Journal of Convention & Event Tourism, 7(1), 5–22.* https://doi.org/ 10.1300/J452v07n01_02

Kim, S., Chon, K., & Chung, K.Y. (2003). Convention industry in South Korea: An economic impact analysis. *Tourism Management*, 24(5), 533–541. https://doi.org/10.1016/S0261-5177(03)00006-2

Kim, I., Choi, S., Kim, D., & Choi, N. (2022). How long do regional MICE events survive? the case of Busan, Korea, Asia Pacific. *Journal of Tourism Research*, 27(8), 807-822. https://doi.org/10.1080/10941665.2022.2131442

Kourkouridis, D., Frangopoulos, Y., & Kapitsinis, N. (2023). Socio-economic effects of trade fairs on host cities from a citizens' perspective: The case of Thessaloniki, Greece. *International Journal of Event and Festival Management*, 14(1), 113-133. https://doi.org/10.1108/IJEFM-10-2022-0078

Lau, C.K., Milne, S., & Johnston, C.S. (2005). MICE, ICT and local economic development: The case of Te Kahurangi, New Zealand. *Journal of Convention & Event Tourism*, 7(1), 61–75. https://doi.org/10.1300/J452v07n01_05

Lawrence, M., & McCabe, V. (2001). Managing conferences in regional areas: a practical evaluation in conference management. *International Journal of Contemporary Hospitality Management*, 13(4), 204–207. http://dx.doi.org/10.1108/09596110110389593

Lee, M.J., & Back, K. (2007). Effects of destination image on meeting participation intentions: Empirical findings from a professional association and its annual convention. *The Service Industries Journal*, 27(1), 59–73, https://doi.org/10.1080/02642060601038676

Lekgau, J. (2023). Examining the glocal forces that determined the MICE tourism recovery post-Covid-19 pandemic. *GeoJournal of Tourism and Geosites*, 49(3), p.1195-1203. https://doi.org/10.30892/gtg.49334-1118

Mena-Navarro, A., Almeida-García, F., & Cortés-Macías, R. (2022). The role of the MICE sector in Singapore's tourism policy. A historical perspective. *Journal of Policy Research in Tourism, Leisure and Events*. https://doi.org/10.1080/19407963.2022.2043880

Parent, M., & Deephouse, D. (2007). A case study of stakeholder identification and prioritization by managers. *Journal of Business Ethics*, 75(1), 1–23. https://doi.org/10.1007/s10551-007- 9533-y

Rogerson, C. (2005). Conference and exhibition tourism in the developing world: The South African experience. *Urban Forum*, 16(2–3), 176–196. https://doi.org/10.4324/9781351300483-7

Rogerson, C.M. (2015). Unpacking business tourism mobilities in sub-Saharan Africa. *Current Issues in Tourism*, 18(1), 44-56. https://doi.org/10.1080/13683500.2014.898619

Rogerson, C.M., & Rogerson, J.M. (2022). The impacts of COVID-19 on urban tourism destinations: The South African experience. *African Journal of Hospitality, Tourism and Leisure*, 11(1), 1-13. https://doi.org/10.46222/ajhtl.19770720.207

Santos, J.A.C., Fernández-Gámez, M.A., Guevara-Plaza, A., Custódio Santos, M., & Pestana, M.H. (2022). The sustainable transformation of business events: sociodemographic variables as determinants of attitudes towards sustainable academic conferences. *International Journal of Event and Festival Management*, 14(1), 1-22. https://doi.org/10.1108/IJEFM-05-2022-0041

Sautter, E.T., & Leisen, B. (1999). Managing stakeholders: A tourism planning model. *Annals of Tourism Research*, 26(2), 312–328. https://doi.org/10.1016/s0160-7383(98)00097-8

Skidmore, A. (1975). *Social work administration: Dynamic management and human relationships*. Boston, MA: Allyn and Bacon, 258 p.

Štetiš, S., Cvijanoviš D., & Šimiţeviš, D. (2014). Posebni oblici turizma Dunavskog regiona Srbije: Monografija. Beograd: Institut za ekonomiku poljoprivrede, 227 p. (In Serbian)

Suchman, M.C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571–610. https://doi.org/10.2307/258788

Swarbrooke, J., & Horner, S. (2001). Business Travel and Tourism, Butterworth-Heinemann, Oxford, 1st Edition, 384. https://doi.org/10.4324/9780080490601

Tichaawa, T.M. (2017). Business tourism in Africa: The case of Cameroon. *Tourism Review International*, 21, 181-192. https://doi.org/10.3727/154427217X14939227920829

Tichaawa, T.M. (2021). Informal business tourism in Cameroon. *GeoJournal of Tourism and Geosites*, 38(4), 1289–1298. https://doi.org/10.30892/gtg.38437-771

Tkaczynski, A. (2009). Destination segmentation: A recommended two-step approach. *Journal of Travel Research*, 49(2), 139–152. https://doi.org/10.1177/0047287509336470

Welthagen, L., Slabbert, E., & Plessis, E.D. (2022). Conference tourism competitiveness: An applied AHP framework. *Journal of Convention & Event Tourism*, 23(5), 435-459. https://doi.org/10.1080/15470148.2022.2095316

Weru, J.N., & Njoroge, J.M. (2021). Investigating the influence of business events experience on international visitors' perceived destination image: The case of Kenya. *Journal of Convention & Event Tourism*, 22(5), 384-406. https://doi.org/10.1080/15470148.2021.1895017

Yoon, Y., Gursoy, D., & Chen, J.S. (2001). Validating a tourism development theory with structural equation modeling. *Tourism Management*, 22(4), 363–372. https://doi.org/10.1016/S0261-5177(00)00062-5

Article history: Received: 30.06.2023 Revised: 25.10.2023 Accepted: 22.11.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1610-1621
DOI 10.30892/gtg.514 spl02-1157

THE EFFECT OF COMPETITIVE ADVANTAGE ON THE RELATIONSHIP BETWEEN ENVIRONMENTAL UNCERTAINTY AND HOTEL PERFORMANCE IN SAUDI ARABIA

Ibrahim ALSUBAIHI*
School of Housing, Building and Planning, Universiti Sains Malaysia, Penang, Malaysia;
Applied College, Jazan University, Jazan, Saudi Arabia, e-mail: ibrahimalsubaihi5@gmail.com

Suraiyati Binti RAHMAN
School of Housing, Building and Planning, Universiti Sains Malaysia, Penang, Malaysia, e-mail: suraiyati@usm.my

Diana Binti MOHAMAD
School of Housing, Building and Planning, Universiti Sains Malaysia, Penang, Malaysia, e-mail: diana_mohamad@usm.my

Citation: Alsubaihi, I., Rahman, S.B., & Mohamad, D.B. (2023). THE EFFECT OF COMPETITIVE ADVANTAGE ON THE RELATIONSHIP BETWEEN ENVIRONMENTAL UNCERTAINTY AND HOTEL PERFORMANCE IN SAUDI ARABIA. *GeoJournal of Tourism and Geosites*, 51(4spl), 1610–1621. https://doi.org/10.30892/gtg.514spl02-1157

Abstract: The study explores the relationship between environmental uncertainty, competitive advantage, and hotel performance in the context of 1, 2, and 3-star hotels in Saudi Arabia. Quantitative methodology was chosen as the primary research approach. This approach systematically collects numerical data and statistical analysis to derive meaningful insights. The research collected comprehensive data from a specific target group, namely the 1, 2, and 3-star hotels in Saudi Arabia. The findings reveal a significant mediation effect of competitive advantage on the relationship between environmental uncertainty and hotel performance. This underscores the importance of developing and maintaining a competitive advantage to thrive in an uncertain environment by anticipating and adapting to market changes. This study emphasises the vital role of competitive advantage in bolstering hotel performance amidst environmental uncertainty. Future research should seek broader industry representation. Overall, it enhances our understanding of Saudi Arabia's hospitality sector, offering practical guidance for hotel owners and managers in navigating uncertainties.

Key words: Tourism, Hospitality, Market Uncertainty, Technology Uncertainty, Competitive Uncertainty, Saudi Arabia, Hotels

* * * * * *

INTRODUCTION

Saudi Arabia has been a sought-after destination for both Arab and international tourists, particularly in the realm of "religious tourism" (Assaf and Barros, 2011). The growth of the hotel and hospitality sector is highly competitive due to the increasing influx of tourists, placing Saudi Arabia among the top tourist destinations. With a shift from an oil-based economy to one centred around tourism and business, as emphasised in the new tourism policy developed in 2019 (Abuhjeeleh, 2019), the hotel industry has emerged as a pivotal player in this transformation. While historically specialised in accommodating religious tourists, there is now a need for Saudi Arabian hotels to focus on the luxury and travel segments (Assaf and Barros, 2011). Despite rising occupancy rates, several major regions in Saudi Arabia, such as Riyadh and Jeddah, grapple with performance challenges, primarily due to increased supply and heightened competition. This fierce competition has resulted in a significant drop in average daily rates, causing financial strain for hotels in the country. Notably, one-, two-, and three-star hotels in Saudi Arabia exhibit lower occupancy rates than their four- and five-star counterparts. Five-star hotels, in particular, boasted an impressive 75% average occupancy rate in 2019, outperforming other categories (Ministry of Tourism KSA, 2020). Adding to the complexity, the growing demand for furnished apartments has created a competitive challenge for the local hotel industry. Occupancy rates in furnished apartments, at 65.5%, are rising, posing direct competition to traditional hotels in Saudi Arabia. Consequently, the Saudi hotel industry grapples with market competition and lower overall performance.

The entry of foreign hotels into the Saudi Arabian market has intensified the competitive landscape. Six financially robust foreign hotels have heightened the rivalry among local hotels, bringing established brand names, management expertise, and access to international marketing channels. While this increased competition can raise customer awareness and demand for hotel services, it also pressures local hotels to enhance their services, amenities, and pricing strategies to remain competitive. Smaller or less-established hotels may face challenges in matching the offerings of foreign hotels.

Local and domestic hotels need a well-crafted competitive strategy that utilises internal resources to compete with larger hotels effectively. This involves strategic approaches encompassing branding, technological advancements, niche promotion, pricing tactics, cost control, service quality optimisation, and employee relationships (Gursoy, 2018). However, previous research has often focused on specific external or internal components in their strategic planning approaches. While Porter's five forces and resource-based management theories dominate strategic management discussions, there

* Corresponding author

remains a concern about these frameworks in the literature. Like many sectors, the hotel industry faces uncertainty in today's global conditions. Environmental uncertainty can negatively impact hotel businesses, and a lack of understanding of how environmental factors influence organisational decisions can exacerbate the situation (Elaraby, 2021; Sunarta et al., 2020). Companies must navigate uncertainty caused by unpredictable environmental changes, including technology, market dynamics, and competition, as failure to do so can lead to declining performance.

Arasli et al.'s (2019) investigation delved into the influence of perceived environmental uncertainty (PEU) on hotel performance (HP), with a focus on the mediating role of balanced scorecard (BSC) adoption. They further explored the moderating effect of organisational structure in the direct and indirect connections between BSC adoption and HP and PEU and HP. The findings indicated that PEU and adopting BSC dimensions, including financial, customer, internal business processes, innovation, and learning, shaped HP. It was established that financial, customer, and internal business processes mediate between PEU and HP. Moreover, the study noted that high decentralisation amplified the impact of financial, customer, and internal business processes on HP. Building upon exploring organisational strategies, Abdulwase et al. (2020) contributed to the literature by examining the relationship between business strategy and its role in establishing a competitive advantage within organisations. The study emphasised the importance of business strategies across different organisational contexts. They identified that a robust business strategy played a crucial role in gaining a competitive edge in the market. Furthermore, the research established that the quality of the strategy had a significant impact on the organisation's market performance, underscoring the significance of effective business strategies for various stakeholders in an organisational context. Hossain et al. (2021) conducted a study in Malaysia to investigate the relationships between absorptive capacity, team culture, competitive intelligence awareness, entrepreneurial behaviour, learning capability, and sustainable competitive advantage within the hotel industry. Their research, founded on quantitative methods and data from Malaysian hotel management staff, revealed that absorptive capacity, team culture, and competitive intelligence awareness significantly influenced learning capability. Learning capability, in turn, significantly affected sustainable competitive advantage, although entrepreneurial behaviour did not exhibit a significant impact. Importantly, the study highlighted the moderating role of innovativeness in the relationship between learning capability and sustainable competitive advantage, providing valuable insights for enhancing long-term survival and competitive strength in the hotel industry.

Pereira-Moliner et al. (2021) delved into evaluating sustainability's impact on cost and differentiation competitive advantages, focusing on uncovering potential synergies between sustainability and overall performance in the hotel industry. Based on data collected from a range of hotels in Spain, their research incorporated Partial Least Squares Structural Equation Modeling (PLS-SEM) to unveil noteworthy positive associations. The study demonstrated the substantial influence of sustainability on cost and differentiation advantages, perceptual performance and key indicators like ADR and RevPAR. Moreover, it identified that hotels surpassing median values in these performance variables exhibited a robust relationship between sustainability and performance, highlighting the synergistic nature of sustainability-performance ties. This comprehensive analysis encompassed economic, environmental, and social sustainability pillars and offered practical insights to enhance sustainable management practices for hotel operators.

Despite numerous studies on performance and competitive advantage in the hotel industry, especially in Saudi Arabia (Al Hanini and Al Oqqaily, 2018; Sirmon et al., 2011), empirical research on this topic is limited. Few studies have focused on hotel performance and competitive advantage in Saudi Arabia. This study aims to address this gap by investigating the factors influencing the performance and competitive advantage of Saudi Arabia's hospitality industry.

While various studies have highlighted the importance of performance and competitive advantage in the hotel industry for achieving organisational goals (Al-Alak and Tarabieh, 2011; Alkhazali et al., 2015; Yaseen et al., 2015), limited research has explored the factors influencing both these aspects. Despite numerous studies on various aspects of the Saudi Arabian hotel sector, none have effectively isolated the factors impacting performance and competitive advantage (Matar et al., 2018). This study aims to fill a gap in the existing literature by investigating the intricate dynamics among environmental uncertainty, competitive advantage, and hotel performance within the specific context of 1, 2, and 3-star hotels in Saudi Arabia. Specifically, our primary objective is to explore the mediating role of competitive advantage in shaping the relationship between environmental uncertainty and hotel performance.

LITERATURE REVIEW

1. Competitive Advantage in the Hotel Industry

Competitiveness initially focused on nation-to-nation rivalry (Porter, 1998), but it has since become a central topic in management research, particularly within industries like hospitality (Sin and Jusoh, 2019). Hotel competitiveness studies aim to pinpoint influencing factors, with brand image, customer happiness, service quality, and productivity emerging as critical determinants (Al-Ababneh et al., 2018; Mohammed and Rashid, 2018; Tavitiyaman et al., 2018). Assessing hotel performance and competitiveness has employed various methods, from Data Envelopment Analysis (DEA) to Confirmatory Factor Analysis (CFA) and Grey Relational Analysis (GRA). Fuzzy numbers have even been used for service quality evaluation. However, there remains a need for a comprehensive system to evaluate multiple hotel attributes and their specific benefits. Given the significance of Saudi Arabia's hotel industry in the nation's economy, understanding competitive advantage is paramount in the face of intensified competition, with Total Quality Management (TQM) and responsible innovation identified as influential factors. Nonetheless, there is limited literature on competitive advantage within Saudi Arabian hotel businesses. This study fills this void by examining competitive advantage in the local context, considering environmental factors and competition's impact on hotel performance. In summary, while past research has highlighted factors affecting hotel competitiveness and assessed performance, a comprehensive framework for evaluating multiple attributes is

needed. The Saudi Arabian hotel industry plays a crucial role, and understanding competitive dynamics and drivers is essential. This study addresses these gaps, providing industry practitioners and policymakers valuable insights.

2. Environmental Uncertainty and Competitive Advantage

2.1. Technological Uncertainty and Competitive Advantage

Technological uncertainty is a critical factor that exacerbates information asymmetry between managers and shareholders (Drnevich and West, 2023; Song and Montoya-Weiss, 2001). In sectors characterised by high technological uncertainty, accurately predicting specific product and process technologies becomes increasingly challenging (Ragatz et al., 2002). Consequently, businesses struggle to select the most suitable strategic alternatives. Even if a company successfully enhances its service goods or process technologies, unforeseen shifts in the industry's technological landscape can rapidly diminish its competitive advantage (Kor and Mahoney, 2005). This underscores the vulnerability of businesses operating in uncertain technological environments. Additionally, uncertain technological landscapes present managers with additional challenges. Monitoring and evaluating managerial tasks become more complex and less predictable in such conditions. This complexity poses a dilemma for shareholders as they grapple with assessing whether managers could have anticipated changes in industry technology trends and adjusted the company's technology strategy accordingly. These challenges, coupled with bounded rationality and information asymmetry, contribute to shareholders' difficulties in evaluating the quality of strategic decisions and managerial performance (Williamson, 1996).

The rapid transmission of information facilitated by the internet plays a central role in transforming the hospitality industry, revolutionising services, organisational structures, and client-service provider dynamics. Consumers can instantly access information through fast connections, reliable networks, user-friendly interfaces, and immersive virtual reality experiences. Technologies like intelligent agents and advanced filtering mechanisms enable efficient processing of vast data volumes (Raghavendra, 2020). Organisations that adapt to technological advancements in this competitive environment gain a significant competitive edge (Ravichandran, 2018). Technological adaptability has become pivotal for hotels worldwide as customers increasingly gravitate towards easily accessible establishments. According to Ezzaouia and Bulchand-Gidumal (2020), information technology profoundly influences the hotel industry, impacting areas such as marketing, managerial and operational decision-making, employee communication, productivity enhancement, and competitive advantage.Therefore, this study aims to bridge the literature gap related to technological uncertainty by developing a model that links hotels' competitive advantage with technological uncertainty in Saudi Arabia. By combining the Resource-Based View (RBV) and contingency theory, this research sheds light on the intricate relationship between technological uncertainty and competitive positioning within the Saudi Arabian hospitality industry.

1. Competitive Uncertainty and Competitive Advantage

Firms facing ambiguity must decide whether to act immediately or wait for ambiguity resolution, particularly when significant "first mover advantages" are at stake in the industry. These advantages include learning curve effects, client loyalty, patent protection, and resource acquisition (Zhang and Song, 2020). Acting promptly entails higher risks, especially for risk-averse companies (Oliver and Velji, 2019). Hence, industry pioneers often attract venture capital funding and exhibit lower risk aversion than traditionally funded businesses. When substantial first-mover advantages are absent, a company should act when it prefers a particular alternative and can influence how uncertainty is resolved to make that alternative a reality. The motivation for swift action increases with more competitors. In scenarios with multiple competitors, the timing and amount of investment become crucial, especially in R&D races (De Waegenaere et al., 2017). As competition intensifies, there is a stronger incentive to focus rather than hedge. Therefore, companies achieving their goals in this competitive and unpredictable environment gain a competitive edge (Yasar and Kiraci, 2017).

Despite limited research on the relationship between competitive uncertainty and competitive advantage, evidence suggests that environmental uncertainty's negative aspects can hinder small business performance (Huang et al., 2023; Yan and Yan, 2017). Response uncertainty negatively correlates with firm performance, with distinct uncertainty affecting performance differently (Afshar Jahanshahi, 2016). In the hospitality sector, competition significantly shapes organisational competitive advantage (Darvishmotevali et al., 2020). This study aims to contribute to understanding competitive uncertainty's role as a predictor of competitive advantage in the Saudi Arabian hotel industry.

2. Market Uncertainty and Competitive Advantage

Global competition drives executives to adapt for a competitive edge amidst changing market dynamics (Huang et al., 2020; Sazegar et al., 2018; Westphal and Zhu, 2019). Executives often adjust strategies through downsizing, repositioning, niche targeting, portfolio changes, and strategic partnerships (Zairi, 1996). Such actions are prevalent, with reorganisation observed in over half of Fortune 500 companies in the 1980s. Market dynamics are explored through various frameworks like the resource-based view (RBV), strategic group approach, and customer or demand-side approach (Kim and Canina, 2011). RBV considers similar resource-equipped enterprises as competitive threats, while the strategic group approach focuses on fierce competition among similar-model businesses. The customer or demand-side approach defines markets based on consumer demands, characterising rivals by supply-side traits (Kim and Canina, 2011). Despite the uncertainty, these frameworks apply to the hotel industry across global and local market layers. Contingency theory highlights how organisations differ due to environmental factors, leading managers to choose context-appropriate tactics (Criado-Perez et al., 2023). Enz (2010) distinguishes between customer-oriented firms, prioritising customer satisfaction and retention, and competitor-oriented firms, emphasising competitor monitoring and outsmarting. Thriving in volatile markets requires balancing customer and supplier demands. Market uncertainty stemming from shifting consumer preferences, technological

advancements, and competitor positioning impacts management and performance goals (McMullen and Shepherd, 2006). This study seeks to enhance our understanding of how market uncertainty influences competitive advantage.

3. Competitive Advantage and Hotel Performance

Existing literature extensively highlights competitive advantage's positive impact on firm performance, enabling firms to surpass their competitors (Abdolshah et al., 2018; Enz, 2010). This study adds to the literature by asserting that competitive advantage indirectly boosts firm performance and elevates market performance in the hotel industry. Market performance refers to a business's ability to retain customers through superior products and services, commonly measured by customer loyalty, product/service quality, customer retention, and satisfaction (Salisu and Goni, 2019). Competitive advantage means offering customers innovative, cutting-edge, high-value products, leading to increased customer satisfaction and loyalty, as customers perceive the offering as high-quality when it delivers greater value (Zeithaml, 1988).

High service quality and customer satisfaction directly enhance customer loyalty (Porter and Millar, 1985), resulting in lower costs for serving existing customers and an enhanced company reputation. This, in turn, facilitates attracting new customers, introducing new products, and adapting to environmental changes. Interactions between staff and customers are particularly significant in-service industries like the hotel sector. According to Anderson et al. (1997), service quality and customer satisfaction are key drivers of the relationship between competitive advantage and performance, meaning that differentiation advantages indirectly enhance business performance.

4. Hypothesis Development

Ongoing changes in the volatile and uncertain business environment raise questions about how organisations can succeed and innovate under such conditions. Contingency theory suggests that organisations considering unstable environmental factors like competitors, technology, resources, and consumers are better equipped to make decisions amid uncertainty (Darvishmotevali et al., 2020). Strategies aligning with the environment's stability, complexity, and organisational challenges tend to be more effective (Donaldson, 2001). Flexible organisations outperform rivals and handle volatility by swiftly adapting to changes, emerging market opportunities, and customer demands (Sazegar et al., 2018). Competitive advantage significantly impacts various areas, including organisational performance, service recovery prediction, success, excellence, human resource productivity, and sustainability (Anwar et al., 2018; Yang et al., 2018). Competitive advantage mediates organisational learning and performance, especially in highly competitive and dynamic contexts (Abolfazl and Mehrdad, 2016). Organisations must proactively respond to changes in competitive contexts for sustainability and profitability. Removing uncertainty as a barrier can enhance employee engagement and empowerment, leading to the following proposed hypotheses:

H1: Competitive advantage mediates the relationship between technology uncertainty and hotel performance in Saudi Arabia.

H2: Competitive advantage mediates the relationship between market uncertainty and hotel performance in Saudi Arabia.

H3: Competitive advantage mediates the relationship between competitive uncertainty and hotel performance in Saudi Arabia.

MATERIALS AND METHODS

This study adopts a quantitative method based on previous positivist investigations, which clearly understand how the phenomenon will likely behave. Numerous studies in the hospitality industry have also utilised the quantitative technique, further supporting its suitability (Al-Hazmia, 2020; Davahli et al., 2020; Mohamed, 2021). This study follows a positivist, empirical, and quantitative research approach. It assumes the existence of laws and principles governing the functioning of the World and aims to identify and describe these principles through data collection. Statistical methods with a strong foundation and evidential support will be employed to analyse the collected data, enabling rigorous analysis and interpretation. Figure 1 visually represents the research process undertaken to attain the study's objectives. The journey commences with an extensive literature review, which serves to identify the key variables under examination and formulate the research hypotheses. Subsequently, the research team determined the sample size through a method tailored to the study's requirements and crafted a comprehensive survey questionnaire. This instrument was subsequently administered to the specified target population, with diligent attention to collecting and validating the responses received. Following this data-gathering phase, an in-depth analysis was conducted, and the findings were thoughtfully presented and discussed. Lastly, the study's culmination involved drawing concise conclusions and offering valuable recommendations.

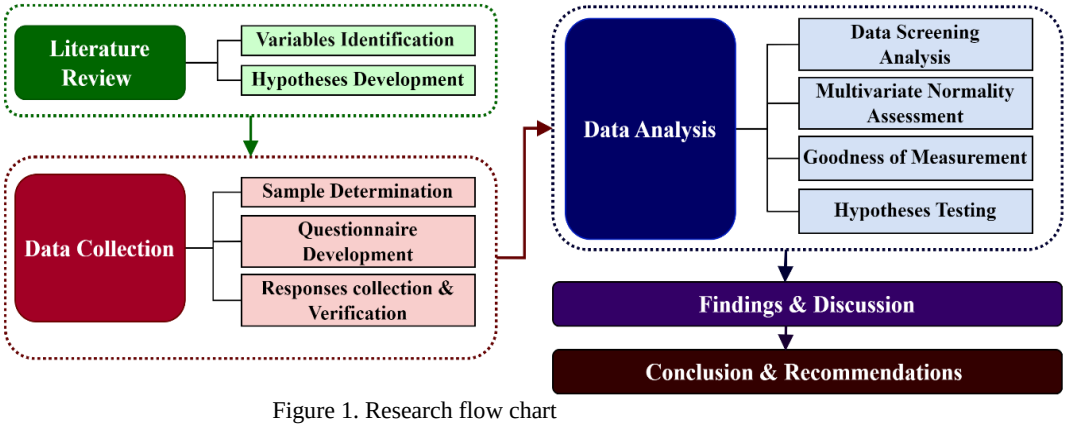


Figure 1. Research flow chart

1. Research Instrument

1.1. Questionnaire Design

The questionnaire was carefully formulated to address all research questions and hypotheses. The questionnaire consists of four parts. Part 1 encompasses demographic information, including gender, age, position, experience, type of lodging, lodging scale, location, hotel size, year of operation, and booking system (self-constructed).

Part 2 covers the independent variables, which include three sections: Section 2A focuses on technology uncertainty, Section 2B on market uncertainty, and Section 2C on competitive uncertainty (closed-ended).

Part 3, Section 3D, pertains to the mediator variable: competitive advantage (closed-ended). Lastly, Part 4, Section 4E, addresses hotel performance, the dependent variable measured using a five-point Likert scale.

1.2. Measurements of Research Variables

This section outlines the sources of measurement items for the questionnaire's study variables. Existing measures were adapted from previous studies. Table 1 presents the measurement items for each variable.

Table 1. Adopted Items for Technology Uncertainty

Variable	Code	Item Questions
Technology Uncertainty TU	TUI	Technologies are changing rapidly in our hotel.
	TU2	Technological changes provide big opportunities.
	TU3	It is difficult for us to predict the future technology for the hotel industry.
	TU4	Our hotel always makes new ideas to adapt to technological advancement.
	TU5	Technological developments in our hotel are relatively minor.
	TU6	Our hotel applies frequent technology improvements to adapt to the technology revolution.
Market Uncertainty (MU)	MUI	Clients' preference in our hotel has been changing over the years.
	MU2	Clients tend to look for new products and services.
	MU3	Our clients are very concerned about market price value.
	MU4	New emerging markets prefer service and product value.
	MU5	Our clients maintain the same preferences over the years.
	MU6	The marketplace in the hotel hospitality industry is uncertain and hard to forecast.
Competitive Uncertainty (CU)	CU1	The competition in the hotel industry in our area is challenging.
	CU2	The hotel competitors show aggressive promotions.
	CU3	The hotel competitors respond to market demand.
	CU4	Price competition is a competitive advantage of our hotel.
	CU5	Establishing a new hotel (1-3 stars) is expected in this area.
	CU6	Our competitors are weaker than us.
Competitive Advantage (CA)	CAI	Our hotel always ensures that the service and product quality match the market demand.
	CA2	Our hotel always adopts Research and Development (R&D) to improve service quality.
	CA3	Our hotel continuously improves its managerial capability to ensure hotel performance.
	CA4	Our hotel has improved the profit margin from time to time.
	CA5	Our hotel strategies the corporate image as our branding.
	CA6	Our hotel has adopted competitive advantage values in ensuring the hotel's performance.
Hotel Performance (HP)	HP1	Our hotel adopted the best services for our clients
	HP2	Our hotel always meets the client's satisfaction level with our services.
	HP3	Our hotel always ensures that employee performance achieves the key performance index.
	HP4	Our hotel's annual occupancy rate consistently achieved the target.
	HP5	Our hotel's net profit after tax is competitive.
	HP6	Our hotel's return on investment achieved the target yearly.
Adopted from: (Chang, 2011; Darvishmotevali et al., 2020; Tavitiyaman et al., 2011)		

Technology uncertainty, the inability to predict aspects of a firm's technological environment, was measured using a questionnaire inspired by Darvishmotevali et al. (2020), which included six selected inquiry items. Market uncertainty, driven by factors beyond a firm's control, was assessed based on Burgers et al. (1993) and Darvishmotevali et al. (2020). Six suitable inquiry items from section 2A of the questionnaire were used. Competitive uncertainty, focusing on unexpected events and competitors' characteristics, strategies, and reactions, was measured using items from Darvishmotevali et al. (2020), comprising six items. Competitive advantage, related to cost-effective product/service production, was measured using six items adapted from Chang (2011). Hotel performance, encompassing various factors related to a hotel's effectiveness, was assessed using a five-point Likert scale with six statements adapted from Tavitiyaman et al. (2011).

2. Population and Sample Size Determination

Determining the appropriate sample size is critical for obtaining accurate results in this study, which focuses on three-star, two-star, and one-star hotels in Saudi Arabia. While the exact population size of managerial-level employees is unknown, an estimated 11,365 individuals were derived, assuming an average of five top management employees per hotel.

To ensure a representative sample, 500 questionnaires were distributed. This sample size aligns with established guidelines. According to Kitchenham and Pfleeger (2002), a sample of at least 384 units is acceptable for populations exceeding 1,000,000 units, with a 95% confidence interval. Additionally, applying the "ten-times rule" by Gefen and Straub (2005), which suggests a minimum sample size of ten times the highest number of predictors, a range of 200-500 samples is considered adequate, given four predictors for both the dependent (hotel performance) and independent

variables (technology uncertainty, market uncertainty, competitive uncertainty, and competitive advantage). Stratified sampling was employed, dividing the population based on hotel rating stars and location.

The distribution of questionnaires was proportional, resulting in 360 in Makkah, 90 in Madinah, 20 in the Eastern region, and 15 in Riyadh and Jazan. This approach ensures representation across strata and minimises bias, as detailed in Table 2. The study aims to collect data from 375 questionnaires, thoughtfully distributed among different hotel rating stars and locations, guided by established sample size principles and stratified sampling techniques.

Table 2. The strata of the research sample

Region	Three Star	Two Star	One Star	Total	Percentage	Questionnaires Distributed
Makkah	331	206	1,041	1578	72.9	360
Madinah	56	65	286	407	18.8	90
Eastern	34	20	16	70	3.2	20
Riyadh	27	14	13	54	2.4	15
Jazan	9	18	28	55	2.5	15

3. Data Collection and Analysis Procedures

The online survey link was sent to selected hotels based on the sampling frame, utilising Google Forms to collect responses for all research questions. The intended respondents were managers or owners of three-star and lower-rated hotels in the five main regions of Saudi Arabia. The questionnaire, provided in English, was accompanied by a cover letter explaining the research's objectives and significance. A gentle reminder was sent after one month to encourage participation. However, due to online survey limitations, achieving the desired sample size within each stratum and region proved challenging. As a result, additional efforts were made to redistribute the survey to stratified hotels based on star ratings in Jazan, Riyadh, and the Eastern Border, ensuring representation and encouraging participation.

For data analysis, SPSS software (Statistical Packages for Social Sciences) and partial least squares (PLS) analysis were employed to align with the study's goals. SPSS facilitated demographic, descriptive, validity, reliability, and multiple regression analyses. PLS analysis, chosen for its versatility in handling various data types and accommodating reflective and formative constructs, provided insights into construct relationships and predictions. It also emphasised explaining variances, which are crucial for drawing meaningful conclusions. The study obtained a comprehensive understanding of the data through these analytical techniques, enabling the exploration of relationships and construct validation.

RESULTS AND DISCUSSION

1. The Data Screening Analysis

Thorough preliminary data screening is crucial in quantitative surveys to ensure reliable and meaningful results, as neglecting this step can significantly impact the quality of analysis (Yuan et al., 2006). This study employed various data screening procedures, including handling missing data, identifying influential data points, and detecting high correlations among variables through multicollinearity testing. These rigorous measures improved data quality, resulting in accurate and trustworthy results. These steps were essential for maintaining the findings' integrity and ensuring the analysis output's reliability.

1.1. Missing Value Analysis

Missing data is a common research concern, and its impact varies depending on its extent. In this study, the missing data amounted to only 0.04%, considered non-significant and below the acceptable threshold of 5%. To address this, the researcher used the mean series method, recommended for random, non-systematic missing data (Tabachnick and Fidell, 2007). Properly handling missing data ensures the validity and reliability of the analysis results.

1.2. Outliers

Outliers in statistics are data points significantly deviating from others, often due to measurement variability or experimental errors. In this study, case-wise diagnostics and separate linear regression analyses identified outliers for the four endogenous variables, using standardised residual values exceeding -3.3 or +3.3 as the criterion. None of the data points fell beyond this range, adhering to Pallant's (2013) recommendation to retain identified outliers as valid responses. Additionally, Cook's Distance assessed influential points, with a threshold of 1.0 indicating significance. No cases exceeded this threshold, ensuring no data points were excluded based on outliers. These outlier detection procedures maintain comprehensive analysis while preserving data integrity.

2. Multivariate Assessment of Normality

A multivariate assessment of skewness and kurtosis was conducted following Hair Jr et al.'s (2017) recommendations to assess data normality using the software available at https://webpower.psychstat.org/models/kurtosis/results. Results showed that the data did not follow a multivariate normal distribution, indicated by significant values for Mardia's multivariate skewness ($\beta = 5.36$, $p<0.01$) and Mardia's multivariate kurtosis ($\beta = 47.45$, $p>0.01$), as displayed in Table 3.

Consequently, the study opted for SmartPLS, a nonparametric analysis software, due to the unique characteristics of the research data. Since the study focuses on a specific subset of three-star hotels and below in Saudi Arabia, the sample size is expected to be small, and variations in responses from hotel managers and owners could lead to non-normal data distribution. SmartPLS, as a nonparametric analysis software, is well-suited for such scenarios, providing reliable results and facilitating result interpretation with its user-friendly interface and graphical output, as employed by Ramayah et al. (2017). By using SmartPLS, the study addresses data non-normality and ensures the robustness of results.

Table 3. Multivariate Normality

Sample size: 238; Number of variables: 5; Univariate Skewness and Kurtosis						
Variables	**Skewness**	**SE-skew**	**Z-skew**	**Kurtosis**	**SE-Kurt**	**Z-Kurt**
C.A	-1.131	0.158	-7.167	2.650	0.314	8.432
CU	-1.021	0.158	-6.468	1.832	0.314	5.828
HP	-0.002	0.158	-0.012	-0.240	0.314	-0.763
MU	-1.384	0.158	-8.773	3.623	0.314	11.527
TU	-0.933	0.158	-5.916	1.385	0.314	4.405

Mardia's Multivariate Skewness and Kurtosis			
	b	**z**	**p-value**
Skewness	5.361045	212.65479	0
Kurtosis	47.451891	11.48008	0

3. Goodness of Measurement

In research, assessing measurement quality is essential. Construct validity ensures that the measurement aligns with the variables, while reliability assesses consistency. Methods like factor analysis and structural equation modelling gauge construct validity, while measures like Cronbach's alpha evaluate reliability.

Evaluating construct validity and reliability is vital for measurement quality. High construct validity and reliability lead to consistent and accurate results, enhancing the study's validity and decision-making. Rigorous assessment ensures measurement model quality, fostering meaningful and trustworthy study conclusions.

3.1. Construct Validity

Evaluating measurement model reliability and validity is crucial for result accuracy. Construct validity, assessing compatibility between the instrument and variables, and reliability, measuring measurement consistency, are vital (Sekaran and Bougie, 2010). Construct validity often uses factor loadings, with values above 0.50 considered acceptable (Hair Jr et al., 2014). This study adopted a 0.50 cutoff (Chin, 1998) and removed items TU5, MU5, CU6, HP4, and HP5 due to low factor loadings. Cross-loadings in Table 4 depict item relationships with intended constructs. Bolded items in Table 8 have sufficient factor loadings. All "competitive advantage" items explained the variable well. "Competitive uncertainty" had one item below the cutoff. "Hotel performance" removed items 4 and 5. "Market uncertainty" removed item 5. "Technology uncertainty" removed item 5. This analysis assures construct validity, ensuring the model accurately measures variables.

Table 4. Factor Loadings

Constructs	**CA**	**CU**	**HP**	**MU**	**TU**
CA1	0.565	0.372	0.341	0.364	0.379
CA2	0.666	0.474	0.166	0.392	0.322
CA3	0.715	0.448	0.255	0.433	0.303
CA4	0.674	0.433	0.239	0.349	0.311
CA5	0.736	0.524	0.123	0.419	0.432
CA6	0.703	0.366	0.27	0.463	0.322
CU1	0.453	0.669	0.289	0.527	0.383
CU2	0.45	0.737	0.142	0.367	0.278
CU3	0.423	0.666	0.245	0.402	0.262
CU4	0.431	0.627	0.152	0.34	0.292
CU5	0.384	0.623	0.013	0.295	0.254
HP1	0.205	0.181	0.62	0.277	0.219
HP2	0.315	0.274	0.793	0.235	0.276
HP3	0.184	0.057	0.633	0.216	0.28
HP6	0.063	0.021	0.567	0.034	0.09
MU1	0.462	0.454	0.285	0.731	0.443
MU2	0.428	0.436	0.26	0.778	0.448
MU3	0.428	0.424	0.27	0.732	0.446
MU4	0.408	0.426	0.204	0.729	0.331
MU6	0.37	0.308	0.127	0.541	0.225
TU1	0.366	0.301	0.235	0.318	0.698
TU2	0.369	0.289	0.42	0.362	0.772
TU3	0.246	0.188	0.009	0.252	0.528
TU4	0.365	0.334	0.263	0.409	0.691
TU6	0.374	0.374	0.236	0.483	0.692

3.2. Convergent Validity

Convergent validity examines correlations within a single construct involving factor loading, average variance extracted (AVE), and composite reliability (CR) (Hair Jr et al., 2014). AVE, representing item variance, should be 0.5 or higher, met in this study. CR values, assessing internal consistency, exceeded the 0.70 threshold (Nunnally, 1978), ranging from 0.70 to 0.99. Table 5 summarises the convergent validity results, meeting all criteria. For "Competitive Advantage," Cronbach's alpha was 0.763, CR was 0.836, and AVE was 0.561. "Competitive Uncertainty" had alpha at 0.784, CR at 0.899, and AVE exceeding the minimum cutoffs as shown in Figure 2. These results confirm construct reliability and convergent validity, assuring accurate measurements for further analysis.

Table 5. Convergent Validity
CA: competitive advantage, CU: competitive uncertainty, HP: hotel performance, TU: technology uncertainty, MU: market uncertainty

Variable	Item	Loadings	Cronbach's Alpha	CR	AVE
CA	CA1	0.565	0.763	0.836	0.561
	CA2	0.666			
	CA3	0.715			
	CA4	0.674			
	CA5	0.736			
	CA6	0.703			
CU	CU1	0.669	0.784	0.899	0.543
	CU2	0.737			
	CU3	0.666			
	CU4	0.627			
	CU5	0.623			
HP	HP1	0.620	0.759	0.827	0.508
	HP2	0.793			
	HP3	0.633			
	HP6	0.567			
MU	MU1	0.731	0.744	0.831	0.500
	MU2	0.778			
	MU3	0.732			
	MU4	0.729			
	MU6	0.541			
TU	TU1	f	0.707	0.810	0.564
	TU2	0.772			
	TU3	0.528			
	TU4	0.691			
	TU6	0.692			

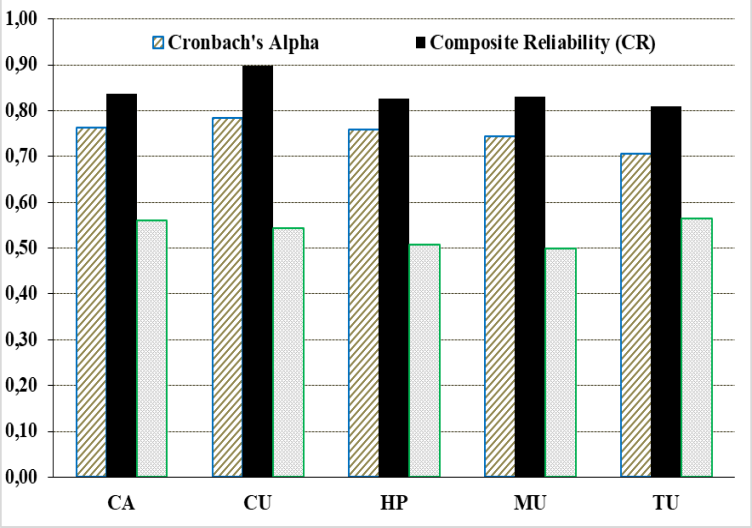


Figure 2. Convergent validity results

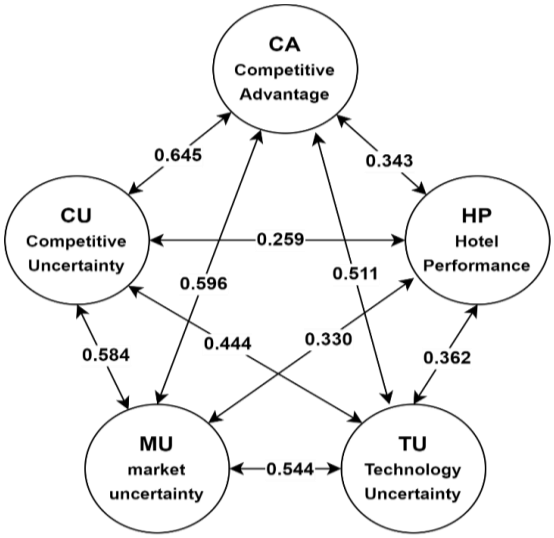


Figure 3. Fornell and Larcker Criterion

3.3. Discriminant Validity

Discriminant validity ensures distinct measures for different variables (O'Leary-Kelly and Vokurka, 1998). It assesses whether measurement items align with their intended constructs and should have square root AVE greater than inter-variable correlations ((Gefen and Straub, 2005). Figure 3 shows that correlations among Competitive Advantage (CA), Competitive Uncertainty (CU), Hotel Performance (HP), Technology Uncertainty (TU), and Market Uncertainty (MU) are lower than their respective AVE values, affirming discriminant validity by demonstrating that items primarily load on their intended variables. Recent advances introduced the Heterotrait-Monotrait Ratio of Correlations (HTMT) as a reliable method for assessing discriminant validity (Henseler et al., 2015). Table 6 displays HTMT values below the threshold of 0.90, reinforcing the discriminant validity between constructs. These results affirm that the measurement model effectively distinguishes between variables, bolstering the study's validity and reliability.

Table 6. HTMT Criterion

Variables	CA	CU	HP	MU	TU
CA					
CU	0.891				
HP	0.475	0.447			
MU	0.792	0.812	0.472		
TU	0.688	0.627	0.554	0.735	

4. Structural Model

To evaluate the structural model, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to assess the model's goodness of fit (Hair Jr et al., 2014). Validity was assessed through variance explained (R2) and path coefficients between constructs, as shown in Figure 4. A bootstrap analysis with 500 re-samplings, following Chin's recommendation (1998), was conducted to determine the significance of path coefficients. Mean values were calculated for each variable. To examine the mediating role of Competitive Advantage, this study used the approach developed by Preacher and Hayes (2008), which is suitable for PLS-SEM due to its distribution-agnostic nature. The significance of the indirect relationship between variables (a) and (b) was assessed to determine the mediating effect. It is worth noting that the mediating effect between independent and dependent variables does not necessarily have to be significant in the absence of the mediating variable. The significance of the paths was assessed using bootstrapping procedures.

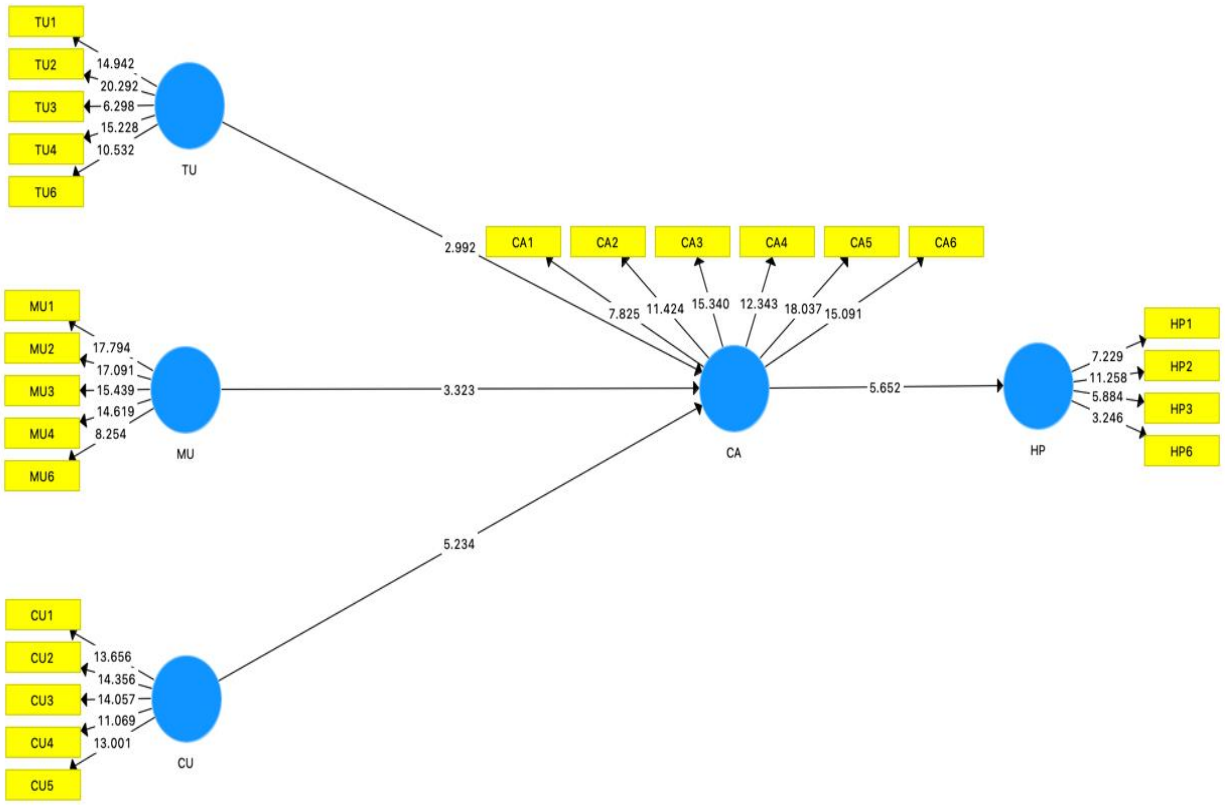


Figure 4. Structural model of the study

Bootstrapping is a nonparametric resampling method widely recognised as robust and effective for testing mediating effects (Hayes, 2009; Zhao et al., 2010). The t-statistic value in bootstrapping was calculated using the provided formula. The Smart PLS software automatically calculated the t-value for indirect effects, eliminating the need for manual calculation.

Table 7. Testing Hypothesis Result

Hyp.	Path	Beta	SD error	T Value	P Values	5.00%	95.00%	Result
H1	TU -> CA -> HP	0.065	0.028	2.314	0.011	0.022	0.118	Accepted
H2	MU -> CA -> HP	0.086	0.037	2.335	0.011	0.029	0.145	Accepted
H3	CU -> CA -> HP	0.142	0.032	4.402	0.000	0.095	0.202	Accepted

The results in Table 7 indicate that H1, H2, and H3 were accepted, supporting the mediating role of competitive advantage in these relationships. In other words, competitive advantage significantly influenced these connections, and no hypothesis involving competitive advantage as a mediator was rejected. In summary, competitive advantage was found to play a significant role when serving as a mediator. The mediation relationships between technology uncertainty and hotel performance, competitive uncertainty and hotel performance, and market uncertainty and hotel performance were supported, with beta values of 0.065, 0.086, and 0.142, confirming H1, H2, and H3.

These findings underscore the vital role of competitive advantage in Saudi Arabian hotel organisations and their overall performance. Competitive advantage affects service recovery prediction, organisational success, human resource productivity, and sustainability. In highly competitive and dynamic environments, where adaptation is crucial, Saudi Arabian hotel firms perceive changes as opportunities. This highlights the importance of actively responding to changes to achieve performance, sustainability, and success in uncertain and competitive settings. Organisations with competitive advantage can effectively navigate uncertainties, engage and empower employees, and maintain performance. These findings align with prior research, such as Abolfazl and Mehrdad (2016), which showed that competitive advantage significantly mediates the impact of organisational learning on organisational performance.

CONCLUSION

This study examined the relationship between environmental uncertainty, competitive advantage, and hotel performance in 1st, second, and third-star hotels in Saudi Arabia, focusing on the mediating role of competitive advantage. Data was collected from five major regions in Saudi Arabia: Mecca, Medina, Eastern Border, Jazan, and Riyadh. The findings revealed that competitive advantage significantly mediates the relationship between environmental uncertainty and hotel performance. This suggests that hotel owners and managers must strive for and maintain a competitive advantage for hotels to thrive in an uncertain environment by anticipating and adapting to market changes and dynamics.

The implications of this study are important for hotel owners and managers who can benefit from understanding the significance of competitive advantage. They should actively work towards developing and sustaining their competitive advantage by identifying their strengths and weaknesses and adjusting their operations and strategies accordingly. Additionally, they should stay proactive in monitoring and responding to changing market trends and customer preferences.

In conclusion, this study provides valuable insights into the interplay of environmental uncertainty, competitive advantage, and hotel performance in Saudi Arabia. By recognising the role of competitive advantage, hotel owners can better prepare for and overcome the challenges posed by environmental uncertainty. Due to the COVID-19 pandemic, data collection was challenging, and the study was conducted during a lockdown period. For future research, collecting data during normal times is recommended to capture a more accurate representation of the hotel industry.

Moreover, the self-reported nature of the questionnaire introduces the possibility of bias, and it is suggested that future studies consider using multiple respondents to mitigate bias. Furthermore, as most participants were from Makkah and Madinah, the data may not fully represent the entire hotel industry in Saudi Arabia. Future studies should aim for a more balanced representation of respondents across all hotel categories to understand the industry comprehensively.

Author Contributions: Conceptualization, I.A. and S.B.R.; methodology, I.A. and S.B.R.; software, I.A. and S.B.R.; validation, I.A. and D.B.M.; formal analysis, I.A. and S.B.R.; investigation, I.A. and S.B.R.; data curation, I.A. and S.B.R.; writing - original draft preparation, I.A.; writing - review and editing, D.B.M and S.B.R..; visualization, I.A. and D.B.M.; supervision, S.B.R. and D.B.M; project administration, S.B.R. and D.B.M. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abdolshah, M., Moghimi, M., & Khatibi, S.A. (2018). Investigating competitive advantage in banking industry based on Porter's Generic strategies: IRANs newly established private banks. *International Journal of Applied Management Sciences and Engineering (IJAMSE)*, *5*(1), 52–62. https://doi.org/10.4018/IJAMSE.2018010104

Abdulwase, R., Ahmed, F., Nasr, F., Abdulwase, A., Alyousofi, A., & Yan, S. (2020). The role of business strategy to create a competitive advantage in the organisation. *Open Access J Sci*, *4*(4), 135–138. https://doi.org/10.15406/oajs.2020.04.00162

Abolfazl, J.M., & Mehrdad, K. (2016). The mediating role of organisational agility in the relationship between organisational learning and organisational performance (Case study: The subsidiaries of Isfahan City general tax office). *International Business Management*, *10*(16), 3530–3535.

Abuhjeeleh, M. (2019). Rethinking tourism in Saudi Arabia: Royal vision 2030 perspective. *African Journal of Hospitality, Tourism and Leisure*, *8*(5), 1–16.

Afshar Jahanshahi, A. (2016). Disentangling the emergence of perceived environmental uncertainty among technology entrepreneurs. *Kybernetes*, *45*(6), 962–976. https://doi.org/10.1108/K-08-2015-0202

Al Hanini, E.A., & Al Oqqaily, Z. (2018). Does the Management Information System Causes Competitive Advantage for Banks working in Jordan? *International Journal of Economics and Financial Issues*, *8*(6), 104–109. https://www.econjournals.com/index.php/ijefi/article/view/7135

Al-Ababneh, M.M., Masadeh, M.A., Al-Shakhsheer, F.J., & Ma'moun, A.H. (2018). The impact of internal service quality on job satisfaction in the hotel industry. *Research in Hospitality Management*, *8*(1), 55–62. https://doi.org/10.1080/22243534.2018.1501182

Al-Alak, B.A., & Tarabieh, S.A. (2011). Gaining competitive advantage and organisational performance through customer orientation, innovation differentiation and market differentiation. *International Journal of Economics and Management Sciences*, *1*(5), 80–91.

Al-Hazmia, N. (2020). A study on the dimensions of the quality of tourism services in the Kingdom of Saudi Arabia. *Management Science Letters*, *10*(5), 1115–1120. https://doi.org/10.5267/j.msl.2019.10.030

Alkhazali, Z.A.F., Halim, S.A., & Osman, A. (2015). The role of human resources towards Jordanian commercial banks' performance. *International Journal of Economics, Commerce and Management*, *3*(2), 1–10.

Anderson, E.W., Fornell, C., & Rust, R.T. (1997). Customer satisfaction, productivity, and profitability: Differences between goods and services. *Marketing Science*, *16*(2), 129–145. https://doi.org/10.1287/mksc.16.2.129

Anwar, M., Khan, S.Z., & Khan, N.U. (2018). Intellectual capital, entrepreneurial strategy and new ventures performance: Mediating role of competitive advantage. *Business and Economic Review*, *10*(1), 63–93. https://doi.org/10.22547/BER/10.1.3

Arasli, H., Alphun, C., & Arici, H.E. (2019). Can balanced scorecard adoption mediate the impacts of environmental uncertainty on hotel performance? The moderating role of organisational decision-making structure. *Journal of Hospitality Marketing & Management*, *28*(8), 981–1009. https://doi.org/10.1080/19368623.2019.1578716

Assaf, A.G., & Barros, C. (2011). Performance analysis of the Gulf hotel industry: A Malmquist index with bias correction. *International Journal of Hospitality Management*, *30*(4), 819–826. https://doi.org/10.1016/j.ijhm.2011.01.002

Burgers, W.P., Hill, C.W.L., & Kim, W.C. (1993). A theory of global strategic alliances: The case of the global auto industry. *Strategic Management Journal*, *14*(6), 419–432. https://doi.org/10.1002/smj.4250140603

Chang, C.H. (2011). The influence of corporate environmental ethics on competitive advantage: The mediation role of green innovation. *Journal of Business Ethics*, *104*, 361–370. https://doi.org/10.1007/s10551-011-0914-x

Chin, W.W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, *295*(2), 295–336.

Criado-Perez, C., Jackson, C., Minbashian, A., & Collins, C.G. (2023). Cognitive Reflection and Decision-Making Accuracy: Examining Their Relation and Boundary Conditions in the Context of Evidence-based Management. *Journal of Business and Psychology*. https://doi.org/10.1007/s10869-023-09883-x

Darvishmotevali, M., Altinay, L., & Köseoglu, M.A. (2020). The link between environmental uncertainty, organisational agility, and organisational creativity in the hotel industry. *International Journal of Hospitality Management*, *87*, 102499. https://doi.org/10.1016/j.ijhm.2020.102499

Davahli, M.R., Karwowski, W., Sonmez, S., & Apostolopoulos, Y. (2020). The hospitality industry in the face of the COVID-19 pandemic: Current topics and research methods. *International Journal of Environmental Research and Public Health*, *17*(20), 7366. https://doi.org/10.3390/ijerph17207366

De Waegenaere, A., Sansing, R.C., & Wielhouwer, J.L. (2017). Development cost capitalisation during R&D races. *Contemporary Accounting Research*, *34*(3), 1522–1546. https://doi.org/10.1111/1911-3846.12306

Donaldson, L. (2001). *The contingency theory of organisations*. SAGE Publications, Thousand Oaks, United States. https://doi.org/10.4135/9781452229249

Drnevich, P.L., & West, J. (2023). Performance implications of technological uncertainty, age, and size for small businesses. *Journal of Small Business Management*, *61*(4), 1806–1841. https://doi.org/10.1080/00472778.2020.1867733

Elaraby, E.G. (2021). The Impact of Communication and Flexibility on Perceived Environmental Uncertainty in B2b Relationships During Covid-19. *International Journal of Tourism and Hospitality Management*, *4*(1), 78–94. https://doi.org/10.21608/ijthm.2021.179369

Enz, C.A. (2010). Commentary: Competitive dynamics and creating sustainable advantage. *The Cornell Hotel School of Hotel Administration Handbook of Applied Hospitality Strategy*, 297–305.

Ezzaouia, I., & Bulchand-Gidumal, J. (2020). Factors influencing the adoption of information technology in the hotel industry. An analysis in a developing country. *Tourism Management Perspectives*, *34*, 100675. https://doi.org/10.1016/j.tmp.2020.100675

Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information Systems*, *16*(1), 91–109. https://doi.org/10.17705/1CAIS.01605

Gursoy, D. (2018). Future of hospitality marketing and management research. *Tourism Management Perspectives*, *25*, 185–188. https://doi.org/10.1016/j.tmp.2017.11.008

Hair Jr, J.F., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Hair Jr, J.F., Sarstedt, M., Ringle, C.M., & Gudergan, S.P. (2017). *Advanced Issues in Partial Least Squares Structural Equation Modeling*. SAGE Publications, Thousand Oaks, United States.

Hayes, A.F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, *76*(4), 408–420. https://doi.org/10.1080/03637750903310360

Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*, 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hossain, M.S., Kannan, S.N., & Raman Nair, S.K.K. (2021). Factors Influencing Sustainable Competitive Advantage in the Hospitality Industry. *Journal of Quality Assurance in Hospitality & Tourism*, *22*(6), 679–710. https://doi.org/10.1080/1528008X.2020.1837049

Huang, H., Ali, S., & Solangi, Y.A. (2023). Analysis of the Impact of Economic Policy Uncertainty on Environmental Sustainability in Developed and Developing Economies. *Sustainability*, *15*(7), 5860. https://doi.org/10.3390/su15075860

Huang, K., Liu, Z., & Tian, G. (2020). Promote Competitive Neutrality to Facilitate China's Economic Development: Outlook, Policy Simulations, and Reform Implementation, A Summary of the Annual SUFE Macroeconomic Report (2019-2020). *Frontiers of Economics in China*, *15*(1), 1–24. https://doi.org/10.3868/s060-011-020-0001-9

Kim, J., & Canina, L. (2011). Competitive sets for lodging properties. *Cornell Hospitality Quarterly*, *52*(1), 20–34. https://doi.org/10.1177/1938965510377606

Kitchenham, B.A., & Pfleeger, S.L. (2002). Principles of survey research: part 3: constructing a survey instrument. *ACM SIGSOFT Software Engineering Notes*, *27*(2), 20–24. https://doi.org/10.1145/511152.511155

Kor, Y.Y., & Mahoney, J.T. (2005). How dynamics, management, and governance of resource deployments influence firm-level performance. *Strategic Management Journal*, *26*(5), 489–496. https://doi.org/10.1002/smj.459

Matar, A., Al-Rdaydeh, M., Al-Shannag, F., & Odeh, M. (2018). Factors affecting the corporate performance: Panel data analysis for listed firms in Jordan. *Academy of Accounting and Financial Studies Journal*, *22*(6), 1–10.

McMullen, J.S., & Shepherd, D.A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, *31*(1), 132–152. https://doi.org/10.5465/amr.2006.19379628

Ministry of Tourism KSA. (2020). *Outbound Tourism Indicators in Saudi Arabia*. https://mt.gov.sa/tic/publications

Mohamed, E.S.A. (2021). The impact of customer experience and relationship quality on corporate reputation in the hotel sector. *International Journal of Customer Relationship Marketing and Management (IJCRMM)*, *12*(2), 53–79. https://doi.org/10.4018/IJCRMM.2021040104

Mohammed, A., & Rashid, B. (2018). A conceptual model of corporate social responsibility dimensions, brand image, and customer satisfaction in Malaysian hotel industry. *Kasetsart Journal of Social Sciences*, *39*(2), 358–364. https://doi.org/10.1016/j.kjss.2018.04.001

Nunnally, J.C. (1978). An overview of psychological measurement. *Clinical Diagnosis of Mental Disorders: A Handbook*, 97–146. https://doi.org/10.1007/978-1-4684-2490-4_4

O'Leary-Kelly, S.W., & Vokurka, R.J. (1998). The empirical assessment of construct validity. *Journal of Operations Management*, *16*(4), 387–405. https://doi.org/10.1016/S0272-6963(98)00020-5

Oliver, J.J., & Velji, N. (2019). Are entrepreneurs becoming more risk averse? *Strategic Direction*, *35*(1), 1–2. https://doi.org/10.1108/SD-09-2018-0182

Pallant, J. (2013). *SPSS survival manual McGraw-Hill Education (UK)*. Open University Press, Maidenhead, Berkshire, United Kingdom.

Pereira-Moliner, J., López-Gamero, M.D., Font, X., Molina-Azorín, J.F., Tarí, J.J., & Pertusa-Ortega, E.M. (2021). Sustainability, Competitive Advantages and Performance in the Hotel Industry: A Synergistic Relationship. *Journal of Tourism and Services*, *12*(23), 132–149. https://doi.org/10.29036/jots.v12i23.282

Porter, M.E., & Millar, V.E. (1985). *How information gives you competitive advantage*. Harvard Business Review Reprint Service, Brighton, United States.

Preacher, K.J., & Hayes, A.F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891. https://doi.org/10.3758/BRM.40.3.879

Ragatz, G.L., Handfield, R.B., & Petersen, K.J. (2002). Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of Business Research*, *55*(5), 389–400. https://doi.org/10.1016/S0148-2963(00)00158-2

Raghavendra, A. (2020). Impact Of Technology On Consumer Intention To Choose Hotels. *Purakala (UGC CARE Journa)*, *31*(11), 267-287.

Ramayah, T., Yeap, J.A., Ahmad, N.H., Halim, H.A., & Rahman, S.A. (2017). Testing a confirmatory model of Facebook usage in SmartPLS using consistent PLS. *International Journal of Business and Innovation*, *3*(2), 1–14.

Ravichandran, T. (2018). Exploring the relationships between IT competence, innovation capacity and organizational agility. *The journal of strategic information systems*, *27*(1), 22-42. https://doi.org/10.1016/j.jsis.2017.07.002

Salisu, Y., & Goni, A.K. (2019). The mediating role of competitive advantage in the relationship between innovation capability and the performance of small and medium enterprises in Nigeria. *Management Research Spectrum*, *9*(2), 54–59.

Sazegar, M., Forouharfar, A., Hill, V., & Faghih, N. (2018). The innovation-based competitive advantage in Oman's transition to a knowledge - based economy: dynamics of innovation for promotion of entrepreneurship. *Entrepreneurship Ecosystem in the Middle East and North Africa (MENA) Dynamics in Trends, Policy and Business Environment*, 491–518. https://doi.org/10.1007/978-3-319-75913-5_18

Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach* (5th ed.). John Willey & Sons Ltd, New York, United States.

Sin, K.Y., & Jusoh, M.S. (2019). Identifying and prioritizing research gaps in studies related to total quality management on competitive advantage in Malaysian hotel industries. *International Journal of Academic Research in Business and Social Sciences*, *9*(5), 335-349. http://dx.doi.org/10.6007/IJARBSS/v9-i5/5875

Sirmon, D.G., Hitt, M.A., Ireland, R.D., & Gilbert, B.A. (2011). Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management*, *37*(5), 1390–1412. https://doi.org/10.1177/0149206310385695

Song, M., & Montoya-Weiss, M.M. (2001). The effect of perceived technological uncertainty on Japanese new product development. *Academy of Management Journal*, *44*(1), 61–80. https://doi.org/10.2307/3069337

Sunarta, I.N., Rohman, A., & Kawedar, W. (2020). Market Competition, Perceived Environmental Uncertainty, Supply Chain Management Systems, and Organisational Performance: Hotel Starred in Bali Province, Indonesia. *International Journal of Supply Chain Management*, *9*(2), 669–676. https://doi.org/10.59160/ijscm.v9i2.4676

Tabachnick, B.G., & Fidell, L.S. (2007). *Experimental designs using ANOVA* (Vol. 724). Thomson/Brooks/Cole Belmont, United States.

Tavitiyaman, P., Qu, H., & Zhang, H.Q. (2011). The impact of industry force factors on resource competitive strategies and hotel performance. *International Journal of Hospitality Management*, *30*(3), 648–657. https://doi.org/10.1016/j.ijhm.2010.11.010

Tavitiyaman, P., Zhang, H.Q., Wei, J., & Saiprasert, W. (2018). Moderating effect of hotel markets on differentiation strategies and performance. *Anatolia*, *29*(3), 379–392. https://doi.org/10.1080/13032917.2018.1428903

Westphal, J.D., & Zhu, D.H. (2019). Under the radar: How firms manage competitive uncertainty by appointing friends of other chief executive officers to their boards. *Strategic Management Journal*, *40*(1), 79–107. https://doi.org/10.1002/smj.2966

Williamson, O.E. (1996). *The mechanisms of governance*. Oxford University Press, Oxford, United Kingdom.

Yan, J., & Yan, L. (2017). Collective entrepreneurship, environmental uncertainty and small business performance: A contingent examination. *The Journal of Entrepreneurship*, *26*(1), 1–26. https://doi.org/10.1177/0971355716677385

Yang, S., Ishtiaq, M., & Anwar, M. (2018). Enterprise risk management practices and firm performance, the mediating role of competitive advantage and the moderating role of financial literacy. *Journal of Risk and Financial Management*, *11*(3), 35. https://doi.org/10.3390/jrfm11030035

Yasar, M., & Kiraci, K. (2017). Market Share, the Number of Competitors and Concentration: An Empirical Application on the Airline Industry. *Anadolu International Conference in Economics Proceedings*, 1–10.

Yaseen, H., Omet, G., & Kahmash, F. (2015). On the entry of foreign banks: The Jordanian experience. *International Journal of Economics and Finance*, *7*(7), 278–282. https://doi.org/10.5539/ijef.v7n7p278

Yuan, J.S., Reed, A., Chen, F., & Stewart, C.N. (2006). Statistical analysis of real-time PCR data. *BMC bioinformatics*, *7*, 1-12. https://doi.org/10.1186/1471-2105-7-85.

Zairi, M. (1996). Competition: what does it mean? *The TQM Magazine*, *8*(1), 54–59. https://doi.org/10.1108/09544789610107270

Zeithaml, V.A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of Marketing*, *52*(3), 2–22. https://doi.org/10.1177/002224298805200302

Zhang, H., & Song, M. (2020). Do first-movers in marketing sustainable products enjoy sustainable advantages? A seven-country comparative study. *Sustainability*, *12*(2), 450. https://doi.org/10.3390/su12020450

Zhao, X., Lynch Jr, J.G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, *37*(2), 197–206. https://doi.org/10.1086/651257

Article history: Received: 06.09.2023 Revised: 26.10.2023 Accepted: 23.11.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1622-1628
DOI 10.30892/gtg.514 spl03-1158

SPATIAL EQUITY ANALYSIS OF EDUCATIONAL SERVICE. METHODOLOGICAL PROPOSAL BASED ON A TRANSPORT SUPPLY MODEL

Juan Manuel GÓMEZ
Universidad Nacional de Colombia, Sede Manizales. Facultad de Ingeniería y Arquitectura, Departamento de Ingeniería Civil, Grupo de investigación en Movilidad Sostenible., Manizales, Caldas, Colombia, e-mail:jumgomezmo@unal.edu.co.

Carlos Alberto MONCADA
Universidad Nacional de Colombia, Sede Bogotá. Facultad de Ingeniería, Departamento de Ingeniería Civil y Agrícola, Programa de Investigación en Tránsito y Transporte – PIT, Bogotá, Colombia, e-mail: camoncadaa@unal.edu.co.

Diego Alexander ESCOBAR*
Universidad Nacional de Colombia, Sede Manizales. Facultad de Ingeniería y Arquitectura, Departamento de Ingeniería Civil, Grupo de investigación en Movilidad Sostenible., Manizales, Caldas, Colombia, e-mail: daescobarga@unal.edu.co.

Citation: Gómez, J.M., Moncada, C.A., & Escobar, D.A. (2023). SPATIAL EQUITY ANALYSIS OF EDUCATIONAL SERVICE. METHODOLOGICAL PROPOSAL BASED ON A TRANSPORT SUPPLY MODEL. *GeoJournal of Tourism and Geosites*, 51(4spl), 1622–1628. https://doi.org/10.30892/gtg.514spl03-1158

Abstract: This study evaluates the spatial equity of the educational service provided in the urban areas of Manizales and Villamaría based on the hypothesis that there is inequity in the provision of this service. Methodology involves GIS-based territorial accessibility analysis using average travel times from a network of transport infrastructures as well as the geographical location of all formal education establishments. This methodology is designed to be applied on different locations around the world. As the main results, the areas with mixed values concerning educational provision are in the lower strata, which directly correlates with low spatial educational equity rates.

Key words: accessibility, education, equity, geo-statistics, public transport

* * * * * *

INTRODUCTION

Education is an essential component for all types of regions, influencing the progress and development of modern societies, essential for all inhabitants to a basic degree to live comfortably, advancing towards better economic and social standards. Global experience shows that there is a close correlation between the country's level of development and the strength of its education and scientific and technological research systems. According to studies by the Organization for Economic Co-operation and Development (OECD), an additional year of schooling increases a country's gross domestic product per capita by 4-7% (OECD, 2010). Education has come to be called a basic need by the United Nations (ONU, 2018), which gives it an important role, especially when talking about developing countries such as those in Latin America. Colombia is an unequal country (Sánchez, 2016), heavily damaged and fragmented by the violence of the 20th century, currently in a period of overall growth and development, facing significant challenges to reach all its regions with the need to close gaps (Sánchez, 2016), for which education plays a key role.

Manizales, capital of Caldas department, located in the Colombian coffee region, with geographical coordinates 5° 03' 58" north latitude and 75° 29' 5" west longitude (Figure 1), has an abrupt topography with an average elevation of 2150 meters above sea level (m.a.s.l.), limiting the processes of urban expansion and intervention (Robledo, 1996). The population registered in the 2018 national census is 400,436 inhabitants (National Administrative Department of Statistics - DANE, 2019). The municipality has a total surface area of 57184 hectares, of which 3818.58 hectares correspond to its urban area (Alcaldía de Manizales, 2019); however, in this research, an area of 5429 hectares is used, considering sectors with transport and public services influence. The transport infrastructure network, the inventory of institutions, and in general, the whole analysis is extended to the neighboring municipality of Villamaría in its urban area to obtain more accurate results in terms of educational coverage. Villamaría is incorporated due to its conurbation with Manizales, sharing economic conditions and connectivity, acting as an additional neighborhood to the capital of the department. It is located on one side of the central mountain range at 5° 02' 44" North latitude and 75° 30' 55" West longitude, with a total area of 46100 hectares, of which only 438.3 belong to the grouping of its urban environment together with the expanding sector of La Florida (Alcaldía de Villamaría, 2018). The total population of the municipality is 62,831 inhabitants as of 2018 (DANE, 2019).

Manizales and its metropolitan area have ranked first in Colombia in the provision of university education services. However, its performance at other educational levels (pre-school, kindergarten, primary, secondary and high school) has not been the best (Consejo Privado de Competitividad and Universidad del Rosario, 2020), ranking 18th among the capitals

* Corresponding author

of the 32 departments of the country, with special shortcomings in the area of educational coverage, in which it ranked 22nd, 25th, 22nd and 15th, for pre-school, primary, secondary and high school education respectively among the 32 departmental capitals. It is, therefore, necessary to strengthen the conditions of equity and access to this service, not only as a means of building capacities and social mobility but also as a source of economic development. The analysis includes 209 educational establishments, divided into 25 for higher education and 184 for basic education, of which 70 provide early education services, 121 basic primary education, 84 basic secondary education, and 82 secondary education, many of which share several levels of education within the same infrastructure. In terms of higher education institutions, there are 13 of a technical-technological type and 12 professional ones, of which 4 correspond to faculties of the University of Caldas and 3 to the National University of Colombia, Manizales campus, leaving 8 universities altogether.

Nowadays, spatial equity refers to the equality that different residents have in accessing a particular service regardless of their social class, income, or ethnicity (Rahman and Rigar Neema, 2015). Measurements mainly include analyses based on geographical accessibility, the Gini coefficient, the Lorentz curve method, the coefficient of variation, and the Teil index (Hu et al., 2019). In terms of accessibility, Hansen (1959) defines it as the potential of opportunities for interaction, the first definition of the term in the geographical context. The potential for opportunities to interact that a particular group of people have in a particular area is then taken as a basis, supported by the argument that accessibility is a measure of spatial distribution from a point, adjusted for the ability and desire to overcome spatial separation. The concept has also been defined as the ease of getting to some activity from a location by a particular mode of transport (Dalvi and Martin, 1976), and taken together with mobility as influencing an individual's ability to travel in everyday life (Morris et al., 1979).

Years after Hansen defined it, some subdivisions of accessibility emerged, with Ingram making the first breakthroughs by defining relative accessibility as the distance or measure of interaction between two points and integral accessibility as the ease of access to a point from a set of nodes connected by a network (Ingram, 1971). Integral accessibility has gained considerable traction and different types of measures of accessibility have been proposed, such as gravity-based, cumulative opportunity-based, and topology- or distance-based measures (Handy and Niemeier, 1997; Pirie, 1979).

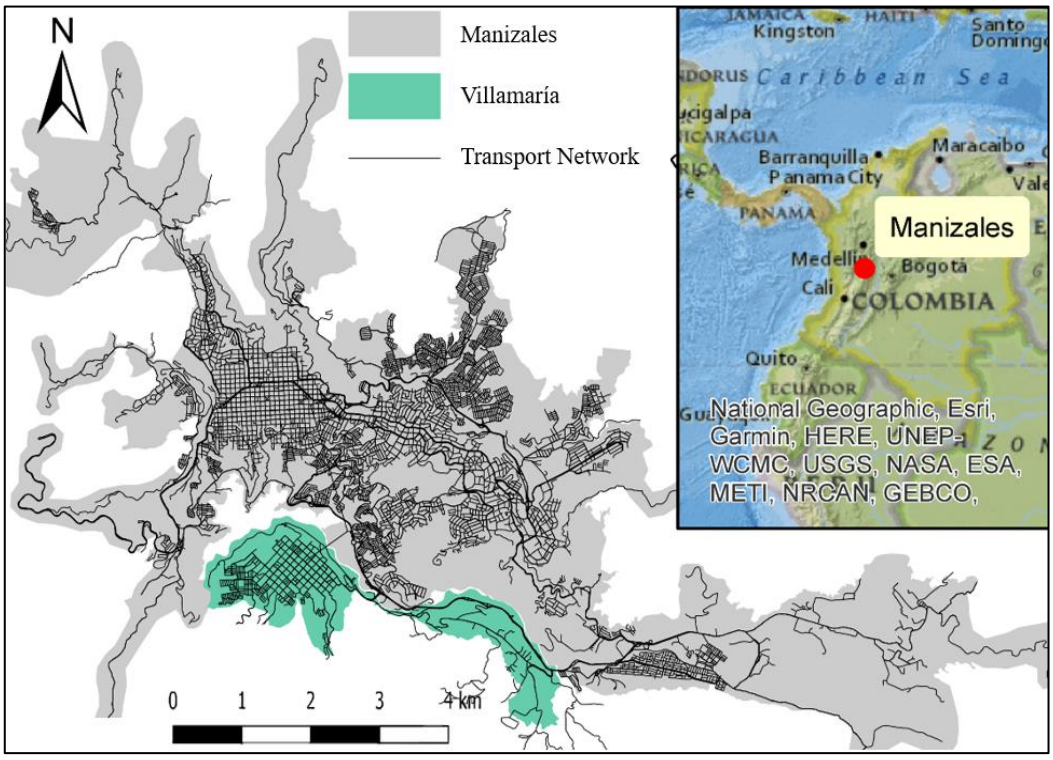


Figure 1. Geographical location of the study area (Source: authors)

Accessibility studies on the location and coverage of educational facilities have been carried out in different parts of the world, using a variety of methodologies to evaluate access to this service. For example, Ireland uses distance measures for its accessibility calculations (Walsh et al., 2015); Canada takes variables in addition to distance such as parental schooling and economic factors (Frenette, 2006); England uses the distance between home dwellings and universities (Gibbons and Vignoles, 2012); Portugal analyses the variables involved in decisions to study away from home (Sá et al., 2011). In addition, the Netherlands analyses the impact of geographical accessibility to higher education institutions and the influence of school background (Sá et al., 2006); Germany includes socio-economic variables (Spiess and Wrohlich, 2010); and Colombia conducts analyses of territorial accessibility to primary activity nodes (Escobar et al., 2016) and assessments of the spatial equity of educational service at the basic level (Avendaño, 2012).

In Manizales, the closest studies involve equity analyses of the university sector (Younes et al., 2016). Studies regarding the location of educational facilities and coverage have focused on single-level educational institutions, mostly on higher education. Additionally, few involve measures of spatial equity, highlighting the assessment of spatial

disparities in access to primary and secondary schools in China (Gao et al., 2016); however, they point, generally, to other objectives being met, using accessibility measured through distance as the assessment value. In recent years, research has been developed around the world related to spatial equity and education, taking as an example the analysis of spatial equity in electric vehicle charging services in China (Li et al., 2022), analysis of spatial equity and access to urban parks in Iran (Fasihi and Parizadi, 2020) and analysis of accessibility to health care centers in China by different researchers (Yang et al., 2022; Liu et al., 2023) as clear examples of spatial equity analysis. While focused on education, Pizzol (Pizzol et al., 2021) published an investigation of accessibility to schools in Sao Paulo including the quality factor.

Studies involving the whole education service, spatial equity, and using travel time as the main variable in accessibility levels are so far non-existent. Therefore, this research aims to close the knowledge gap and proposes a methodology for calculating the Educational Equity Index (EEI), based on the analysis of social, economic, demographic, geographic, operational, spatial, and physical variables, by using measures of territorial accessibility and geostatistical models, through geographic information systems (GIS), assuming the existence of a strong inequity in educational service provision at all levels (initial, basic, middle and higher) in the study area, considering the geospatial configuration of the institutions and transport networks and the current conditions of the mentioned variables.

MATERIALS AND METHODS

The methodological procedure used in this study is shown in Figure 2, following six broadly defined steps subdivided into tasks that are more specific.

Phase 1 – Network update and validation: Investment in road infrastructure has been high over the past decades, changing travel conditions and making it necessary to update the digitized transport infrastructure network with the most recent works for a proper calculation of travel times and accessibility levels. New connections, turns, and reroutes are verified with online or field network viewers if necessary. The network for public and private transport is updated for the year 2021 based on an analysis network for public transport accessibility studies in the city, updated and optimized by Montoya (Montoya, 2019), based on the network previously built by the National University of Colombia, with speeds measured via GPS (Escobar and García, 2012; Younes et al., 2016) and excellent coverage of the study area. The updating process was carried out in the ArcMap program, using its network-editing tool, where it is possible to create and modify arcs or lines, as well as to calculate the real length of the new elements. Figure 3 shows the network used for the particular transport study, which has a total of 10,133 nodes and 12,766 arcs assigned for the different existing roads. On the other hand, the same updates were made to the public transport scenario, making similar changes and additions, but always maintaining the original differentiation and configuration of the network, which contains 19,838 arches and 15,380 nodes. The higher number is due to the existence of a pedestrian network base very similar to that of private transport, with some additional pedestrian-only crossings such as bridges and stairs, superimposed by the network composed of public transport routes, connected to each other at the location of the stops. As a basic input for the process, it is necessary to have the travel times calculated within the digitized network; these times are obtained by considering the length of the arches and the average speed assigned. Through equation 1, the travel times for the arcs are calculated within the ArcMap field calculator tool. Where: TV = Travel Time; Li= Length of the arc in km; Vi= Speed assigned to the arc in km/h.

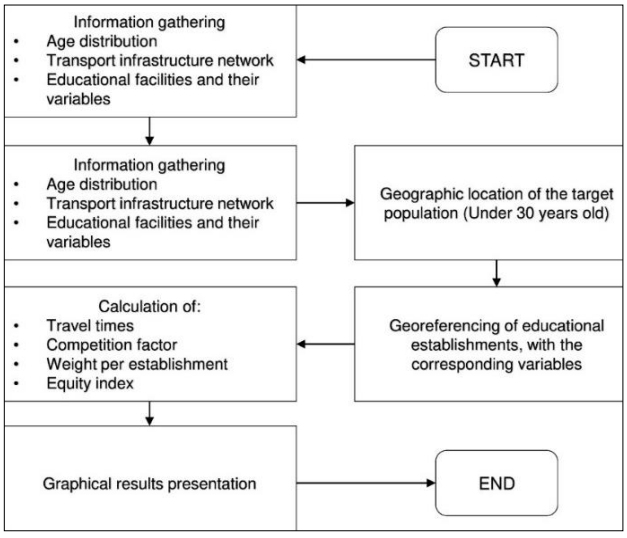


Figure 2. Research Methodology (Source: authors)

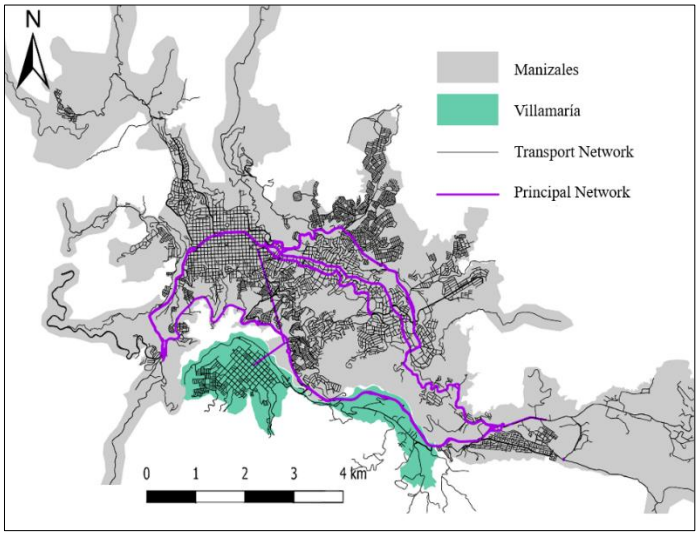


Figure 3. Private transport network (Source: authors)

$$TV = \frac{\text{Li}}{\text{Vi}} * 60 \quad (1)$$

Phase 2 – Target population: The population under consideration corresponds to people of school age, defined in our case as those inhabitants under 30 years of age since the study includes institutions from the first to the last stage of education. The age distribution is obtained from official databases (DANE, 2019) and is shown in Figure 4 with a graphical partitioning of natural breaks so that similar values are better grouped together and differences between classes are maximized.

Phase 3 – Facilities location: This is an important aspect in the development of the research, as the results will vary depending on the spatial distribution of the institutions. The geographical location was checked for all educational establishments so that there were no overlaps with other properties, they did not occupy part of the public space, or they were not at their real address; this last check is done with the help of Google Street View or in situ if necessary. Once the database had been optimized, the institutions were geo-spatially located in a new layer of polygons within the ArcMap program, using the tool to create new Shape-type entities, separating them by the educational level at which they provide. Figure 5 shows the geographical distribution of educational institutions in the study area.

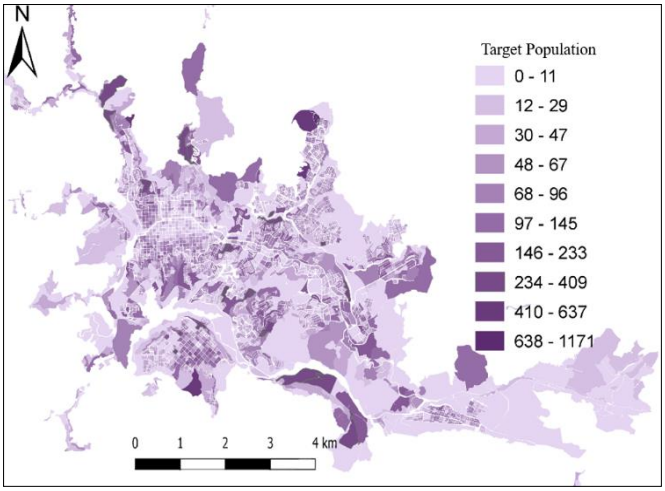


Figure 4. Student-aged population (Source: authors)

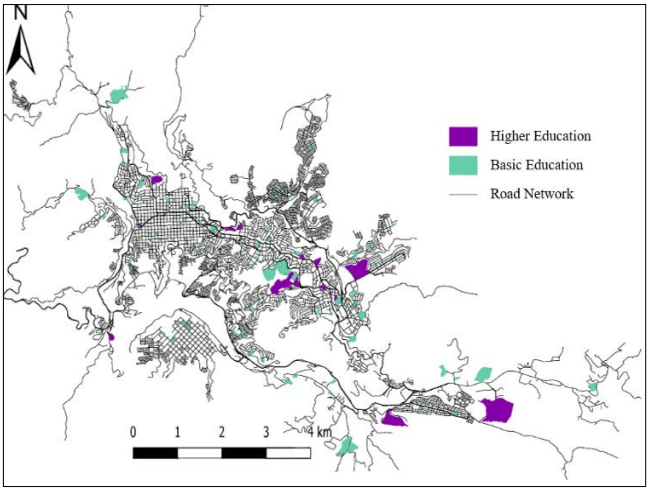


Figure 5. Location of educational institutions (Source: authors)

Phase 4 – Index calculation: First, external nodes to the network must be created, positioned at the location of the facilities to be analyzed, connecting to the nearest node of the network through a new arc with travel time equal to zero, so that it only generates a connection without increasing the distance or travel time. Then, travel time vectors are obtained under the different conditions of analysis, for which it is required to incorporate an additional computational tool -the TransCAD program- whose specific mathematical processing capacity for transport models is better optimized than ArcMap and does not require overly powerful hardware. Using the multiple paths extension of the TransCAD program, which involves the minimum paths algorithm born in 1959 (Dijkstra, 1959) and allows to obtain the travel times in matrix form between the desired points of the network, in our case from those created for the blocks, to the institutions initially and also between all the blocks.On the other hand, based on the general gravitational potential model, spatial equity models integrating different modes of transport have emerged (Chang and Liao, 2011), considering the mentioned results and the model developed on them by Hu to assess the spatial equity of elderly homes in Changchun (Hu et al., 2019), within which he incorporates the competition factor and the attractiveness factor of the assessed facilities. It is proposed to follow the line of development and use a similar equation, calculating the attractiveness factor based on the set of variables incorporated for educational establishments and the competition factor between blocks using travel times as the proximity value. The educational equity index is calculated from Equation 2, which condenses the procedure for obtaining the index as a ratio between the supply given by the educational establishments within the area of influence (20 minutes travel time) and the population competition (Equation 3) multiplied by the population-weighted average travel time for each mode of transport.

$$IE_i = \frac{\sum_{j=1}^{m} M_j * S_j}{V_i * \left(a_{1i} * p_i * T_{i(pub)}\right)} + \frac{\sum_{j=1}^{m} M_j * S_j}{V_i * \left(a_{2i} * p_i * T_{i(priv)}\right)} \quad (2)$$

$$V_i = \sum_{k=1}^{n} \frac{P_k}{D_{ik}^{\beta}} \quad (3)$$

Where, IE_i is the educational equity index of block i, M_j is the student capacity of educational institution j measured from registered enrolment. S_j is the attractiveness factor of each institution normalized by min-max normalization, which varies between 0 and 1, considering the academic level according to state tests, the number of educational levels served, the available area, and the monthly value of education; the latter aspect being evaluated inversely, i.e. the higher the cost, the lower the attractiveness. Institutions whose travel time exceeds the threshold range of 20 minutes automatically have an S_j =0, as they are not within the direct area of influence. V_i corresponds to the block's competition coefficient, a_{1i} and a_{2i} are the percentages of the block's population that make their study trips by private and public transport mode respectively, according to the TAZ (Traffic Analysis Zone) to which it belongs, based on the division and trip percentages recorded in the Manizales Mobility Plan 2017. pi is the school-age population of block i and $\mathbf{T_{i(pri)}}$ and $\mathbf{T_{i(pub)}}$ are the average travel times to reach educational institutions by private and public transport mode, respectively. In equation 3, P_k is the population under 30 years of age in block k corresponding to all other blocks other than i within a range of 1 minute, Dik is the separation between blocks measured in travel times, and β is the friction coefficient, taken as 2 for survey trips (Hansen, 1959). The value of V_i is uniform for both transport modes since in this section the spatial proximity is the same regardless of the mode.

The calculations of equations 2 and 3 are carried out through computational programming in Python, using the Pandas and Numpy libraries, which allow the handling of large databases and the performance of mathematical operations with them in a simple and fast way. The results are represented graphically in the ArcMap program, using the representation by

quantities grouped in groups of colors corresponding to the quantiles considered necessary. In addition, the minimum, maximum, average, and standard deviation values of the public and private components are obtained separately, as well as the values for the result, so that a comparison of results internal to the index is possible. An analysis is also made by socio-economic stratum, finding the average value of the index for each stratum using Python.

Finally, Moran's spatial autocorrelation index is calculated, which evaluates how a phenomenon varies across geographical space. If the analyzed aspect tends to be grouped in uniform areas, forming clusters, then there is a positive autocorrelation. Conversely, if the variable measures in nearby units are different, i.e., if the phenomenon tends to be dispersed, then the spatial autocorrelation is negative; when the phenomenon behaves randomly, and no defined or structured behavior is identified, there is no spatial autocorrelation. Once again using the ArcMap program, the Moran index is calculated with the results per block of the IE, using the Spatial Autocorrelation (Moran I) tool, with the layer and field corresponding to the calculated value of IE as inputs, in its two components and in a grouped form, with a spatial relationship of inverse distance squared and using a Euclidean distance of 200 meters to designate the neighbouring entities. This tool outputs the Moran index, the z-value, and the p-value.

RESULTS AND DISCUSSION

The resulting value is made up of two parts, one corresponding to the section studied in public transport and the other in private transport, the sum of both of which makes up the final value. Bearing this in mind, the results are shown in three different ways, for each part and in aggregate, displayed in 10 quantiles so that the difference between values is visible. Polygons corresponding to zero index blocks are not shown on the maps, making the presentation cleaner. Figure 6 shows the spatial equity values for the public transport component, presenting a heterogeneous distribution on the map, but despite this, a concentration of the top quantiles along the main roads and in the city center, accompanied by some medium values next to the current overhead cable stations.The values in this section reach a limit of 737.39, with a mean of 2.14 and a standard deviation of 15, which indicates a very high concentration of very low values, less than 1, so it is necessary to show more than 2 decimal places, there are also singular points in high values. The Moran index in ArcMap resulted in 0.055, with a z-score of 7.31 and p-value = 0.00, indicating that the probability of the values being randomly distributed is very small, and the z-score being higher than 0 creates separate clusters of high and low values, i.e., the data are configured in a more spatially cohesive way than would be expected for a completely random distribution. The mean value of the equity index for stratum one is 0.94, for stratum two 0.80, for stratum three 3.72, for stratum four 3.99, for stratum five 4.24, and for stratum six 5.03, indicating a clear inequity for the lowest strata.

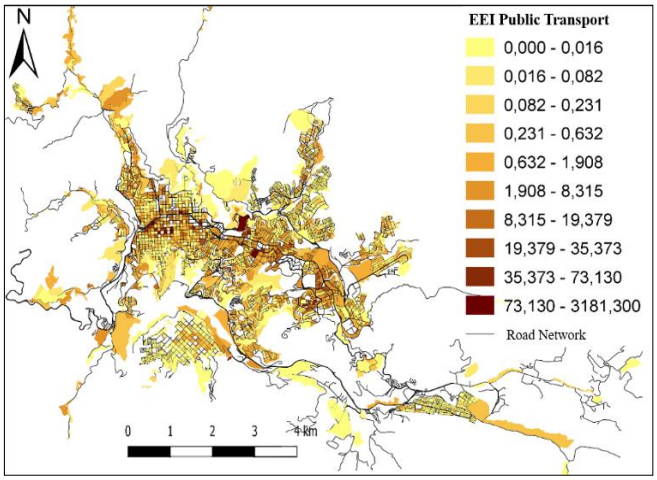


Figure 6. Spatial equity in public transport (Source: authors)

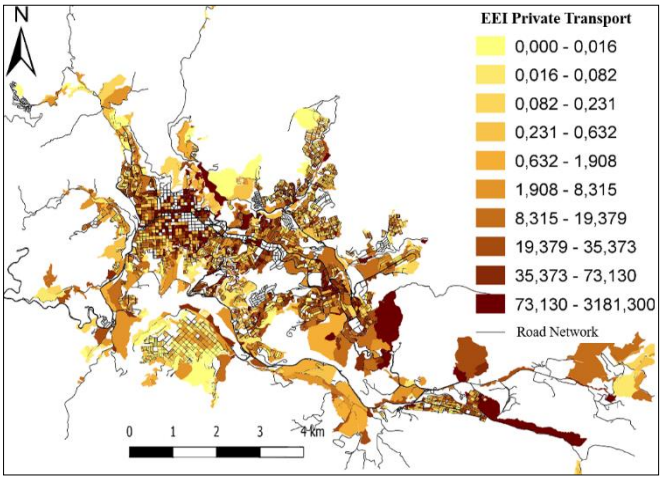


Figure 7. Spatial equity in private transport (Source: authors)

In the case of private transport, the results are shown in Figure 7, with a maximum value of 3162.21, a mean of 26.30, and a standard deviation of 116.46, indicating a low clustering of values. Levels of spatial equity are much higher than in public transport due to the ease with which this mode of transport can access institutions within the time limit. Differences in concentration are observed concerning the public transport map, with the strongest shades being found in the center of the analyzed sector, close to the El Cable area, while high values increase in the city's outskirts, especially in the eastern area. Moran's I. results give a value of 0.124, slightly higher than for private transport, together with a z-score of 13.88 and p-value of 0.00, which also represents a cluster-prone distribution. The mean values per stratum from one to six result in a mean of 21.09, 18.72, 40.03, 42.00, 24.98, and 45.69 respectively, indicating, once again, better conditions for the higher strata compared to the lower strata. The final result comprises the sum of opportunities offered by each mode of transport, integrating the variation of access based on the choice of transport mode declared in the 2017 mobility master plan surveys, is presented in Figure 8, reaching values of 3181.30 at its upper limit, with a mean of 28.44 and standard deviation of 121.86, equally high as in the two components that make up its value.

Moran's index results in 0.122, together with a z-score of 13.58 and p-value of 0.00, having a distribution with very low randomness, with a trend to clustering as mentioned above. These results indicate from a statistical point of view that the values obtained for the Educational Equity Index are not the product of coincidence or chance, but they are distributed in a

concentrated sectorial manner within the geographical space. The maximum values are distributed in the area without a defined concentration but always surrounded by high and medium-high values, which can be seen in sectors with low student-age populations. For instance, in the historic center, where equity values are increased since the offer is the same for a few applicants, while blocks with a high concentration of young people have reduced values caused by a high level of competition. Areas located close to the main universities, such as Universidad Nacional or Universidad Autónoma, also stand out with medium-high concentrated values. The mean results per stratum are as follows: for stratum 1= 22.03; stratum 2= 19.53; stratum 3= 43.75; stratum 4= 46.00; stratum 5= 29.22 and stratum 6= 50.73, indicating that the highest stratum tends to obtain better results while the two lowest strata have the lowest values.

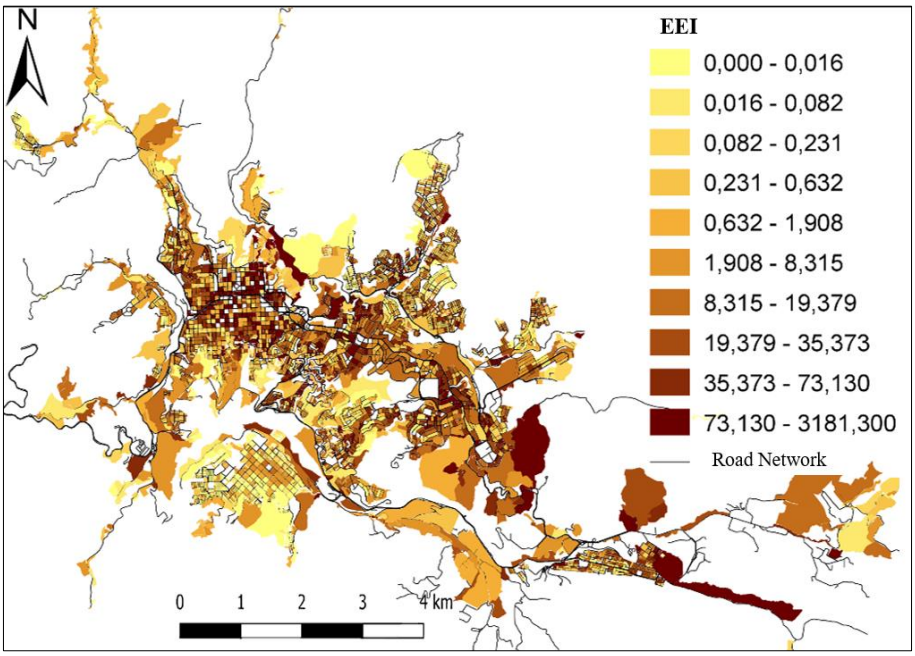


Figure 8. Total equity index Source: authors

CONCLUSION

The proposed model for measuring spatial equity in education can assess the coverage characteristics for each block individually, considering the institutions covered at a given time, its own and the neighborhood's student-age population, and recognizing the modal distribution for the purpose of study in its analysis. This methodology can be applied in any city as long as the basic information is properly organized. The results of the index have a low impact on small institutions such as kindergartens, where only one level of education is provided to a few students with a minimal area compared to large university campuses. This shows that although there are good levels of integral accessibility to early childhood or basic education institutions, the overall levels are not very good. The spatial equity values show the sectored concentration of values, with a partially homogeneous distribution on the map, so that there is a distribution with a little random tendency of the result. The spatial equity index is influenced by the location of the institutions, the density of the student population, and the travel mode of preference, where strata one and two represent the lowest average values of the index, indicating shortcomings in the access of this service by having high concentrations of the student population in small areas whose main mode of transport corresponds to collective public transport, which is in unequal conditions compared to private transport in terms of the number of opportunities reached in a given time.

Author Contributions: Conceptualization, J.M.G. and D.A.E.; methodology, J.M.G., D.A.E and C.A.M.; formal analysis, J.M.G.; investigation, J.M.G; writing - original draft preparation, J.M.G; writing - review and editing, D.A.E. and C.A.M.; visualization, J.M.G.; supervision, D.A.E.; project administration, C.A.M. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The authors would like to thank GIMS members for their constant accompaniment and support. In addition, this work was supported by the Universidad Nacional de Colombia [Methodological proposal for an educational equity index calculation at basic, secondary, and higher education levels in the urban areas of the cities of Manizales and Villamaría – Caldas- Hermes code: 45892]

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Alcaldía de Manizales. (2019). *Información General [General information]*. (In Spanish). https://manizales.gov.co/informacion-general/

Alcaldía Municipal de Villamaría en Caldas. (2018). (In Spanish). http://www.villamaria-caldas.gov.co/

Avendaño Rodríguez, N.R. (2012). *La equidad espacial en la distribución del servicio educativo (1999-2009) [Spatial equity in the distribution of educational services (1999-2009)]*. 102. (In Spanish).

Chang, H.S., & Liao, C.H. (2011). Exploring an integrated method for measuring the relative spatial equity in public facilities in the context of urban parks. *Cities* 28, 361–371. https://doi.org/10.1016/j.cities.2011.04.002

Consejo Privado De Competitividad & Universidad Del Rosario. (2020). *Índice De Competitividad De Ciudades 2020 [Cities Competitiveness Index 2020]*, (In Spanish).

Dalvi, M.Q., & Martin, K.M. (1976). The measurement of accessibility: Some preliminary results. *Transportation (Amst)*. 5, 17–42. https://doi.org/10.1007/BF00165245

Departamento Administrativo Nacional de Estadística – DANE. (2019). Censo Nacional de Población y Vivienda [National Population and Housing Census]. (In Spanish). http://microdatos.dane.gov.co/index.php/catalog/643/get_microdata

Dijkstra, E.W. (1959). A note on two problems in connexion with graphs. *Numerische Mathematik*. 1, 269–271. https://doi.org/10.1007/BF01386390

Escobar, D., & Garcia, F. (2012). Territorial Accessibility Analysis as a Key Variable for Diagnosis of Urban Mobility: A Case Study Manizales (Colombia). *Procedia - Soc. Behav. Sci*. 48, 1385–1394. https://doi.org/10.1016/j.sbspro.2012.06.1114

Escobar, D.A., Holguin, J.M., & Zuluaga, J.D. (2016). *Accesibilidad de los centros de ambulancias y hospitales prestadores de servicio de urgencias y su relacion con la inequidad especial [Accessibility of ambulance centers and hospitals providing emergency services and its relationship with special inequality]*. Espacios 37, 429–431, (In Spanish).

Fasihi, H., & Parizadi, T. (2020). Analysis of spatial equity and access to urban parks in Ilam, Iran. *Journal of environmental management*, *260*, 110122.

Frenette, M. (2006). Too far to go on? Distance to school and university participation. *Educ. Econ*. 14, 31–58. https://doi.org/10.1080/09645290500481865

Gao, Y., He, Q., Liu, Y., Zhang, L., Wang, H., & Cai, E. (2016). Imbalance in spatial accessibility to primary and secondary schools in China: Guidance for education sustainability. *Sustain*. 8. https://doi.org/10.3390/su8121236

Gibbons, S., & Vignoles, A. (2012). Geography, choice and participation in higher education in England. *Reg. Sci. Urban Econ*. 42, 98–113. https://doi.org/10.1016/j.regsciurbeco.2011.07.004

Handy, S.L., & Niemeier, D.A. (1997). Measuring accessibility: An exploration of issues and alternatives. *Environ. Plan. A* 29, 1175–1194. https://doi.org/10.1068/a291175

Hansen, W.G. (1959). How Accessibility Shapes Land Use. *J. Am. Plan. Assoc*. 25, 73–76. https://doi.org/10.1080/01944365908978307

Hu, S., Song, W., Li, C., & Lu, J. (2019). The spatial equity of nursing homes in Changchun: A multi-trip modes analysis. *ISPRS Int. J. Geo-Information* 8. https://doi.org/10.3390/ijgi8050223

Ingram, D.R. (1971). The Concept of Accessibility: A Search for an Operational Form. *Reg. Stud.* 5, 101–107. https://doi.org/10.1080/09595237100185131

Montoya Goméz, J.A. (2019). *Análisis De Cobertura, Mediante Accesibilidad Geográfica, Para Sistemas De Paraderos De Transporte Público Colectivo Urbano [Coverage Analysis, Through Geographical Accessibility, For Urban Public Transportation Stop Systems]*. (In Spanish).

Li, G., Luo, T., & Song, Y. (2022). Spatial equity analysis of urban public services for electric vehicle charging - Implications of Chinese cities. *Sustainable Cities and Society*, *76*, 103519.

Morris, J.M., Dumble, P.L., & Wigan, M.R. (1979). Accessibility indicators for transport planning. *Transp. Res. Part A Gen*. 13, 91–109. https://doi.org/10.1016/0191-2607(79)90012-8

Liu, L., Zhao, Y., Lyu, H., Chen, S., Tu, Y., & Huang, S. (2023). Spatial Accessibility and Equity Evaluation of Medical Facilities Based on Improved 2SFCA: A Case Study in Xi'an, China. *International Journal of Environmental Research and Public Health*, *20*(3), 2076.

OECD. (2010). *Educación Hoy: La perspectiva de la OCDE, Educación Hoy [Education Today: The OECD Perspective, Education Today]*. (In Spanish). https://doi.org/10.1787/9789264252486-es

Organización de las Naciones Unidas – ONU. (2018). *Objetivos de Desarrollo Sostenible [Sustainable Development Goals]*. (In Spanish). http://www.undp.org/content/undp/es/home/sustainable-development-goals.html.

Pirie, G.H. (1979). Measuring Accessibility: A Review and Proposal. *Environ. Plan. A Econ. Sp*. 11, 299–312. https://doi.org/10.1068/a110299

Pizzol, B., Giannotti, M., & Tomasiello, D.B. (2021). Qualifying accessibility to education to investigate spatial equity. *Journal of Transport Geography*, *96*, 103199.

Rahman, M., & Nigar Neema, M. (2015). A GIS Based Integrated Approach to Measure the Spatial Equity of Community Facilities of Bangladesh. *AIMS Geosci*. 1, 21–40. https://doi.org/10.3934/geosci.2015.1.21

Robledo, J.E. (1996). *La ciudad en la colonización antioqueña: Manizales [The city in the Antioquia colonization: Manizales]*. (In Spanish).

Sá, C., Amado Tavares, D., Justino, E., & Amaral, A. (2011). Higher education (related) choices in Portugal: Joint decisions on institution type and leaving home. *Stud. High. Educ*. 36, 689–703. https://doi.org/10.1080/03075071003725343

Sá, C., Florax, R.J.G.M., & Rietveld, P. (2006). Does Accessibility to Higher Education Matter? Choice Behaviour of High School Graduates in the Netherlands. *Spat. Econ. Anal*. 1, 155–174. https://doi.org/10.1080/17421770601009791

Sánchez, C.F. (2016). *Colombia en el post-acuerdo y el rol de la infraestructura de transporte [Colombia in the post-agreement and the role of transportation infrastructure]*. Rev. Ing. 0, 28, (In Spanish). https://doi.org/10.16924/riua.v0i44.918

Spiess, C.K., & Wrohlich, K. (2010). Does distance determine who attends a university in Germany? *Econ. Educ. Rev*. 29, 470–479. https://doi.org/10.1016/j.econedurev.2009.10.009

Walsh, S., Flannery, D., & Cullinan, J. (2015). Geographic accessibility to higher education on the island of Ireland. *Irish Educ. Stud*. 34, 5–23. https://doi.org/10.1080/03323315.2015.1010302

Yang, Y., He, R., Tian, G., Shi, Z., Wang, X., & Fekete, A. (2022). Equity Study on Urban Park Accessibility Based on Improved 2SFCA Method in Zhengzhou, China. *Land*, *11*(11), 2045.

Younes, C., Escobar, D.A., & Holguín, J.M. (2016). *Equidad, accesibilidad y transporte. Aplicación explicativa mediante un análisis de accesibilidad al sector universitario de manizales (Colombia) [Equity, accessibility and transportation. Explanatory application through an analysis of accessibility to the university sector of Manizales (Colombia)]*. (In Spanish). Inf. Tecnológica 27, 107–118. https://doi.org/10.4067/S0718-07642016000300010

Article history: Received: 25.09.2023 Revised: 27.10.2023 Accepted: 24.11.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1629-1635
DOI 10.30892/gtg.514 spl04-1159

PEDAGOGICAL METHODS OF TOURISM EDUCATION IN GENERAL EDUCATION SCHOOLS IN KAZAKHSTAN

Ozerke AMANGELDI*
Al-Farabi Kazakh National University, Department of Geography, Land Management and Cadastre, Almaty, Kazakhstan, e-mail: ozerke1990@gmail.com

Gaukhar AUBAKIROVA
Al-Farabi Kazakh National University, Department of Geography, Land Management and Cadastre, Almaty, Kazakhstan. e-mail:aubakirova.gauhar@kaznu.kz

Kulzada DUISEBAYEVA
Al-Farabi Kazakh National University, Department of Geography, Land Management and Cadastre, Almaty, Kazakhstan, e-mail: kulzada.duisebayeva@gmail.com

Ulzhalgas ESNAZAROVA
Al-Farabi Kazakh National University, Department of Geography, Land Management and Cadastre, Almaty, Kazakhstan, e-mail: ataulymektep@mail.ru

Turker KURT
Gazi University, Gazi Faculty of Education, Department of Educational Sciences, Ankara, Turkey, e-mail: turker@gazi.edu.tr

Citation: Amangeldi, O., Aubakirova, G., Duisebayeva, K., Esnazarova, U., & Kurt, T. (2023). PEDAGOGICAL METHODS OF TOURISM EDUCATION IN GENERAL EDUCATION SCHOOLS IN KAZAKHSTAN. *GeoJournal of Tourism and Geosites*, 51(4spl), 1629–1635. https://doi.org/10.30892/gtg.514spl04-1159

Abstract: The study aims to assess the effectiveness of pedagogical methods in tourism education within Kazakhstani secondary schools. Employing bibliographic, theoretical, modeling, and analysis methods, the research focuses on innovative teaching approaches. Qualitative research methods, including interviews with students and field trips to Almaty, were utilized. Priority methods, such as problem-based learning, Inquiry-based Learning, and group work, were identified. The effectiveness of these methods was specifically examined at Gymnasium-School No. 81 in Almaty through questionnaires and interviews conducted with 51 students and 162 city residents/tourists. The findings underscore the significance of developing innovative teaching methods aligned with students' preferences. The study emphasizes the importance of problem-based learning, Inquiry-based Learning, and group work in enhancing the quality of tourism education in Kazakhstani secondary schools

Key words: Tourism education, pedagogical methods, general education schools, geography, Kazakhstan

* * * * * *

INTRODUCTION

The burgeoning tourism industry in Kazakhstan necessitates trained specialists to elevate services and contribute to sectoral growth. This article addresses the need for effective pedagogical methods in teaching tourism within secondary schools. A review of current pedagogical practices identifies challenges and opportunities in Kazakhstan's educational landscape. “To develop a comprehensive tourism policy and implement strategies, one must start from the very beginning of education, that is, from school” (Toleubayev and Sarsembayeva, 2018; Wendt, 2020). However, challenges persist, including infrastructure enhancement (Dmitriyev et al., 2021) and environmental considerations. Kazakhstan's tourism policy should prioritize niche segments, such as cultural, adventure, and eco-tourism, supporting small and medium-sized enterprises (Saparov et al., 2017; Mazhitova et al., 2018; Koshim et al., 2019; Wendt et al., 2021; Issakov et al., 2022; Dmitriyev et al., 2023; El Archi et al., 2023). To make sustainable tourism development more feasible, education is crucial. Education plays a pivotal role in promoting sustainable tourism development (Kim, 2013). Thus, effective pedagogical methods are crucial for both secondary schools and higher education institutions in Kazakhstan, addressing the industry's growth. The absence of a comprehensive educational approach in Kazakhstan is identified as a major challenge (Karimova et al., 2019), emphasizing the need for pedagogical methods accommodating both secondary and higher education.

Additionally, problem-based learning enhances analytical and decision-making skills (Kanca et al., 2018; Yumatov et al, 2017; García-Rosell, 2014; Agbeh, 2015; Kivela and Kivela 2005). Geographical education's tourism and local lore activities play a crucial role in shaping the region's local image (Issakov et al., 2023).

Espinoza-Figueroa et al. (2021) study explores the perception of research-based learning (RBL) as an added value in tourism education using a qualitative approach with three focus groups of tourism students in southern Ecuador,

* Corresponding author

showing that the RBL approach can effectively link theory and practice through real-world case studies and territorial issues. To improve the quality and effectiveness of collaborative, interdisciplinary, and international learning in tourism, modern tourism education applies innovative technologies through the introduction of innovative technologies and the use of interactive technologies (Liburd and Hjalager, 2010).

This study explores the potential of student-led initiatives to address infrastructure issues in tourist areas. Students visit local tourist sites and conduct surveys to identify problems and develop solutions. In response to evolving socio-economic conditions, the education system faces the challenge of quickly optimizing the pedagogical process, particularly in organizing tourist and local history activities for the comprehensive development and social adaptation of students; however, the lack of professional preparation among school teachers and a dearth of literature on organizing and training for such activities present significant obstacles to addressing this pedagogical need. Drawing upon literature on sustainable tourism practices and student-led initiatives, the study aims to promote active student participation in sustainable tourism practices and infrastructure development (Demeuov et al., 2023; Issakov et al., 2023).

In the domain of tourism education within Kazakhstan's general education schools, recent research within the last three years has significantly contributed to our understanding of effective pedagogical methods. Mak et al. (2017) have explored the impact of teamwork on students' practical knowledge and skills, emphasizing its relevance in the context of tourism education. Increasing the sustainability of educational institutions, developing cooperation with the tourism industry, and utilizing joint research projects are important directions for the development of the tourism-education cluster, aiming to ensure sustainability, trends in tourism, and emerging educational needs for mutual competitiveness and benefit (Makenov et al., 2023). This compilation of works provides a current and comprehensive overview of pedagogical methods in tourism education, offering valuable insights for educators and researchers alike.

This study aims to assess the effectiveness of pedagogical methods in tourism education within Kazakhstani secondary schools, with a focus on innovative teaching approaches. Utilizing qualitative research methods, including interviews and field trips, priority methods such as problem-based learning, Inquiry-based Learning, and group work were identified. The study specifically examined the effectiveness of these methods at Gymnasium-School No. 81 in Almaty. The findings emphasize the importance of developing innovative teaching methods aligned with students' preferences, particularly highlighting the role of problem-based learning, Inquiry-based Learning, and group work in enhancing the quality of tourism education in Kazakhstani secondary schools. The research also explores the potential of student-led initiatives to address infrastructure challenges in tourist areas, promoting active student participation in sustainable tourism practices and infrastructure development. The literature review encompasses recent studies addressing the challenges and opportunities in Kazakhstan's tourism industry, underscoring the need for comprehensive educational approaches. The study contributes to the discourse on effective pedagogical methods in tourism education, with practical implications for both secondary and higher education institutions in Kazakhstan.

MATERIALS AND METHODS

In recent years, the tourism industry has been rapidly growing in Kazakhstan, and with it, the need for qualified professionals who can contribute to its sustainable development. A crucial step towards achieving this is to provide quality education in tourism, starting with schools. Utilizing pedagogical methods in tourism education offers multifaceted benefits, enhancing students' knowledge of the tourism industry's economic potential (Dredge and Jamal, 2015), equipping them with essential skills for successful careers in tourism (Mungai et al., 2021), and instilling a sense of responsibility and sustainability (Martins and Guerra, 2022; Lim et al., 2023; Zhang and Gibson, 2021). In Kazakhstan's general education schools, pedagogical methods for tourism education are gaining prominence (Altynbassov et al., 2022; Sergeyeva et al., 2022). Incorporating practical training in the learning process: In addition to using pedagogical methods, incorporating practical training in the learning process is also essential in teaching tourism in schools. An innovative pedagogical approach in geography education, problem-based learning (PBL), has been successfully applied. Problem-based learning (PBL) in school-based STEM education is used to build teacher capacity and effectively integrate STEM subjects, highlighting key aspects such as knowledge flexibility, metacognitive reasoning, intrinsically motivated collaboration, and problems embedded in real and rich contexts (Smith et al., 2022) PBL enhances critical thinking, problem-solving, teamwork skills, and boosts student motivation and engagement. The methodology employed in this study is designed to systematically address the research objectives, ensuring a comprehensive investigation into the pedagogical methods used in tourism education within general education schools in Kazakhstan. The following section outlines the step-by-step approach taken to collect, analyze, and interpret the data, providing transparency and reproducibility to our research process.

Research Design: To ascertain the effectiveness of pedagogical methods in enhancing students' understanding of the tourism industry, a structured research design was implemented. This design incorporates both qualitative and quantitative methods to capture a holistic view of the educational interventions and their impact. Participants: The study involved 51 9th-11th grade students of School-Gymnasium No. 81 and 162 respondents who participated in interviews and questionnaires.

Data Collection: Data collection was multidimensional and included questionnaires, interviews, and observations. The questionnaire survey of tourists/residents was conducted to find out their opinions about tourist spots and suggestions for improving tourist spots in the experiment area, while in-depth interviews provided qualitative information. In addition, data analysis was conducted by students in addition to observations of quantitative data in the classroom and practice.

Data Analysis: Quantitative data was subjected to statistical analysis using descriptive statistics, inferential statistics, and correlation analysis, which allowed for the identification of apparent tourism problems and problem-solving. Qualitative data was subjected to thematic analysis, allowing for a more nuanced analysis of participants' experiences and perceptions.

Ethical Considerations: Ethical guidelines were strictly adhered to throughout the research process. Informed consent was obtained from all participants, and measures were implemented to ensure confidentiality and anonymity.

A flowchart illustrating the sequential steps involved in conducting the research methodology is presented in Figure 1.

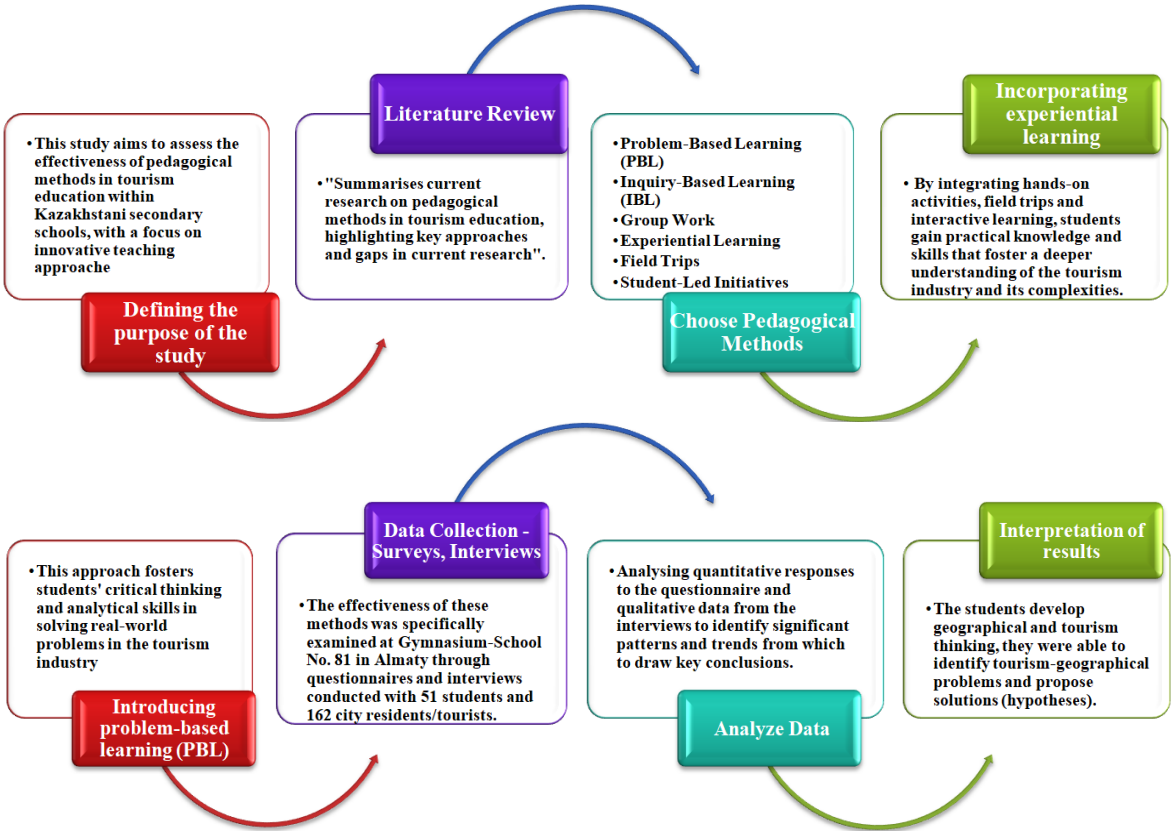


Figure 1. Flowchart of the methodology steps (Source: authors)

In Kazakhstan, using pedagogical methods to teach geography with a focus on tourism knowledge can lead to improved student engagement and a better understanding of the country's diverse geography.

As geography and tourism knowledge are closely linked, it is the teaching of Geography at school that plays a crucial role in fostering students' interest in tourism and local history.

To improve the learning process and effectively engage students, geography teachers are constantly looking for innovative methods. The most effective pedagogical methods used in tourism education are presented in Figure 2.

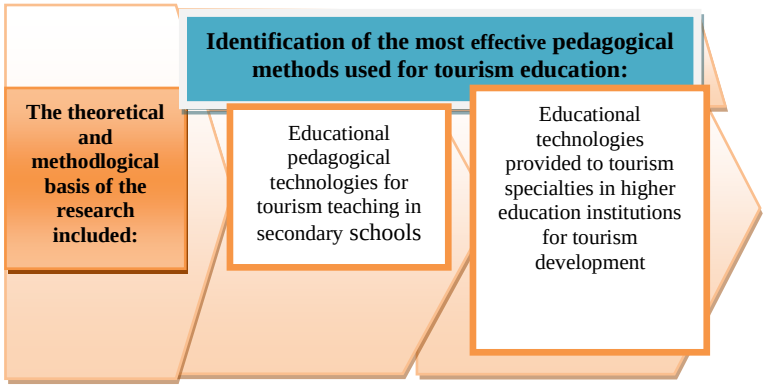


Figure 2. Theoretical and methodological basis of the research (Source: authors)

This comprehensive methodology aimed to provide a robust foundation for investigating the impact of pedagogical methods on tourism education in Kazakhstan's general education schools. The subsequent sections will present and discuss the findings derived from this rigorous research process. Tourism education has gained significant importance in recent years due to the growth of the tourism industry and the need for skilled professionals in the field. Several studies have highlighted the benefits of using pedagogical methods in teaching tourism to enhance student's learning experiences.

The works of Kazakh authors and foreign literature discussed in this Scopus-indexed article are a variety of teaching methods for geography teachers aimed at awakening students' interest in tourism and local history. From interactive geotours to project-based learning, from geographic storytelling to gamification and international research results, these approaches foster a dynamic learning environment that fosters a deep understanding of Kazakhstan's rich cultural heritage and tourist attractions. By implementing these innovative methods, geography teachers can inspire a new generation of students to explore their surroundings and actively participate in preserving their country's history and promoting its tourism potential. In conclusion, using pedagogical methods and incorporating practical training in the learning process is essential for teaching tourism in schools. These approaches not only improve students' knowledge and skills but also help to promote the sustainable development of the tourism industry in Kazakhstan. Geography and tourism are inherently linked, as tourism is both a product and a generator of geographic knowledge. Thus, incorporating tourism knowledge into geography education can enhance students' understanding and engagement with the subject matter. This literature review

aims to explore the benefits of using pedagogical methods in teaching geography using tourism knowledge. Overall, using pedagogical methods to teach geography with a focus on tourism knowledge in Kazakhstan has the potential to enhance student learning and engagement, and prepare them for careers in the tourism industry. The following pedagogical teaching methods were used in the research work: Problem-based Learning involves the students identifying a real-world problem or issue related to tourism education in Kazakhstan and working together to find a solution, and Inquiry-based learning (IBL)involves the students posing questions and seeking answers through research and investigation. The students could use their survey and research findings to develop questions related to tourism education in Kazakhstan and use these questions to guide further research and analysis. These pedagogical methods will help students engage with the topic of tourism education in Kazakhstan, develop critical thinking skills, and apply their knowledge in real-world settings.

After analyzing the work of scientists on tourism education, we chose two methods and used them to deepen tourist knowledge when studying the geography of students. The first was to introduce students to the geographical culture and to visually see the "Geographical picture of the world" by traveling to tourist places. The second was to identify current tourist problems utilizing questionnaires, questions, and answers from tourists, and citizens with whom schoolchildren met in tourist places. As a result, the geographical and tourist thinking of students matured and they were able to identify tourist and geographical problems and offer their solutions (hypotheses). In response to the challenges of economic globalization and increased competition, this study advocates the key role of domestic tourism development in improving the competitiveness of the state, stressing the need to make appropriate adjustments in the training of qualified personnel, as evidenced by a sociological survey among tourism companies in Almaty (Kalenova et al., 2022). To train qualified personnel, it is necessary to start introducing tourism knowledge and tourism critical thinking into general education schools.

RESULTS AND DISCUSSION

The scientific experiment was attended by students from the 9th to 11th grades of School Gymnasium No. 81 in Almaty. In total, 51 students took part in the excursion lesson, and received questionnaires from tourists and vacationers of the city, who met in tourist places, to determine the problems of tourism in Kazakhstan. The purpose of these excursions was for students to independently identify problems and suggest ways to solve them. For this, several research methods in geography and pedagogy were used. These are the descriptive method, questioning method, question and answer method, and the method of exploring effective and ineffective aspects to propose a solution to the problem. The general data of the participants is demonstrated in Table 1 and Figures 3-4. The average age of 51 students is 14-16 years old, girls 16, boys 25. 17 (33.4%) 9th graders, 12 (23.5%) 10th graders, and 22 (43.1%) 11th graders participated in classes.

Table 1. The study participants

№	Grade	Quantity	%	Gender		Age
				male	female	
1	9	17	33.4	7	10	14-15
2	10	12	23.5	5	7	15-16
3	11	22	43.1	14	8	15-16
General		51	100	26	25	14-16

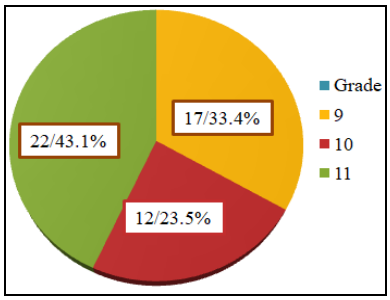


Figure 3. Quantity of participants

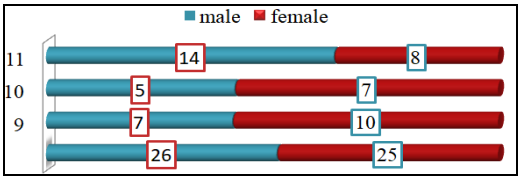


Figure 4. The study participants

In Kazakhstan, according to the updated educational program on geography in grade 9, section 3: Physical geography, four zones and natural territories, natural heritage of Kazakhstan, the significance of natural burials (specially protected territories), physical and geographical, and large areas of knowledge tourism. This also covers allocated as very few hours were allocated, schoolchildren visited tourist places, were able to see with their own eyes and determine the quality and problems of tourist places. In this regard, for the perception of tourism knowledge in geography, pupils benefited from the teaching technology showing not only photos and videos about tourism but also viewing tourist places and open interviews with tourists. This kind of activitie allows students to see a problem and propose a solution To facilitate this methods were used together for a pedagogical experiment in the classroom, a pedagogical experiment in the together: Experiential learning and Problem-based learning. The students visited two tourist places in the suburbs of Almaty, where they interviewed people and answered questions. They needed to find out what contributes to the development of these tourist places and what problems they have. The selected tourist places were the mountain resort "Oi-Karagai" and the Medeu Ice Rink. Oi-karagai is a 40-minute drive from Almaty and offers outdoor recreation, skiing, and horseback riding at the racetrack.The Medeu Ice Rink, located in the beautiful city of Almaty, Kazakhstan, is one of the most popular and picturesque ice rinks in the world. Built in 1972, the Medeu Ice Rink is situated at an altitude of 1,691 meters

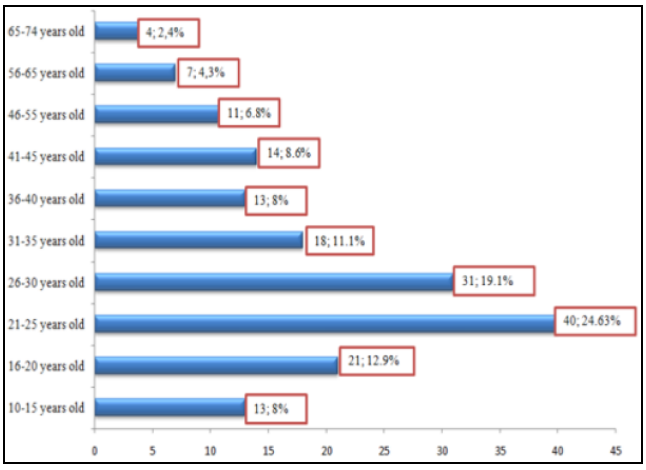


Figure 5. Age and quantity of survey participants (Source: authors)

above sea level in the mountains of the Trans-Ili Alatau, providing breathtaking views for visitors. It is a major tourist attraction in Almaty and has hosted numerous international ice skating competitions, including the 2011 Asian Winter Games. The rink is open year-round, but it is especially popular during the winter months when the temperature drops and snow covers the surrounding mountains. Upon arriving at the tourist destination, the participants of the scientific experiment, which are students from grades 9-11, took interviews and administered questionnaires to tourists and citizens. According to this research, 162 people completed the questionnaire, which consisted of 10 questions. The survey was conducted by people of varying ages, ranging from an 11-year-old child to a 35-year-old average person to a 74-year-old elderly pensioner, thus allowing, the worldviews of literally three generations will be visible. The highest number of respondents according to age, as shown in Figure 5, was 21-25 years (40) 24.63 percent, 26-30 years (31); 19.1 percent and the minimum number of 65-74 years (4) 2.4 percent. The answers to 1-4 questions are illustrated shown in Figures 6, 8 and 9.

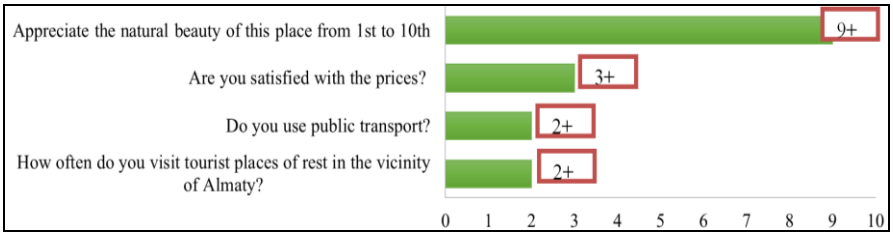


Figure 6. Assessment of tourist infrastructure by Almaty tourists (Source: authors)

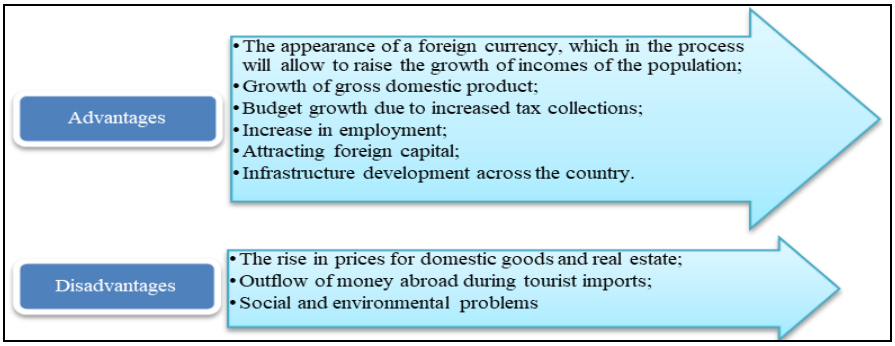


Figure 7. The advantages and disadvantages of domestic tourism (Source: authors)

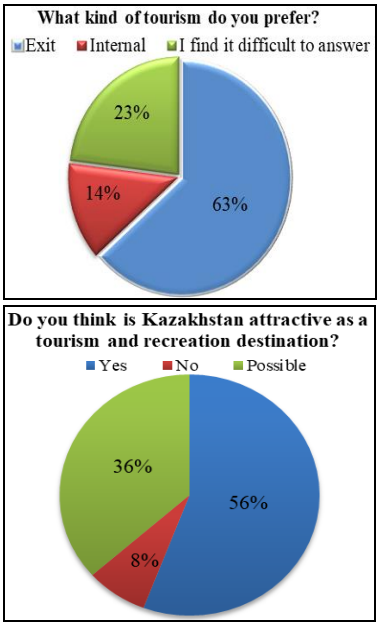


Figure 8. Questions No. 5-6

In response to the question of whether there are any problems with the use of public transport, and if so, what, the answers were that the number of buses arriving at this place is small; when the bus arrives, people can run and squeeze each other without queuing; and the bus stop is not fenced. A study published in the Journal of Destination Marketing and Management suggested that to increase tourism in Almaty, it is important to focus on creating unique experiences that showcase the city's cultural heritage and natural attractions, developing new tourism products that highlight local food, crafts, and traditions, as well as promoting outdoor activities like hiking and skiing (Mansurov et al., 2020). In the context of modern tourism, this study explores the branding of tourism clusters, focusing on the Almaty Mountain Cluster in Kazakhstan, emphasizing the importance of integration, cooperation, and competition for sustainable development and outlining key strategies for territory branding in the tourism industry (Zharkenova et al., 2023). These two methods were used together for a pedagogical experiment in the classroom:project-based learning: and inquiry-based learning (IBL). To date, tourism around the world is not in the best condition, because the whole world is now experiencing a post-coronavirus situation and now, as it is more than ever, clear how important inbound tourism is for any of the country. Students, based on the answers to their questionnaires, identified the advantages and disadvantages of domestic tourism in Figure 7.

The next questions were: Question No. 5: “What kind of tourism do you prefer?", with the options of “Outbound”, “Domestic”, and “I find it difficult to answer”. Question No. 6: “Do you think is Kazakhstan attractive as a tourism and recreation destination?”, with the options of “Yes”, “No” and “Possible”. Based on the answers, it is clear that people are faced with such problems as the lack of basic infrastructure, such as tourist accommodation facilities (motels, hotels, etc.), tourist transport facilities, catering facilities, and well-maintained places of first use. According to statistics, these amenities are available only closer to cities, and foreigners come to Kazakhstan mainly to enjoy nature or sacred places, which are mainly located in the steppes, mountains, and far from civilization. In places located in the steppes or mountains, of course, there is also some infrastructure, but today it no longer meets normal standards, mainly due to the lack of basic sanitary and safety standards. To the question “What kind of tourism do you prefer?” 63% of the participants answered that they would prefer outbound tourism, 23% domestic tourism and the remaining 14% found it difficult to choose an answer. From the answers, it can be judged that After all, many Kazakhstanis or tourists prefer outbound tourism. However, respondents (56%) answered the following question that they consider Kazakhstan an attractive tourist destination, 36% of respondents believed “no”, and the remaining 8% answered, “possible”. To the question “What do you think should be done to make inbound tourism in Kazakhstan relevant as outbound tourism?” the following results were obtained from the respondents: 34 respondents – “Solve infrastructure problems”, 25 chose the answer that it is necessary to solve such problems as that it is necessary to build tourist complexes, 13 respondents – “To create ethnographic complexes where residents”, 26 respondents believe that it is necessary to prepare high-quality guides, another 28 people chose the answer “To attract financial in the form of grants or investment”.

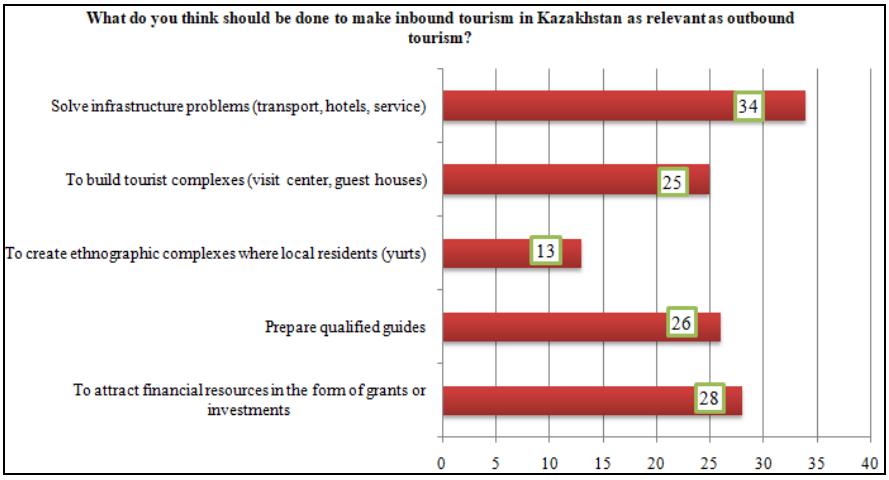


Figure 9. Question No 7. Inbound tourism of Kazakhstan

Inquiry-based learning can be implemented in a geography class in Kazakhstan by having students develop their research questions about a particular tourism-related topic, such as the impact of tourism on a local community or the factors influencing tourist behavior in a certain region. In addition, another research paper by Tian et al. (2022) "Undergraduate Research and Inquiry-Based Learning in Geographical Information Science: A Case Study from China" examines the implementation of inquiry-based learning (IBL) and Undergraduate Research Experience (URE) in Geographical Information Science (GIS) in China, presents two pathways of student development and practical experiences of course design, IBL tool building, and student mentoring, which contributes to improving the quality of higher education and developing competitive universities in China. One example of project-based learning in the context of tourism education could be having students plan and design a sustainable eco-tourism project for a local community in Kazakhstan.

CONCLUSION

In conclusion, this paper highlights the need for continuous improvement in pedagogical methods used in teaching tourism in secondary schools and higher educational institutions in Kazakhstan. The implementation of innovative teaching methods and the development of standardized curricula will help to prepare students for the challenges and opportunities of the dynamic tourism industry. This paper aims to provide a foundation for future research and policy development in this area.The use of pedagogical methods in teaching tourism in higher education has numerous advantages, including developing critical thinking and problem-solving skills, enhancing students' motivation and engagement, and providing practical skills and knowledge that are applicable in real-world situations. Therefore, incorporating pedagogical approaches in tourism courses should be encouraged to ensure the sustainability of the tourism industry.Incorporating pedagogical methods that incorporate tourism knowledge into geography education has been found to enhance students' understanding, engagement, and motivation in the learning process. Problem-based learning, experiential learning, work-integrated learning, and creativity have all been identified as effective pedagogical methods in tourism education. These methods have been found to enhance students' skills, knowledge, and employability in the tourism industry.

Author Contributions: Conceptualization, O.A. and K.D.; methodology, O.A. and G.A.; software, O.A. and U.A.; validation, O.A. and G.A.; formal analysis, O.A. and K.D.; investigation, O.A. and U.A..; data curation, O.A. and T.K.; writing - original draft preparation, O.A. and T.K.; writing - review and editing, O.A. and K.D.; visualization, O.A. and G.A.; supervision, O.A.; project administration, O.A. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: We would like to thank the headmaster of school-gymnasium 81 Nurgali Asanovich Turumbetov and the students for taking part in the survey and contributing to our research.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Agbeh, A. (2015). *Problem-Based Learning in a Hospitality and Tourism. Journal of Teaching in Travel & Tourism,* 19(2), 126-139.https://doi.org/10.1080/15313220.2018.1522290

Altynbassov, B., Bayanbayeva, A., Issabekov, B., Barlykov, Y., Akhmetov, B., Zhankubayev, B., & Shokhanova, I. (2022). Academic Tourism as an Emerging Tourism Industry in Kazakhstan. *Journal of Environmental Management & Tourism*, 13(6), 1646-1657. https://doi.org/10.14505/jemt.13.6(62).13

Demeuov, A., Mazbayev, O., Aukenova, G., Kholoshyn, I., & Varfolomyeyeva, I. (2021). P*edagogical possibilities of tourist and local history activities*. https://doi.org/10.1051/e3sconf/202128011011

Dmitriyev, P.S., Fomin, I.A., Nazarova, T.V., & Wendt, J.A. (2021). Transport accessibility of the lake ecosystem in the North Kazakhstan region as a factor of tourism development. *GeoJournal of Tourism and Geosites*, 35(2), 289–296. https://doi.org/10.30892/gtg.35204-650

Dmitriyev, P.S., Zuban, I.A., Fomin, I.A., & Wendt, J.A. (2023). Assessment of the Natural Resource Potential of the Important Bird Areas of the North Kazakhstan Region for the Development of Ornithological Tourism. *GeoJournal of Tourism and Geosites*, 47(2), 563–572. https://doi.org/10.30892/gtg.47224-1056

Dredge, D., & Jamal, T. (2015). *Mobilities on the move: New directions in tourism and mobilities research*. Ashgate Publishing, Ltd.

El Archi, Y., Benbba, B., Nizamatdinova, Z., Issakov, Y., Vargáné, G.I., & Dávid, L.D. Systematic Literature Review Analysing Smart Tourism Destinations in Context of Sustainable Development: Current Applications and Future Directions. *Sustainability.* 2023; 15(6), 5086. https://doi.org/10.3390/su15065086

Espinoza-Figueroa, F., Vanneste, D., Alvarado-Vanegas, B., Farfan-Pacheco, K., & Rodriguez-Giron, S. (2021). based learning (RBL): Added-value in tourism education. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 28, 100312. https://doi.org/10.1016/j.jhlste.2021.100312

García-Rosell, J.C. (2014). *Promoting critical reflexivity in tourism and hospitality education through problem-based learning*. The routledge handbook of tourism and hospitality education, 279. https://doi.org/10.4324/9780203763308-26

Issakov, Y., Imanbekova, B., Beisembinova, A., Moldgaliyeva, A., Abisheva, Z., Ussenov, N., & Dávid, L. (2023). Study of the effectiveness of tourism and local lore activities of geography teachers in Kazakhstan. *GeoJournal of Tourism and Geosites*, 48(2), 741–750. https://doi.org/10.30892/gtg.482spl08-1074

Issakov, Y., Kamelkhan, G., Imanbekova, B., Zhoya, K., Zheldibayev, A., Molzhigitova, D., & Dávid, L.D. (2023). Study of the problems and prospects of small tourism business development in the city of Almaty. *GeoJournal of Tourism and Geosites*, 46(1), 293–303. https://doi.org/10.30892/gtg.46133-1027

Issakov Y., Laiskhanov S., Mazbayev O., Ussenov N., Zheldibayev A., Kamelkhan G., & Dávid, L.D. (2022). Opportunities to use mobile GIS applications in the formation of tourist and local lore competencies in students: case study in Almaty, Kazakhstan. *GeoJournal of Tourism and Geosites*, 41(2), 597–605. https://doi.org/10.30892/gtg.41234-868

Kalenova, S.A., Yerubayeva, G.K., Razakova, D.I., Demeuova, B.M., & Ushakov, D. (2020). *Directions and practical tools for professional education quality increase (The case of tourism industry of the Republic of Kazakhstan)*. In E3S Web of Conferences (210, 22007). EDP Sciences. https://doi.org/10.1051/e3sconf/202021022007

Kanca, I.N., Ginaya, G., & Astuti, N.N.S. (2018). Designing problem-based learning (PBL) model for tourism vocational education in 4. o industry. *International Journal of Linguistics, Literature and Culture*, 6. https://doi.org/10.21744/ijllc.v6n1.808

Karimova, A., Nogaibayeva, M., & Zhamangaraev, M. (2019). Sustainable tourism development in Kazakhstan: current state and prospects. *Journal of Environmental Management and Tourism*, 10(4), 792-802. https://doi.org/10.14505//jemt.v10.4(40).11

Kim, K.B. (2013). *The perceived role of key stakeholders' involvement in sustainable tourism development* (Doctoral dissertation, University of Nottingham). https://eprints.nottingham.ac.uk/id/eprint/14389

Kivela, J., & Kivela, R.J. (2005). Student perceptions of an embedded problem-based learning instructional approach in a hospitality undergraduate programme. *International Journal of Hospitality Management*, 24(3), 437-464. https://doi.org/10.1016/j.ijhm.2004.09.007

Koshim, A.G., Sergeyeva, A.M., Saparov, K.T., & Wendt, J.A. (2019). Development of scientific tourism at Baikonur Cosmodrome, Kazakhstan. *GeoJournal of Tourism and Geosites*, 24 (1), 267-197. https://dpi.org/10.30892/gtg.24121-358

Liburd, J., & Hjalager, A.M. (2010). Changing approaches towards open education, innovation and research in tourism. *Journal of Hospitality and Tourism Management*, 17(1), 12-20. https://doi.org/10.1375/jhtm.17.1.12

Lim, T.Y., Chan, M.W.T., Leong, C.M., & Chin, C.H. (2023). To visit and preserve an ecotourism destination? The moderating effect of the sense of responsibility. *Journal of Responsible Tourism Management*, 3(1), 24-43. https://doi.org/10.47263/JRTM.03-01-03

Mak, B., Lau, C., & Wong, A. (2017). Effects of experiential learning on students: An ecotourism service-learning course. *Journal of Teaching in Travel & Tourism*, 17(2), 85-100. https://doi.org/10.1080/15313220.2017.1285265

Makenov, C., Narynbayeva, A., Petrichsheva, N., & Umirzakova, M. (2023). Tourism and Educational Cluster in Tourism Industry. *Journal of Environmental Management and Tourism*, 14(6), 2510-2519. https://doi.org/10.14505/jemt.v14.6(70).03

Mansurov, A., Ospanova, S., Zhussupova, A., & Kozhakhmetova, M. (2020). Creating a destination image for Almaty city (Kazakhstan) through cultural heritage and natural attractions. *Journal of Destination Marketing & Management*, 16, 100400. https://doi.org/10.1016/j.jdmm.2020.100400

Martins, M., & Guerra, R. (2022). *Transformational Education for Sustainable Tourism in Middle-Schools, Séraphin, H.* (Ed.) Children in Sustainable and Responsible Tourism, Emerald Publishing Limited, Bingley, 129-142. https://doi.org/10.1108/978-1-80117-656-920221010

Mazhitova, G.Z., Pashkov, S.V., & Wendt J.A. (2018). Assessment of landscape ecological – recreational capacity of north Kazakhstan region, *GeoJournal of Tourism and Geosites*, 11 (3), 731–737.

Mungai, Margaret, W., Kieti, D.M & Cheloti-Mapelu, I. (2021). The Tourism Education and the Tourism Industry Imbalances: A Review of Skills, Curriculum Proponents and the Way Forward. *European Journal of Hospitality and Tourism Research*, l9(3), 14-26, 2021, Available at SSRN. https://ssrn.com/abstract=3885444

Saparov, K.T., Yeginbayeva, A.Y., Nurgalieva, G.Z., Kulzhanova, S.M., Atasoy, E., & Wendt, J.A. (2017). The question of Kazakh national and geographical toponymic as potential factor of tourism development. *GeoJournal of Tourism and Geosites* 10 (1), 115-125.

Sergeyeva, A.M., Abdullina, A.G., Albekova, A.Y., & Shumakova, G.Z. (2022). Development of children's and youth tourism in the modern social space of Kazakhstan. *Journal of Geology, Geography and Geoecology*, 31(1), 142-151. https://doi.org/10.15421/112214

Smith, K., Maynard, N., Berry, A., Stephenson, T., Spiteri, T., Corrigan, D., & Smith, T. (2022). Principles of Problem-Based Learning (PBL) in STEM education: Using expert wisdom and research to frame educational practice. *Education Sciences*, 12(10), 728. https://doi.org/10.3390/educsci12100728

Tian, J., Wang, Y., Ren, C., & Lei, Y. (2022). Undergraduate Research and Inquiry-Based Learning in Geographical Information Science: A Case Study from China. *Scholarship and Practice of Undergraduate Research*, 5(4), 16-23. https://doi.org/10.18833/spur/5/4/8

Toleubayev, A., & Sarsembayeva, G. (2018). Tourism Development in Kazakhstan: Challenges and Opportunities. *International Journal of Economics, Commerce and Management*, 6(4), 184-195. https://doi.org/10.11648/j.jhrm.20190201.12

Wendt, J.A. (2020). Directions and area of tourism research in Kazakhstan. *GeoJournal of Tourism and Geosites*, 32(4), 1418–1424. https://doi.org/10.30892/gtg.32433-589

Wendt, J.A., Pashkov, S.V., Mydłowska, E., & Bógdał-Brzezińska, A. (2021). Political and Historical Determinants of the Differentiation of Entrepreneurial Ecosystems of Agritourism in Poland and Kazakhstan. *Sustainability*, 13, 10487. https://doi.org/10.3390/su131810487

Yumatov, K.V., Kiriyanova, L.G., Yakimova, N.S., Zaitseva, N.A., Larionova, A.A., & Korsunova, N.M. (2017). Problem-based learning methods for training staff for tourism and hospitality clusters. *Eurasian Journal of Analytical Chemistry*, 12(5), 803-812. https://doi.org/10.12973/ejac.2017.00212a

Zhang, H., & Gibson, H.J. (2021). Long-term impact of study abroad on sustainability-related attitudes and behaviors. *Sustainability*, 13(4), 1953. https://doi.org/10.3390/su13041953

Zharkenova, B., Mukanov, A., Mussina, K., Mutaliyeva, L., Sagatbayev, Y., & Pashkov, S. (2023). Branding Of Tourist Cluster Systems: Case Of Almaty Mountain Cluster In The Republic Of Kazakhstan. *GeoJournal of Tourism and Geosites*, 49(3), 1152–1164. https://doi.org/10.30892/gtg.49330-1114

Article history: Received: 25.09.2023 Revised: 30.10.2023 Accepted: 27.11.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1636-1644
DOI 10.30892/gtg.514 spl05-1160

MODERATING EFFECT OF AGE ON THE ADOPTION OF DIGITAL MARKETING TOOLS AND PLATFORMS IN DOMESTIC LEISURE TRAVEL

Mavis CHAMBOKO-MPOTARINGA*
University of Johannesburg, School of Tourism and Hospitality, College of Business and Economics, Johannesburg, South Africa, e-mail: mavischamboko@yahoo.co.uk.

Tembi M. TICHAAWA
University of Johannesburg, School of Tourism and Hospitality, College of Business and Economics, Johannesburg, South Africa, e-mail: tembit@uj.ac.za.

Citation: Chamboko-Mpotaringa, M. & Tichaawa, T.M. (2023). MODERATING EFFECT OF AGE ON THE ADOPTION OF DIGITAL MARKETING TOOLS AND PLATFORMS IN DOMESTIC LEISURE TRAVEL. *GeoJournal of Tourism and Geosites*, 51(4spl), 1636–1644. https://doi.org/10.30892/gtg.514spl05-1160

Abstract: Despite many studies exploring the factors that influence the use of technology in tourism, research focusing on the moderating effect of age on the use of digital marketing tools and platforms for domestic leisure travel purposes remains elusive. Using dimensions from the Technology Acceptance Model and motivation as an additional construct, this study examined the moderating effects of age on digital marketing tools and platform adoption. A sample of 401 domestic tourists and a self-administered questionnaire were used for data collection. Regression analysis was used to analyze the relationships between the proposed variables and the moderating effect of age on these relationships. The findings revealed that perceived usefulness and motivation significantly influenced the use of digital marketing tools and platforms, and the effect of motivation was more significant. Tourists' age played a notable role in contributing to the strength of the relationships. Tourism marketers, managers, business owners, and web developers can use these results as tools to make more effective marketing decisions to promote leisure travel.

Key words: Moderating effect, motivation, perceived ease of use, perceived usefulness, Technology Acceptance Model

* * * * * *

INTRODUCTION

In recent years, tourism has made tremendous advancements in technology adoption for marketing. Digital technologies have transformed the way people communicate and are kept informed. They have opened avenues for audiovisual media and resulted in a shift in the way content is disseminated on digital platforms (websites, blogs, online sharing platforms and social networking sites such as Twitter, Facebook, Instagram, and TikTok) (Zeng et al., 2023). People of all ages are reaping the benefits of the technology boom (Buhalis and Karatay, 2022; Monaco, 2018; Zhang et al., 2023). This research identifies tourists as individuals who utilise digital marketing tools and platforms for their benefit in their travel decisions. Tourists are increasingly pressured to use digital marketing tools and platforms for fear of missing out (FOMO). At the same time, destination marketers embrace digital technologies to avoid falling behind in the ongoing digital transformation. Dinhopl and Gretzel (2016) posit that today's travellers are hybrid tourists who use different technologies to obtain the necessary information. This provides unprecedented opportunities for tourism marketing (Buhalis et al., 2023).

New technologies have caused users to change their travel behaviour and habits, with others investing more time connected to the Internet (Yousaf and Xiucheng, 2018). Any business that wishes to succeed and survive must understand the factors that influence customer behaviour (Etale and Uranta, 2022). Understanding factors influencing consumer travel behaviour helps marketers understand customer preferences (Chamboko-Mpotaringa and Tichaawa, 2021). Times have radically changed to the extent that within two decades, some media have become antiquated and obsolete because of changes in consumer preferences. Upon entering the marketing field, digital technologies triggered unprecedented changes in tourism marketing, shaping a highly dynamic environment that facilitates the networked connectivity of people, processes, data, and things. As digital technologies proliferate, tourism marketers have become increasingly reliant on digital marketing as consumers increasingly turn to digital platforms to research and make travel bookings online. Digital marketing empowers destination branding, positioning, awareness, and marketing. In addition, digital marketing tools and platforms provide opportunities to support tourists' travel decisions in travel planning and booking, during a trip and after a trip to gain maximum enjoyment from their travel experiences (Gajdošík, 2022), thereby effectively transforming consumer behaviour (Rauschnabel et al., 2022). The efficacy of digital marketing strategies cannot be argued.

As a result of the advent of digital technologies, the tourism market has become much more competitive and technology-based. Tourists no longer conform to the rules of tourism destinations. As expected, many tourism destinations have had to transform their marketing and redesign the best marketing and operational practices available to benefit from

* Corresponding author

the technological paradigm shifts experienced (Buhalis, 2020). A digital presence neither brings nor guarantees visibility and accessibility to tourism destinations. Tourism marketers can fulfil tourists' preferences and meet expectations by adopting a well-articulated and systematic approach to using technology and providing personalised services to tourists. Practitioners often encounter challenges when launching marketing campaigns using digital channels to maximise effectiveness. Therefore, it is essential for tourism marketers to comprehend the influential factors and effects of age when utilising digital marketing tools and platforms to achieve success in tourism marketing (Balouchi et al., 2017).

The potential benefits of using digital technologies have engendered significant debates within the tourism marketing-focused discourse. Most research consisted of fervent discussions concerning how stakeholders can use digital platforms to market tourism destinations (Dwivedi et al., 2022; Lamberton and Stephen, 2016; Talwar et al., 2022; Tsourgiannis and Valsamidis, 2019). Furthermore, some research has concluded that as much as tourists utilise digital platforms, tourists are different (González-Reverté and Liviano-Solís, 2020). To highlight this phenomenon, some studies focused on the younger generation (Acheampong and Siiba, 2020; Matikiti-Manyevere and Hattingh, 2020) while others concentrated on the older generation (Zhang et al., 2023; Zhou et al., 2014). Previous studies have not paid attention to the moderating effect of age on factors that influence the use of tourism digital marketing tools and platforms. The factors that enable the actual use of digital platforms need to be explored, amplified, and tackled to maximise adoption (Mametja et al., 2023). Thus, the need for empirical research on the factors that influence the use of digital marketing tools and platforms should not be overlooked. Furthermore, with technology accessible and used by different ages, it is crucial to understand the moderating effect of age in digital marketing tools and platforms. As such, the study proposes the following research question: What is the moderating effect of age on the relationship between perceived usefulness (PU), perceived ease of use (PEOU), motivation (M), and tourists' actual use of digital marketing tools and platforms for tourism?

LITERATURE REVIEW

Theoretical background

Several information systems (IS) models related to the adoption of new technology have been put forward by different scholars (Davis, 1989; DeLone and McLean, 2003; Mason, 1978; Taylor and Todd, 1995; Venkatesh et al., 2003, 2012; Wixom and Todd, 2005). However, several studies on technology adoption have focused on understanding the variables affecting technology acceptability (Isaac et al., 2019). One widely accepted and used model which has gained popularity because of its simplicity and adaptability is the Technology Acceptance Model (TAM) (Al-Qaysi et al., 2020), which Davis (1989) developed. TAM allows easy transfer and application to different contexts (Chocarro et al., 2023). The TAM has gained popularity as a grounding theory since one can explain and predict the acceptance of technology among potential users based on causal relationships (Chocarro et al., 2023). The TAM uses a user-centric approach as it emphasises the perception of users. The TAM reflects that the actual use of new technology is determined by a user's perceived benefits obtained from using the new technology, as well as its perceived ease of use (Chamboko-Mpotaringa and Tichaawa, 2023).

Various scholars have successfully adopted the TAM to study technology acceptance and usage in different contexts, such as in education (Chocarro et al., 2023), banking (Purohit and Arora, 2023), metaverse (Almarzouqi et al., 2022) and tourism (Alma Çallı et al., 2023; Liu and Zheng, 2023). However, the model faced criticism because of its limitations, such as the factors in TAM alone being insufficient to predict user acceptance (Wong et al., 2022). The factors in the TAM do not characterise much detail about technology use and acceptance (Lin and Yu, 2023). Since the TAM accounts for slightly more than 40% of the variance, the contribution of other variables requires examination (Legris et al., 2003). To overcome that, additional variables such as perceived enjoyment, perceived risk, and perceived social capital (Singh and Srivastava, 2019), trust (Liu and Zheng, 2023), experience (Huang et al., 2019), engagement, immersion, and perceived utility (Sepasgozar, 2022) have been added in extant studies. This study proposes adding M to the TAM constructs as an important variable in the adoption of digital marketing for tourism use. Motives are general tendencies that affect people's behaviours taken to satisfy a need or desire (Miranda et al., 2023). Motivations for using digital marketing tools and platforms for travel purposes are varied and can include a source of information, social interaction, convenience, feedback, and ease to use (Dyk et al., 2020; Lou and Xie, 2021). The comprehension of tourists' intentions and expectations concerning system utilisation is paramount, and motivation plays a crucial role for marketers in acquiring this comprehension (Hew et al., 2023; Lowry et al., 2015).

Hypothesis and research model

In this study, tourists are considered as users of digital marketing tools and platforms in their travel decisions. When tourists are exposed to new technology, many factors influence their acceptance decision (Chamboko-Mpotaringa and Tichaawa, 2023). This paper adopts the TAM to measure tourists' use of digital marketing tools and platforms in travel decisions. The TAM rests on the notion that tourists' behavioural intention to use digital marketing tools and platforms is determined by two central beliefs: PU and PEOU. PU refers to the degree to which a person believes using a particular technology would enhance performance. PEOU refers to the degree to which a person believes using a particular system would be free from effort (Davis, 1989). In the case of digital marketing tools and platforms, PU entails the benefits derived from using digital marketing tools and platforms, and PEOU refers to the ease with which tourists can use digital marketing tools and platforms. Marketers can promote digital marketing tools and platforms if the tourists believe they can benefit from using the digital platforms and they are easy to use. Two hypotheses would be tested based on the traditional TAM constructs: PU and PEOU according to similar research (Singh and Srivastava, 2019) using TAM constructs in the context of tourism. Many previous studies have identified a positive relationship between PU, PEOU, and actual use of technology (Renny et al., 2013; Tavitiyaman et al., 2022). However, a considerable body of research found contradicting

results regarding the predictive role of PU and PEOU. For example, Deng and Yu (2023) could not confirm the influence of PU. Similarly, Musina and Gao (2016) could not establish a relationship between ease of use and the use of new technology. Confronted with such inconsistencies in the existing literature, the study tests the following hypotheses:

H1: PU positively influences the use of digital marketing tools and platforms for tourism.

H2: PEOU positively influences the actual use of digital marketing tools and platforms.

Motivations for using digital marketing tools and platforms for travel purposes are varied and can include a source of information, social interaction, convenience, feedback, and ease to use (Dyk et al., 2020; Lou and Xie, 2021). Several authors have reported a positive relationship between motivation and user intention (Ali et al., 2022; Hew et al., 2023). Venkatesh et al. (2012) maintain that motivation is a powerful predictor of technology adoption and usage behaviour. However, literature is scant in tourism studies that exclusively examined the influence of motivation in assessing the actual usage behaviour of technology in digital marketing tools and platforms, which led to testing the following hypothesis:

H3: M positively influences the use of digital marketing tools and platforms for tourism.

The moderating effect of age

Age is a crucial marketing phenomenon in tourism as it affects tourists' consumption patterns of tourism products (Wong et al., 2022). In marketing, it is common practice to categorise target markets into consumer segments. This is often done using the term "generation," which refers to age, birth year, location, or significant life events (Dida et al., 2021; Jonck et al., 2017). People born in the same generation often exhibit similar behavioral patterns due to shared experiences that shape their childhood. Their preferences change as they progress through different life stages, such as childhood, adolescence, or becoming senior citizens (George, 2019). The use of new technology differs from one age group to another (Zhuang et al., 2021). People's technological preferences in their teens may differ from those in their seventies (Zhang et al., 2023). Therefore, marketers often use age as a means of segmenting markets (Funk, 2008).

In technology adoption and acceptance age is an important demographic variable that has moderating and direct effects on technology adoption and acceptance (Anwar et al., 2021; Hua et al., 2021). Earlier studies have been undertaken to understand the impact of age on technology use in tourism (Chen et al., 2023; Hua et al., 2021; Setiawan et al., 2018). The studies show an age gap between young people, who embrace existing mobile applications, and those who follow new mobile phone features. Chen et al. (2023) found significant effects of age on Chinese handwriting performance on touch screens through fingers and stylus. Older adults use limited phone functions, with the camera being popular for viewing photos. According to Setiawan et al. (2018), millennials value family and leisure and use smartphones for communication and problem-solving. They spend their free time on social media and are interested in its audio and visual aspects. Thus, the current study attempts to understand the moderating effect of age on the study's variables, and the following hypothesis were developed:

H4a: Age moderates the relationship between PU and tourists' use of digital marketing tools and platforms.

H4b: Age moderates the relationship between PEOU and tourists' use of digital marketing tools and platforms.

H4c: Age moderates the relationship between M and tourists' use of digital marketing tools and platforms.

Based on the literature, the authors propose a model (Figure 1) which shows the relationship between the constructs, the type of relationships, and the moderating effect of age.

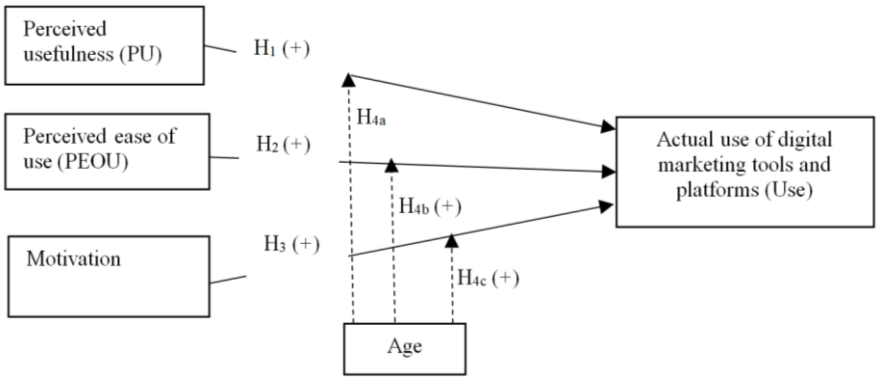


Figure 1. Proposed model

METHODOLOGY

In the positivist paradigm, this study examines the antecedents of digital marketing tools and platforms' actual usage for tourism purposes through quantitative research design. The sample population for the study was domestic tourists travelling to the Free State province in South Africa, either as day visitors or overnight visitors. The selection criteria to be included in the study is that tourists must be familiar with and should have used digital marketing tools and platforms in their travel decisions. Non-probability, convenience sampling techniques were used to select the sample from the sampling frame. The respondents were approached face-to-face and asked to complete a self-administered questionnaire survey focused on digital marketing tools and platforms. The survey consisted of 24 items and was divided into four themes: digital marketing tools and platforms usage, M, PU and PEOU.

The questionnaire was based on previous studies (Breda et al., 2019; Davis, 1989; Dyk et al., 2020; González-Reverté and Liviano-Solís, 2020; Jeng et al., 2017; Singh and Srivastava, 2019; Venkatesh et al., 2012) but was

modified to better suit the objectives of this study and improve the generalisation of the findings. The variables of the research and indicators are shown in Table 1. The study utilised a five-point Likert scale to evaluate the questionnaire items. The scale ranged from strongly disagree (1) to strongly agree (5). SPSS software version 27 was utilised to capture and analyse the data, conducting descriptive and inferential statistics. Descriptive analysis summarised the variables, and regression analyses were performed to test the study's hypotheses.

Table 1. Study variables

Variables	Indicators
Perceived usefulness (PU)	useful on trips, enhances the quality of trips, enables convenient trips, allows for instant feedback, gives ideas about possible next trips
Perceived ease of use (PEOU)	part of lifestyle, user-friendly, familiarity, content is readily and easily available, flexibility
Motivation (M)	benefits derived, easy-to-use, high-quality information, the quality of the digital marketing platforms concerned, and high-quality service received when using digital marketing tools.
Use of/Intent	blogs, consumer review sites, online sharing economy platforms, social network sites, travel applications

RESULTS

Sample description

The respondents' demographic statistics are presented in Table 2. As presented in Table 2, 55.3% of the respondents were females, while 44.7% were male. Respondents aged 18 to 30 years constituted 35.9%, those aged 31 to 40 constituted 32.7%, and those above 40 years of age constituted 31.4% of the sample. The income bracket of respondents revealed that 23.3% of the respondents earned R1000 or below, 15.3% earned between R1001-R5000, 10.7% earned between R5001-R10000, and 13.7% earned between R10001-R15000. Most of the participants (24.1%) earned more than R20000.

Table 2. Demographic statistics for 401 respondents

Criterion	Factor	Frequency	Percentage
Sex	Female	222	55.3%
	Male	179	44.7%
Age	18-30	144	35.9%
	31-40	131	32.7%
	41-50	67	16.7%
	51-60	31	7.7%
	≥61	28	7%
Income	≤R1000	85	23.3%
	R1001-R5000	56	15.3%
	R5001-10000	39	10.7%
	R10001-R15000	50	13.7
	R15001-R20000	47	12.9
	≥R20001	88	24.1%

Table 3. Cronbach's Alpha reliability results

Construct	No of items	Cronbach's Alpha
Use/Intent	9	0.846
Motivation (M)	5	0.929
Perceived usefulness (PU)	5	0.932
Perceived ease of use (PEOU)	5	0.949

Table 4. Kaiser-Meyer-Olkin test of sampling adequacy and Bartlett's test of sphericity

Kaiser-Meyer-Olkin measure of sampling adequacy		0.948
Bartlett's test of sphericity	Approx. Chi-Square	7560.696
	df	276
	Sig	0.000

Reliability of constructs

The Cronbach's Alpha test was used to evaluate the reliability of the study constructs. Findings showed that all the construct variables were reliable, with an Alpha coefficient above 0.8 (Table 3). A cut-off value of 0.7 or higher implies increased reliability when evaluating composite reliability coefficients for internal consistency reliability (Hair et al., 2019).

Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Bartlett's test of sphericity were performed to validate the sample size. The KMO value for the scale items was 0.948, surpassing the recommended value of 0.6, meaning an acceptable value as seen in Table 4. Kaiser (1974) suggested that values between 0.8 and 0.9 are meritorious, while Hair et al. (2006) suggested accepting values between 0.7 and 0.8 as good. Bartlett's test of sphericity results (Table 4) was significant (Chi-Square = 7560.696; $p < 0.000$), substantiating that the sample size was adequate.

Regression analyses were performed to test the statistical significance of the variables. Collinearity statistics (tolerance and Variance Inflation Factor (VIF)) were used to test multicollinearity. As shown in Table 5, the study findings revealed that tolerance values ranged from 0.261 to 0.322, and VIF values ranged from 3.107 to 3.831. These findings suggested that multicollinearity issues were not of concern. Tolerance values of less than 0.7 and VIF values of less than 10 are acceptable (Balachandran and Tan, 2015; Şengel et al., 2022). Table 5 shows that all four constructs are positively correlated with each other. The correlation coefficients (0.585, 0.499, and 0.590) indicate positive linear relationships.

Table 5. Multicollinearity test and correlation analysis

Independent variable	Direction of path	Dependant variable	Correlations	Collinearity statistics	
				Tolerance	VIF
Perceived usefulness (PU)	→	Digital marketing tools and platforms used	0.585	0.261	3.831
Perceived ease of use (PEOU)	→	Digital marketing tools and platforms used	0.499	0.291	3.432
Motivation (M)	→	Digital marketing tools and platforms used	0.590	0.322	3.107

The study proposed a positive significant relationship between the independent variables, PU, PEOU, M, and the dependent variable, tourists' use of digital marketing tools and platforms. Study findings are shown in Table 6.

Table 6. Results of hypothesis testing(M: motivation; PE-perceived usefulness; PEOU-perceived ease of use)

Dependent variable: Digital marketing tools and platforms used						
Goodness of fit: R=0.618, R^2=0.382, Adjusted R^2=0.377, Standard error of estimate= 0.719						
Analysis of variance		**Df**	**Sum of squares**		**Mean square**	
Regression		3	125.922		41.974	
Residual		395	203.916		0.516	
F-static=81.306						
Significant F=<0.001						
Hypothesis and relationship	**Path**	**Standardised coefficient Beta (β)**	**Standard error (SE)**	**t-Value**	**p-value**	**Hypothesis supported**
$H_{1\,(+)}$	PU ⟶ Use	0.344	0.066	4.445	0.000	Yes
$H_{2\,(+)}$	PEOU ⟶ Use	0.065	0.059	0.886	0.376	No
$H_{3\,(+)}$	M ⟶ Use	0.364	0.061	5.217	0.000	Yes

Table 6 shows that 38% (R^2=0.38) of the variance in tourists' use of digital marketing tools and platforms for tourism purposes can be explained by tourists' perceptions of the usefulness, ease of use, and motivation to use digital marketing tools and platforms. Table 6 also shows that the model is statistically significant (p<0.001). H_1 proposed that PU positively influences the use of digital marketing tools and platforms for tourism.

The results in Table 6 support the hypothesis (β=0.344, SE=0.066, t=4.445, p=0.000). H_2 proposed that PEOU positively influences the actual use of digital marketing tools and platforms for tourism purposes. As the findings show Table 7 (β=0.065, SE=0.059, t=0.886, p=0.376), PEOU is not significantly related to the actual use of digital marketing tools and platforms for tourism purposes. Therefore, H_2 is not supported. H_3 proposed that motivation positively influences the use of digital marketing tools and platforms for tourism. Findings (β=0.364, SE=0.061, t=5.217, p=0.000) indicate a statistically significant relationship. Therefore, H_3 is supported. Motivation surfaces as the most significant influence (β=0.368) on the actual use of digital marketing tools and platforms.

The study examined how age affects the relationship between PU, PEOU, M, and tourists' use of digital marketing tools and platforms. A moderator variable alters the connection between two other variables (Albaom et al., 2022). For instance, in this study, age is a moderator. If the relationship between PU, PEOU, M, and tourists' use of digital marketing tools and platforms were moderated by age, they would have an impact on the strength or direction of the relationship. The outcomes of the hypothesised relationship for testing the moderating effect of age are summarised in Table 7.

Table 7. Results for hypothesis testing (moderation effect)
(INT-Interactive item; M- motivation; PE-perceived usefulness; PEOU-perceived ease of use)

Dependent variable: Digital marketing tools and platforms used						
Goodness of fit: R=0.624, R^2=0.389, Adjusted R^2=0.383, Standard error of estimate= 0.715						
Analysis of variance		**Df**	**Sum of squares**		**Mean square**	
Regression		4	128.323		32.081	
Residual		394	329.837		0.511	
F-static=62.724						
Significant F=<0.001						
Hypothesis and relationship	**Path**	**Standardised coefficient Beta (β)**	**Standard error (SE)**	**t-value**	**p-value**	**Hypothesis supported**
	INT ⟶ Use	0.085	0.035	2.167	0.031	Yes
$H_{4a\,(+)}$	Moderating effect PU ⟶ Use	0.350	0.071	4.540	0.000	Yes
$H_{4b\,(+)}$	Moderating effect PEOU ⟶ Use	0.072	0.066	0.992	0.322	No
$H_{4c\,(+)}$	Moderating effect M ⟶ Use	0.368	0.063	5.302	0.000	Yes

The model uses the predictor variables PU, PEOU, and M, the hypothesised moderator (age), and their interaction to predict the result. Table 7 reveals that considering the moderation effect, the model explains that 39% (R^2=0.39) of the variance in tourists' use of digital marketing tools and platforms for tourism purposes can be explained by tourists' motivation, perceptions of the usefulness and ease of use of digital marketing tools and platforms. The model is statistically significant (p<0.001). The path coefficient of the interactive item of PU, PEOU and M is (β=0.085, SE=0.035, t=2.167, p=0.031), implying that the moderating role of age is statistically significant.

H_{4a} proposed that age moderates the relationship between PU and tourists' use of digital marketing tools and platforms. The results in Table 7 show that age moderates the relationship between PU and tourists' use of digital marketing tools and platforms (β=0.350, SE=0.071, t=4.540, p=0.000). Therefore, H_{4a} is supported. H_{4b} proposed that age moderates the relationship between PEOU and tourists' use of digital marketing tools and platforms.

The results in Table 7 show that age does not mediate the relationship between PEOU and tourists' use of digital marketing tools and platforms (β=0.072, SE=0.066, t=0.992, p=0.322). Like H_2 in the original model (Table 6), the p-value is greater than 0.05, indicating that this moderated relationship is not statistically significant at the conventional

level. Therefore, H_{4b} is not supported. H_{4c} proposed that age moderates the relationship between motivation and tourists' use of digital marketing tools and platforms. The results in Table 7 show that age moderates the relationship between motivation and tourists' use of digital marketing tools and platforms (β=0.368, SE=0.063, t=5.302, p=0.000). Therefore, H_{4c} is supported. The results of the model testing are illustrated in Figure 2.

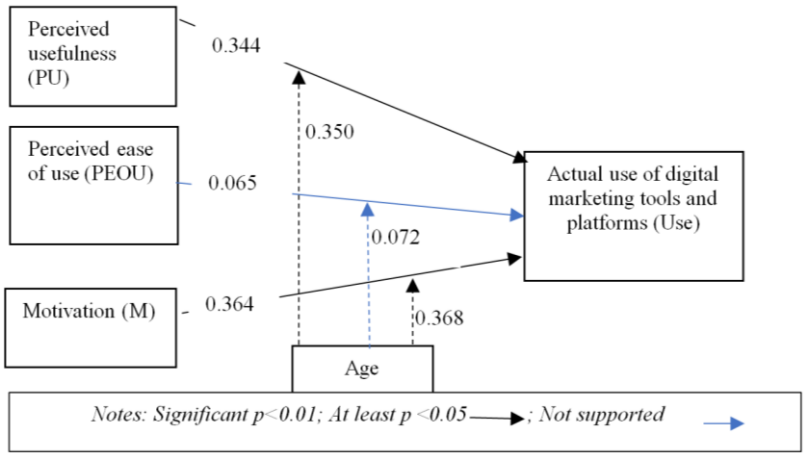


Figure 2. Results of model testing

The standardised coefficients for PU, PEOU, and M in the original model are 0.344, 0.065 and 0.364 respectively. In the moderation effect model, the standardised coefficients for PU, PEOU, and M are 0.350, 0.072, and 0.368, respectively. In both models, the findings indicate that these variables have positive effects on actual usage behaviour. In comparison, the standardised coefficients for PU, PEOU, and M are slightly higher in the moderation effect model than in the original model.

DISCUSSION AND CONCLUSIONS

Theoretical implications

This study extends the theoretical research on the TAM model by adding M as a factor influencing tourists' use of digital marketing tools and platforms. It assesses the moderating effect of age on the use of digital marketing tools and platforms for tourism purposes. The study made three contributions to existing literature related to tourism digital marketing.

Firstly, the study contributes to the existing literature and extension of the scope of the application of TAM in adopting technology in tourism research. In Table 6 and as shown in Figure 2, it was found that PU and M (H1 and H3) significantly positively affect tourists' use of digital marketing tools and platforms for tourism purposes. These findings are consistent with previous scholars (Ali et al., 2022; Tavitiyaman et al., 2022). PU has been found to contribute significantly to the acceptance and use of technology for tourism purposes (Alma Çallı et al., 2023). Considering motivation, the study findings are consistent with Camilleri and Falzon (2021), who concluded that motivation has a significant effect on the intention to use technology. Studies have shown that when adopting new technology, people are more likely to do so if they find it easy to use (Davis, 1989; Renny et al., 2013). This study showed that PEOU (H2) positively correlates with using digital marketing tools and platforms. However, it was not statistically significant (as shown in Table 6 and Figure 2). This means that while there may be a positive trend, the relationship is not strong enough to confidently conclude that it exists in the current study's population. Thus, the study contradicts Venkatesh et al. (2012) but is consistent with Ali et al. (2022), who also found the insignificant influence of ease of use on the actual use of technology. Secondly, this study uses PU, PEOU and use of/intention from the TAM model and added M as an independent variable. In line with the other studies which have added variables to the original TAM model (Albaom et al., 2021; Estriegana et al., 2019; Matikiti et al., 2018), the study has confirmed TAM's versatility and broader applicability based on the findings of the current research.

Thirdly, age was also used as a moderating variable in this study. This study extends our understanding of the moderating effect of age on factors affecting acceptance of new technology. Several studies have used age as a moderator in adopting new technology (Hua et al., 2021) and found significant effects (Chen et al., 2023; Hua et al., 2021; Zhuang et al., 2021). The moderation effect model introduces the role of age as a moderator in the relationships between the predictor variables (PU, PEOU, and M) and the use of digital marketing tools and platforms for tourism. The study findings suggest that age has a positive effect on the actual usage of digital marketing tools and platforms, which is consistent with (Chen et al., 2023; Zhang et al., 2023). In the cases of PU and M (H4a, H4c), age was found to have a significant moderating effect on the relationship with tourists' actual use of digital marketing tools and platforms. However, regarding PEOU (H4b), age was not found to have a significant moderating effect on the relationship. This means that age does not significantly alter the relationship between PEOU and tourists' use of digital marketing tools and platforms.

Practical implications

The study has a few practical implications. Firstly, the study uncovers core factors (PU and M) influencing the usage of digital marketing tools and platforms for tourism. As a result, tourism marketers need to be aware of these factors since they provide them with insights into the aspects of their digital marketing tools and platforms that need to be considered to leverage and influence behavioural intentions.

Secondly, this study provides an understanding of the effect of age on factors that influence the adoption of technology in tourism. The study suggests that the influence of PU and M on tourists' use of digital marketing tools and platforms varies depending on the age of the tourists. This information is valuable in understanding the role of age as a factor in shaping tourists' behaviors toward technology adoption. This understanding is relevant in tourism marketing for designing targeted interventions, marketing strategies, or policies that address different age groups' diverse needs and preferences when accepting and adopting new digital marketing tools and platforms.

Drawing on the research findings, managers and policymakers can address potential concerns related to the digital divide, ensuring that inclusivity and accessibility considerations align with SDG 10 (reduced inequalities). Researchers and scholars can also gain novel insights from the current study findings, which aids in developing future tourism research studies where technology is a crucial component.

Limitations and suggestions for future studies

The study examined the moderating effect of age on given variables without delving into the specifics of different age groups, thus limiting its contribution to our understanding of generational heterogeneity concerning their acceptance of new technology in tourism. Future studies could focus on comprehensive generational analysis, specifically on generational differences regarding technology adoption.

Author Contributions: Conceptualization, M.C and T.H.; methodology, M.C and T.H.; software, M.C and T.H.; validation, M.C and T.H.; formal analysis, M.C and T.H.; investigation, M.C and T.H.; data curation, M.C and T.H.; writing - original draft preparation, M.C and T.H.; writing - review and editing, M.C and T.H.; visualization, M.C and T.H.; supervision, M.C and T.H.; project administration, M.C and T.H. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Acheampong, R.A., & Siiba, A. (2020). Modelling the determinants of car-sharing adoption intentions among young adults: The role of attitude, perceived benefits, travel expectations and socio-demographic factors. *Transportation*, 47(5), 2557–2580. https://doi.org/10.1007/S11116-019-10029-3/TABLES/3

Albaom, M.A., Sidi, F., Jabar, M.A., Abdullah, R., Ishak, I., Yunikawati, N.A., Priambodo, M.P., Husen, J.H., Issac, O., & Al-Harasi, A.H. (2021). The impact of tourist's intention to use Web 3.0: A conceptual integrated model on TAM & DMISM. *Journal of Theoretical and Applied Information Technology*, *99*(24), 6222–6238.

Albaom, M.A., Sidi, F., Jabar, M.A., Abdullah, R., Ishak, I., Yunikawati, N.A., Priambodo, M.P., Nusari, M.S., & Ali, D.A. (2022). The moderating role of personal innovativeness in tourists' intention to use Web 3.0 based on updated information systems success model. *Sustainability (Switzerland)*, *14*(21), 13935. https://doi.org/10.3390/su142113935

Ali, M.B., Tuhin, R., Alim, M.A., Rokonuzzaman, M., Rahman, S.M., & Nuruzzaman, M. (2022). Acceptance and use of ICT in tourism: The modified UTAUT model. *Journal of Tourism Futures*. https://doi.org/10.1108/JTF-06-2021-0137

Alma Çallı, B., Çallı, L., Sarı Çallı, D., & Çallı, F. (2023). The impact of different types of service robots usage in hotels on guests' intention to stay. *Journal of Hospitality and Tourism Technology*, *14*(4). https://doi.org/10.1108/JHTT-09-2021-0266

Almarzouqi, A., Aburayya, A., & Salloum, S.A. (2022). Prediction of user's intention to use metaverse system in medical education: A hybrid SEM-ML learning approach. *IEEE Access*, *10*, 1–1. https://doi.org/10.1109/ACCESS.2022.3169285

Al-Qaysi, N., Mohamad-Nordin, N., & Al-Emran, M. (2020). Employing the technology acceptance model in social media: A systematic review. *Education and Information Technologies*, *25*(6), 4961–5002 (2020). https://doi.org/10.1007/s10639-020-10197-1 https://doi.org/10.1007/S10639-020-10197-1

Anwar, A.P., Yuvaraj, G., Nurul, S.Z., & Ahmad, K. (2021). Determinants of customers' intention to use online food delivery application through smartphone in Malaysia. *British Food Journal*, *124*(3), 732–753. https://doi.org/10.1108/BFJ-01-2021-0075

Balachandran, D., & Tan, G.W.H. (2015). Regression modelling of predicting NFC mobile payment adoption in Malaysia. *International Journal of Modelling in Operations Management*, *5*(2), 100. https://doi.org/10.1504/ijmom.2015.072671

Balouchi, M., Aziz, Y.A., Hasangholipour, T., Khanlari, A., Abd Rahman, A., & Raja-Yusof, R.N. (2017). Explaining and predicting online tourists' behavioural intention in accepting consumer generated contents. *Journal of Hospitality and Tourism Technology*, *8*(2), 168–189. https://doi.org/10.1108/JHTT-09-2016-0059

Breda, Z., Pacheco, C., & Dinis, G. (2019). Future trends in the hospitality industry: An analysis from the consumers'point of view. *Tourism in Southern and Eastern Europe*, *5*, 139–162. https://doi.org/10.20867/tosee.05.9

Buhalis, D. (2020). Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review*, *75*(1), 267–272. https://doi.org/10.1108/TR-06-2019-0258

Buhalis, D., & Karatay, N. (2022). Mixed Reality (MR) for Generation Z in cultural heritage tourism towards metaverse. In J. L. Stienmetz, B. Ferrer-Rosell, & D. Massimo (Eds.), *Information and Communication Technologies in Tourism 2022* (pp. 16–27). Springer. https://doi.org/10.1007/978-3-030-94751-4_2

Buhalis, D., Leung, D., & Lin, M. (2023). Metaverse as a disruptive technology revolutionising tourism management and marketing. *Tourism Management*, *97*, 104724. https://doi.org/10.1016/J.TOURMAN.2023.104724

Camilleri, M.A., & Falzon, L. (2021). Understanding motivations to use online streaming services: integrating the technology acceptance model (TAM) and the uses and gratifications theory (UGT). *Spanish Journal of Marketing - ESIC*, *25*(2), 217–238. https://doi.org/10.1108/SJME-04-2020-0074

Chamboko-Mpotaringa, M., & Tichaawa, T.M. (2021). Digital trends and tools driving change in marketing Free State tourism destinations: A stakeholder's perspective. *African Journal of Hospitality, Tourism and Leisure.*, *10*(6), 1973–1984. https://doi.org/10.46222/ajhtl.19770720.204

Chamboko-Mpotaringa, M., & Tichaawa, T.M. (2023). Domestic tourists' perceptions of the intention to use digital marketing tools and platforms. *Geojournal of Tourism and Geosites*, *46*(1), 9–18. https://doi.org/10.30892/gtg.46101-995

Chen, Z., Yun, D., & Zhou, J. (2023). Handwriting on touch screens through fingers and stylus: Investigating the optimal size of the input box for younger and older adults. *International Journal of Human–Computer Interaction*, 1–10. https://doi.org/10.1080/10447318.2023.2192107

Chocarro, R., Cortiñas, M., & Marcos-Matás, G. (2023). Teachers' attitudes towards chatbots in education: a technology acceptance model approach considering the effect of social language, bot proactiveness, and users' characteristics. *Educational Studies*, *49*(2), 295–313. https://doi.org/10.1080/03055698.2020.1850426

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339. https://doi.org/10.2307/249008

DeLone, W.H., & McLean, E.R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

Deng, X., & Yu, Z. (2023). An extended hedonic motivation adoption model of TikTok in higher education. *Education and Information Technologies*. https://doi.org/10.1007/s10639-023-11749-x

Dida, S., Hafiar, H., Kadiyono, A.L., & Lukman, S. (2021). Gender, education, and digital generations as determinants of attitudes toward health information for health workers in West Java, Indonesia. *Heliyon*, *7*(1), 1–8. https://doi.org/10.1016/J.HELIYON.2021.E05916

Dinhopl, A., & Gretzel, U. (2016). Selfie-taking as touristic looking. *Annals of Tourism Research*, *57*, 126–139. https://doi.org/10.1016/j.annals.2015.12.015

Dwivedi, Y.K., Hughes, L., Wang, Y., Alalwan, A.A., Ahn, S.J., Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavián, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A.S., & Wirtz, J. (2022). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology and Marketing*, *40*, 750–776. https://doi.org/10.1002/MAR.21767

Dyk, A.V., Slabbert, E., & Tkaczynski, A. (2020). Segmenting tourists based on traditional versus social media usage and destination image perception. *Tourism, Culture and Communication*, *20*(4), 189–206. https://doi.org/10.3727/194341420X15905692660247

Estriegana, R., Medina-Merodio, J.A., & Barchino, R. (2019). Student acceptance of virtual laboratory and practical work: An extension of the technology acceptance model. *Computers and Education*, *135*, 1–14. https://doi.org/10.1016/j.compedu.2019.02.010

Etale, L.M., & Uranta, K.G. (2022). Digital marketing and consumer behavioral pattern of fast food business enterprises in Yenagoa, Bayelsa State. *European Journal of Hospitality and Tourism Research*, *10*(1), 1–13. https://doi.org/10.37745/ejhtr.2013/vol10no1pp.1-13

Funk, D.C. (2008). *Consumer behaviour in sport and events: Marketing action*. Butterworth-Heinemann.

Gajdošík, T. (2022). Smart tourists. In *Encyclopedia of Tourism Management and Marketing* (pp. 130–132). Edward Elgar Publishing. https://www.elgaronline.com/view/book/9781800377486/b-9781800377486.smart.tourists.xml

George, R. (2019). *Marketing Tourism in South Africa* (6th ed.). OUP Southern Africa.

González-Reverté, F., & Liviano-Solís, D. (2020). We are all digital tourists, but are all digital tourists the same? In I. de Luna, A. Fitó-Bertran, J. Lladós-Masllorens, & F. Liébana-Cabanillas (Eds.), *Sharing economy and the impact of collaborative consumption* (pp. 263–277). IGI. https://doi.org/10.4018/978-1-5225-9928-9.ch014

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2006). *Multivariate data analysis*. Pearson University Press.

Hair, J.F., Risher, J.J., Sarstedt, M., & Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*, 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hew, J.J., Lee, V.H., T'ng, S.T., Tan, G.W.H., Ooi, K.B., & Dwivedi, Y.K. (2023). Are online mobile gamers really happy? On the suppressor role of online game addiction. *Information Systems Frontiers*, 2023. https://doi.org/10.1007/s10796-023-10377-7

Hua, C., Cole, S., & Xu, N. (2021). Rethinking trust in tourism apps: The moderating effect of age. *Journal of Hospitality and Tourism Technology*, *12*(3), 548–562. https://doi.org/10.1108/JHTT-01-2020-0013

Huang, Y., Chang, L., Yu, C., & Chen, J. (2019). Examining an extended technology acceptance model with experience construct on hotel consumers' adoption of mobile applications. *Journal of Hospitality Marketing & Management*. https://doi.org/10.1080/19368623.2019.1580172

Isaac, O., Aldholay, A., Abdullah, Z., & Ramayah, T. (2019). Online learning usage within Yemeni higher education: The role of compatibility and task-technology fit as mediating variables in the IS success model. *Computers and Education*, *136*, 113–129. https://doi.org/10.1016/j.compedu.2019.02.012

Jeng, M.Y., Pai, F.Y., & Yeh, T.M. (2017). The virtual reality leisure activities experience on elderly people. *Applied Research in Quality of Life*, *12*(1), 49–65. https://doi.org/10.1007/s11482-016-9452-0

Jonck, P., van der Walt, F., & Sobayeni, N.C. (2017). A generational perspective on work values in a South African sample. *SA Journal of Industrial Psychology*, *43*(1), a1393. https://doi.org/10.4102/sajip.v43.1393

Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31–36. https://doi.org/10.1007/BF02291575

Lamberton, C., & Stephen, A.T. (2016). A thematic exploration of digital, social media, and mobile marketing: Research evolution from 2000 to 2015 and an agenda for future inquiry. *Journal of Marketing*, *80*(Special issue), 146–172. https://doi.org/10.1509/jm.15.0415

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information and Management* , *40*(3), 191–204. http://dx.doi.org/10.1016/S0378-7206(01)00143-4

Lin, Y., & Yu, Z. (2023). Extending Technology Acceptance Model to higher-education students' use of digital academic reading tools on computers. *International Journal of Educational Technology in Higher Education*, *20*(1), 34. https://doi.org/10.1186/s41239-023-00403-8

Liu, S., & Zheng, D. (2023). Impacts of tourists' trust, perception and acceptance of health quick response technology on responsible pandemic travel behaviours. *Journal of Hospitality and Tourism Technology*, *14*(2), 278–294. https://doi.org/10.1108/JHTT-11-2021-0330

Lou, C., & Xie, Q. (2021). Something social, something entertaining? How digital content marketing augments consumer experience and brand loyalty. *International Journal of Advertising*, *40*(3), 376–402. https://doi.org/10.1080/02650487.2020.1788311

Lowry, P.B., Gaskin, J., & Moody, G.D. (2015). Proposing the multi-motive information systems continuance model (MISC) to better explain end-user system evaluations and continuance intentions. *Journal of the Association for Information Systems*, *16*(7), 515–579. http://dx.doi.org/10.17705/1jais.00403

Mametja, T.R., Lebambo, M.M., & Tichaawa, T.M. (2023). The adoption of digital technologies by women-owned tourism micro-enterprises. *African Journal of Hospitality, Tourism and Leisure*, *12*(2), 717–734. https://doi.org/10.46222/ajhtl.19770720.395

Mason, R.O. (1978). Measuring information output: A communication system. *Information and Management*, *1*(4), 219–234. https://doi.org/10.1016/0378-7206(78)90028-9

Matikiti, R., Mpinganjira, M., & Roberts-Lombard, M. (2018). Application of the Technology Acceptance Model and the Technology–Organisation–Environment Model to examine social media marketing use in the South African tourism industry. *SA Journal of Information Management*, *20*(1), 1–12. https://doi.org/10.4102/sajim.v20i1.790

Matikiti-Manyevere, R., & Hattingh, J. (2020). Factors influencing intention to use social media sites for holiday destination selection by the young generation. *African Journal of Hospitality, Tourism and Leisure*, *9*(3), 302–318. https://doi.org/10.46222/ajhtl.19770720-20

Miranda, S., Trigo, I., Rodrigues, R., & Duarte, M. (2023). Addiction to social networking sites: Motivations, flow, and sense of belonging at the root of addiction. *Technological Forecasting and Social Change*, *188*, 122280. https://doi.org/10.1016/j.techfore.2022.122280

Monaco, S. (2018). Tourism and the new generations: Emerging trends and social implications in Italy. *Journal of Tourism Futures*, *4*(1), 7–15. https://doi.org/10.1108/JTF-12-2017-0053

Musina, Ž., & Gao, X. (2016). DMO tourism website's success evaluation model and framework. *European Journal of Economics and Management Sciences*, *16*(4), 61–76. https://doi.org/10.20534/ejems-16-4-61-76

Purohit, S., & Arora, R. (2023). Adoption of mobile banking at the bottom of the pyramid: an emerging market perspective. *International Journal of Emerging Markets*, *18*(1), 200–222. https://doi.org/10.1108/IJOEM-07-2020-0821

Rauschnabel, P.A., Babin, B.J., tom Dieck, M.C., Krey, N., & Jung, T. (2022). What is augmented reality marketing? Its definition, complexity, and future. *Journal of Business Research*, *142*, 1140–1150. https://doi.org/10.1016/j.jbusres.2021.12.084

Renny, Guritno, S., & Siringoringo, H. (2013). Perceived usefulness, ease of use, and attitude towards online shopping usefulness towards online airlines ticket purchase. *Procedia - Social and Behavioral Sciences*, *81*, 112–216. https://doi.org/10.1016/j.sbspro.2013.06.415

Şengel, Ü., Genç, G., Işkın, M., Çevrimkaya, M., Assiouras, I., Zengin, B., Sarıışık, M., & Buhalis, D. (2022). The impacts of negative problem orientation on perceived risk and travel intention in the context of Covid-19: A PLS-SEM approach. *Journal of Tourism Futures*, (ahead-of-print). http://dx.doi.org/10.1108/JTF-05-2021-0130

Sepasgozar, S.M.E. (2022). Immersive on-the-job training module development and modeling users' behavior using parametric multi-group analysis: A modified educational technology acceptance model. *Technology in Society*, *68*, 101921. https://doi.org/10.1016/j.techsoc.2022.101921

Setiawan, B., Trisdyani, N.L.P., Adnyana, P.P., Adnyana, I.N., Wiweka, K., & Wulandani, H.R. (2018). The profile and behaviour of 'digital tourists' when making decisions concerning travelling, case study: Generation Z in South Jakarta. *Advances in Research*, *17*(2), 1–13. https://doi.org/10.9734/AIR/2018/43872

Singh, S., & Srivastava, P. (2019). Social media for outbound leisure travel: a framework based on Technology Acceptance Model (TAM). *Journal of Tourism Futures*, *5*(1), 43–61. https://doi.org/10.1108/JTF-10-2018-0058

Talwar, S., Kaur, P., Nunkoo, R., & Dhir, A. (2022). Digitalization and sustainability: Virtual reality tourism in a post pandemic world. *Journal of Sustainable Tourism*. https://doi.org/10.1080/09669582.2022.2029870

Tavitiyaman, P., Zhang, X., & Tsang, W.Y. (2022). How tourists perceive the usefulness of technology adoption in hotels: Interaction effect of past experience and education level. *Journal of China Tourism Research*, *18*(1), 64–87. https://doi.org/10.1080/19388160.2020.1801546

Taylor, S., & Todd, P.A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, *6*(2), 144–176. https://doi.org/https://doi.org/10.1287/isre.6.2.144

Tsourgiannis, L., & Valsamidis, S. (2019). Digital marketing in tourism: Why Greek tourists use digital marketing applications like Airbnb. *International Journal of Culture, Tourism, and Hospitality Research*, *13*(4), 473–486. https://doi.org/10.1108/IJCTHR-03-2019-0043

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly: Management Information Systems*, *27*(3), 425–478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J.Y.L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly: Management Information Systems*, *36*(1), 157–178. https://doi.org/10.2307/41410412

Wixom, B.H., & Todd, P.A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, *16*(1), 85–102. http://dx.doi.org/10.1287/isre.1050.0042

Wong, L.W., Tan, G.W.H., Hew, J.J., Ooi, K.B., & Leong, L.Y. (2022). Mobile social media marketing: a new marketing channel among digital natives in higher education? *Journal of Marketing for Higher Education*, *32*(1), 113–137. https://doi.org/10.1080/08841241.2020.1834486

Yousaf, S., & Xiucheng, F. (2018). Halal culinary and tourism marketing strategies on government websites: A preliminary analysis. *Tourism Management*, *68*, 423–443. http://dx.doi.org/10.1016/j.tourman.2018.04.006

Zeng, S., Lin, X., & Zhou, L. (2023). Factors affecting consumer attitudes towards using digital media platforms on health knowledge communication: Findings of cognition–affect–conation pattern. *Frontiers in Psychology*, *14*, 1008427. https://doi.org/10.3389/fpsyg.2023.1008427

Zhang, B., Ying, L., Khan, M.A., Ali, M., Barykin, S., & Jahanzeb, A. (2023). Sustainable digital marketing: Factors of adoption of M-technologies by older adults in the Chinese market. *Sustainability*, *15*(3), 1972. https://doi.org/10.3390/su15031972

Zhou, J., Rau, P.L.P., & Salvendy, G. (2014). Older adults use of smart phones: An investigation of the factors influencing the acceptance of new functions. *Behaviour and Information Technology*, *33*(6), 552–560. https://doi.org/10.1080/0144929X.2013.780637

Zhuang, X., Hou, X., Feng, Z., Lin, Z., & Li, J. (2021). Subjective norms, attitudes, and intentions of AR technology use in tourism experience: the moderating effect of millennials. *Leisure Studies*, *40*(3), 392–406. https://doi.org/10.1080/02614367.2020.1843692

Article history: Received: 27.10.2023 Revised: 31.10.2023 Accepted: 28.11.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1645-1654
DOI 10.30892/gtg.514 spl06-1161

THE IMPACT OF FINANCIAL MANAGEMENT TOOLS ON TOURISM COMPANIES IN THE POST-COVID ENVIRONMENT

Catan PETRU*
University of European Studies of Moldova, Kishinev, Moldova,
e-mail: researchers2205@gmail.com

Aliona LÎSÎI
Economic Sciences Faculty, University of European Political and Economic Studies ”Constantin Stere”, Kishinev, Moldova, e-mail: lisiilion@gmail.com

Sofia SCUTARI
“Business Administration, Marketing and Accounting” Department, University of European Political and Economic Studies ”Constantin Stere”, Kishinev, Moldova, e-mail: sscutari453@gmail.com

Ludmila FRUMUSACHI
“Business Administration, Marketing and Accounting” Department, University of European Political and Economic Studies ”Constantin Stere”, Kishinev, Moldova, e-mail: millasachi8915@gmail.com

Georgeta MELNIC
“Accounting, Auditing and Economic Analysis” Department, Academy of Economic Studies of Moldova, Kishinev, Moldova, e-mail: georgettamel@gmail.com

Citation: Petru, C., Lîsîi, A., Scutari, S., Frumusachi, L., & Melnic, G. (2023). THE IMPACT OF FINANCIAL MANAGEMENT TOOLS ON TOURISM COMPANIES IN THE POST-COVID ENVIRONMENT. *GeoJournal of Tourism and Geosites*, 51(4spl), 1645–1654. https://doi.org/10.30892/gtg.514spl06-1161

Abstract: This research focused on the financial management of tourism companies in Moldova during the post-Covid period, highlighting its critical role in ensuring business sustainability and stakeholder value creation in times of crisis. The aim of the paper is to determine the impact of financial management practices on the development of tourism companies of Moldova in post-Covid period in terms of short- and long-term financial management. The study employed the methods of financial analysis to identify the peculiarities of financial management of tourism companies of Moldova in the post-Covid period. The methodological framework of the analysis is the method of analyzing financial ratios from four groups: ROA; Debt/Equity; Liquidity; EBITDA Margin, Profit Margin. Key financial indicators for 2022 showed improvements: ROA increased to 2.1%, the Debt/Equity ratio improved to -2.8 times, liquidity management normalized to 1.7 times, EBITDA Margin rose to 32.1%, and Profit Margin to 6.9%. Practical significance of this study lies in its provision of a direct, applicable set of short-term and long-term financial management strategies for tourism companies during the economic recovery phase post-pandemic. Prospects for further research are to study both financial and market factors influencing the practice of financial management in the post-Covid period and adaptation as part of the economic recovery after the pandemic.

Key words: financial management, post-Covid environment, sustainability, Return on Assets, working capital, liquidity, stakeholder

* * * * * *

INTRODUCTION

The coronavirus pandemic caused a large-scale crisis entailing a wide range of socio-economic consequences. Different groups of economic agents suffered significant financial losses as a result of the crisis. The pandemic caused not only a general decline in economic activity in the world, but also had more specific manifestations. The economic recovery in the post-Covid period is a separate challenge due to the significant impact of the pandemic. Accordingly, companies from various sectors of the economy found themselves in a difficult situation in the post-Covid environment. Their specifics determined varying degrees of influence on different sectors and branches of the economy. The mentioned consequences are diverse, for example: a drop in the purchasing power of households, depressed consumer expectations, reduced passenger traffic, restrictions on physical contact, negative news background and many others. The above-mentioned consequences have a negative impact on the state of the tourism sector, which is a key component of the service sector.

Small and medium-sized companies are under specific pressure from exogenous and endogenous environmental factors due to their limited resources and low market power compared to large companies. This puts companies in the tourism sector in a difficult position. Their management faces the task of preserving the company itself, as well as the value created

* Corresponding author

for stakeholders. Adequate financial management in the post-Covid environment is key to ensuring the achievement of these goals. Adequate financial management enables assessing the current financial condition of the company, potentially threatened areas in the context of financial management, and the effectiveness of the company's actions on the market. Achieving short- and long-term results in the field of financial management is important not only for the company's management, but also for its stakeholders, which allows them to be convinced of the company's health and its future prospects. In this context, the specifics of financial management decisions for tourism companies in the post-Covid environment require detailed study. The aim of the article is to analyse peculiarities and challenges in financial management faced by tourism companies during the pandemic, the subsequent recovery phase, and the proposed measures for improvement. The aim involved the fulfilment of the following research objectives:

- carry out an analysis of the financial status of a sample of tourism companies of Moldova;
- propose the ways of improving the practice of financial management of tourism companies of Moldova in the post-Covid environment.

LITERATURE REVIEW

There is a significant number of studies on the economic essence of the crisis caused by the pandemic and the post-Covid period, the resulting socio-economic consequences and the impact on different economic agents, in particular, tourism companies. Hanifah et al. (2023) indicate a significant relationship between risk management, investment decisions, and firm value during this period, underscoring the importance of strategic decision-making in times of crisis. Arango et al. (2023) provide a localized view of the pandemic's impact on tourism, emphasizing stakeholder perceptions in a specific geographic context. Seshadri et al. (2023) offer marketing solutions tailored to the unique challenges and opportunities emerging in the UAE's tourism industry after the pandemic. Gu (2023) focuses on the financial implications of a global health crisis on a major industry in one of the world's largest economies. From the perspective of financial losses for business as a result of the crisis caused by the pandemic, Anderson et al. (2020) notes the significant destructive impact of both the pandemic itself and the socio-economic consequences that rise during the crisis. This is explained not only by the force of destruction directly caused by the pandemic, but also by the factor of deep integration and interconnection of various companies, industries, markets, and countries, which has lasted for the past decades. Gourinchas (2020) emphasises the fact that economic agents are strongly interconnected in the globalized world. This is the reason why the established relationships are destroyed during a crisis, paralyzing the functioning of economic sectors. The damage was also caused at the micro level – the pandemic worsened the company's financial condition, as the vast majority of companies faced decreased sales and increased liabilities (Devi et al., 2020; Alviana and Megawati, 2021).

It should be understood that the crisis caused by the pandemic is significantly different from more traditional socio-economic crises by its nature and range of socio-economic consequences. This thesis is supported by Gills (2020) regarding the fundamental change of the development paradigm as a result of the pandemic. Lewandowsky et al. (2021) finds both challenges and opportunities in the context of transformation during the pandemic-related crisis. Some researchers — Song et al. (2021) and Ding et al. (2021) — suggest that the socio-economic crisis caused by the pandemic is fundamentally different from past crises in terms of its causes, scale, and severity of consequences. This thesis is further confirmed by the fact that the study of the socio-economic consequences of the pandemic is a complex interdisciplinary task that cannot be fulfilled by applying only one field of knowledge (Wen et al., 2020). The industries that were open to globalization and were the main drivers of accelerating economic growth suffer particularly hard as a result of the pandemic. McCabe and Qiao (2020) notes that the tourism sector has a significant contribution to global economic development and is a leading sector that creates jobs in all regions of the world. In turn, Novelli et al. (2018) emphasises that the tourism sector is vulnerable to numerous environmental, political, socio-economic risks. A UNWTO study (2020) notes that the impact of the pandemic on the tourism sector will not be uniform across time and space, with financial losses already amounting to $1.2 trillion in export earnings and 120 million lost jobs in the industry as of September 2020.

The tourism sector is significantly limited in its development as a result of the pandemic, which has a negative impact on the economy as a whole. The negative consequences of the crisis most affected the tourism sector in developing countries, in particular, in the Southeast Asian region (Rassanjani et al., 2021). Different countries of the world suffer from the consequences of the pandemic for the tourism sector. In Bangladesh (Rahman et al., 2021), the tourism sector is one of the significant drivers of the national economy, where the pandemic has caused unemployment among workers in the hotel industry. In Iran (Masaeli et al., 2022), the pandemic and its impact on the tourism sector are considered through the reduction of economic activity in related sectors of the economy. In Spain (Araújo et al., 2021), the pandemic prompted significant changes in the management practices of the tourism companies. In South Africa (Nyawo, 2020), the problem of ensuring the functioning of the tourism sector during the pandemic is considered at the national level. In particular, there are significant reductions among hotel workers under the influence of the pandemic (Joanna, 2021).

Hall et al. (2020) notes that socio-economic crises did not become a turning point in the development of the tourism sector before the pandemic. In this context, Gills (2020) notes that the pandemic will be a point of transformation that will lead to significant changes in the world. A revision of the development paradigms that prevailed before the pandemic will be one of such drivers of changes in views on the prospects for the development of the tourism sector (Ioannides and Gyimóthy, 2020; Higgins-Desbiolles, 2020). Skare et al. (2021) deals with the problem of the impact of the pandemic on the tourism sector, studying the significant destructive impact of the crisis on the sector. The researcher proposes the introduction of a private-public partnership in order to support it, as well as provides suggestions for the development of new risk management methods in order to overcome the consequences of the crisis in the sector.

There are a number of studies on the impact of the economic crisis on the specifics of financial management of companies depending on the industry and size. In particular, Eggers (2020) concludes that small and medium-sized companies are more affected by the pandemic than large companies. Eggers (2020) explains this by the unfavourable position of a small company as such in a crisis period, as well as the lack of resources in small and medium-sized companies. Eggers (2020) suggests ways to overcome economic downturns in terms of finance, strategy and institutional environment. Dimson et al. (2020) studies a sample of small and medium-sized companies from 5 European countries (Great Britain, Spain, Italy, Germany, France) and shows that the vast majority of analysed small and medium-sized companies report a decrease in their revenues. In Great Britain, Italy, and Spain, the decrease in their incomes is approximately 30-33%, while in Germany and France — 23% and 27%, respectively. Another study conducted by Kalemli-Ozcan et al. (2020) based on the data from companies from 17 countries estimates an increase in the bankruptcy rate of small and medium-sized companies by about 9 percentage points in the context of the pandemic. Kalemli-Ozcan et al. (2020) notes that the tourism sector is one of the most affected sectors of the economy.

One of the key consequences of the current crisis at the micro level is the deterioration of the financial condition of companies. In this context, Mirza et al. (2020) conducted a study of the impact of the pandemic on the solvency of a sample of non-financial companies listed on the stock exchange in 15 EU member states. Mirza et al. (2020) identified the problem of the growth of the risk of bankruptcy of companies because of the fall in their market capitalization. Moreover, Rizvi et al. (2020) assesses the impact of the Covid-19 crisis on the market valuation of non-financial companies in 10 EU member states using a stress-testing scenario. Rizvi et al. (2020) uses a sample of non-financial companies listed on the stock exchange, and based on the results of the analysis shows significant losses in terms of market valuation results obtained in all sectors of the economy. Among the key drivers, Rizvi et al. (2020) names a possible decline in sales and an increase in the cost of equity capital. Rizvi et al. (2020) estimates that medium-sized enterprises in some sectors of the economy can lose up to 60% of their estimated value in a one-year period because of the crisis caused by the Covid-19 pandemic.

Accordingly, companies had to change their approaches to financial management against the background of the atypical course of the current crisis. Gadelius and Larsson (2019) notes that as a result of the crisis, the approach to working capital management, which is considered by management as a tool for increasing the company's profitability, has changed. Salehi et al. (2019) also noted the importance of short-term financial management during a crisis, where managerial decisions regarding working capital are considered as a critical component of improving the financial condition of a company in a crisis period. In turn, Chang (2019) notes that, erroneous management decisions regarding working capital made during a crisis period can lead to significantly negative consequences for the company because of the loss of liquidity.

Mullins (2020) offers a set of tools that are easy to use and support effective cash flow management in the context of effective financial management during a crisis. Mullins (2020) argues that the need for working capital must be financed by both internal and external resources (using leverage) that can be raised in the long run. Mullins (2020) notes that a company's financing decision affects its overall performance. For this reason, companies should deeply study the positive and negative aspects of each method of financing their activities. Studying the problems of financial management in the post-Covid environment is of particular importance at the current stage. Schillig (2021) points to the importance of building a sustainable relationship between public policy aimed at exiting the crisis caused by the pandemic and micro-level financial management. Tokbolat and Le (2022) point to the importance of adequate financial management during the post-Covid stage to restore sustainable business growth. Crook (2022) suggests taking into account the context of post-Covid business environment in business planning, including in the investment policy of companies of the post-Covid crisis.

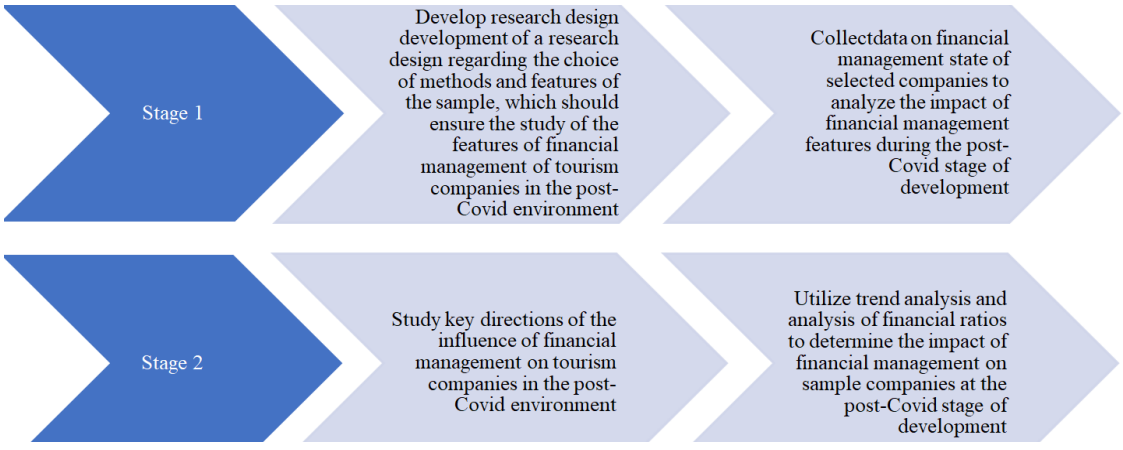


Figure 1. Key steps in research design (Source: created by the author)

METHODOLOGY

Research design

The first — preparatory — stage provided for the analysis of current studies on the issues of financial management of tourism companies in the post-Covid environment. A critical evaluation of the results of previous studies gave grounds for formulating the aim and objectives of researching the main directions and challenges for financial management in the current conditions. The next part of the preparatory stage is the development of a research design regarding the choice of

methods and features of the sample, which should ensure the study of the features of financial management of tourism companies in the post-Covid environment. It was followed by the data collection on the state of financial management for selected companies for their further processing and use in the study of the impact of financial management features at the post-Covid stage of development. The second stage of the research involves the study of the key directions of the influence of financial management on tourism companies in the post-Covid environment. At this stage, the obtained results are interpreted using the methods of financial analysis. The trend analysis and analysis of financial ratios is applied to determine the impact of financial management on sample companies at the post-Covid stage of development. The final stage of the study provides for determining the limitations under the methodology and implementation of the conducted study of the impact of financial management on tourism companies in the post-Covid environment, as well as drawing conclusions based on the conducted research. The research design flowchart is presented on Figure 1.

Sample

The sample was formed from leading tourism companies of Moldova (a total of 15 companies). The sample of this size is sufficient for the purposes of analysing their financial management practices. The companies included in the sample are leaders in their market and have a high quality of information disclosure. The sample included companies that make up the foundation of the Moldovan tourism sector, namely tourist operators, hotel complexes, and wineries. Table 1 presents the composition of the sample companies.

Table 1. Sample companies (Source: created by the author)

Company	Country	The field of the tourism sector
BT Travel S.R.L.	Moldova	Tourist operator
Trapeza Tour S.R.L.	Moldova	Tourist operator
S.C. Nobiltur S.R.L	Moldova	Tourist operator
S.C. Dromos Tur S.R.L.	Moldova	Tourist operator
I.M. Intercangal S.R.L.	Moldova	Tourist operator
Cosmos S.R.L.	Moldova	Hotel operator
Hotelul Codru I.M.	Moldova	Hotel operator
Leogrand Hotel S.R.L.	Moldova	Hotel operator
Cricova S.A.	Moldova	Hotel operator
Castel Mimi S.R.L.	Moldova	Hotel operator
I.M. VINARIA PURCARI S.R.L.	Moldova	Winery
VITIS-HÎNCEȘTI S.A.	Moldova	Winery
VINURI-IALOVENI S.A.	Moldova	Winery
F.C.P. ASCONI	Moldova	Winery

Methods

The methods of financial analysis were used in order to study the impact of financial management practices on the development of tourism companies in the post-Covid environment. In particular, it is a method of trend analysis of trends in terms of financial management of sample companies at the post-Covid stage, as well as a method of analysing financial ratios to identify key features of financial management of sample companies in the post-Covid period. The methodological framework of the analysis is the methodologies of Walden University (2022), Deloitte (2020). These methodologies are focused on studying the specifics of financial management of companies during the crisis caused by the pandemic and in a post-Covid environment. The applied financial ratios are the most common in terms of the best practices of strategic and operational management of companies during the crisis and post-crisis period. The analysis of financial ratios based on the financial statements of the sample companies was carried out for 2019-2022. Table 2 provides the description of the applied financial ratios.

Table 2. Financial ratios used in the financial analysis of sample companies (Source: created by the author)

Financial ratio	Comments	Formula
ROA, %	the effectiveness of the use of assets	Net profit/ Assets, %
Debt/ Equity, times	the ratio of loan capital to equity capital	Bank loans/ Equity, times
Liquidity, times	the company's ability to cover short-term obligations	Short-term assets/ Short-term liabilities, times
EBITDA Margin, %	the level of the company's operational efficiency	(Earnings before interest and tax + Depreciation + Amortization) / Total revenue, %
Profit Margin, %	the company's profitability	Net profit/ Total revenue, %

Table 3. Results of financial ratio analysis for sample companies, 2019-2022 (Source: created by the author)

Financial ratio	2019	2020	2021	2022
The values of the financial ratios, 2019-2022				
ROA, %	11.1%	-19.1%	-3.9%	2.1%
Debt/Equity, times	32.2	-148.1	-9.1	-2.8
Liquidity, times	1.0	6.5	3.8	1.7
EBITDA Margin, %	45.1%	-62.3%	23.2%	32.1%
Profit Margin, %	11.2%	-12.1%	5.1%	6.9%
Annual growth of the financial ratios, %				
ROA growth, %	5.1%	-30.2%	15.2%	6.0%
Debt/Equity growth, times	10.2	-180.3	139.0	6.3
Liquidity growth, times	0.4	5.5	-2.7	-2.1
EBITDA Margin growth, %	10.4%	-107.4%	85.5%	8.9%
Profit Margin growth, %	9.3%	-23.3%	17.2%	1.8%

Instruments

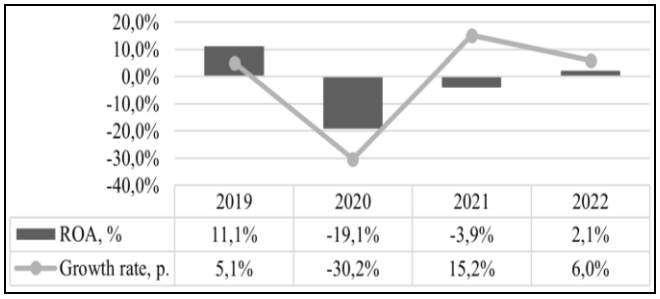
The research employed MS Excel for the purpose of data analysis of the financial statements of the sample companies. In particular, Analyze Data on the MS Excel platform is used.

RESULTS

Table 3 presents the key trends in financial management for a sample of companies in the post-Covid period. A more detailed description of key trends in financial management of the sample companies under study is provided below. The analysis of the financial statements of the sample companies showed a number of key trends. The gradual recovery of the Return on Assets (ROA) from 11.1% in 2019 to 2.1% in 2022 is notable among these trends in the post-Covid period. The tendency to reduce the financial leverage (Debt/Equity) from 32.2 times in 2019 to -2.8 times in 2022 is also noticeable. The trend of increasing liquidity (Current Assets/Current Liabilities) from 1.0 in 2019 to 1.7 in 2022. There is a tendency to restore the profitability rate at various levels of activity.

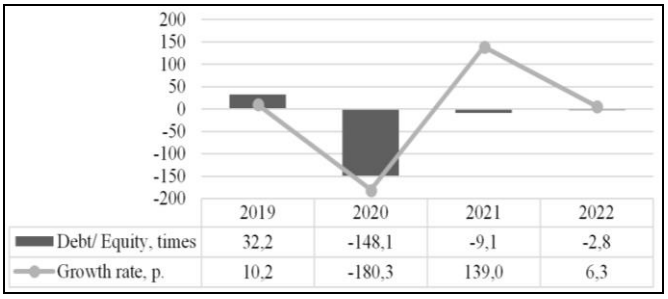
In particular, EBITDA Margin shows a recovery trend from 45.1% in 2019 to 32.1% in 2022. In turn, Profit Margin also shows a recovery trend from 11.2% in 2019 to 6.9% in 2022. In the context of the pandemic, Return on Assets (ROA) of the sample companies decreased significantly against the background of the negative dynamics of the exogenous and endogenous environment in which the tourism companies of Moldova operate. The ROA trend had a moderate trajectory, with a decrease from 11.1% in 2019 to 2.1% in 2022. This observation indicates a declining profitability of the company over the period. In annual terms, the figure declined to 30.2% in 2020, followed by a recovery of 15.2% in 2021, and ultimately showed growth of 2.6% in 2022. The significant decline in 2020 can be explained by the COVID-19 pandemic, which negatively affected the companies under study. The resumption of growth observed in 2021 indicates that the sample companies are experiencing a post-pandemic recovery phase.

However, the increase in ROA has been relatively modest over the previous years. The negative compound annual growth rate at -7.0% indicates that the ROA trend is decreasing during the studied period. A lower level of profitability turns into less created value for stakeholders. As a result, this leads to, firstly, a decrease in capitalization, secondly, the need for additional financing from shareholders, and thirdly, a decrease in the interest of potential investors and partners in such companies. In the post-Covid period, the state of the studied indicator shows a positive trend towards improvement, which indicates a strong position of the companies in the sample. Figure 2 demonstrates the results of the analysis.



	2019	2020	2021	2022
ROA, %	11,1%	-19,1%	-3,9%	2,1%
Growth rate, p.	5,1%	-30,2%	15,2%	6,0%

Figure 2. ROA dynamics for sample companies, 2019-2022 (Source: created by the author)



	2019	2020	2021	2022
Debt/ Equity, times	32,2	-148,1	-9,1	-2,8
Growth rate, p.	10,2	-180,3	139,0	6,3

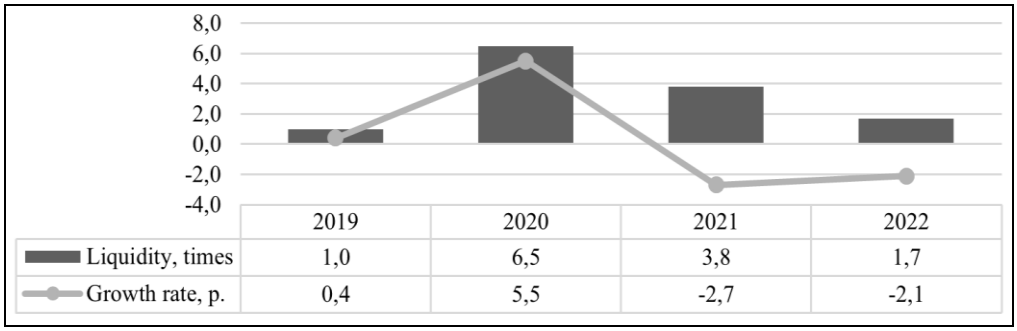
Figure 3. Debt/ Equity dynamics for sample companies, 2019-2022 (Source: created by the author)

A decreased profitability of the studied companies because of the negative impact of the exogenous and endogenous environment leads to an increase in the debt burden. Companies need additional financing, it becomes more difficult for them to finance their assets at the expense of equity capital. In turn, the debt burden is growing against the background of worse financial results and the market conditions. The analysis of the sample companies showed that the financial leverage (Debt/Equity) increased significantly during the pandemic. In 2019, the Debt/Equity ratio of the sample companies was 32.2. The value of this ratio for the sample companies is quite high, which indicates a significant level of debt financing leverage. In 2020, the Debt/Equity ratio of the sample companies was -148.1. The sample companies showed an improvement in the state of the debt burden, which was reflected in the improvement of the state of the indicator to -9.1 in 2021. At the current stage, the financial ratio remains negative (although this is the closest approach to zero that was observed during the studied period). Therefore, it is important to closely monitor the Debt/Equity ratio of the sample companies in subsequent periods to prevent dangerous trends. It should be taken into account that a sharp increase in financial leverage leads to an increase in the risk of insolvency and the company's dependence on creditors. It should be noted that the debt burden of the sample companies shows an improving trend in the post-Covid period.

This indicates a decreasing dependence on loan financing thanks to the restoration of normal business functioning in the post-Covid environment. Figure 3 presents the results of the analysis. The analysis of the studied companies showed an increase in liquidity during the pandemic. This is explained by the great importance of the company's ability to pay for its obligations on a short term during a crisis. The average annual change in liquidity during the previous four-year period was recorded at -41.0%. This indicates a significant decrease in liquidity during the previous 4 years. The liquidity for 2019 was 1.0 times with a sharp increase to 6.5 times in 2020, the crisis year of the pandemic. The financial ratio further stabilized at 3.8 times for 2021, reaching 1.7 times at the current stage.

Annual liquidity fluctuations show a stable negative trend, with an average change of 0.4 times per period. The focus on short-term assets leads to excessive immobilization of funds and loss of opportunities to invest in business development in the medium and long term. In the context of the pandemic, companies need to find a balance between the short-term ability to cover all their obligations and the prospects for business development. In the post-Covid period, the excessive focus on the liquidity of the sample companies is decreasing, which indicates the improvement of financial management practices. Figure 4 illustrates the results of the analysis.

All of the above leads to a decrease in the profitability of the studied companies. EBITDA Margin and Profit Margin decreased during the pandemic with a slight improvement in the Moldovan tourism sector. EBITDA Margin of the sample showed a favourable trajectory between 2019 and 2022. After a significant decline in 2020, the sample companies managed to resume the growth trend and achieve higher profitability both in 2021 and 2022. The percentage change from 2019 to 2020 is -107.4%. This is followed by the percentage growth of +186.9% from 2020 to 2021, while the percentage growth was +38.4% from 2021 to 2022. Although EBITDA Margin in 2022 remains lower than in 2019, the observed growth trajectory indicates that the sample companies are achieving development in a favourable direction. In the context of the post-pandemic and the resulting crisis, the studied companies show an increased marginality rate, which is additional evidence of the recovery of financial management in the post-Covid environment.

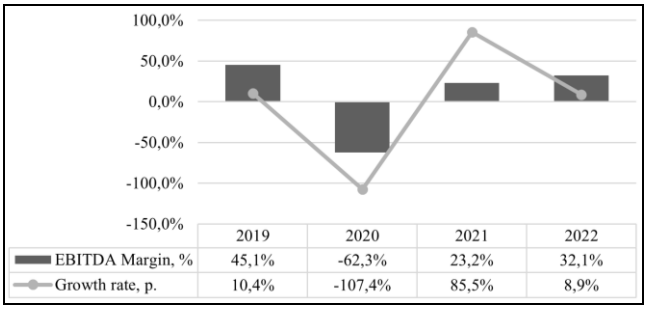


	2019	2020	2021	2022
Liquidity, times	1,0	6,5	3,8	1,7
Growth rate, p.	0,4	5,5	-2,7	-2,1

Figure 4. Liquidity dynamics for sample companies, 2019-2022 (Source: created by the author)

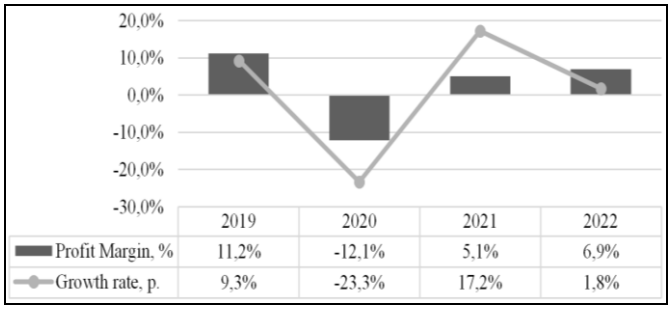
Figure 5 and Figure 6 present the results of the analysis. The aforementioned requires tourism companies to adequately respond to the exogenous and endogenous challenges - in terms of their financial management. The areas of financial management for the analysed companies in the post-Covid environment are combined into the following complex:

1. Short-term financial management, working capital management;
2. Medium- and long-term financial management;
3. Management of financial obligations;
4. Financial control and monitoring.



	2019	2020	2021	2022
EBITDA Margin, %	45,1%	-62,3%	23,2%	32,1%
Growth rate, p.	10,4%	-107,4%	85,5%	8,9%

Figure 5. EBITDA Margin dynamics for sample companies, 2019-2022 (Source: created by the author)



	2019	2020	2021	2022
Profit Margin, %	11,2%	-12,1%	5,1%	6,9%
Growth rate, p.	9,3%	-23,3%	17,2%	1,8%

Figure 6. Profit Margin dynamics for sample companies, 2019-2022 (Source: created by the author)

Table 4. "Short-term financial management, and working capital management" block (Source: created by the author)

Tasks within the direction	List of measures
Prioritization and allocation of key financial management processes	Determine the most relevant areas of financial management for managers, for which it is necessary to maintain communication in the crisis environment; Reject redundant and irrelevant financial management processes left over from the pre-crisis period; Maximize financial management processes for the end user.
Adaptation of financial management processes to the current realities	Introduce the practice of recurrent and short-term, but comprehensive reporting of cash flows, debt service, status of key customers and suppliers; Refuse irrelevant reports in the field of financial management during the crisis period.
Communication of changes in financial management processes	Implement the practice of regularly informing stakeholder groups according to their areas of responsibility; Create a comprehensive list of the most common questions and answers for internal use in the context of financial management problems during a crisis.
Management of the programme of payments and incentives	Develop adequate plans for working with personnel in the event of a reduction or postponement of material benefits for personnel employed by the company (as a result of the introduction of a part-time working week, downtime, etc.), in particular, in terms of psychological motivation and other support measures for employees who will lose part of their income.
Updating the cash flow forecast in accordance with current realities	Carry out an in-depth analysis of the range of factors influencing cash flow, including indirect factors; Use terminology and means of communication that are available to non-financial managers and help them make effective decisions; Prepare several scenarios with cash flow forecast, including sensitivity analysis; Revise seasonality assumptions in the context of cash flow management;

	Introduce the practice of cash flow reporting on a weekly basis (in some cases — daily).
Application of measures to immediately reduce company costs	Identify areas of immediate cost reduction and formation of measures that enable this task (significant limitation of business trips, non-priority purchases, etc.); Revise groups of expenses that the company can temporarily abandon without harming the key business (subscriptions, consultations, etc.); Develop an action plan to reduce personnel costs taking into account future business needs; Identify areas of possible cost reduction (capital investment programmes); Start a programme for the implementation of measures aimed at reducing the cost price (without harming the quality of the product)
Using opportunities for short-term cash flow growth	Offer special conditions for customers with the aim of increasing sales in the short and medium term; Study the possibility of selling non-core assets even in unfavourable market price conditions in order to increase the company's cash flows.
Using opportunities to attract short-term financing on special terms	Study the possibilities of attracting financing on special terms from a partner bank; Prepare a programme for negotiations on restructuring of the debt to the bank; Maintain open and transparent communication with the bank for attracting additional short-term financing; Create a "reserve" of financial flexibility as additional leverage in negotiations with the bank; Study the existing possibilities of attracting short-term financing outside the partner bank on favourable conditions for the company.
Attracting state aid	Study the existing state support programme in order to use it optimally by the company; Study the possibilities of participation in the state support programme before taking irreversible measures in the field of human resources, work with clients and suppliers; Study the working conditions for bank loans guaranteed by the state.
Inventory management	Create an optimal level of stocks, which is enough for uninterrupted work in the crisis period without excess and deficit; Study the possibility of selling stocks of finished products at a reduced price in order to generate cash and avoid their immobilization in stocks.
Accounts receivable management	Improve monitoring of overdue payments; Update critical accounts receivable aggregated data: contract details, accuracy of invoices, problem counterparties for which late payments are identified or expected; Coordinate action plans with key clients who may have payment difficulties; Consider the possibility of changes in the conditions of trade credit for suppliers — where possible and justified for the crisis period; Consider the early payment discount tool.
Accounts payable management	Propose a plan to postpone the payment of payables with an agreed payment calendar; Maintain communication with suppliers with potential payment difficulties, preferably with a prepared action plan and negotiating position.

Table 5. "Medium- to long-term financial management" block (Source: created by the author)

Tasks within the direction	List of measures
Loan management	Consider opportunities to take advantage of low interest rates; Avoid increasing financial leverage above an excessive level, which can become a burden on the company's existing business model.
Management of own capital	Recurrently inform shareholders about the course of events and the current market and financial position of the company; Study the possibilities of additional capital investment by shareholders.
Dividend policy management	Consider the possibility of reducing the dividend rate

Table 6. "Financial Liabilities Management" Block (Source: created by the author)

Tasks within the direction	List of measures
Bank covenants management	Revise covenants together with the bank;Maintain open and transparent communication with the bank, especially in case of potential risk of non-compliance with covenants; Consider the possibilities of attracting loan financing under special support programmes from the state.
Restructuring of financial obligations	Propose a debt restructuring programme or special debt service conditions for the period of crisis (credit holidays, postponement of repayment of the loan body) attractive to various groups of stakeholders

Table 7. Block "Financial control and monitoring" (Source: created by the author)

Tasks within the direction	List of measures
Ensuring the reliability of control, taking into account operational changes in the company	Do not impose excessive bureaucracy during the crisis period; Explain the reasons for changes and communicate changes in the company's business processes.
Confirmation of the cost management policy	Balance the need for greater control with the need to quickly respond to new circumstances of the exogenous environment (for example, authorization of new suppliers in a crisis period); Revise the policy of personnel costs in the context of the changed working methods of the company; Carry out effective communication regarding changes in the corporate spending policy.
Improvement of the reporting reconciliation process	Increase the frequency and accuracy of balance sheet reconciliations and substantiation in order to confirm cash flow forecasts; Periodically check the status of debtors for the possibility of collecting the debt on trade credit

The proposed complex of financial management measures for tourism companies in the post-Covid environment covers critical areas — both in terms of financial and market position of companies. The proposed complex is balanced

in its structure - both short-term and long-term financial management measures are available. The proposed set of measures covers the tasks of both operational (working capital, liquidity) and strategic (equity capital, loan capital) financial management. This contributes to meeting the needs of a wide range of stakeholders of the analysed companies that occur during the crisis. The proposed set of financial management measures in the post-crisis period is considered in more details below. Tables 4-7 present the list of proposed measures within the framework of selected areas of financial management for tourism companies in the post-Covid environment in detail.

Accordingly, this set of measures is designed to fulfil a number of key tasks in light of improving financial management in the post-Covid environment. First of all, these measures are aimed at restoring the economic development of companies in the tourism sector of Moldova, as well as ensuring business resilience to future exogenous challenges.

DISCUSSION

The features of financial management at tourism companies in the post-Covid conditions with a focus on both the short- and long-term horizon of management decisions are established. This approach is designed to support the sustainable development of tourism companies at the post-Covid stage of development, taking into account the needs and motivations of key stakeholder groups. The obtained results will be described in greater detail below.

This study indicates that financial management is of key importance in forming the basis for the tourism companies to get out of the crisis caused by the coronavirus pandemic. This impact is reflected in both the short and long term of business management in the tourism sector. Special focus should be on alignment of short-term and long-term goals in order to ensure sustainable recovery of business in the post-Covid stage. This result is supported by a number of previous studies. In this context, the obtained result is supported by Anderson et al. (2020) in terms of the significant impact of the pandemic on the financial and economic condition of the tourism sector with the need for competent financial management as a basis for the companies' going out of the crisis. This result is also confirmed by Gourinchas (2020) in terms of the need for significant investments in the post-crisis stage of the development of companies in the light of the post-Covid stage of development of the national and world economies. In addition, this thesis is confirmed by Song et al. (2021), which focuses on the significant challenges of a financial and economic nature for companies at the stage of out of the crisis caused by the coronavirus pandemic. This result finds confirmation in the earlier work of Ding et al. (2021) in terms of the need for competent financial management at the company level in the period of recovery from the crisis caused by the pandemic to ensure long-term business growth.

Earlier studies on the economic and financial state of the purely tourist sector in light of the impact of the pandemic add separate accents in terms of the obtained result. The thesis of McCabe and Qiao (2020) about the devastating impact of the crisis caused by the pandemic and the need for balanced financial management for tourism companies when successfully going out the resulting crisis confirms that. This is additionally conformed by the previous work of Skare et al. (2021) in terms of the critical importance of adequate financial management for companies in the tourism sector in order to ensure business survival. Additional confirmation is given by another thesis of Skare et al. (2021) in terms of the need to competently provide financial management techniques from other industries and sectors of the economy for the management of tourism companies when getting out of the crisis caused by the pandemic. In addition, the obtained result confirms a number of previous studies on the problems of financial management when going out of the crisis caused by the pandemic for small and medium-sized companies, including tourism companies.

Earlier study by Dimson et al. (2020) emphasizes the need for competent management of working capital as an integral component of financial management of companies during the crisis and when going out of the crisis. The obtained result is also confirmed by Kalemi-Ozcan (2020) in terms of the importance of ensuring the key urgent needs of the business through competent financial management, taking into account the future trajectory of going out of the crisis caused by the pandemic. In this area, a result was also obtained regarding the peculiarities of the financial management of the sample of companies in terms of the growth of liquidity among those companies in the studied period. Similar findings were recorded in earlier studies, in particular, Gadelius and Larsson (2019) note that the approach to working capital management, which is considered by management as a tool for increasing the company's profitability, has changed because of the crisis. This result is supported by another earlier work by Salehi et al. (2019). Salehi et al. (2019) proves that managerial decisions regarding working capital are considered as a critical component of improving the company's financial condition during a crisis. This thesis is supported by the results of earlier work by Chang (2019). In particular, Chang (2019) notes that erroneous management decisions regarding working capital made in a crisis period can lead to significantly negative consequences for the company due to the loss of liquidity.

The results of the analysis of the level of profitability and financial stability of companies carried out in this study showed the importance of long-term financial planning for companies during the pandemic and the post-Covid period. In contrast to the reviewed earlier studies on the financial management practices during the pandemic, the results of this study emphasize the importance of maintaining a balance between short- and long-term financial planning. This result is important in the current context of going out of the Covid-related crisis and updating the needs of financial management in the post-Covid environment. It should also be emphasized that earlier studies do not cover the issues of financial management in the tourism sector despite the fact that this industry is a leading component of the service sector of the economy. Moreover, unlike earlier studies, which lack practical recommendations regarding comprehensive financial management measures for going out of the current crisis, the proposed study provides a set of industry-specific recommendations.

CONCLUSIONS

The study identified the peculiarities of financial management of tourism companies in the post-Covid period. The special importance of adequate financial management for tourism companies of Moldova is emphasized, which shall ensure the preservation of business and the creation of value for a wide range of stakeholders during the crisis and in the post-crisis environment. The analysis of the financial statements of the sample companies showed the deterioration of their financial position during the pandemic with the subsequent recovery of financial management in the post-Covid environment. The identified set of consequences of the pandemic indicates an urgent need to apply a set of financial management measures both in the short and long term. In particular, an improvement was recorded for 2022 in almost all key indicators of financial management of sample companies in the post-Covid environment. In the post-Covid conditions, the studied companies showed an increase in ROA to 2.1%, an improvement in the Debt/Equity ratio to -2.8 times, a normalization of liquidity management to 1.7 times, an increase in the EBITDA Margin 32.1% and Profit Margin 6.9%.

The results of this study gave grounds to propose a set of practical measures to improve the financial management of tourism companies in the post-Covid period. The proposed set of measures covers four directions, namely:

1. Short-term financial management, working capital management;
2. Medium- and long-term financial management;
3. Management of financial obligations;
4. Financial control and monitoring.

The proposed set of measures covers the tasks of both operational (working capital, liquidity) and strategic (equity capital, loan capital) financial management. The practical value of the obtained research results is in the proposed set of financial management measures for tourism companies during the period of economic recovery after the pandemic. The list of measures that can be directly used in planning and implementation of financial management measures in the post-Covid environment is of practical interest.

Prospects for further research may include the extended study of factors influencing the financial management of tourism companies in the context of adaptation to the post-Covid environment. It is also promising to study not only financial, but also market indicators that reflect the state of tourism companies in the post-Covid environment. The study of the problem of adaptation of tourism companies to potential new pandemics can be of interest.

Author Contributions: Conceptualization, C.P., S.S. and G.M.; methodology, A.L., S.S., and G.M.; validation, A.L., L.F. and G.M.; formal analysis, C.P., A.L. and G.M.; investigation, C.P., A.L., S.S., L.F. and G.M.; data curation, C.P., A.L., S.S., L.F. and G.M.; writing - original draft preparation, C.P., A.L., S.S. and G.M.; writing - review and editing, C.P. and G.M.; visualization, A.L., S.S. and L.F.; supervision, C.P. and G.M. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Alviana, T., & Megawati, M. (2021). Comparative Analysis of Company Financial Performance Before and During the Covid-19 Pandemic on LQ45 Index. *Financial Management Studies*, 4(1), 60-73. https://jkmk.ppj.unp.ac.id/index.php/fms/article/view/52

Anderson, R.M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T.D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet*, 395(10228), 931-934. https://doi.org/10.1016/S0140-6736(20)30567-5

Arango, L.F.Q., Arias, D.J.Z., & Piñeros, S.T. (2023). Perception of tourism stakeholders due to the effects of covid-19. Case of municipal territories in Antioquia - Colombia. *Tendencias*, 24(1), 1–23. https://doi.org/10.22267/rtend.222302.213

Araújo, N., Brea, J., & Matos Pereira, A. (2021). Societal Changes Due to "COVID-19". An Analysis of the Tourism Sector of Galicia, Spain. *Sustainability*, 13(15), 8449. https://doi.org/10.3390/su13158449

Chang, C.C., Kam, T.Y., Chang, Y.C., & Liu, C.C. (2019). Effects of the 2008 Financial Crisis on the Working Capital Management Policy of US Enterprises. *International Journal of Business & Economics*, 18, 121-39. https://ijbe.fcu.edu.tw/assets/ijbe/past_issue/No.18-2/pdf/vol_18-2-1.pdf

Crook, M.W. (2022). Mission impossible: Foundation investment policy in the Post-COVID world. *Social Science Research Network*, 1-12. https://doi.org/10.2139/ssrn.4178186

Deloitte. (2020). Confronting the crisis. https://www2.deloitte.com/us/en/insights/economy/covid-19/covid-19-crisis-management-in-financial-services.html

Devi, S., Made, N., Warasniasih, S., Masdiantini, P.R., & Musmini, L.S. (2020). The Impact of COVID-19 Pandemic on the Financial Performance of Firms on the Indonesia Stock Exchange. *Journal of Economics, Business, and Accountancy Ventura*, 23(2), 226-242. http://dx.doi.org/10.14414/jebav.v23i2.2313

Dimson, J., Mladenov, Z., Sharma, R., & Tadjeddine, Z. (2020). COVID-19 and European small and medium-size enterprises: How they are weathering the storm. *McKinsey & Compan*y. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-european-small-and-medium-size-enterprises-how-they-are-weathering-the-storm

Ding, W., Ross, L., Chen, L., & Wensi, X. (2021). Corporate Immunity to the COVID-19 Pandemic. *Journal of Financial Economics*, 141(2), 802-830. https://doi.org/10.1016/j.jfineco.2021.03.005

Eggers, F. (2020). Masters of disasters? Challenges and opportunities for SMEs in times of crisis. *Journal of Business Research*, 116, 199-208. https://doi.org/10.1016/j.jbusres.2020.05.025

Gadelius, A., & Larsson, E. (2019). The impact of the global financial crisis on working capital management in Swedish listed firms. *Digitala Vetenskapliga Arkivet*. https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1356093&dswid=-4689

Gills, B. (2020). Deep restoration: From the great implosion to the great awakening. *Globalizations*, 17(4), 577-579. https://doi.org/10.1080/14747731.2020.1748364

Gourinchas, P.O. (2020). Flattening the pandemic and recession curves. *CEPR*. https://cepr.org/voxeu/columns/flattening-pandemic-and-recession-curves

Gu, S. (2023). Financial distress in the China hospitality industry during the Covid-19 disaster. *South Asian Journal of Social Studies and Economics*, 18(3), 38–49. https://doi.org/10.9734/sajsse/2023/v18i3659

Hall, C.M., Scott, D., & Gössling, S. (2020). Pandemics, transformations and tourism: Be careful what you wish for. *Tourism Geographies*, 22(3), 577-598. https://doi.org/10.1080/14616688.2020.1759131

Hanifah, U., Widyarti, M.T.H., & Hardiningsih, S. (2023). The effect of enterprise risk management and investment decision on firm value during the Covid-19 pandemic (Evidence from hotels, restaurants, and tourism companies listed in Indonesia Stock Exchange 2020-2021). *Applied Accounting and Management Review (AAMAR)*, 1(2), 36–45. http://dx.doi.org/10.32497/aamar.v1i2.4166

Higgins-Desbiolles, F. (2020). Socialising tourism for social and ecological justice after COVID-19. *Tourism Geographies*, 22(3), 610-623. https://doi.org/10.1080/14616688.2020.1757748

Ioannides, D., & Gyimóthy, S. (2020). The COVID-19 crisis as an opportunity for escaping the unsustainable global tourism path. *Tourism Geographies*, 22(3), 624-632. https://doi.org/10.1080/14616688.2020.1763445

Joanna, L., Rosmah, M., & Anuar, S. (2021). A Bibliometric Analysis of Employee Turnover Intention in the Hotel Industry (1988-2020). *Journal of Management & Muamalah*, 11(2), 29-53. https://www.researchgate.net/publication/353730072_A_Bibliometric_Analysis_of_Employee_Turnover_Intention_in_the_Hotel_Industry_1988-2020

Kalemli-Ozcan, S., Gourinchas, P.O., Penciakova, V., & Sander, N. (2020). COVID-19 and SME Failures. *International, Monetary Fund Working Paper*, 20(207), 1-55. https://www.imf.org/-/media/Files/Publications/WP/2020/English/wpiea2020207-print-pdf.ashx

Lewandowsky, S., Facer, K., & Ecker, U. (2021). Losses, hopes, and expectations for sustainable futures after COVID. *Humanities and Social Sciences Communications*, 8, 1-17. https://doi.org/10.1057/s41599-021-00961-0

Masaeli, A., Rezaei, N., Derafshi, K., & Basakha, M. (2022). Effects of Corona Epidemic on Labor Employment in Iran's Tourism-Related Industries. *Tourism & Management Studies*, 16(56), 279-308. https://doi.org/10.22054/tms.2021.59352.2512

McCabe, S., & Qiao, G. (2020). A review of research into social tourism: Launching the Annals of Tourism Research Curated Collection on Social Tourism. *Annals of Tourism Research*, 85, 103103. https://doi.org/10.1016/j.annals.2020.103103

Mirza, N., Rahat, B., Nagvi, B., Kumail, S., & Rizvi, A. (2020). Impact of Covid-19 on corporate solvency and possible policy responses in the EU. *The Quarterly Review of Economics and Finance*, 4, 1-10. https://doi.org/10.1016/j.qref.2020.09.002

Mullins, J. (2020). Are your cash-flow tools recession ready? *Business Horizons*, 63(6), 693-704. https://doi.org/10.1016/j.bushor.2020.04.003

Novelli, M., Gussing Burgess, L., Jones, A., & Ritchie, B.W. (2018). 'No Ebola…still doomed' – The Ebola-induced tourism crisis. *Annals of Tourism Research*, 70, 76-87. https://doi.org/10.1016/j.annals.2018.03.006

Nyawo, J. (2020). Evaluation of Government Responses and Measures on COVID-19 in the Tourism Sector: A Case of Tour Guides in South Africa. *African Journal of Hospitality Tourism and Leisure*, 9(5), 1144-1160. https://doi.org/10.46222/ajhtl.19770720-74

Rahman, M., Muzareba, A.M., Amin, S., Faroque, A.R., & Gani, M.O. (2021). Tourism Resilience in the Context of Tourism Destination Management in Post-COVID-19 Bangladesh. In *Destination Management in a Post-Pandemic Context (Tourism Security-Safety and Post Conflict Destinations)*, 113-125, Emerald Publishing Limited, Leeds. https://doi.org/10.1108/978-1-80071-511-020211008

Rassanjani, S., Novialdi, R., & Maz, D. (2021). Impact of COVID-19 on Economic Activities and Poverty Threats in the Asia-Pacific Region. *Policy & Governance Review*, 5, 82-96. https://doi.org/10.30589/pgr.v5i1.353

Rizvi, S.K.A., Yarovaya, L., Mirza, N., & Naqvi, B. (2020). The impact of COVID-19 on valuations of non-financial European firms. *SSRN*. https://doi.org/10.2139/ssrn.3705462

Salehi, M., Mahdavi, N., & Tarighi, H. (2019). Association between the availability of financial resources and working capital management with stock surplus returns in Iran. *International Journal of Emerging Markets*, 14, 343-361. https://doi.org/10.1108/IJoEM-11-2017-0439

Schillig, M. (2021). Banking and Finance after COVID-19. *King's Law Journal,* 32(1), 49-59. https://doi.org/10.1080/09615768.2021.1886659

Seshadri, U., Kumar, P., Vij, A., & Ndlovu, T. (2023). Marketing strategies for the tourism industry in the United Arab Emirates after the COVID-19 era. *Worldwide Hospitality and Tourism Themes*, 15(2), 169–177. https://doi.org/10.1108/whatt-10-2022-0120

Skare, M., Soriano, D., & Porada-Rocho, N. (2021). Impact of COVID-19 on the travel and tourism industry. *Technological Forecasting and Social Change*, 163, 1-14. https://doi.org/10.1016/j.techfore.2020.120469

Song, J.H., Yeon, J., & Lee, S. (2021). Impact of the COVID-19 pandemic: Evidence from the US restaurant industry. *International Journal of Hospitality Management*, 92, 102702. https://doi.org/10.1016/j.ijhm.2020.102702

Tokbolat, Y., & Le, H. (2022). Covid-19: Corporate diversification and post-crash returns. *Finance Research Letters*, 46, 102501. https://doi.org/10.1016/j.frl.2021.102501

UNWTO. (2020). UNWTO; Madrid, Spain: 2020. *UNWTO World Tourism Barometer*, 18(2),1-26. https://webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2020-05/UNWTO_Barom20_02_May_Statistical_Annex_en_.pdf

Walden University. (2022). Managing finances in times of crisis. https://www.waldenu.edu/programs/business/resource/managing-finances-in-times-of-crisis

Wen, J., Wang, W., Kozak, M., Liu, X., & Hou, H. (2020). Many brains are better than one: The importance of interdisciplinary studies on COVID-19 in and beyond tourism. *Tourism Recreation Research*, 5, 310-313. https://doi.org/10.1080/02508281.2020.1761120

Article history: Received: 10.10.2023 Revised: 01.11.2023 Accepted: 29.11.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1655-1662
DOI 10.30892/gtg.514 spl07-1162

GREENHOUSE GAS EMISSIONS, INBOUND TOURISM DEMAND, AND INFORMATION AND COMMUNICATION TECHNOLOGY: WHERE IS THE LINK?

Jean Claude MANALIYO*
School of Tourism Management & TREES, North-West University; Corner of Albert Luthuli and University Drive, Mmabatho, Mafikeng, South Africa, e-mail: 25842927@nwu.ac.za

Citation: Manaliyo, J.C. (2023). GREENHOUSE GAS EMISSIONS, INBOUND TOURISM DEMAND, AND INFORMATION AND COMMUNICATION TECHNOLOGY: WHERE IS THE LINK? *GeoJournal of Tourism and Geosites*, 51(4spl), 1655–1662. https://doi.org/10.30892/gtg.514spl07-1162

Abstract: The world experiences an increase in greenhouse gas emissions linked to human activities such as information and communication technology (ICT) and tourism activities. The aim of this study is to investigate the effects of ICT and inbound tourism demand on greenhouse gas emissions in South Africa. The study involved annual time series data (1989-2020), and this data was analysed using autoregressive distributed lag (ARDL) and Granger causality models. The empirical results indicate that a 1% increase in inbound tourism demand causes the level of greenhouse gas emissions to increase by 0.52% in the long-run, but inbound tourism demand has no short-run effect on greenhouse gas emissions. On the other hand, ICT only has a short-run effect on greenhouse gas emissions. The results also show that there is a unidirectional causal relationship between greenhouse gas emissions to ICT and inbound tourism demand.

Key words: Greenhouse gas emissions; ICT; Inbound tourism demand; ARDL; Granger causality; South Africa

* * * * * *

INTRODUCTION

The tourism industry has established itself as a major contributor to the economies of countries across the world, both developed and developing countries. The total contribution of the tourism industry to the global economy hovered around US$10 trillion (10.4% of the global GDP) in 2019, but the contribution declined in the subsequent year owing to the COVID-19 pandemic (World Travel and Tourism Council [WTTC], 2022). However, the tourism industry is blamed for contributing to the level of greenhouse gas emissions in the atmosphere. Reports indicate that tourism generated more than 8% of the global greenhouse gas emissions between 2009 and 2013 (Dunne, 2018; Sustainable Travel International, 2020), and it projected that greenhouse gas emissions from the tourism industry will increase by 25% between 2016 and 2030 (UN World Tourism Organisation [UNWTO], 2019). Most tourism-related greenhouse gases are emitted by transport and energy consumption in tourist accommodations.

The increase in greenhouse gas emissions in the tourism industry is linked to the growing tourism demand (Lenzen et al., 2018), and this increase in the emissions of greenhouse gases may intensify as global tourism demand is on the rise again after the COVID-19 pandemic, which crippled the tourism industry because of domestic and international travel restrictions imposed by governments across the world. The pandemic hit the tourism industry hard, but evidence shows that the greenhouse gas emissions linked to tourism declined significantly during the pandemic (Nagaj and Žuromskaitė, 2021). In Spain, for example, the level of greenhouse gas emissions declined by 63% in 2020 in relation to pre-pandemic levels of greenhouse gas emissions (Osorio et al., 2023). Sharing the same sentiment with Lenzen et al. (2018), reducing tourism carbon emissions is highly improbable given that the measures taken by countries to stimulate tourism demand outstrip the measures taken to mitigate tourism greenhouse gas emissions.

Countries are vehemently competing to develop and market tourism destinations in attempts to lure large numbers of tourists. However, there are views that the advancements of ICT play a pivotal role in decelerating the emissions of greenhouse gases (Asongu, 2018; Danish, 2019; Melson, 2022; Wei and Liu, 2023; Wen et al., 2022; Zafar et al., 2023). This implies that tourism establishments may curb the emissions of carbon dioxide by embracing ICT in their operations. The role of ICT in restraining greenhouse gas emissions in the tourism industry, however, is still unexplored.

This study aims at investigating the effects of information and communication technology (ICT) and inbound tourism demand influence greenhouse gas emissions. There is sparse literature related to the effects of ICT on greenhouse emissions in the tourism industry. This is the existing lacuna in literature this study envisaged to fill, using time series data for South Africa. The choice of South Africa as a case study is based on the vibrancy and development of the country's tourism industry. South Africa is among the top five most visited countries in Africa, alongside Egypt, Morocco, Tunisia, and Algeria (Dzinduwa, 2022; Obiero, 2022; Pariona, 2017). In fact, the country is the most preferred destination in the entire Sub-Saharan region, receiving an annual average of 10 million international tourists. In 2019, the country lured 10.2 million international tourists despite the threat of COVID-19 (South African Tourism, 2019). The country's ITC sector is also developed and the largest on the African continent, leading in computers, mobile, and software (Gillwald et al., 2018). The remainder of this paper is divided into four sections, which are literature review, methodology, findings and discussion, and conclusion.

* Corresponding author

LITERATURE REVIEW

1. The link between tourism and greenhouse gas emissions

Greenhouse gas emissions have become a topical research area in the past few decades, following the increasing and devastating impacts of climate change on humans and the environment. There are sizeable studies on the causes of greenhouse gas emissions (Anser et al., 2021; Basarir and Çakir, 2015; Kwakwa et al., 2023). The chief causes of greenhouse gas emissions are human activities such as transport, farming, and tourism (Lenzen et al., 2018). A number of reports and empirical studies have shown that the tourism industry contributes to greenhouse gas emissions (Abeydeera and Karunasena, 2019; Basarir and Çakir, 2015; Daniels, 2018; Koçak et al., 2020; Sharma, 2022; Yu-Guo and Zhen-Fang, 2014). Between 2009 and 2013, for example, the tourism industry emitted around 8% of total global greenhouse gases, and tourism's share in greenhouse gas emissions is projected to rise as tourism demand is swelling across the world (Lenzen et al., 2018). Greenhouse gas emissions in the tourism industry are caused by transport, catering, accommodation, and other activities that use a huge amount of energy and emit carbon dioxide into the atmosphere (Tang et al., 2014), but among tourism activities, transport takes the lead in emitting greenhouse gases (Daniels, 2018; Sharma and Ghoshal, 2015; World Tourism Organisation [WTO], 2003, Yu-guo and Zhen-fang, 2014). In the US, for example, 76% of the total greenhouse emissions linked to tourism activities come from transport (WTO, 2003). In attempts to lessen greenhouse gas emissions caused by tourism transport, strategies such as promoting domestic tourism and travelling short distances, using land transport instead of air and water transport, staying longer at destinations, and reducing travel frequency were proposed (Perch-Nielsen et al., 2010; Unger et al., 2016).

The level of the contribution of tourism to greenhouse emissions varies from country to country, and from one region to another. A high volume of tourism-related greenhouse gas is emitted in and by developed countries (Lenzen et al., 2018) because these countries have a developed tourism industry. The US is the leading tourism-related greenhouse gas emitter due to a considerable number of both inbound and outbound tourists in the country, but greenhouse gas emissions in middle-income countries like China, Brazil, and India are exponentially increasing as the citizens of these countries become more interested in travelling to other countries (Coghlan, 2018). There is a link between tourist flows and greenhouse gas emissions. A study conducted in China, for example, reported that an increase in tourist arrivals between 1990 and 2012 resulted in an increase in greenhouse gas emissions (Tang et al., 2014). This link between increased tourist arrivals and high greenhouse gas emissions needs no sophisticated explanation. An increasing number of tourist arrivals consumes high energy, which also leads to increased greenhouse gas emissions (Rehman et al., 2022). A study conducted in 32 OECD countries, however, shows a bidirectional causal relationship between tourist arrivals and greenhouse gas emissions in some countries like Canada, and a unidirectional causal relationship from tourist arrivals to CO_2 emissions in countries such as Chile, Germany, Ireland, and Latvia (Balli, 2021). Similar results were reported by Irfan et al. (2023) indicating that all sub-sectors of the tourism industry Granger cause most of the greenhouse gas emissions in China.

2. The link between ICT and greenhouse gas emissions

The relationship between the advancement in ICT and greenhouse gas emissions is easily discernible considering the influence of ICT on human activities, including energy consumption, production, and service delivery (Anser et al., 2021; Hernández et al., 2020; Lefophane and Kalaba, 2020; World Meteorological Organisation, 2022), which are major contributors of greenhouse gas emissions to the atmosphere. The argument is that the application of ICT in human activities influences the emission of greenhouse gases. A substantial number of earlier empirical studies have affirmed the link between the application of ICT and greenhouse gas emissions (Ahmed et al., 2021; Atsu et al., 2021; Park et al., 2018; Malmodin et al., 2010). However, there is no consensus among studies on whether the advancement in ICT application diminishes or raises greenhouse gas emissions. Some studies indicate that the advancement in the use of ICT results in an increase in greenhouse gas emissions (Atsu et al., 2021; Malmodin et al., 2010; Su et al., 2021), whereas other studies oppose these results, affirming that ICT and its application play a pivotal role in reducing greenhouse gas emissions (Asongu, 2018; Avom et al., 2020; Danish, 2019). Specifically, Malmodin et al. (2010) found that the information and communication technology sector alone generated 1.3% of global greenhouse gas emissions in 2007. In 2020, it was reported that the ICT sector alone used 4% of the global electricity, which is approximately 1.4% of the global greenhouse gas emissions (Malmodin et al., 2023). The positive influence of ICT on CO_2 was also reported by Simpson et al. (2019), whose study involved panel data for 113 countries. Their results indicated that the use of fixed telephones and the internet is linked to higher CO_2 emissions in developed countries. It is argued that the effects of fixed telephones and the internet, which are proxies of ICT on greenhouse gas emissions, are low in developing countries because developing countries have limited fixed telephone and internet connections.

A study conducted in BRICS countries (Brazil, Russia, India, China, and South Africa) also reveals that high technology experts and electric power consumption result in high CO_2 emissions (Su et al., 2021). Similarly, a study conducted in South Africa reveals that carbon dioxide (CO_2) emissions increase by 0.565% in the long term when fixed telephone subscriptions increase by 1%, whereas CO_2 emissions go up 0.255% when fixed telephone subscriptions increase by 1% in the short run (Atsu et al., 2021). A study conducted in China also found that the level of greenhouse gas emissions goes up by 0.205% when ICT increases by 1% (Liu and Wan, 2023). On the one hand, Danish (2019) found that the advancement in ICT plays a vital role in curbing the emissions of greenhouse gases. Similar to this result, Asongu's (2018) findings suggest that applying ICT may diminish the negative effects of globalisation on CO_2 emissions. For example, virtual services may be offered without people traveling to service providers. The COVID-19 pandemic galvanised some tourism destinations to offer virtual guided tours without tourists travelling to the destinations physically (Repo and Pesonen, 2022). In their study conducted in 77 countries, Al-Mulali et al. (2015) found that internet shopping mitigates greenhouse gas emissions, but this mitigation was found in developed countries. Yet, Chatti (2021) argued that employing

ICT in the transport sector has the potential to reduce air pollution. Based on the above empirical literature, the role of ICT in reducing CO_2 emissions is no longer disputable. However, arguing that increasing greenhouse gas emissions promotes the advancement of ICT and its application is sensible. ICT applications may be developed in attempts to find solutions to the increasing emissions of greenhouse gases. This argument is supported by Appiah-Otoo et al. (2022), whose findings indicate that there is bi-directional causality between CO_2 and ICT in countries that have a high and moderate quality of ICT, and there is unidirectional causality from CO_2 to ICT in countries that have a low quality of ICT.

3. The relationship between ICT and tourism

ICT in the tourism industry plays a profound and fundamental role in different ways, ranging from linking tourism service providers with customers and other key stakeholders to improving production and quality service delivery (Anser et al., 2021; Khan and Hossain, 2018; Nikoli and Lazakidou, 2019; Sardar et al., 2021; Trivedi et al., 2018). The advancement in ICT application in the tourism industry enables tourism service providers including destinations and individual tourism businesses to market and sell their products and services to potential tourists, irrespective of time and geographical location (Khan and Hossain, 2018; Trivedi et al., 2018), denoting that long distance between service providers and tourists is no longer an obstacle. Gritta and Calabrese (2023) reported interesting results which show that digital marketing enables small businesses in Italy to succeed in the country and abroad. To this end, tourists who are technologically empowered can view and purchase tourism products online at their convenience without physical contact with tourism service providers (Khan and Hossain, 2018), leading to increased tourism demand and revenue. Empirical studies affirm that incorporating ICT in tourism has positive effects on tourism growth (Adeola and Evans, 2020; Kumar and Kumar, 2020; Kumar, 2013; Sharma et al., Mohapatra and Giri, 2022). For example, Sharma et al. (2022) found that foreign tourist arrivals in India grow by 1.40% in the long run if ICT application increases by one unit. Similarly, Kumar and Kumar (2020) reported that a 1% in broadband subscriptions and mobile subscriptions causes foreign tourist arrivals to increase by 0.11% and 0.04%, respectively.

Based on these findings and the findings of other studies, such as Lee et al. (2021), and Roy and Ahmed (2019), it is unequivocal that embracing ICT in the tourism industry brings many benefits to the industry. However, the argument that ICT benefits from the tourism industry to some extent is sensible. Factors such as competition and changes in behaviour and preferences of tourists may require tourism service providers to invest in new technologies that may foster innovation and creativity for them to remain or become competitive. Similar to this argument, Adeola and Evans (2019) report a bidirectional causality between tourism and ICT, particularly internet usage and mobile penetration. Wagaw and Mulugeta (2018) also found that the intention to use ICT in the tourism sector increases when the technology is believed to heighten competitive advantage. The use of information and communication technology in tourism is also sparked by factors such as the attractiveness and location of tourist destinations (Sardar et al., 2021). Nevertheless, the role of the tourism industry in advancing ICT continues to be overshadowed by the contribution of ICT to tourism. Consequently, this study aims to determine whether there is a symbiotic relationship between tourism growth and information and communication technology.

METHODOLOGY

a. The description of data

The study used 32 annual observations, starting from 1989 to 2020, and this sample period was dictated by the availability of data. The data is made up of three variables, which are greenhouse gas emissions, inbound tourism demand, and information communication and technology accessed from the World Bank Development Indicators. The dependent variable is greenhouse gas emissions (GHG), whereas information communication and technology (ICT) and inbound tourism demand (TA) are independent variables. The greenhouse gas emissions index is measured by total greenhouse gas emissions (kt of CO_2 equivalent); the inbound tourism demand index is represented by foreign tourist arrivals; and the index for ICT is measured by indices of three proxies, which are mobile cellular subscriptions, individuals using the internet (% of the population), and fixed telephone subscriptions. One single and robust index for ICT was constructed by applying principal component analysis (PCA). This analysis was used to overcome the problem of multicollinearity in variables. Adeola and Evans (2020) argue that PCA solves the problems of multicollinearity. Similarly, Dunteman (1989) advises that PCA can be used to improve the precision of regression results of the original variables in case there is multicollinearity among variables. However, all variables were transformed into natural logarithm form before conducting any tests to increase the reliability of results. The descriptive statistics and correlation matrix of the study variables are depicted in Table 1.

Table 1. Descriptive statistics and correlation matrix

Statistics	LNGHG	LNICT	LNTA
Mean	13.00509	-0.049287	15.68438
Median	13.04716	-0.008033	15.76242
Maximum	13.23723	0.000000	16.16423
Minimum	12.68841	-0.213193	14.35174
Std. Dev.	0.190074	0.062180	0.437978
Skewness	-0.343208	-0.984327	-1.253179
Kurtosis	1.616756	2.670997	4.206083
Jarque-Bera	3.179374	5.311788	10.31529
Probability	0.203989	0.070236	0.005755
Sum	416.1629	-1.577184	501.9001
Sum Sq. Dev.	1.119977	0.119857	5.946560
Observations	32	32	32

Correlation matrix

LNGHG	1.000000		
LNICT	0.787092	1.000000	
LNTA	0.801306	0.571727	1.000000

b. Model specification

To determine the long-run relationship among the study variables, the autoregressive distribution lag (ARDL) model by Pesaran and Shin (1995) was employed, after conducting unit root tests to determine whether the study variables meet the criteria for the ARDL model. The rule of thumb is that the ARDL model is applied only if there no study variables are stationary at second difference I(2) (Pesaran et al., 2001). The model is applied when study variables are stationary at level I(0) or at the first difference I(1), or when some variables are stationary at I(0) and others are stationary at I(1). To determine the stationary of variables, the augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests were conducted. The initial model used to test the relationship between greenhouse gas emissions, tourism growth, and information and communication technology is expressed as:

$$GHG = f(TA, ICT) \quad (1)$$

Where GHG is greenhouse gas emissions, *f* is a functional notation, TA represents tourism growth measured by tourist arrivals, and ICT represents information and communication technology. After transforming the study variables into natural logarithm (LN), the above model becomes:

$$LNGHG = f(LNTA, LNICT) \quad (2)$$

The ARDL model specification for the relationship between the independent and dependent variables is derived from the above model (2), and the new model is as follows:

$$LNGHG_t = \alpha_0 + \varphi_j LN\,GHG_{t-i} + \delta_j LN\,TA_{t-i} + \beta_j LN\,ICT_{t-i} + e_t \quad (3)$$

Where α_0 denotes a constant, $LN\,GHG_{t-i}$ represents the value of greenhouse gas emissions in natural logarithm at time t, $LN\,TA_{t-i}$ symbolises the value of tourist arrivals in natural logarithm at time t, and $LN\,ICT_{t-i}$ represents the value of information and communication technology in natural logarithm. The coefficients of the long-run relationship are represented by φ_j, δ_j, and β_j. And e_t stands for the error correction term. Then, the regression equation for testing the cointegration is expressed below:

$$\Delta LNGHG_t = \alpha_0 + \Sigma_{j=1}^{k}\varphi_j\Delta LNGHG_{t-j} + \Sigma_{j=1}^{k}\delta_j\Delta LNTA_{t-j} + \Sigma_{j=1}^{k}\beta_j\Delta LNICT_{t-j} + \Sigma_{j=1}^{k}\gamma_j\Delta LNGHG_{t-j} + \Sigma_{j=1}^{k}\omega_j\Delta LNTA_{t-j} + \sigma_j LNICT_{t-1} + e_t \quad (4)$$

In the above equation, Delta (Δ) indicates a change in the value of variables, whereas γ_j, ω_j, and σ_j represent the coefficients of the short-run relationship. The bounds cointegration was tested based on the following hypotheses:

H_0: $\varphi_j = \delta_j = \beta_j = 0$, suggesting that there is no cointegration among the variables.

H_1: $\gamma_j \neq \omega_j \neq \sigma_j \neq 0$, suggesting that there is a long-run relationship among the variables.

The bounds for the cointegration test were conducted to test the existence of a long-run relationship. The value of the calculated F-statistic was compared against the critical values of both lower bound I(0) and upper bound I(0) to determine whether there is a long-run relationship among the variables. It is concluded that there is a long-run relationship among variables if the calculated F-statistic value is above the critical values of the upper bound, meaning that the H_0 is rejected. On the other hand, the H_0 is not rejected if the value of the calculated F-statistic is below the critical values of the lower bound. In case the calculated F-statistic value falls between the critical values of lower and upper bounds, the result is inconclusive, implying that it may not be concluded that there is a long-run or there is no long-run relationship (Pesaran et al., 2001). The existence of a long-run relationship, because of the calculated F-statistic, paves the way for determining the adjustment of the disequilibrium caused by short-run shocks. The adjustment is established using the error correction model (ECM). The equation used for establishing the adjustment is expressed as follows:

$$\Delta LNGHG_t = \alpha_0 + \Sigma_{j=1}^{k}\varphi_j\Delta LNGHG_{t-j} + \Sigma_{j=1}^{k}\delta_j\Delta LNTA_{t-j} + \Sigma_{j=1}^{k}\beta_j\Delta LNICT_{t-j} + \Sigma_{j=1}^{k}\gamma_j\Delta LNGHG_{t-j} + \Sigma_{j=1}^{k}\omega_j\Delta LNTA_{t-j} + \sigma_j LNICT_{t-1} + ECT_{t-1} + e_t \quad (5) \quad (5)$$

Where ECT_{t-1} denotes the error correction term. Residual diagnostic and stability tests were conducted to establish the validity and stability of the ARDL model in the study. The presence of a long-run relationship galvanised a further analysis. The paired Granger causality test was carried out to determine the causal relationship among the study variables.

EMPIRICAL RESULTS AND DISCUSSION

1. Results of unit root tests

Two unit root tests (PP and ADF) were conducted to determine whether there no study variable is stationary at I(2). The results of both tests presented in Table 2 below indicate that the variables are a combination of I(0) and 1(1). No variable is stationary at second difference, I(2). Since the results meet the precondition for applying the ARDL model, the model was applied to investigate the relationship among the variables.

2. Results of F-bounds cointegration and long-run tests

The results from F-bounds cointegration test (Table 3) reveal that the value of the computed F-statistic (28.93269) is much higher than the critical values of the upper bounds at the 10%, 5%, 2.5%, and 1% significance levels. These results led to a conclusion that there is a long-rung relationship among the study variables, meaning that the null hypothesis that there is no long-run relationship among the variables was rejected. Based on these results, the effects of information communication and technology, and inbound tourism demand on greenhouse gas emissions in the long run were determined. The results of the long-run test reveal that changes in the use of ICT do not have effects on the emission of greenhouse gases in the atmosphere (Table 4). The coefficient (-0.003756) of ICT has a negative sign, but it is not statistically significant at the 5% level, denoting that any changes in ICT as measured by internet users and subscribers of mobile phones and fixed telephone lines do not have an effect on the level of greenhouse emissions in South Africa in the long run. These results are different from

the results of previous studies that indicate that advancement in technology leads to high greenhouse gas emissions (Atsu et al., 2021; Su et al., 2021). To be precise, a previous study conducted in South Africa revealed that CO_2 emissions go up by 0.565% in the long run when the number of fixed telephone users grows by 1% (Atsu et al., 2021). On the other side of the coin, other studies found that an increase in ICT reduces greenhouse emissions (Asongu, 2018; Danish, 2019).

The emissions of greenhouse gases in the atmosphere in South Africa are influenced by inbound tourism demand. A 1% increase in inbound tourism as measured by foreign tourist arrivals leads to a 0.52% increase in greenhouse gas emissions. This influence is not surprising given that an increase in the arrival of international tourists implies that substantial amounts of CO_2 were transmitted in the air by airlines and other means of transport used by the tourists visiting South Africa. This result supports the results of earlier studies that also suggested that the tourism industry contributes to the increasing greenhouse gas emissions in the atmosphere (Abeydeera and Karunasena, 2019; Daniels, 2018; Koçak et al., 2020; Sharma, 2022). Increased tourist arrivals are also linked to high consumption of energy by tourists and tourist facilities (Rehman et al., 2022).

Table 2. Unit root test results

Variable	Integration orders		LNGHG	LNICT	LNTA
PP (t-values)	I(0)	Intercept	-1.149345	-1.613895	-2.140826
		Trend & intercept	-3.937257	-1.864450	-2.703712
	I(1)	Intercept	-6.544308*	-5.299909*	-5.101401*
		Trend & intercept	-6.687603*	-5.826933*	-4.873911*
ADF (t-values)	I(0)	Intercept	-1.098276	-1.893984	-2.167845
		Trend & intercept	-3.497921	-4.240783*	-2.752203
	I(1)	Intercept	-6.519463*	-5.100786*	-5.137694*
		Trend & intercept	-6.254172*	-5.062994*	-4.995119*
Order of integration			I(1)	I(1)	I(1)

Table 3. Results of F-bounds cointegration test

F-Bounds Test	Null hypothesis: No levels relationship			
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	28.93269	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Table 4. Results of long-run test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNICT	-0.003756	0.479708	-0.007829	0.9938
LNTA	0.517228	0.071889	7.194859	0.0000
C	4.925607	1.141807	4.313870	0.0002

3. Results of short-run test

The short-run results reveal that inbound tourism demand has no effect on greenhouse gas emissions, implying that the level of greenhouse gas emissions remains unchanged in the short run irrespective of an increase or a decrease in foreign tourist arrivals. Surprisingly, a positive effect of information communication and technology on greenhouse gas emissions was detected. Greenhouse gas emissions increase by 0.61% in the short run if the application of ICT increases by 1% (Table 5). This result supports the result of a previous study that indicated that the use of ICT contributed 1.3% to CO_2 emissions in 2007 (Malmodin et al., 2010). It was also found that greenhouse emissions have a lagged effect.

The level of greenhouse gas emissions contracts by 0.3% (0.295520) in the current year because of the increase of 1% in the previous year. Since there is a long-run relationship among the series, there was a need to apply the error correction model in an attempt to determine the period needed for correcting disequilibrium in the long-run. The result shows that the coefficient (-0.300561) of the error correction term (ECT) is statistically significant at the 5% level and has a negative sign as expected (Table 5). The interpretation of this coefficient is that 30% of the disequilibrium is corrected each year. This speed (30%) of adjustment to equilibrium is relatively slow. Therefore, 3.327116 (1/0.300561) years, implying three years and four months are required for the disequilibrium to be adjusted.

Table 5. Results of short-run tests and ECT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGHG(-1))	-0.295520	0.064717	-4.566345	0.0001
D(LNICT)	0.610884	0.113053	5.403524	0.0000
CointEq(-1)	-0.300561	0.026341	-11.41039	0.0000

Table 6. Results of residual diagnostic test

Test	**Null hypothesis**	**Prob.**
Breusch-Godfrey Serial Correlation LM Test	No serial correlation	0.2813
Breusch-Pagan-Godfrey Heteroskedasticity test	Homoskedasticity	0.9378
Jarque-Bera Normality test	No normality	0.4453

4. Results of residual diagnostic and stability tests

To determine the reliability of the model used for the data analysis, residual diagnostic and stability tests were conducted. Residual diagnostic tests are autocorrelation, heteroscedasticity, and normality, whereas stability tests are cumulative sum (CUSUM) and cumulative sum of square (CUSUMSQ). The results from residual diagnostic tests affirm that there is no autocorrelation and heteroscedasticity in the series. The results also indicate that the series are normally distributed as depicted in Table 6. Therefore, the results are accurate and valid. The stability test, on the other hand, shows that CUSUM and CUSUMSQ (blue lines) in Figure 1 and Figure 2 remained within the critical boundaries throughout the sample period at the 5% level of significance. The results led to the conclusion that the model was stable.

5. Results of paired Granger causality test

The current results reveal that inbound tourism demand and ICT do not granger cause the emissions of greenhouse gas in the atmosphere. Basarir and Çakir (2015), however, found that tourist arrivals granger cause greenhouse gas emissions. The results show only a unidirectional causal relationship running from greenhouse gas emissions to inbound tourism demand and to ICT (Table 7).

Table 7. Paired Granger causality test results

Null Hypothesis:	Obs	F-Statistic	Prob
LNICT does not Granger cause LNGHG	30	0.29886	0.7443
LNGHG does not Granger cause LNICT	30	7.41523	0.0030
LNTA does not Granger cause LNGHG	30	0.29309	0.7485
LNGHG does not Granger cause LNTA	30	9.45006	0.0009
LNTA does not Granger cause LNICT	30	2.36286	0.1148
LNICT does not Granger cause LNTA	30	2.55476	0.0978

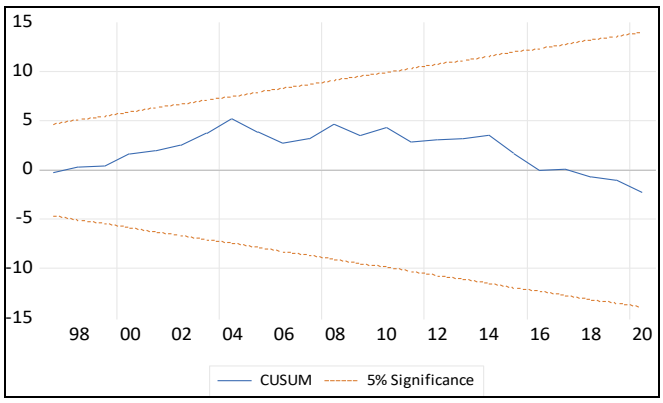


Figure 1. CUSUM result

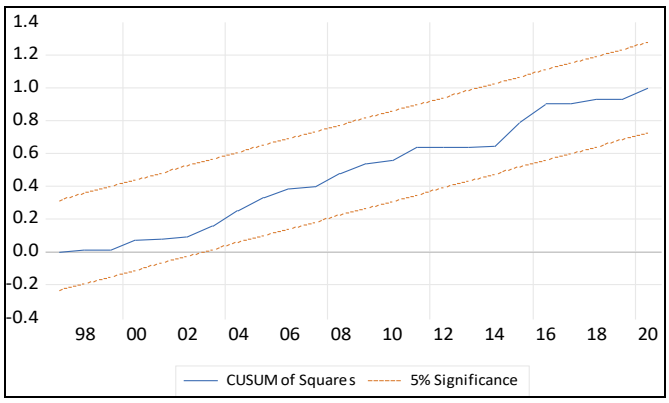


Figure 2. CUSUMSQ result

But a study conducted by Koçak et al. (2020) reveals that tourism development (measured by tourist arrivals and tourist receipts) and greenhouse gas emissions have a bidirectional causality relationship. The causal relationship from greenhouse gas emissions towards ICT is justifiable. Increasing greenhouse emissions may galvanise governments and businesses to invest in ICT and its application in attempts to slow down the increase in greenhouse gas emissions. Similar to this argument, a study conducted by Al-Mulali et al. (2015) also found that greenhouse gas emissions in developed countries reduce if online shopping increases. A previous study conducted in India indicates that information and communication technology granger causes foreign tourist arrivals (Sharma et al, 2022), but the results of the current study show that ICT does not granger cause inbound tourism demand in South Africa (Table 7).

The null hypothesis that ICT does not granger cause tourist arrivals was not rejected as the p-value is statistically insignificant at 5% level, indicating that there is no causal relationship moving either from tourist arrivals to information and communication technology (ICT) or from ICT to tourist arrivals. This result contradicts the findings of Adeola and Evans (2019) which show that mobile penetration, internet, and tourism in Africa have a bidirectional causal relationship.

CONCLUSION

Studies on the effects of ICT and inbound tourism demand on greenhouse gas emissions report contracting results. Findings of some studies show that an increase in ICT or inbound tourism demand increases the emissions of greenhouse gases in the atmosphere, whereas other studies reveal that advancements in ICT reduce greenhouse gas emissions. There are even studies that suggest that a growing level of greenhouse gas emissions prompts an increase in the use of ICT. This contraction in results of different studies was the central motivation for conducting this study, to investigate the link between ICT and inbound tourism demand on greenhouse gas emissions in South Africa, using the ARDL model and Granger causality. The ARDL results indicate that only inbound tourism demand has a positive effect on greenhouse gas emissions in the long run. The level of greenhouse gas emissions goes up by 0.52% when foreign tourist arrivals increase by 1%. The use of ICT has an effect on greenhouse gas emissions only in the short run, where greenhouse gas emissions grow 0.61% when the use of ICT increases by 1%. Unlike in the long run, inbound tourism demand has no effect on greenhouse gas emissions in the short run. The Granger causality results, on the other hand, show a unidirectional causality relationship running from greenhouse gas emissions to ICT and inbound tourism demand. There is no causal relationship between ICT and inbound tourism demand.

The theoretical contribution of this study is the expansion of the existing literature. There are scant empirical studies investigated the relationship among three variables, which are greenhouse gas emissions, ICT, and tourism activities. Previous studies focused mainly on the relationship between two variables. Furthermore, this study differs from previous studies in terms of methodology. Paper used time series data and employed principal component analysis (PCA) to construct one single ICT index for three ICT indices (fixed telephone users, mobile cellular subscriptions, and the internet users), instead of using the traditional method of calculating the average or the total of the three indices.

The policy implication of this study is that South Africa has to promote vehemently the use of ICT in the tourism sector in attempts to mitigate the long-run effects of tourist arrivals on greenhouse gas emissions. An increase in tourist arrivals has a long-run effect on greenhouse gas emissions, but advancements in ICT have no long run effect on greenhouse gas emissions. Therefore, ICT may be used to curb an increase in greenhouse gas emissions caused by an increase in tourist arrivals.

This study was limited to greenhouse gas emissions, ICT, and inbound tourism demand, future studies may investigate the relationship among greenhouse gas emissions, ICT, and domestic tourism demand or outbound tourism demand. The study also used three indices (fixed telephone subscriptions, internet users, and mobile cellular subscribers) as proxies for ICT, future studies may include more proxies to construct one index for ICT.

Author Contributions: Conceptualization, J.C.; methodology, J.C.; software, J.C.; validation, J.C.; formal analysis, J.C.; investigation, J.C.; data curation, J.C.; writing - original draft preparation, J.C.; writing - review and editing, J.C.; visualization, J.C.; supervision, J.C.; project administration, J.C.; All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abeydeera, L.H.U.W., & Karunasena, G. (2019). Greenhouse gas emission reporting mechanism for hotel industry: a case of Sri Lanka. *International Journal of Environmental Sciences & Natural Resources*, 20(4), 00111-00118. https://doi.org/10.19080/IJESNR.2019.20.556042

Adeola, O., & Evans, O. (2020). ICT, infrastructure, and tourism development in Africa. *Tourism Economics*, 26(1), 97-114. https://doi.org/10.1177/1354816619827712

Adeola, O., & Evans, O. (2019). Digital tourism: mobile phones, internet and tourism in Africa. *Tourism Recreation Research*, 44(2), 190-202. https://doi.org/10.1080/02508281.2018.1562662

Ahmed, Z., Nathaniel, S.P., & Shahbaz, M. (2021). The criticality of information and communication technology and human capital in environmental sustainability: evidence from Latin American and Caribbean countries. *Journal of Cleaner Production*, 286(2021), 125529.

Al-Mulali, U., Sheau-Ting, L., & Ozturk, I. (2015). The global move toward internet shopping and its influence on pollution: an empirical analysis. *Environmental Science and Pollution Research*, 22, 9717–9727.

Anser, M.K., Adeleye, B.N., Tabash, M.I., & Tiwari, A.K. (2021). Services trade-ICT-tourism nexus in selected Asian countries: new evidence from panel data techniques. *Current Issues in Tourism*, 0(0), 1-16. https://doi.org/10.1080/13683500.2021.1965554

Appiah-Otoo, A., Acheampong, A.O., Song, N., & Chen, X. (2022). The impact of information and communication technology (ICT) on carbon dioxide emissions: evidence from heterogeneous ICT countries. *Energy & Environment* https://doi.org/10.1177/0958305X221118877

Asongu, S.A. (2018). ICT, openness and CO_2 emissions in Africa. *Environmental Science and Pollution Research*, 25, 9351-9359.

Atsu, F., Adams, S., & Adjei, J. (2021). ICT, energy consumption, financial development, and environmental degradation in South Africa. *Heliyon*, 7(2021)e07328. https://doi.org/10.1016/j.heliyon.2021.e07328

Avom, D., Nkengfack, H., Fotio, H.K., & Totouom, A. (2020). ICT and environmental quality in Sub-Saharan Africa: effects and transmission channels. *Technological Forecasting and Social Change*, 155, 120028. https://doi.org/10.1016/j.techfore.2020.120028

Balli, E. (2021). The nexus between tourism, environmental degradation and economic growth. https://dergipark.org.tr/en/download/article-file/1676276

Basarir, Ç., & Çakir, Y.N. (2015). Causal interactions between CO_2 emissions, financial development, energy, and tourism. *Asian Economic and Financial Review*, 5(11), 1227-1238. https://doi.org/10.18488/journal.aefr/2015.5.11/102.11.1227.1238

Chatti, W. (2021). Moving towards environmental sustainability: information and communication technology (ICT), freight transport, and CO2 emissions. *Heliyon*, 7(10). https://doi.org/10.1016/j.heliyon.2021.e08190

Coghlan, A. (2018). Tourism is four times worse for the climate than we thought. Newscientist, 08 May. https://www.newscientist.com/article/2168174-tourism-is-four-times-worse-for-the-climate-than-we-thought/

Daniels, M. (2018). Tourism environmental footprint in Sweden. http://www.15th-tourism-stats-forum.com/pdf/Papers/S2/2_4_Tourism_environmental_footprint_in_Sweden_linking_tourism_and_environmental_satellite_accounts.pdf

Danish. (2019). Effects of information and communication technology and real income on CO_2 emissions: the experience of countries along Belt and Road. *Telematics Informatics*, 45(2019), 101300. https://doi.org/10.1016/j.tele.2019.101300

Dunne, D. (2018). Tourism responsible for 8% of global greenhouse gas emissions, study finds. https://www.carbonbrief.org/tourism-responsible-for-8-of-global-greenhouse-gas-emissions-study-finds/

Dunteman, G.H. (1989). *Principal Components Analysis*. Sage Publications, Inc.: California.

Dzinduwa, S. (2022). Top 10 most visited countries in Africa, 2022. *The African Exponent*, 24 April. https://www.africanexponent.com/post/18045-top-10-most-visited-countries-in-africa-2022

Gillwald, A., Mothobi, O., & Rademan, B. (2018). State of ICT in South Africa. Research ICT Africa. https://researchictafrica.net/wp/wp-content/uploads/2018/10/after-access-south-africa-state-of-ict-2017-south-africa-report_04.pdf

Gritta, F., & Calabrese, M. (2023). Internet use in small tourism in Italy: what will be the role of local government? *Transforming Government: People, Process and Policy*, 17(4), 632-654.

Hernández, R.C.V., Hernandez, J.G.L., Villanueva, A.F., & Ortega, V.A. (2020). Impact of ICT to improve of the manufacturing in a SME biomedical of Mexicali, Mexico. https://www.intechopen.com/chapters/73233

Irfan, M., Ullah, S., Razzaq, A., Cai, J., & Adebayo, T.S. (2023). Unleashing the dynamic impact of tourism industry on energy consumption, economic output, and environmental quality in China: A way forward towards environmental sustainability. *Journal of Cleaner Production*, 387, 135778. https://doi.org/10.1016/j.jclepro.2022.135778

Khan, Y.H., & Hossain, A. (2018). The effects of ICT application on the tourism and hospitality industries in London. *SocioEconomic Challenges*, 2(4), 60-68.

Koçak, E., Ulucak, R., & Ulucak, Z.S. (2020). The impact of tourism development on CO_2 emissions: an advanced panel data estimation. *Tourism Management Perspectives*, 33(2020), 100611. https://doi.org/10.1016/j.tmp.2019.100611

Kumar, N., & Kumar, R.R. (2020). Relationship between ICT and international tourism demand: A study of major tourist destinations. *Tourism Economics*, 26(6), 908–925.

Kumar, R.R. (2013). Exploring the role of technology, tourism and financial development: an empirical study of Vietnam. *Qual Quant*, 48, 2881-2898. https://doi.org10.1007/s11135-013-9930-5

Kwakwa, P.A., Adjei-Mantey, K., & Adusah-Poku, F. (2023). The effect of transport services and ICTs on carbon dioxide emissions in South Africa. *Environ Sci Pollut Res*, 30, 10457–10468. https://doi.org/10.1007/s11356-022-22863-7

Lee, C.C., Chen, M.P., Wu, W., & Xing, W. (2021). The impacts of ICTs on tourism development: International evidence based on a panel quantile approach. *Information Technology & Tourism*, 23, 509–547. https://doi.org/10.1007/s40558-021-00215-4

Lefophane, M.H., & Kalaba, M. (2020). Estimating effects of information and communication technology (ICT) on the productivity of manufacturing industries in South Africa. *African Journal of Science, Technology, Innovation and Development*, 12(7), 813-830. https://doi.org/10.1080/20421338.2020.1714175

Lenzen, M., Sun, Y.Y., Faturay, F., Ting, Y.P., Geschke, A., & Malik, A. (2018). The carbon footprint of global tourism. *Nature Climate Change*, 8, 522–528. https://doi.org/10.1038/s41558-018-0141-x

Liu, G., & Wan, S. (2023). The impact of information and communication technology on carbon emissions in China: spatial effect and mechanism discussion. *The Environmental Science and Pollution Research*, 30, 16178–16194. https://doi.org/10.1007/s11356-022-23201-7 Malmodin, J., Lövehagen, N., Bergmark. P., & Lundén, D. (2023). ICT sector electricity consumption and greenhouse gas emissions – 2020 outcome. https://dx.doi.org/10.2139/ssrn.4424264

Malmodin, J., Moberg, A., Lunden, D., Finnveden, G., & Lövehagen, N. (2010). Greenhouse gas emissions and operational electricity use in the ICT and entertainment & media sectors. *Journal of Industrial Ecology*, 14(5), 770-790.

Melson, C. (2022). IT sustainability think tank: The role of ICT in delivering net-zero and energy efficiency. Computer Weekly.com. https://www.computerweekly.com/opinion/IT-Sustainability-Think-Tank-The-role-of-ICT-in-delivering-net-zero-and-energy-efficiency

Nagaj, R., & Žuromskaitė, B. (2021). Tourism in the era of Covid-19 and its impact on the environment. *Energies*, 21, 14(7), 2000. https://doi.org/10.3390/en14072000

Nikoli, G., & Lazakidou, A. (2019). The impact of information and communication technology on the tourism sector. *Journal of Tourism, Culture and Territorial Development*, 45-68. https://doi.org/10.6092/issn.2036-5195/8553

Obiero, G.M. (2022). 10 most visited countries in Africa. *Tuko*, 28 November. https://www.tuko.co.ke/338065-10-visited-countries-africa.html

Osorio, P., Cadarso, M., Tobarra, M., & García-Alaminos, A. (2023). Carbon footprint of tourism in Spain: Covid-19 impact and a look forward to recovery. *Struct Chang Econ Dyn*, 65, 303–318. https://doi.org/10.1016/j.strueco.2023.03.003

Pariona, A. (2022). The most visited countries in Africa. World Atlas. https://www.worldatlas.com/articles/the-most-visited-countries-in-africa.html

Park, Y., Meng, F., & Baloch, M.A. (2018). The effect of ICT, financial development, growth, and trade openness on CO_2 emissions: an empirical analysis. *Environmental Science and Pollution Research*, 25, 30708-30719. https://doi.org/10.1007/s11356-018-3108-6

Perch-Nielsen, S., Sesartic, A., & Stucki, M. (2010). The greenhouse gas intensity of the tourism sector: the case of Switzerland. *Environmental Science & Policy*, 13, 131-140. https://doi.org/10.1016/j.envsci.2009.12.002

Pesaran, M.H., Shin, Y., & Smith, R.J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(1), 289-326.

Pesaran, M.H., & Shin, Y. (1995). An Autoregressive Distributed Lag modelling approach to cointegration analysis. *DAE Working Paper*, No. 9514, Department of Applied Economics, University of Cambridge. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.153.3246&rep=rep1&type=pdf

Rehman, I.A., Svobodova, L., Akbar, A., Shah, M.H., Zeeshan, M., & Rehman, M.A. (2022). Investigating relationships between tourism, economic growth, and CO_2 emission in Brazil: an application of the nonlinear ARDL approach. *Frontiers in Environmental Science*, 10(843906), 1-10. https://doi.org/10.3389/fenvs.2022.843906

Repo, R., & Pesonen, J. (2022). Identifying the main service elements for customer-oriented live guided virtual tours. In J. L. Stienmetz, B. Ferrer-Rosell, & D. Massimo (Eds) *Information and Communication Technologies in Tourism 2022*. ENTER 2022. Springer, Cham. https://doi.org/10.1007/978-3-030-94751-4_19

Roy, B., & Ahmed, S. (2019). Role of information and communication technology (ICT) in tourism industry: an empirical study in Bangladesh. *Journal of Business Studies*, XL (2), 93-110. https://fbs-du.com/news_event/9315977308506.%20%20Biplab%20Roy%20&%20Saud%20Ahmed.pdf

Sardar, S., Hossain, E., Kamruzzaman, M., & Ray, R. (2021). ICT application in tourism and hospitality industry of Bangladesh: a research review. *IJRDO – Journal of Business Management*, 7(6), 64-74. https://doi.org/10.53555/bm.v7i6.4404

Sharma, M., Mohapatra, G., & Giri, A.K. (2022). Assessing the role of ICT, governance, and infrastructure on inbound tourism demand in India. *Journal of Economic and Administrative Sciences*. https://doi.org/10.1108/JEAS-03-2022-0064

Sharma, S., & Ghoshal, S.K. (2015). Hydrogen the future transportation fuel: from production to applications. *Renewable and Sustainable Energy Reviews*, 43, 1151-1158. https://doi.org/10.1016/j.rser.2014.11.093

Simpson, J.M., & Dunlap, R.E., & Fullerton, A.S. (2019). The Treadmill of Information: Development of the Information Society and Carbon Dioxide Emissions. *Sociology of Development*, 5(4), 381-409. https://doi.org/10.1525/sod.2019.5.4.381

South African Tourism. (2019). Tourism performance report. https://live.southafrica.net/media/276660/tourism-perfomance-report-2019_v12062020.pdf?downloadId=333390

Su, C., Xie, Y., Shahab, S., Faisal, C.M.N., Hafeez, M., & Qamri, G.M. (2021). Towards achieving sustainable development: role of technology innovation, technology adoption and CO_2 emission for BRICS. *International Journal of Environmental Research and Public Health*, 18(277), 1-13.

Sustainable Travel International. (2020). Carbon footprint of tourism. https://sustainabletravel.org/issues/carbon-footprint-tourism/

Tang, Z., Shang, J., Shi, C., Liu, Z., & Bi, K. (2014). Decoupling indicators of CO_2 emissions from the tourism industry in China: 1990 – 2012. *Ecological Indicators*, 46, 390-397. https://doi.org/10.1016/j.ecolind.2014.06.041

Trivedi, U.B., Kumar, M., & Sharma, S.K. (2018). Role of ICT in tourism. *Journal of Emerging Technologies and Innovative Research (JETIR)*, 5(8), 897-901.

Unger, R., Abegg, B., Mailer, M., & Stampft, P. (2016). Energy consumption and greenhouse gas emissions resulting from tourism travel in an Alpine setting. *Mountain Research and Development*, 36(4), 475-483. https://doi.org/10.1659/MRD-JOURNAL-D-16-00058.1

UN World Tourism Organisation. (2019). Transport-related CO2 emissions of the tourism sector. https://www.e-unwto.org/doi/book/10.18111/9789284416660

Wagaw, M., & Mulugeta, F. (2018). Integration of ICT and tourism for improved promotion of tourist attractions in Ethiopia. *Applied Informatics*, 5(6), 1-12. https://doi.org/10.1186/s40535-018-0053-x.

Wei, Y., & Liu, Q. (2023). How does the travel and tourism industry contribute to sustainable resource management? The moderating role of ICT in highly resource-consuming countries. *Resources Policy*, 82(2023), 103536. https://doi.org/10.1016/j.resourpol.2023.103536

Wen, Y., Shabbir, M.S., Haseeb, M., Kamal, M., Anwar, A., Khan, M.F., & Malik, S. (2022). The dynamic effect of information and communication technology and renewable energy on CO2 emission: Fresh evidence from panel quantile regression. *Front. Environ. Sci*. 10:953035. https://doi.org/10.3389/fenvs.2022.953035

World Meteorological Organisation (2022). More bad news for the planet: greenhouse gas levels hit new highs. https://public.wmo.int/en/media/press-release/more-bad-news-planet-greenhouse-gas-levels-hit-new-highs

World Travel & Tourism Council. (2022). Economic impact research. https://wttc.org/research/economic-impact#:~:text=In%202022%2C%20the%20Travel%20%26%20Tourism,and%20only%2011.4%25%20below%202019.

World Tourism Organisation. (2003). Climate change and tourism. Proceedings of the 1st International Conference on Climate Change and Tourism. Djerba, Tunisia, 9 – 11 April 2003.

Yu-guo, T., & Zhen-fang, H. (2014). Review of accounting for carbon dioxide emissions for tourism at different spatial scales. *Acta Ecological Sinica*, 34(2014), 246-254. https://doi.org/10.1016/j.chnaes.2014.03.00

Zafar, S.Z., Zhilin, Q., Mabrouk, F., Ramirez-Asis, E., Alzoubi, H.M., Hishan, S.S., & Mivumbi, M. (2023). Empirical linkages between ICT, tourism, and trade towards sustainable environment: evidence from BRICS countries. *Economic Research-Ekonomska Istraživanja*, 36(2), 2127417 https://doi.org/10.1080/1331677X.2022.2127417

Article history: Received: 15.09.2023 Revised: 02.11.2023 Accepted: 30.11.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1663-1675
DOI 10.30892/gtg.514 spl08-1163

FACTORS AFFECTING THE DECISION OF SELECTING A DESTINATION FOR INTERNATIONAL TOURISTS AT THE HOI AN WORLD CULTURAL HERITAGE SITE

Toan Duc LE
Socio-Economic Research Institute, Duy Tan University, Da Nang City, Vietnam, e-mail: leductoan2002@duytan.edu.vn

Tuan Anh LE*
Faculty of Accounting, Duy Tan University, Da Nang City, Vietnam, e-mail: latuan0507@gmail.com

Phu Huu NGUYEN
Faculty of Accounting, Vice Provost, Duy Tan University, Da Nang City, Vietnam, e-mail: nhphunq@duytan.edu.vn

Yen Thi Phi HO
Faculty of Accounting, Duy Tan University, Da Nang City, Vietnam, e-mail: hothiphiyen@gmail.com

Bao Hoai Phuoc LE
Faculty of Finance, Danang University of Economics, e-mail: lephuochoaibao@gmail.com

Citation: Le, T.D., Le, T.A., Nguyen, P.H., Ho, Y.T.P., & Le, B.H.P. (2023). FACTORS AFFECTING THE DECISION OF SELECTING A DESTINATION FOR INTERNATIONAL TOURISTS AT THE HOI AN WORLD CULTURAL HERITAGE SITE. *GeoJournal of Tourism and Geosites*, 51(4spl), 1663–1675. https://doi.org/10.30892/gtg.514spl08-1163

Abstract: The paper aims to study the factors affecting the decision of international tourists to choose a tourism destination at Hoi An World Cultural Heritage Site. Based on the theory of intended behavior integrates new factors: Tourism products; Destination image; and Perceived risk. The research results show that: Using the Theory of Intended Behavior (TPB) with integration with 03 new components in the study of destination choice decisions of international visitors at the Hoi An World Cultural Heritage Site is appropriate; The model achieves composite reliability, discriminant, and extracted variance. The empirical model reached a high level of explaining the variation of variance and the predictive power reached a medium level; Two intermediate structures have been identified in the model, namely Attitude and Destination Image; Affirming the importance of structures has a strong influence on the decision structure of tourist destination selection, namely, perceived risk, social influence, image, and tourism product.

Key words: decision of selecting the destination of international tourists, intermediator variable, important performance map analysis

* * * * * *

INTRODUCTION

Consumer behavior is the specific behavior of an individual when making decisions to purchase, use, and dispose of a product or service (Kotler and Armstrong, 2010). Consumer behavior is related to products, services, activities, and ideas, but has a broader meaning than a person buying physical products such as motorbikes, televisions, instant noodles, etc. It also includes the purchase of services, travel, medical treatment, implementation of other activities and ideas such as going to the park, participating in a fitness class, doing charity work, protecting the environment. Fishbein and Ajzen (1977) showed that behavioral intention is considered to be the best predictor of behavior, which is well established in the consumer research literature (Im et al., 2011; Martins et al., 2014; Farzin et al., 2023). Studies on the relationship between behavioral intention and actual usage have been carried out in the field of travel, online travel purchasing behavior, mobile banking, online banking, and service usage mobile service (Arenas-Gaitán et al., 2015; Baptista and Oliveira, 2015; Escobar-Rodríguez and Carvajal-Trujillo, 2014; Ruiz Mafe et al., 2010; Ramírez-Correa et al., 2019). Choosing a tourist destination is a very important decision process not only for tourists but also for the destination as a whole. Around the world, studies show that there are many factors influencing the choice of destination (Guillet et al., 2011; Zhu, 2022). To improve destination competitiveness, and tourist satisfaction and attract more and more tourists, local managers and tourism business organizations need to understand the influencing factors, the process of decide and decide on the destination of tourists to have orientation, infrastructure investment solutions, development of new products, improve service quality to attract tourists.

Hoi An is a tourist city, an ideal destination for international and domestic tourists. Hoi An is famous for its Ancient Town which was recognized by UNESCO as a World Cultural Heritage on December 4, 1999, and Cu Lao Cham World Biosphere Reserve recognized by UNESCO on May 29, 2009. Visitors Hoi An arrivals in 2018 reached more than 5 million arrivals, an increase of 53.6% compared to 2017. International visitors accounted for 74.8% of the total arrivals. In 2019, the number of visitors to Hoi An reached 5.35 million, an increase of nearly 6% compared to 2018. Hoi An tourism

* Corresponding author

continues to be voted for and won many prestigious international awards such as "The most wonderful city in the World", "Asia's leading cultural city destination in 2019", and "Hoi An, the most attractive city in the World". In the years 2020-2022, due to the impact of the COVID-19 pandemic, the number of visitors decreased quite large, only 7-15% compared to 2019.

The paper studies factors affecting the decision to select a destination for international tourists at the Hoi An World Cultural Heritage Site for the following reasons:

-In the world, there are many theories of behavioral intention and these theories have been applied to empirical research in the field of tourism, however, in Vietnam, so far, there are no research topics. on the factors affecting the intention to choose a tourist destination for international tourists, especially in Destination Hoi An.

-There are no studies, or empirical evaluations on the suitability of theoretical models of behavioral intention to choose tourist destinations in the context of Hoi An World Cultural Heritage Destination.

-The number of international visitors to Hoi An is not much, compared to the destinations of Thailand and Malaysia, the number of international visitors to Hoi An is still low.

-The length of stay of tourists in Hoi An is still low (2.2 - 2.5 days per trip). In Hoi An Site, the types and products of tourism, facilities are still limited, tourism products and services are still affected by seasonality, etc.

And this paper aims to study the factors affecting the decision to choose Hoi An as the destination for international tourists and to propose recommendations for the development of tourism. products, investing destinations to satisfy international tourists and attract tourists to Hoi An.

LITERATURE REVIEW AND HYPOTHESES

Theoretical basis

There were the theoretical models of human behavior as a theory of reasoned action (Ajzen, 2020); Technology Acceptance Theory (Davis, 1989; Ulker-Demirel and Ciftci, 2020), and Theory of Planned Behaviour (Ajzen, 1991; Japutra et al., 2019). These models represent the decision-making steps from perception to the final choice decision, consumer behavior of tourists is the process of finding answers to related questions on your own related to destination choice such as: What factors influence to a decision to select a tourism destination or for actual behavior? Value characteristics of each destination? What factors have the strongest influence on the decision to choose a destination? The importance of each factor in formatting the decision to choose a tourist destination?

-The Theory of Reasoned Action (TRA): TRA argues that individuals evaluate the consequences of a particular behavior and generate an intention to act by their assessment. More specifically, the TRA states that individuals' behavior can be predicted from their intentions, which can be predicted from their attitudes and subjective norms. After the prediction sequence goes further, attitudes can be predicted from an individual's beliefs about the consequences of a behavior. One particularly useful aspect of TRA from a technology perspective is its assertion that any other factors influencing behavior do so only indirectly through the attitudinal component and subjective norms. Therefore, TRA is quite appropriate in the context of predicting behavior using multimedia technology (Hasan, 2020). However, the TRA has the limitation that it doesn't specify which particular beliefs would be appropriate in particular situations.

-Technology Acceptance Model (TAM): TAM was developed by Davis (1989). According to Davis' research, two important factors influence their decision about how and when they will use it those are Perceived usefulness (PU) and Perceived ease of use (PEoU). TAM is the most widely applied model in research on the use of technological products and services, especially in the field of E-banking. The drawback of TAM is it focuses only on the determinants of intention and does not tell us how such perceptions are formed or how they can be manipulated to foster user acceptance and increased usage (Sagnier et al., 2020).

-The Theory of Planned Behavior (TPB): TPB (Ajzen, 1991, Bosnjak et al., 2020) developed from TRA (Ajzen and Fishbein, 1975), assumes that a behavior can be predicted or explained by behavioral tendencies to perform that behavior. The TPB suggests that in addition to determinants of behavioral attitude and subjective norm, a third element, perceived behavioral control (PBC), also influences behavioral intentions and actual behavior. The TPB model is considered to be more optimal than the TAM model in predicting and explaining consumer behavior in the same research content and context (Bhinekawati et al., 2020).

-Unified theory of technology adoption and use: Venkatesh et al. (2012) established the Unified Theory of Acceptance and Use of Technology (UTAUT). This model is a combination of some components of 8 previous theories/models to establish a common point of view for studying user acceptance of new information systems. UTAUT includes constructs such as Performance Expectancy; Effort Expectancy, Social Influence; Facilitating Conditions; Hedonic Motivation; Price Value; Habit, and moderator variables such as Age; Gender; Experience. There are also other experimental studies such as Jalilvand and Samiei (2012); Mohaidin et al. (2017); Viet (2019); Perera and Vlosky (2017); Seyidov and Adomaitiene (2016); Venkatesh (2022).

Hypotheses and proposed research model

Based on the background theories and empirical studies on behavioral intention, the article proposes the following hypotheses:

-Tourism products: Jeffries (1971) showed that tourism product is a problem that needs to be met when tourists make a trip out of their place of residence. Le et al. (2023) argued that tourism products are means to satisfy the needs of tourists. What do tourists consume and use during the trip? Marketing theories have focused on this issue as early as the 1970s through discussions and seminars. Perera and Vlosky (2013) proposed an ecotourism model based on the Theory of Intentional Behavior, which combined two new constructs, namely knowledge and satisfaction when planning to predict

ecotourism behavioral intentions. Research results of Perera and Vlosky (2017) have shown that knowledge structures, attitudes, social influence, and cognitive behavioral control are important precursors to forming behavioral intentions to participate in tourism. eco-history, and satisfaction constructs act as mediating structures in these relationships. The study of Perera and Vlosky (2017) has supplemented the research model components and contributed to the development of the theory of consumer behavior in the field of tourism.

H1a: Tourism products have a positive influence on tourism destination image

H1b: Tourism products have a positive influence on tourists' attitudes

-Attitude towards destination: Attitude towards a destination or a tourist product or service is described as psychological tendencies, expressing positive or negative evaluations of tourists when performing a certain behavior (Ajzen, 1991). Therefore, attitude is considered as the environment that shapes behavior, directs consumers' interest in products and services, or is the attitude that orients visitors to a particular destination with its unique characteristics. to satisfy the needs that tourists think the destination can bring to them. This explains why tourists will choose a certain destination instead of choosing another destination for their travel trip. According to TPB (Ajzen, 1991), behavioral intention is influenced by the visitor's attitude, subjective standards, and other controlling mood factors. If tourists show a preference for the destination, more likely they are to choose the destination (Ajzen, 2020). Studies also demonstrate that attitudes influence the grouping of potential destinations that will commit to choosing and guide the choice of the final destination (Um and Crompton, 1990; Lee et al., 2007; Aksöz and Çay, 2022). So hypothetical proposal:

H2: A tourist's attitude has a positive influence on the intention to choose a tourist destination

-Social influence: Social influence is defined as the degree to which an individual perceives that significant others believe he/she should use the new system. Social influences that are integrated from other similar architectures are: Subjective Norms (derived from the TRA, TAM2, TPB/DTPB, and C-TAM-TPB models)

H3: Social influence (subjective norm) has a positive influence on the intention to choose a tourist destination

Perceived Behavioral Control: Perceived behavioral control is the control that users perceive to be able to limit their behavior (Ajzen, 1991). For example, can I apply for a credit card and what are the requirements? Can I travel abroad and what are the requirements like finance, time, and health?

H4: Perceived behavioral control has a positive effect on the intention to choose a tourist destination

Destination image: Hunt (1975) suggested that images are formed by potential tourists' perceptions of factors such as climate, people, and culture that affect the attractiveness of a destination. Destination image is people's impression of a place where they do not reside (Bojanic, 1991), or destination image is the sum of beliefs, ideas, and impressions that a person has towards a destination (Crompton, 1979; Chaieb and Chaieb, 2023).

Image is a complex concept and has important value in understanding tourist behavior, and there have been many studies on the influence of destination image such as:

- Impact on behavioral intention and destination choice decision-making (Baloglu, 1997; Chon, 1990; Echtner and Ritchie, 1991; Sirakaya et al., 2001; Pike, 2002; Chen and Tsai, 2007; Chi and Qu, 2008; Lopes, 2011; Yen et al., 2021).

-Has a significant impact on post-decision behaviors including participation (on-site experience), assessment (satisfaction), and future behavioral intentions (revisit intention and ready to recommend) (Mansfeld, 1992; Bigne et al., 2001; Lee and Tideswell, 2005; Chen and Tsai, 2007; Chi and Qu, 2008).

Therefore, the researcher put forward the following hypotheses:

H5a: Destination image has a positive influence on the intention to choose a tourist destination

H5b: Destination image has a positive influence on travel behavior

Effect of perceived risk on destination: Perceived risk is defined as the customer's perception of an unstable, unsafe situation (Bauer, 1960). The issue of guest risk perception can have a significant influence on customer behavior (Mitchell, 1999; Paker and Gök, 2021). They prefer to minimize risk rather than encounter problems, and this is especially important when choosing a new product or choosing a tourist destination. Furthermore, they try to reduce the risk associated with a particular decision or behavior. In recent years, terrorism has increased and geopolitical conflicts have been occurring in many regions such as West Asia, the Middle East, Ukraine, etc., and the COVID-19 pandemic has had a great impact. affects the activities of individuals, businesses, and governments, and has a strong impact on financial markets and tourism around the world. Therefore, the following hypotheses are suggested:

H6a: Perceived risk has a positive influence on the intention to choose a tourist destination

H6b: Perceived risk has a positive effect on travel behavior

Intention to choose the destination: Ajzen and Fishbein (1975) showed that behavioral intention is considered to be the best predictor of behavior, which is well established in the consumer research literature (Im et al., 2011; Martins et al., 2014; Khan et al., 2022). Studies on the relationship between behavioral intention and actual usage have been carried out in the field of travel, online travel purchasing behavior, mobile banking, online banking, and service usage mobile service (Baptista and Oliveira, 2015; Ruiz Mafe et al., 2010). Therefore, we hypothesize:

H7: Intention to choose a tourist destination has a positive influence on travel behavior

Actual behavior: According to the theory of intended behavior (TPB), both attitudes towards the behavior and subjective norms are direct determinants of intention to perform a behavior. Based on certain beliefs, a person forms an attitude towards some object, based on which a person forms an intention about how to behave towards that object. Behavioral intention is the sole determinant of actual behavior (Davis, 1989; Ajzen, 1991).

With the hypotheses mentioned above, the article proposes a research model based on the TPB model that integrates new structures, which are: Tourism products; Destination image, and Perceived risk (Figure 1).

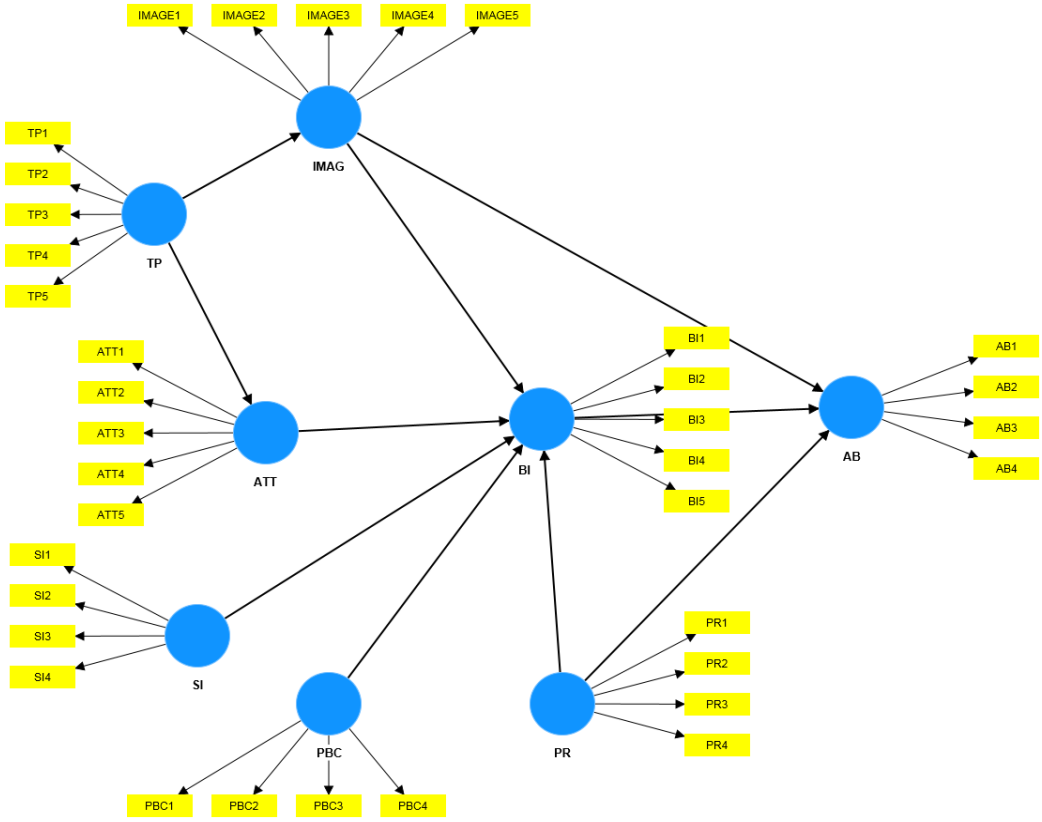


Figure 1. The proposed model

RESEARCH METHODS

Questionnaire design

The questionnaire was designed with two main parts. Part 1 is the personal information of the respondents including: Gender; Country of destination; Year old; Academic level; and Income. Part 2 includes measures that fit the research model. Details of variables are in Appendix 1. The 5-point Likert scale was used in the study (1- Strongly disagree, 5- Strongly agree).

-Destination image (IMAG) including 5 variables from IMAG1 to IMAG5 is acquired from the studies of Ramkissoon et al. (2011), Oppewal et al. (2015), Yoon and Uysal (2005), Woodside and Lysonski (1989), Beerli and Martin (2004).

-Tourism product (TP) includes 5 variables from TP1 to TP6 which are acquired from Perera and Vlosky (2017), Paul (1977), Jovičić (1988).

-Attitude (ATT) including 5 variables from ATT1 to ATT6 was acquired from Ajen (1991), Davis (1989), Jalilvand and Samiei (2012), Perera and Vlosky (2017), Mohadin et al. (2017).

-Social influence (SI) (Subjective norm) including 4 variables from SI1 to SI5 was obtained from Ajzen and Fishbein (1975), Davis (1989), Cheng et al. (2006); Nasri and Charfeddine, (2012); Yadav et al. (2015).

- Perceived behavioral control (PBC) including 4 variables from PBC1 to PBC4 was acquired from Ajzen (1991), Cheng et al. (2006); Nasri and Charfeddine (2012).

- Risk perception (PR) including 4 variables from PR1 to PR4 was acquired from Venkatesh et al. (2012).

-Intention to choose a tourist destination (BI) includes 5 variables from BI1 to BI5 which are learned from Ajzen and Fishbein (1975); Ajzen (1991); Davis (1989); Cheng et al. (2006); Yadav et al. (2015), Yoon and Uysal (2005), Ramkissoon et al. (2011);

-Actual behavior (AB) including 4 variables from AB1 to AB5 is learned from Ajzen (1991), Davis (1989), Ajzen and Fishbein (1975); Woodside and Lysonski (1989);

Preliminary survey and adjustment of the questionnaire

After designing the survey, conducting a preliminary survey by directly contacting 10 international tourists visiting Hoi An during September and October 2022 and receiving customer feedback is a questionnaire that is easy to understand, has clear information, and can reflect the intention to choose a destination. Based on the feedback, the survey has been adjusted to conduct a formal survey from February to March 2023.

Samples and data collection

The proposed model of the article has 8 structures with 36 items (indicators), so according to Hair et al. (1998) the sample size must be larger than 180. Given the survey implementation and available resources, the article surveyed 470 customers to be able to obtain a sample size larger than the minimum sample size and highly reliable research results. After receiving back 431 survey questionnaires from the survey submission, 52 questionnaires with incomplete information were reviewed and discarded. The final result obtained by the study was 379 questionnaires with satisfactory response information used for analysis. Figure 2 describes the composition of the study sample by gender, age, education level, income, and destination of international tourists.

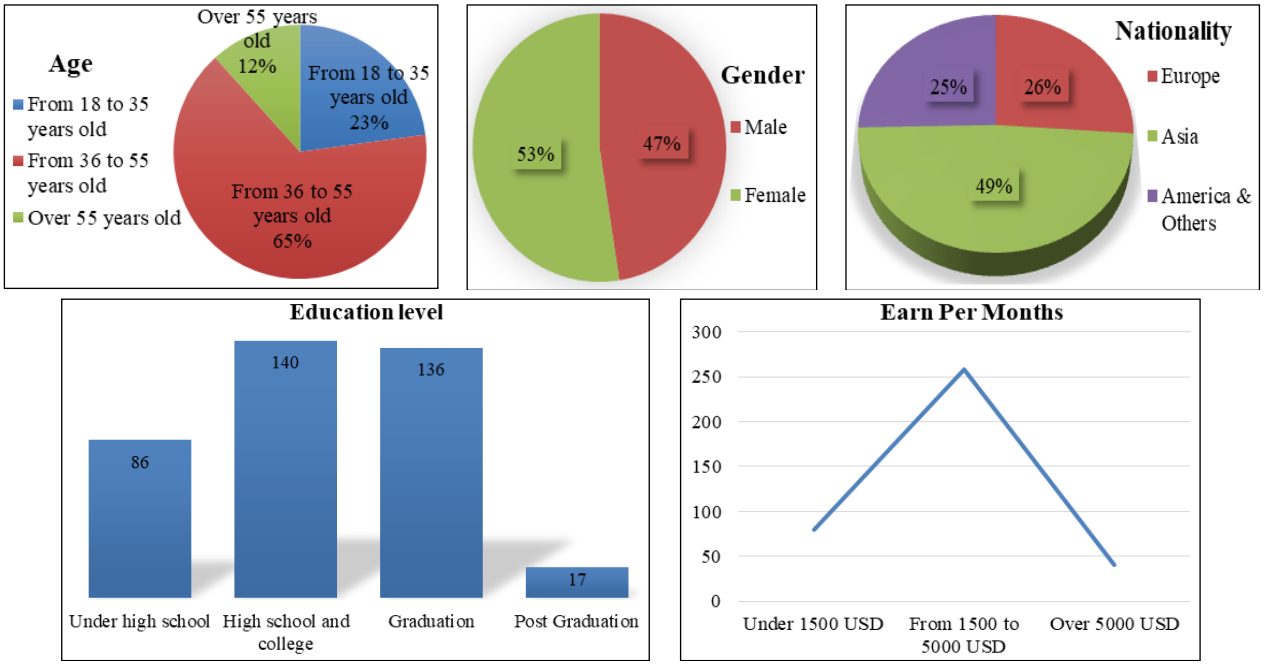


Figure 2. Description of study sample characteristics (Source: The authors collected)

RESULTS

Preliminary test of the reliability of the scale in the research model

Using statistical software SmartPLS 4 to analyze research data with a sample size of 379 international tourists. To test the reliability of the preliminary scale, the article uses the Outer Loading coefficient. The satisfactory Outer Loading value according to Hair et al. (1988) is greater than 0.7, so Table 2 has excluded indicators with a coefficient <0.7 from the processing step in PLS Model such as indicators: IMAG3, PBC3, PBC4, PR1, PR2, TP5 (Table 1)

Table 1. Outer loading (Source: Compiled by the authors)

	AB	ATT	BI	IMAG	PBC	PR	SI	TP
AB1	0.759							
AB2	0.913							
AB3	0.896							
AB4	0.817							
ATT1		0.892						
ATT2		0.783						
ATT3		0.865						
ATT4		0.803						
ATT5		0.757						
BI1			0.906					
BI2			0.873					
BI3			0.722					
BI4			0.717					
IMAG1				0.703				
IMAG2				0.741				
IMAG4				0.718				
IMAG%				0.727				
PBC1					0.932			
PBC2					0.957			
PR3						0.902		
PR4						0.891		
SI1							0.805	
SI2							0.759	
SI3							0.815	
SI4							0.782	
TP1								0.848
TP2								0.709
TP3								0.865
TP4								0.867

Evaluation of the reliability, validity, and discriminant of the structures in the PLS-SEM model

Table 2 presents the criteria to evaluate the reliability and validity of the scale, and extracted variance. According to Fornell and Larcker (1981), the extracted variance must be greater than or equal to 0.5 for the scale to have convergent validity. The magnitude of Cronbach's Alpha coefficients shows that the model satisfies the requirements (>0.7) according

to Hair et al. (2021), and the AVEs (Average variance extracted) are all larger than 0.5, so all meet the requirements of the model. Fornell and Larcker (1981) made a requirement to ensure the discriminant of the factors that the square root of the variance extracted for each factor must be greater than all the correlation coefficients between it and the other factors. Table 3 presents the results of testing the discriminant validity of the scale according to the Fornell-Larcker criteria. The results show that the square root of the extracted variance of each factor shown in bold is greater than all the correlation coefficients of that factor, the other factors are shown in the same column or row. Thus, the scale has ensured discriminant validity.

Table 2. Construct reliability and validity (Source: Compiled by the authors)

	Cronbach's alpha	Composite reliability rho_a)	Composite reliability (rho_c)	The average variance extracted (AVE)
AB	0.869	0.894	0.911	0.720
ATT	0.880	0.911	0.912	0.675
BI	0.823	0.871	0.882	0.654
IMAGE	0.750	0.783	0.813	0.521
PBC	0.881	0.914	0.943	0.893
PR	0.756	0.758	0.891	0.804
SI	0.803	0.809	0.869	0.625
TP	0.842	0.860	0.894	0.680

Table 3. Discriminant value fornell-larcker (Source: Compiled by the authors)

	AB	ATT	BI	IMAGE	PBC	PR	SI	TP
AB	**0.849**							
ATT	0.319	**0.821**						
BI	0.919	0.328	**0.809**					
IMAGE	0.614	0.162	0.534	**0.722**				
PBC	0.287	9.852	0.305	0.159	**0.945**			
PRC	0.757	0.195	0.758	0.433	0.186	**0.897**		
SI	0.545	0.249	0.547	0.353	0.272	0.431	**0.790**	
TP	0.740	0.214	0.765	0.532	0.191	0.620	0.424	**0.825**

Table 4. R-Square
(Source: Compiled by the authors)

	R-Square	R.Square Adjusted
ATT	0.046	0.043
BI	0.685	0.681
AB	0.873	0.872
IMAG	0.283	0.281

Figure 3 and Table 4 describe the results of the analysis of the linear structural model.

The coefficient of determination R^2 represents the percentage of the variance of the endogenous variable that is explained by the corresponding exogenous variables. According to Cohen (1988), the R^2 value is in the range from 2% to less than 13%, the exogenous variable has a small impact on the endogenous variable, from 13% to less than 26%, the exogenous variable has a moderate impact on the endogenous variable. endogenous and 26% or more have a large impact. In the model, the Actual Behavior (AB) structure achieves a high level of explanatory power.

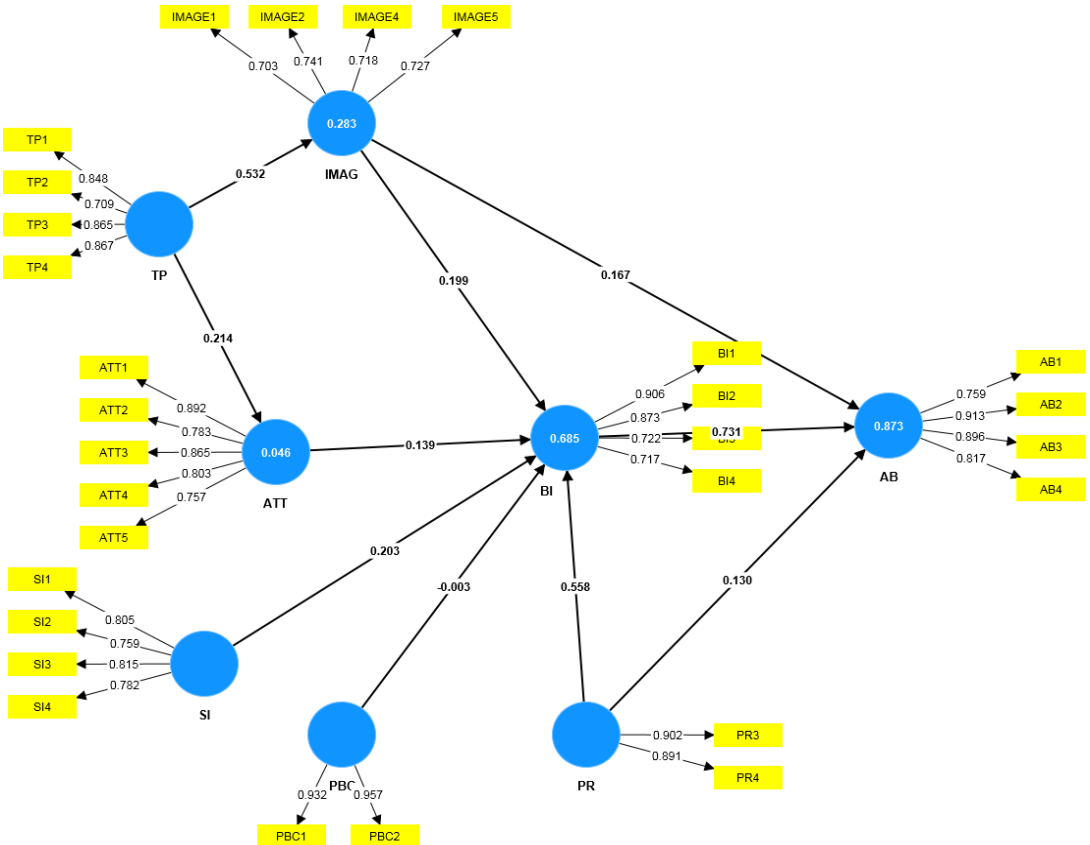


Figure 3. PLS-SEM model (Source: Compiled by the authors)

Bootstrapping test to determine the path coefficients

Hair et al. (2021) suggest that the number of subsamples generated when performing the Bootstrapping test should be 5,000. So in this study done with the number of subsamples generated is 5,000. Table 5 presents the results of Bootstrapping test with p-values to determine the statistical significance of the relationships. The p-values < 0.05, the relationships are significant. The coefficients of the original sample (O) and Sample mean (M) are both positive (Figure 4). Thus, it can be concluded: Accept the following hypotheses: (Reject hypothesis H4)

H1a: Tourism products have a positive and statistically significant influence on tourist destination image

H1b: Tourism products have a positive and statistically significant effect on tourists' attitudes

H2: Tourist attitude has a positive and statistically significant influence on the intention to choose a tourist destination.

H3: Subjective norm has a positive and statistically significant influence on intention to choose a tourist destination

H5a: Destination image has a positive and statistically significant influence on the intention to choose a tourist destination.

H5b: Destination image has a positive and statistically significant effect on travel behavior

H6a: Perceived risk has a positive and statistically significant effect on the intention to choose a tourist destination.

H6b: Perceived risk has a positive and statistically significant effect on travel behavior

H7: Intention to choose a tourist destination has a positive and statistically significant effect on actual behavior.

Table 5. Path coefficient (Source: Compiled by the authors)

	Original Sample (O)	Sample mean (M)	Standard Deviation (STDEV)	t-Statistic	P-value	Accept or Reject Hypothesis
TP → IMAG	0.532	0.537	0.035	15.142	0.000	Accept H1a
TP → ATT	0.214	0.220	0.059	3.652	0.000	Accept H1b
ATT → BI	0.139	0.145	0.059	2.353	0.019	Accept H2
SI → BI	0.203	0.204	0.056	3.628	0.000	Accept H3
PBC → BI	-0.003	-0.003	0.054	0.054	0.957	Reject H4
IMAG → BI	0.199	0.196	0.043	4.566	0.000	Accept H5a
IMAG → AB	0.167	0.168	0.027	6.236	0.000	Accept H5b
PR → BI	0.558	0.561	0.070	7.936	0.000	Accept H6a
PR → AB	0.130	0.137	0.062	2.084	0.037	Accept H6b
BI → AB	0.731	0.723	0.066	11.061	0.000	Accept H7

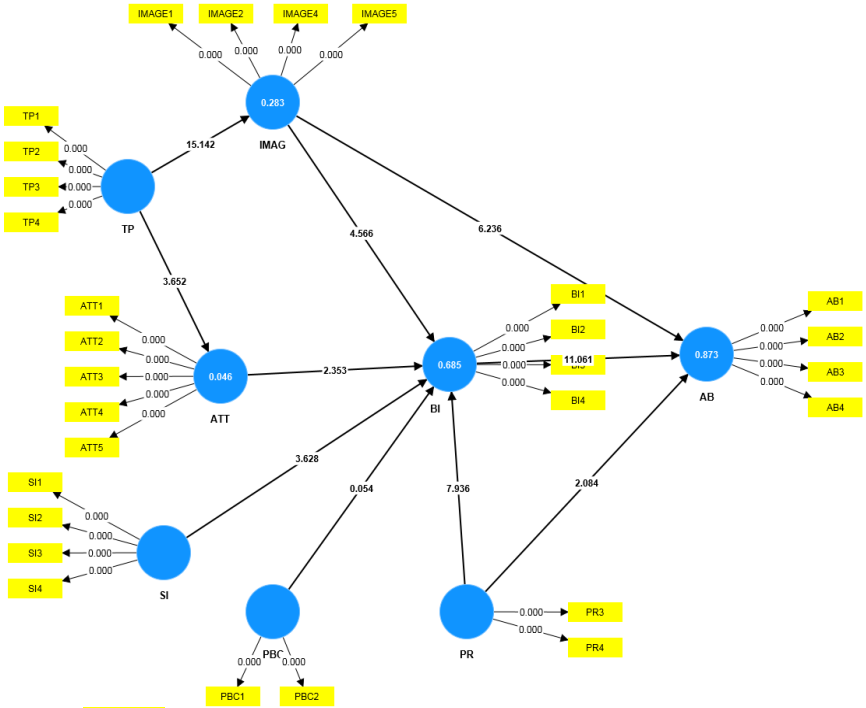


Figure 4. The results of bootstrapping (Source: Compiled by the authors)

Mediation Variable

The results from Table 6 show indirect relationships:

-TP has a positive and statistically significant indirect relationship with BI

-TP has a positive and statistically significant indirect relationship with AB

-ATT has a positive and statistically significant indirect relationship with AB

-SI has a positive and statistically significant indirect relationship with AB

-PBC has a positive and statistically significant indirect relationship with AB

-PR has a positive and statistically significant indirect relationship with AB

And: - IMAG acts as an intermediary structure in the relationship between TP and BI, between TP and AB

- ATT acts as an intermediary structure in the relationship between TP and BI, between TP and AB

Table 6. Specific indirect effects (Source: Compiled by the authors)

	Original Sample (O)	Sample mean (M)	Standard Deviation (STDEV)	t-statistic	P-value
TP → IMAG → BI	0.106	0.106	0.026	4.041	0.000
TP → IMAG → AB	0.089	0.090	0.015	6.007	0.000
TP → IMAG → BI → AB	0.077	0.077	0.021	3.656	0.000
TP → ATT → BI	0.030	0.032	0.017	1.744	0.081
TP → ATT → BI → AB	0.022	0.024	0.013	1.639	0.100
IMAG → BI → AB	0.145	0.142	0.036	4.070	0.000
PR → BI → AB	0.408	0.403	0.044	9.236	0.000
SI → BI → AB	0.149	0.149	0.048	3.067	0.002
PBC → BI → AB	-0.002	-0.009	0.039	0.054	**0.957**

Table 7. MV prediction summary for construct AB (Source: Compiled by the authors)

	Q^2 predict	PLS-SEM _RMSE	PLS-SEM _MAE	LM-RMSE	LM_ MAE
AB1	0.262	0.568	0.395	0.560	0.399
AB2	0.662	0.404	0.262	0.337	0.222
AB3	0.662	0.393	0.255	0.324	0.197
AB4	0.354	0.528	0.371	0.531	0.385

Table 8. The difference between PLS-SEM_MAE and LM_MAE of construct AB

	PLS-SEM_MAE	LM_ MAE	Difference
AB1	0.395	0.399	-0.004
AB2	0.262	0.222	0.040
AB3	0.255	0.197	0.058
AB4	0.371	0.385	-0.014

Table 9. Summary of the IPMA

	Total effects (Importance)	Performance
PR	0.558	75.827
SI	0.203	48.606
IMAG	0.199	55.442
TP	0.135	64.756
ATT	0.139	78.075
PBC	-0.003	78.824

Evaluate the predictive power of the model

The most popular metric to quantify the degree of predictive errors is the root–mean–square error (RMSE). Another popular metric is the mean absolute error (MAE). Performing MV prediction summary for structure AB (Actual Behavior), the results show that the Q^2 predict indices are all greater than 0, so the prediction errors in the symmetric distribution are high (Table 7). For more clarification and detail, it is necessary to perform a PLS-SEM MV errors histogram for the indicators of the AB structure. The results from the PLS-SEM MV errors histogram showed that the indicators AB1, AB2, AB3, and AB4 do not have a symmetrical distribution across the 0 axis. Shmueli et al. (2016) stated the basic principles in evaluating the predictive power of the model are: If errors are normally distributed, use RMSE to evaluate; If the errors are not normally distributed, use Mean Absolute Error (MAE). Since the variance of the error is variable, we cannot use PLS-SEM_RMSE nor LM_RMSE and it is necessary to check whether the errors in PLS-SEM_MAE are less than LM_MAE. Further, it is necessary to evaluate the difference between the value of PLS-SEM_MAE and LM_MAE. Based on the four principles proposed by Shmueli et al. (2019), we can conclude that the predictive power of the model is the medium level.

Important Structures Diagram Analysis (IPMA)

IPMA is used to identify the predecessors that have relatively high importance for Actual Behavior (AB) but also relatively low performance. IPMA is shown in Figure 5, in which: The x–axis depicts the (unstandardized) total effect of TP, IMAGE, ATT, SI, PBC, PR, and BI on the target construct (Actual Behavior); The y-axis represents the average rescaled (unstandardized) latent variable score of IMAGE, ATT, TP, PBC, SI, PR, BI. The results in Figure 5 and Table 9 find that the constructs PR, SI, IMAG, and TP have high importance for the Actual Behavior.

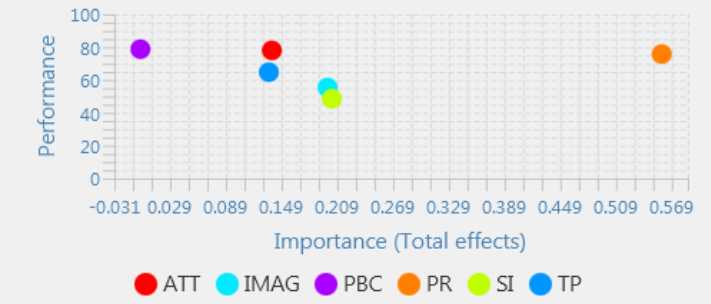


Figure 5. Importance performance map for the target construct actual behavior (Source: Compiled by the authors)

Table 10. Influence of gender (male, female) on destination choice decision (Source: Compiled by the authors)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-statistic |O|/STDEV	P-value
ATT → BI	0.139	0.146	0.059	2.359	**0.018**
BI → AB	0.724	0.715	0.067	10.832	**0.000**
Gender → AB	-0.029	-0.027	0.037	0.778	0.437
Gender x IMAG → AB	0.032	0.029	0.041	0.791	0.429
IMAG → AB	0.158	0.159	0.030	5.257	**0.000**
IMAG → BI	0.199	0.196	0.043	4.575	**0.000**
PBC → BI	-0.003	-0.012	0.054	0.049	0.961
PR → AB	0.134	0.142	0.062	2.144	**0.032**
PR → BI	0.558	0.561	0.070	7.949	**0.000**
SI → BI	0.203	0.204	0.056	3.636	**0.000**
TP → ATT	0.214	0.220	0.059	3.651	**0.000**
TP → IMAG	0.532	0.538	0.035	15.166	**0.000**

Multigroup Analysis

Consider the influence of gender (male, female) on destination choice decision: The results in Table 10 show that gender has no effect on AB (p-value=0.437), and gender interacts with IMAG and has no statistically significant effect on AB (p-value =

0.429) Multigroup analysis: The AB structure has a variable variance, so for multigroup analysis, the Welch test must be used instead of the Parametric test. The purpose is to consider and evaluate whether there is a difference between the two groups (male and female) in the destination choice decision of international tourists in Hoi An Sites. The results in Table 11 give us some conclusions as following: There is a statistically significant difference between Females and Males in the relationship BI -> AB with p-value = 0.005, the difference is -0.320; There is not a statistically significant difference between Females and Males in the relationship IMAGE -> AB with p-value =0.319; Evaluating similarly for the other relationships of the model.

Table 11. Path Coefficients - Welch – Satterthwaite test (Source: Compiled by the authors)

	Difference (female-male)	1-tailed (female vs male) p-value	2-tailed (female vs male) p-value
ATT -> BI	-0.212	1.789	0.075
BI -> AB	**-0.320**	2.817	**0.005**
IMAGE -> AB	0.051	0.998	0.319
IMAGE -> BI	**-0.171**	2.229	**0.027**
PBC -> BI	0.119	1.116	0.266
PR -> AB	**0.305**	2.774	**0.006**
PR -> BI	**0.310**	2.804	**0.006**
SI -> BI	-0.129	1.333	0.184
TP -> ATT	-0.065	0.574	0.567
TP -> IMAGE	-0.116	1.683	0.094

5. DISCUSSION AND CONCLUSIONS

To analyze the factors affecting the intention to choose a tourist destination of international visitors at World Heritage Destination Hoi An, the study used a survey sample of 379 international tourists and used SmartPLS 4 software to evaluate and test. Research results show that:

First, using the Theory of Intended Behavior (TPB) with integrating of 03 new components namely Tourism Product (TP), Destination Image (IMAG), and Risk Perception (PR) in researching the actual behavior of international tourists at the World Cultural Heritage Hoi An Site is appropriate.

Second, the model achieves composite reliability, discriminant, and extracted variance. The experimental model reached the level of explaining 87% of the variation of the variance and the predictive power of the model reached the average level.

Third, identify two intermediate structures (mediator variables) in the model, namely Attitude (ATT) and Destination Image (IMAG). IMAG acts as an intermediary structure in the relationship between TP and BI and between TP and AB. ATT acts as an intermediary structure in the relationship between TP and BI and between TP and AB.

Fourth, about direct relationships:

-Tourism product (TP) has a positive and statistically significant impact on destination image and attitude. This result is consistent with the studies of Perera and Vlosky (2017), Paul (1977), and Jovičić (1988).

-Destination image (IMAG) has a positive and statistically significant effect on destination choice intention and travel behavior. This result is consistent with the study of Perera and Vlosky (2017).

-Attitude influence (ATT) has a direct and positive impact on the intention to choose a destination. The results are consistent with Davis (1989), Ajzen (1991), Lam and Hsu, (2006).

-Social influence (SI) has a direct and positive impact on the intention to choose a destination. The results are consistent with Davis (1989), Ajzen (1991)

-Risk perception (PR) has a positive and statistically significant effect on the intention to choose a tourist destination and travel behavior. The results are consistent with Venkatesd et al. (2012), Rodríguez-Torrico et al. (2017)

-Destination intention has a positive and statistically significant impact on actual behavior. The results are consistent with Venkatesd et al. (2012), Davis (1989), Ajzen (1991), Rodríguez-Torrico et al. (2017).

Fifth, about indirect relationships:

-Tourism product (TP) has a positive and statistically significant indirect relationship with the behavioral intention and travel behavior of international visitors.

-Attitude (ATT) has a positive and statistically significant indirect relationship with travel behavior

-Social Influence (SI), Perceived Behavioral Control (PBC), and Risk Perception (PR) have a positive and statistically significant indirect relationship with travel behavior.

Sixth, the ability to explain and predict

-R. Square of the structure AB is 0.87, which shows that the research model explains 87% of the variance of the variables, achieving a fairly good level of explanation.

-The good predictive power of the research model is average

Seventh, the importance of each component (structure) affects the destination choice decision of international tourists. Research results show that there are 3 important influential structures ranked from high to low, which are: Perceived risk; Social Influence, Image, and Tourism Products.

Based on the research results, the paper proposes policy implications and governance implications to attract international visitors, exploit the potentials and advantages of the locality, and enhance the competitiveness of tourist destinations, contributing to realizing the economic restructuring goal in the coming years of Hoi An City.

Policy implications

To develop tourism products and services, create a good image for tourists, and improve the competitiveness of Hoi An

destination, to attract more international tourists, some policy implications for Quang Nam province and city government. Hoi An is as follows:

-First, carry out the socio-economic master plan and the spatial planning of the tourism territory of Hoi An city until 2035, with a vision to 2045, in which:

+ Need to complete tourism environment and infrastructure; especially, there must be a break through tourism product, refer to the tourism practices of the world's major tourist centers, and transform the mindset of turning tourism into a spearhead economic sector of the province and the locality.

During the planning process, attention should be paid to connecting with the East-West economic corridor, both creating a development space for Hoi An, Quang Nam province, and connecting with Laos, Thailand, and the ASEAN region.

+ Planning on city land use, focusing on forming new destinations, eco-tourism areas, high-tech agricultural zones, commercial and shopping areas, public parking lots, bungalow areas, coastal sports areas, etc. to attract domestic and foreign businesses to invest in developing new tourist attractions and products and services; at the same time, resolutely handle suspended projects, projects behind schedule, problems caused by inspection and examination results.

+ Proposing to the Government to develop a project to develop 1-2 world-class entertainment zones in Hoi An

-Secondly, Implement Co Co River Project, spatial planning for riverside development, dredging to clear Co Co flow, developing complexes, riverside eco-tourism areas interspersed with other areas. urban, new residential area

+ Completing bridges and roads connecting tourist areas and urban areas.

+ Allocating funds and contractors to execute the project of dredging, emergency flood drainage, and combating saltwater intrusion of the Co Co River through Quang Nam.

+ Detailed planning of 1/500 scale along the Co Co River through Quang Nam territory to call for investment and development of complexes, riverside eco-tourism areas interspersed with fish.

Management Implications

Hoi An Ancient Town is ranked second by Tripadvisor in the list of 25 emerging destinations in the world. The website rates Hoi An, a city on the south-central coast of Vietnam, as "a well-preserved model of an important trading port city in Southeast Asia from the 15th century to the 19th century." 19th century".

Hoi An is a popular destination for foreign tourists, and its popularity is also increasing among tourists in general. Topping the list this year is Cuba, an island that offers a great opportunity to experience cultural differences. Havana is a blend of old architecture and modern culture. Leaving the capital city, visitors can visit the small town of Trinidad to admire many Spanish-style architecture. This is a UNESCO World Heritage Site and is a great starting point for a visit to the Sugar Mills Valley, the land that was once the center of the sugar industry in Cuba. In addition, in this year's list of emerging world destinations, there are many other interesting names such as Mauritius - Africa, Siem Reap - Cambodia, Chiang Mai - Thailand, Grand Cayman - Cayman Islands, Fes - Morocco, Baku - Azerbaijan, Kathmandu - Nepal…

Developping the night economy at Hoi An Site and catamaran sailing services on the Cua Dai Sea, Hoi An City. Currently, when tourists come to Hoi An, besides participating in traditional activities such as walking to visit the old town, cycling, and swimming, they tend to look for modern and new fun and entertainment activities. which extends the stay in the locality areas. It is necessary to develop services such as purchasing on night, extreme off-road racing, catamaran sailing, kayaking, and sidecars that will contribute to creating new, unique, and safe tourism products for visitors, thereby further enhancing the image of tourists. of Hoi An destination in the eyes of Vietnamese and international tourists

Author Contributions: Conceptualization, Le, T.D. and Le, T.A; methodology, Le, T.A. and Nguyen, H.P.; software, Nguyen, H.P and Ho, T.P.Y.; validation, Ho, V.T. and Le, P.H.B.; formal analysis, Le, T.D., Le, T.A., Nguyen, H.P and Ho, T.P.Y.; investigation, Ho, T.P.Y. and Le, P.H.B.; data curation, Le, P.H.B. and Le, T.D.; writing—original draft preparation, Le, T.D., Le, T.A. and Le, P.H.B.; writing—review and editing, Le, T.A., Nguyen, H.P. and Le, P.H.B.; visualization, Le, P.H.B. and Le, T.D.; supervision, Le, T.D.; project administration, Le, T.A. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix 1. Indicators of constructs in the proposed model (Source: Compiled by the authors)

	Indicator	Variable	Resource
Tourism Products	HoiAn City is both a coastal city and a cultural heritage city	TP1	Paul (1977); Jovičić (1988); Perera and Vlosky (2017)
	Hoi An City is the tour destination ranked 7th of the World's Top 15 cities by the Travel & Leisure Magazine, and Hoi An City now still retains much of its Asian authentic architecture as well as its nostalgic ambiance; especially the old town	TP2	

	Tourists can take part in many activities such as visiting Cham Island and My Son Sanctuary, swimming, and tourists can participate in sport tourism, sightseeing, fishing, Jet-ski service, Night Yacht Service, etc.	TP3	
	HoiAn City has been developing tourism products, handicraft villages, health care tourism, agricultural tourism, and event tourism v.v...	TP4	
	HoiAn needs to diversify tourism activities, developing ecotourism products, handicraft villages, health care tourism, agricultural tourism, event tourism v.v.	TP5	
Image	The HoiAn destination has the attractive historic and cultural sites	IMAG1	Ramkissoon et al. (2011); Jalivand et al. (2012); Yoon and Uysal (2005); Beerli and Martin (2004a); Woodside and Lysonski (1989)
	It is easy to visit historical and touristic places in the HoiAn destination	IMAG2	
	The level of service quality is excellent	IMAG3	
	The residents of the HoiAn destination are friendly	IMAG4	
	Hoi An destination created many pleasured	IMAG5	
Attitude	Making the travel to HoiAn City environmentally favorable	ATT1	Jalivand et al. (2012); Ajzen (1991); Lee et al. (2007); Lam and Hsu, (2006).
	Traveling to HoiAn City is interesting	ATT2	
	Traveling to HoiAn City is enjoyable	ATT3	
	Traveling to HoiAn City is educational	ATT4	
	The city is backpacker-friendly	ATT5	
	HoiAn City has a distinguished history and heritage	ATT6	
Social Influence	The popular thinking in society is to travel to HoiAn City	SI1	Ajzen (1991); Lam and Hsu, (2006); Cheng et al. (2006); Nasri and Charfeddine (2012); Yadav et al. (2015)
	People who are important to me would like to travel to HoiAn City	SI2	
	My colleagues would think I should travel to HoiAn City	SI3	
	My family members would think I should take part in HoiAn City	SI4	
	My friends would think I should travel to HoiAn City	SI5	
Perceived Behavior Control	I have enough money when I go to travel HoiAn City	PBC1	Ajzen (1991); Cheng et al. (2006); Nasri and Charfeddine (2012)
	I have much information to select the HoiAn destination	PBC2	
	I have enough stamina to take part in tourism	PBC3	
	To participate in traveling HoiAn City, I have enough time	PBC4	
	Tôi có đủ khả năng để sử dụng dịch vụ ngân hàng điện tử	PBC5	
Perceived Risk	HoiAn destination is completely safe and secure	PR1	Mitchell, (1999); Rodríguez-Torrico et al. (2017);
	HoiAn destination is well maintained	PR2	
	HoiAn Government has efficiently implemented solutions to protect tourists and prevent Covid-19	PR3	
	It is scarce to happen risk for tourists visiting HoiAn	PR4	
Behavior Intention	HoiAn is the city that I want to travel	BI1	Cheng et al. (2006); Yadav et al. (2015); Rodríguez-Torrico et al. (2017);
	I intend to go to HoiAn City shortly	BI2	
	In the future, I intend to go to HoiAn City whenever I have a travel	BI3	
	I shall recommend the HoiAn destination to others	BI4	
Actual Behavior	Observed nature and seabeach thoroughly	AB1	Fishbein and Ajzen (1977); Ajzen (1991); Woodside and Lysonski (1989);
	Coming HoiAn City to see the Asian authentic architecture as well as its nostalgic ambiance; especially the old town	AB2	
	Helped to maintain the local environmental quality	AB3	
	I am going to revisit HoiAn City on the next day	AB4	

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, *50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, *2*(4), 314-324. https://doi.org/10.1002/hbe2.195

Ajzen, I., & Fishbein, M. (1975). A Bayesian analysis of attribution processes. *Psychological bulletin*, *82*(2), 261. https://doi.org/10.1037/h0076477

Aksöz, E.O., & Çay, G. (2022). Investigation of perceived service quality, destination image and revisit intention in museums by demographic variables. *GeoJournal of Tourism and Geosites*, *43*(3), 1138-1147. https://doi.org/10.30892/gtg.43335-929

Arenas Gaitán, J., Peral Peral, B., & Ramón Jerónimo, M. (2015). Elderly and internet banking: An application of UTAUT2. *Journal of Internet Banking and Commerce, 20 (1), 1-23.* https://idus.us.es/bitstream/handle/11441/57220/Elderly%20and%20internet%20banking.pdf?sequence=1&isAllowed=y

Baloglu, S. (1997). The relationship between destination images and sociodemographic and trip characteristics of international travellers. *Journal of vacation marketing*, *3*(3), 221-233. https://doi.org/10.1177/135676679700300304

Baptista, G., & Oliveira, T. (2015). Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior*, *50*, 418-430.https://doi.org/10.1016/j.chb.2015.04.024

Bauer, R.A. (1960). Consumer behavior as risk taking. In *Proceedings of the 43rd National Conference of the American Marketing Assocation, June 15, 16, 17, Chicago, Illinois, 1960*. American Marketing Association.

Beerli, A., & Martin, J.D. (2004). Factors influencing destination image. *Annals of tourism research*, *31*(3), 657-681. https://doi.org/10.1016/j.annals.2004.01.010

Bhinekawati, R., Nelloh, L.A.M., & Abdurahman, O. (2020). The analysis of entrepreneurial intention in rural area: A case study of bukit peramun geosite in Indonesia. *GeoJournal of Tourism and Geosites*, *28*(1), 80-94. https://doi.org/10.30892/gtg.28106-453

Bigne, J.E., Sanchez, M.I., & Sanchez, J. (2001). Tourism image, evaluation variables and after purchase behaviour: inter-relationship. *Tourism management*, *22*(6), 607-616. https://doi.org/10.1016/S0261-5177(01)00035-8

Bojanic, D.C. (1991). The use of advertising in managing destination image. *Tourism management*, *12*(4), 352-355. https://doi.org/10.1016/0261-5177(91)90047-W

Bosnjak, M., Ajzen, I., & Schmidt, P. (2020). The theory of planned behavior: Selected recent advances and applications. *Europe's Journal of Psychology*, *16*(3), 352. https://doi.org/10.5964/ejop.v16i3.3107

Chen, C.F., & Tsai, D. (2007). How destination image and evaluative factors affect behavioral intentions?. *Tourism management*, *28*(4), 1115-1122. https://doi.org/10.1016/j.tourman.2006.07.007

Cheng, T.E., Lam, D.Y., & Yeung, A.C. (2006). Adoption of internet banking: an empirical study in Hong Kong. *Decision support systems*, *42*(3), 1558-1572. https://doi.org/10.1016/j.dss.2006.01.002

Chi, C.G.Q., & Qu, H. (2008). Examining the structural relationships of destination image, tourist satisfaction and destination loyalty: An integrated approach. *Tourism management*, *29*(4), 624-636. https://doi.org/10.1016/j.tourman.2007.06.007

Chaieb, A., & Chaieb, S. (2023). The impact of the destination image and the information sources on the perception of the medical image of the country and the intention to visit it for medical purposes. *Tourism and hospitality management*, *29*(3), 381-395. https://doi.org/10.20867/thm.29.3.7

Chon, K.S. (1990). The role of destination image in tourism: A review and discussion. *The tourist review*, *45*(2), 2-9. https://doi.org/10.1108/eb058040

Cohen, J. (1988). Statistical power analysis for the behavioral sciences New York. *NY: Academic*, *54*.

Crompton, J. (1979**)**. 'Motivations for pleasure travel', *Annual of Tourism Research*, 6, 408–424. https://doi.org/10.1016/0160-7383(79)90004-5

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340. https://doi.org/10.2307/249008

Echtner, C.M., & Ritchie, J.B. (1991). The meaning and measurement of destination image. *Journal of tourism studies*, *2*(2), 2-12. https://d1wqtxts1xzle7.cloudfront.net/24746223/jcudev_012855-libre.pdf?1390868291=&response-content-disposition=inline%3B+filename%3DThe_meaning_and_measurement_of_destinati.pdf&Expires=1694228491&Signature=Cqs~0cmUDuLHE7w9oVZ2lLmDwKwM-kVmSJSr4S1z5V9Hn3bs0R6KsAmI4DNMvvYYvwdjjPzlBxO5tNUdPmaHnvhwoKBxz-cc3pbKFX-bnthAViMkF4YMBB6Hyg1r0XnXLGaPDMLp3DcRsmTo5N9cz33BO9u5arFJ7RVYtC13HR-kXVU9cv7hJGrUZEDW5flL9cpIJdWudbcL8-zBtB-nfe79qVkb6jpiidwnLhB9Ka83Srzum9-exWB6ZgthJK7Cxdcj4fYIyoKCj6Kym8MASJFflvy0QlojkLW8Xug2rMs~5B0O5yfFFC mbph4Wc0dWAaXLkeB-1syuYkXfe6QXFA__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA

Escobar-Rodríguez, T., & Carvajal-Trujillo, E. (2014). Online purchasing tickets for low cost carriers: An application of the unified theory of acceptance and use of technology (UTAUT) model. *Tourism management*, *43*, 70-88. https://doi.org/10.1016/j.tourman.2014.01.017

Farzin, I., Mamdoohi, A.R., & Ciari, F. (2023). Autonomous vehicles acceptance: A perceived risk extension of unified theory of acceptance and use of technology and diffusion of innovation, evidence from Tehran, Iran. *International Journal of Human–Computer Interaction*, *39*(13), 2663-2672. https://doi.org/10.1080/10447318.2022.2083464

Fishbein, M., & Ajzen, I. (1977). Belief, attitude, intention, and behavior: An introduction to theory and research. https://philarchive.org/archive/FISBAI

Fornell, C., & Larcker, D.F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. https://doi.org/10.1177/002224378101800313

Guillet, B.D., Lee, A., Law, R., & Leung, R. (2011). Factors affecting outbound tourists' destination choice: The case of Hong Kong. *Journal of Travel & Tourism Marketing*, *28*(5), 556-566. https://doi.org/10.1080/10548408.2011.588120

Hair, J., Anderson, R., Tatham, R., & Black, W. (1988). Multivariate Data Analysis, Engleweed Cliffs.

Hair Jr, J., Hair Jr, J.F., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications.

Hasan, A.A., Biswas, C., Roy, M., Akter, S., & Kuri, B.C. (2020). The applicability of theory of planned behaviour to predict domestic tourist behavioural intention: the case of Bangladesh. *GeoJournal of Tourism and Geosites*, *31*(3), 1019-1026. https://doi.org/10.30892/gtg.31313-536

Hunt, J.D. (1975). Image as a factor in tourism development. *Journal of travel research*, *13*(3), 1-7. https://doi.org/10.1177/004728757501300301

Im, I., Hong, S., & Kang, M.S. (2011). An international comparison of technology adoption: Testing the UTAUT model. *Information & management*, *48*(1), 1-8. https://doi.org/10.1016/j.im.2010.09.001

Jalilvand, M.R., & Samiei, N. (2012). The impact of electronic word of mouth on a tourism destination choice: Testing the theory of planned behavior (TPB). *Internet research*, *22*(5), 591-612. https://doi.org/10.1108/10662241211271563

Japutra, A., Loureiro, S.M.C., Molinillo, S., & Ekinci, Y. (2019). Travellers' mindsets and theory of planned behaviour. *Tourism Management Perspectives*, *30*, 193-196. https://doi.org/10.1016/j.tmp.2019.02.011

Jeffries, D.J. (1971). Defining the tourist product—and its importance in tourism marketing. *The Tourist Review*, *26*(1), 2-5. https://doi.org/10.1108/eb057631

Jovičić, Ž. (1988). A plea for tourismological theory and methodology. *Revue de Tourisme*, *43*(3), 2-5.

Khan, I.U., Hameed, Z., Khan, S.N., Khan, S.U., & Khan, M.T. (2022). Exploring the effects of culture on acceptance of online banking: A comparative study of Pakistan and Turkey by using the extended UTAUT model. *Journal of Internet Commerce*, *21*(2), 183-216. https://doi.org/10.1080/15332861.2021.1882749

Kotler, P., & Armstrong, G.M. (2010). *Principles of marketing*. Pearson Education India.

Lam, T., & Hsu, C.H. (2006). Predicting behavioral intention of choosing a travel destination. *Tourism management*, *27*(4), 589-599. https://doi.org/10.1016/j.tourman.2005.02.003

Le, T.D., Le, T.A., Vo, H.T., Ho, V.T., & Pham, S.X. (2023). ANTECEDENTS OF TOURISTS'LOYALTY: THE ROLE AND INFLUENCE OF TOURISM PRODUCTS, DESTINATION IMAGE IN HOIAN WORLD CULTURAL HERITAGE SITE. *GeoJournal of Tourism and Geosites*, *47*(2), 573-583. https://doi.org/10.30892/gtg.47225-1057

Lee, C.K., Yoon, Y.S., & Lee, S.K. (2007). Investigating the relationships among perceived value, satisfaction, and recommendations: The case of the Korean DMZ. *Tourism management*, *28*(1), 204-214. https://doi.org/10.1016/j.tourman.2005.12.017

Lee, S.H., & Tideswell, C. (2005). Understanding attitudes towards leisure travel and the constraints faced by senior Koreans. *Journal of Vacation Marketing*, *11*(3), 249-263. https://doi.org/10.1177/1356766705055716

Lopes, S.D.F. (2011). Destination image: Origins, developments and implications. *PASOS. Revista de Turismo y Patrimonio Cultural*, *9*(2), 305-315. https://www.pasosonline.org/Publicados/9211/PASOS24.pdf#page=89

Mansfeld, Y. (1992). From motivation to actual travel. *Annals of tourism research*, *19*(3), 399-419. https://doi.org/10.1016/0160-7383(92)90127-B

Martins, C., Oliveira, T., & Popovič, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International journal of information management*, *34*(1), 1-13. https://doi.org/10.1016/j.ijinfomgt.2013.06.002

Mitchell, V.W. (1999). Consumer perceived risk: conceptualisations and models. *European Journal of marketing*, *33*(1/2), 163-195. https://doi.org/10.1108/03090569910249229

Mohaidin, Z., Wei, K.T., & Murshid, M.A. (2017). Factors influencing the tourists' intention to select sustainable tourism destination: a case study of Penang, Malaysia. *International Journal of Tourism Cities*, *3*(4), 442-465. https://doi.org/10.1108/IJTC-11-2016-0049

Nasri, W., & Charfeddine, L. (2012). Factors affecting the adoption of Internet banking in Tunisia: An integration theory of acceptance model and theory of planned behavior. *The journal of high technology management research*, *23*(1), 1-14. https://doi.org/10.1016/j.hitech.2012.03.001

Oppewal, H., Huybers, T., & Crouch, G.I. (2015). Tourist destination and experience choice: A choice experimental analysis of decision sequence effects. *Tourism Management*, *48*, 467-476. https://doi.org/10.1016/j.tourman.2014.12.016

Paker, N., & Gök, O. (2021). The influence of perceived risks on yacht voyagers' service appraisals: evaluating customer-to-customer interaction as a risk dimension. *Journal of Travel & Tourism Marketing*, *38*(6), 582-596. https://doi.org/10.1080/10548408.2021.1969316

Perera, P., & Vlosky, R. (2013). How previous visits shape trip quality, perceived value, satisfaction, and future behavioral intentions: The case of forest-based ecotourism in Sri Lanka. *International Journal of Sport Management, Recreation & Tourism*, *11*, 1-24. https://doi.org/10.5199/ijsmart-1791-874X-11a

Perera, P., & Vlosky, R.P. (2017). Understanding Ecotourist Behavior The Case of Forest based Ecotourism in Sri Lanka. http://www.dr.lib.sjp.ac.lk/bitstream/handle/123456789/7643/Understanding%20Ecotourist%20Behavior%20The%20Case%20of%20Forest%20based%20Ecotourism%20in%20Sri%20Lanka.pdf?sequence=1&isAllowed=y

Pike, S. (2002). Destination image analysis—a review of 142 papers from 1973 to 2000. *Tourism management*, *23*(5), 541-549. https://doi.org/10.1016/S0261-5177(02)00005-5

Ramírez-Correa, P., Rondán-Cataluña, F.J., Arenas-Gaitán, J., & Martín-Velicia, F. (2019). Analysing the acceptation of online games in mobile devices: An application of UTAUT2. *Journal of Retailing and Consumer Services*, *50*, 85-93. https://doi.org/10.1016/j.jretconser.2019.04.018

Ramkissoon, H., Uysal, M., & Brown, K. (2011). Relationship between destination image and behavioral intentions of tourists to consume cultural attractions. *Journal of Hospitality Marketing & Management*, *20*(5), 575-595. https://doi.org/10.1080/19368623.2011.570648

Rodríguez-Torrico, P., Cabezudo, R.S.J., & San-Martin, S. (2017). Tell me what they are like and I will tell you where they buy. An analysis of omnichannel consumer behavior. *Computers in Human Behavior*, *68*, 465-471. https://doi.org/10.1016/j.chb.2016.11.064

Ruiz Mafe, C., Sanz Blas, S., & Fernando Tavera-Mesías, J. (2010). A comparative study of mobile messaging services acceptance to participate in television programmes. *Journal of service Management*, *21*(1), 69-102. https://doi.org/10.1108/09564231011025128

Sagnier, C., Loup-Escande, E., Lourdeaux, D., Thouvenin, I., & Valléry, G. (2020). User acceptance of virtual reality: an extended technology acceptance model. *International Journal of Human–Computer Interaction*, *36*(11), 993-1007. https://doi.org/10.1080/10447318.2019.1708612

Seyidov, J., & Adomaitienė, R. (2016). Factors influencing local tourists' decision-making on choosing a destination: a case of Azerbaijan. *Ekonomika*, *95*(3), 112-127. https://doi.org/10.15388/Ekon.2016.3.10332

Shmueli, G., Ray, S., Estrada, J.M.V., & Chatla, S.B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of business Research*, *69*(10), 4552-4564. https://doi.org/10.1016/j.jbusres.2016.03.049

Shmueli, G., Sarstedt, M., Hair, J.F., Cheah, J.H., Ting, H., Vaithilingam, S., & Ringle, C.M. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. *European journal of marketing*, *53*(11), 2322-2347. https://doi.org/10.1108/EJM-02-2019-0189

Sirakaya, E., Sonmez, S.F., & Choi, H.S. (2001). Do destination images really matter? Predicting destination choices of student travellers. *Journal of vacation marketing*, *7*(2), 125-142. https://doi.org/10.1177/135676670100700203

Ulker-Demirel, E., & Ciftci, G. (2020). A systematic literature review of the theory of planned behavior in tourism, leisure and hospitality management research. *Journal of Hospitality and Tourism Management*, *43*, 209-219. https://doi.org/10.1016/j.jhtm.2020.04.003

Um, S., & Crompton, J.L. (1990). Attitude determinants in tourism destination choice. *Annals of tourism research*, *17*(3), 432-448. https://doi.org/10.1016/0160-7383(90)90008-F

Venkatesh, V., Thong, J.Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS quarterly*, 157-178. https://doi.org/10.2307/41410412

Venkatesh, V. (2022). Adoption and use of AI tools: a research agenda grounded in UTAUT. *Annals of Operations Research*, 1-12. https://doi.org/10.1007/s10479-020-03918-9

Viet, B.N. (2019). The influence of destination image components on tourist satisfaction and loyalty: A case study in Côn Đảo Islands, Vietnam. *Foreign Exchange (VND/USD)*, *21148*(21697), 21935. https://www.ajhtl.com/uploads/7/1/6/3/7163688/article_17_vol_8_4__2019_vietnam.pdf

Woodside, A.G., & Lysonski, S. (1989). A general model of traveler destination choice. *Journal of travel Research*, *27*(4), 8-14. https://doi.org/10.1177/004728758902700402

Yadav, R., Chauhan, V., & Pathak, G.S. (2015). Intention to adopt internet banking in an emerging economy: a perspective of Indian youth. *International Journal of Bank Marketing*, *33*(4), 530-544. https://doi.org/10.1108/IJBM-06-2014-0075

Yoon, Y., & Uysal, M. (2005). An examination of the effects of motivation and satisfaction on destination loyalty: a structural model. *Tourism management*, *26*(1), 45-56. https://doi.org/10.1016/j.tourman.2003.08.016

Yen, C.H., Tsaur, S.H., & Tsai, C.H. (2021). Destination safety climate: Scale development and validation. *Journal of Travel & Tourism Marketing*, *38*(3), 303-315. https://doi.org/10.1080/10548408.2021.1906385

Zhu, K. (2022). Factors Determining Chinese Tourists' Travel Intentions: The New Normal Situation. *Journal of Pharmaceutical Negative Results*, 5843-5854. https://doi.org/10.47750/pnr.2022.13.S10.719

Article history: Received: 15.09.2023 Revised: 03.11.2023 Accepted: 01.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1676-1691
DOI 10.30892/gtg.514 spl09-1164

DEVELOPMENT OF THE SPHERE OF HOSPITALITY IN STRATEGY RECOVERYOF THE TOURIST INDUSTRY OF UKRAINE

Yurii Y. KYRYLOV*
Department of Public Management and Law, Kherson State Agrarian and Economic University, Kherson, Ukraine, e-mail: yurii_kyrylov@edu.cn.ua

Viktoriia H. HRANOVSKA
Department of Tourism, Hotel and Restaurant Business and Foreign Languages, Kherson State Agrarian and Economic University, Kherson, Ukraine, e-mail: vgranovska@ukr.net

Viktoriia M. KRYKUNOVA
Department of Tourism, Hotel and Restaurant Business and Foreign Languages, Kherson, Ukraine, e-mail: krykunova_vm@yahoo.com

Ivan V. SVYNOUS
Department of Accounting and Taxation, Bila Tserkva National Agrarian University, Bila Tserkva, Ukraine, e-mail: isvinous@ukr.net

Kateryna S. NIKITENKO
Department of Tourism, Hotel and Restaurant Business and Foreign Languages, Kherson State Agrarian and Economic University, Kherson, Ukraine, e-mail: nikitenko0506437139@gmail.com

Citation: Kyrylov, Y.Y., Hranovska, V.H., Krykunova, V.M., Svynous, I.V., & Nikitenko, K.S. (2023). DEVELOPMENT OF THE SPHERE OF HOSPITALITY IN STRATEGY RECOVERY OF THE TOURIST INDUSTRY OF UKRAINE. *GeoJournal of Tourism and Geosites*, 51(4spl), 1676–1691. https://doi.org/10.30892/gtg.514spl09-1164

Abstract: By defining a strategy for the tourism industry's recovery in the Western region of Ukraine, the study aims to support a methodical approach to evaluating the sector's economic attractiveness from the perspectives of the government, investors, and consumers. This plan will ensure the growth of positive externalities and minimize negative dynamics within the ecosystem during the post-conflict phase. The method of analyzing hierarchies was used, with the help of which the index of the economic attractiveness of the hospitality sector was evaluated for the level of reproduction of the tourism industry. Regarding the relative coherence of indicators of the appeal of the hospitality sector of the Carpathian tourist destination, an interaction between the starting data and the vectors of the matrices of pairwise comparisons was correlated. Using average weight criteria, the integral index of the hospitality sector's attractiveness for the Carpathian region of Ukraine was computed.

Key words: the sphere of hospitality, economic attractiveness, the state, the investor, consumers of tourist services, strategies for the recovery of the tourism industry

* * * * * *

INTRODUCTION

The upheavals caused by the armed conflict in Ukraine leveled the normal functioning of the tourism industry in the country and reduced the achievements of the regional socio-economic destination to low criteria for assessing the quality of components and components of the tourist product and tourist flows in the national economy along the lines of the European vector of development. However, the tourism industry in Ukraine remains the most dynamic and promising sector of the economy, which embodies increased competition in the market of tourist services and requires service standards in the field of hospitality. The study of the peculiarities of the development of the hospitality sector in the strategy of restoring the tourism industry of Ukraine during the period of the military conflict with the aggressor country is aimed at the reproduction of own capabilities and the formation of a stable position of competitive advantages to ensure the dynamic recovery of the country's economy in the post-conflict recovery, which determines the level of attractiveness of the territory with a significant natural resource potential. The war in Ukraine became a huge tragedy in the life of the Ukrainian people it affected the world economy and the international tourist market. The upheavals caused by the armed conflict stopped the normal functioning of the tourism industry and in some places nullified all the achievements.

But even during hostilities, the tourism industry did not stop its activities. Since the beginning of the war, Ukrainian hotels have been a place of accommodation for a large number of refugees they prepare hot meals for Ukrainian defenders and volunteers, and provide their premises for humanitarian aid warehouses. There are many examples in the world when, after large-scale conflicts, countries quickly recovered and welcomed guests again, and the share of foreign tourists increased. Therefore, the tourism industry in Ukraine remains the most dynamic and promising sector of the economy, which embodies increased competition in the market of tourist services and requires service standards in the sphere of hospitality.

* Corresponding author

The objective features and phenomena loading on the "sphere of hospitality" is the maximum satisfaction of consumer needs through: accommodation facilities; commercial tourism enterprises; specialized transport enterprises; public catering establishments; institutions of culture and art; enterprises whose activities are aimed at providing individual and mass entertainment services; other enterprises whose activities are aimed at meeting the needs of service consumers. Quite often, the characteristics of the sphere of hospitality include the level of service provided to visitors from the point of view of providing them with additional services. It is the presence of this component (additional services) that complicates the process of determining the list of quality services of transportation, rest (recreation), as well as cognitive, entertainment, business, health and sports service (Buryak, 2014; Halasiuk, 2012; Horina, 2009; Pandyak et al., 2023).

That is a comprehensive systemic approach to understanding of the sphere of hospitality as one of the most important directions of socio-economic transformations in regions to be shall with an attractive production sector and established historical potential natural resources. The problems of state support for enterprises of the tourism industry are devoted to the work of such Researchers as Dyadechko (2007), Ingram (1996), Kalinina (2006), Kokkranikal et al. (2011), Liubytseva (2002), Milashovska (2008), Pereguda and Kryvoberets (2022), Shupik (2020), Shikina and Merezhko (2017), Tkachenko (2006), Trusova et al. (2020a; 2023a; 2023b). The problems of military-political aggression, the aggravation of Ukrainian-Russian interstate relations and on the post-war recovering tourism industry focused their research Causevic and Lynch (2013), Holod (2017), Khudaverdiyeva et al. (2022), Smirnov and Lyubitseva (2022), Hurin (2023), Babushko and Opanasiuk, (2023), Kvasnii et al. (2023), Yasnolob et al. (2023). Such scientists like: Dvorska (2022), Nosyriev et al. (2022), Parfinenko (2015), Rodak (2022), Romanova (2018), paid attention to the study of international tourist flows and the development of the field of hospitality before the full-scale invasion of the aggressor country on the territory of Ukraine, and emphasized the directions of international cooperation between neighboring countries within the regional blocs of tourism business.

The priority of our research is the substantiation of a methodical approach to assessing the economic attractiveness of the sphere of hospitality from the position of the state, investor and consumer, with the definition of a strategy for the recovery of the tourism industry of the Western region of Ukraine, which ensures the growth of positive externalities and minimizes the negative dynamics of the local ecosystem in the post-conflict period.

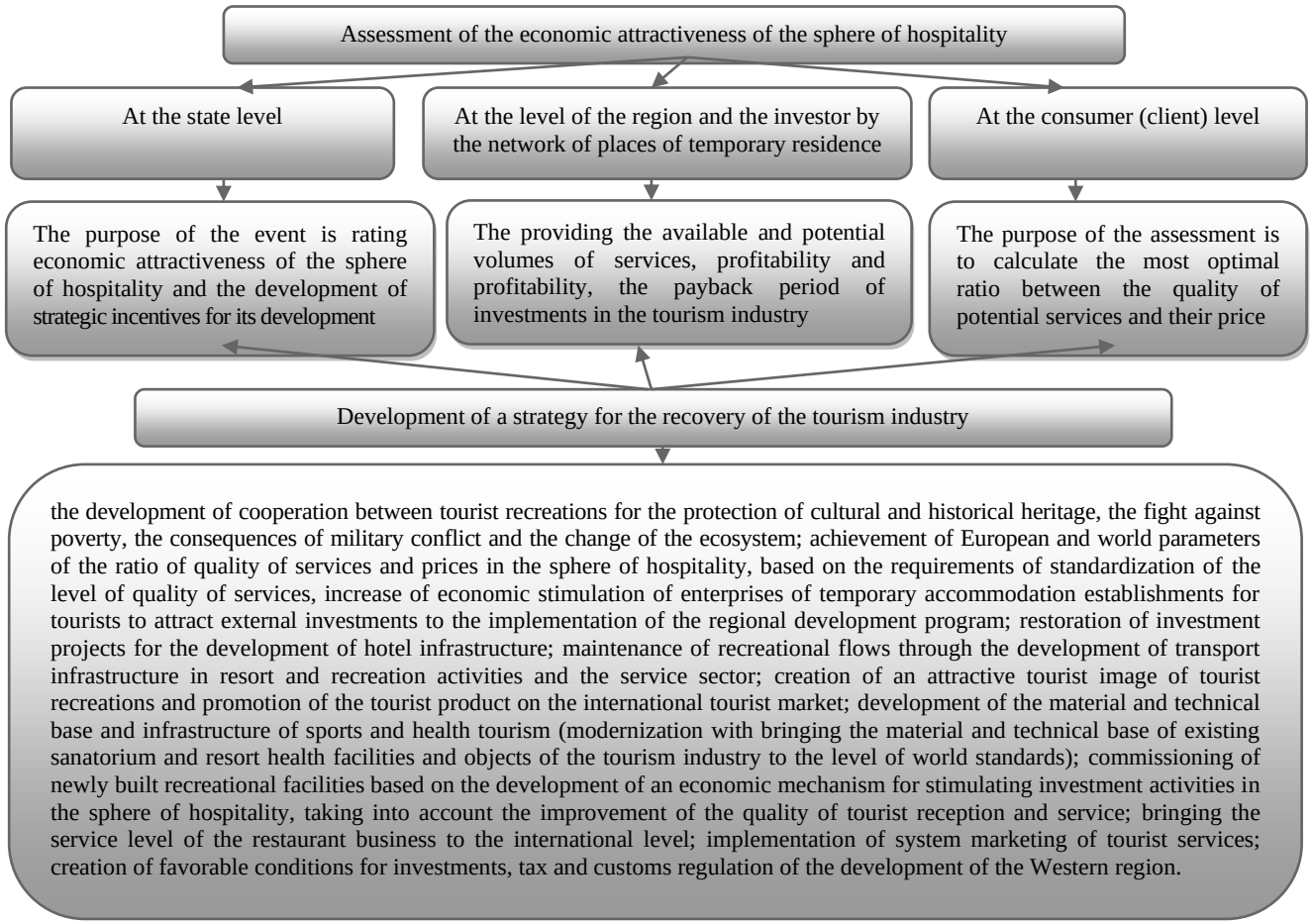


Figure 1. Three-vector measurement of the assessment of the economic attractiveness of the sphere of hospitality in the tourism industry recovery strategy Source: constructed by the authors on data (Buntova, 2016; Borushchak, 2006; Galasyuk and Shikina, 2015; Carlisle et al., 2016; Asian Development Bank, 2023; Malska and Pandyak, 2009)

METHODS AND MATERIALS

The sphere of hospitality has become an important sphere of socio-economic development of the tourism industry in the existing global transformations of the competitive environment. The hospitality economic platform conceptualizes a

combination of traveler decision-making processes regarding the attractiveness of a vacation destination and its benefits, as well as the ability of a hospitality destination to match individual customer benefits (Buntova, 2016). Researchers M. Malska and I. Pandyak (2009) considered the hospitality tourist destinations of the country as a way to attract tourists to cluster associations with the determination of the attractiveness of places of temporary residence and their attractiveness in relation to the target tourist market of neighboring countries, which remain competitors (Malska and Pandyak, 2009).

The target market chosen by tourists with a formed network of places of temporary residence in the regions of the country, according to the economic attractiveness of the sphere of hospitality, is determined by several criteria: similarity in terms of the degree of international economic integration among countries, which determines the freedom of movement of people and exemption from formalities during travel; similarity in living conditions, which determine the intensity of travel; similarity in the level of tourism development (place, natural conditions and historical development) (Buntova, 2016; Galasyuk and Shikina, 2015; Malska and Pandyak, 2009; Zayed et al. 2022). Therefore, from the perspective of the three-vector dimension, the economic attractiveness of the sphere of hospitality is determined at the level of the state, regions, investor and consumer (client), which is presented in the Figure 1.

At the same time, the network of places of temporary residence in the regions interacts with related industries, forming the general economic effect of the direct and indirect influence of the sphere of hospitality on the restoration of the tourism industry in the state (Figure 2). For a comprehensive methodical approach to assessing the economic attractiveness of the sphere of hospitality and its impact on the recovery of the tourism industry in the country, groups of indicators are identified: the presence of tourist resources (natural, historical monuments, various types of events); availability of hotel and transport infrastructure (accommodation facilities, catering, road condition); the development of hospitality enterprises in the region; economic efficiency indicators of the development of enterprises in the sphere of hospitality (Dyadechko, 2007; Kozmenko et al., 2015; Lyubitseva et al., 2007).

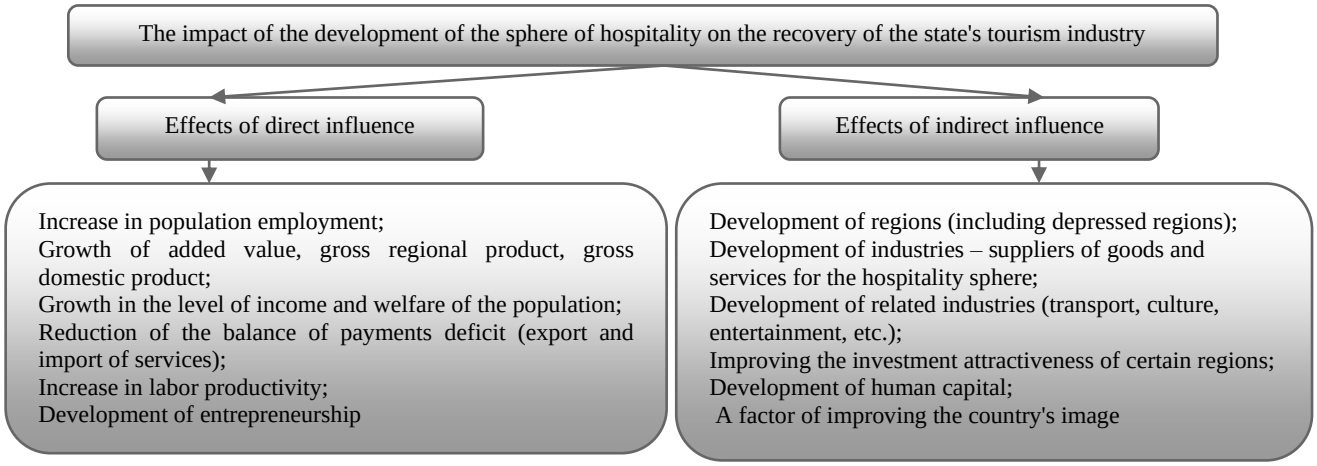


Figure 2. The impact of the development of the sphere of hospitality
on the recovery of the tourism industry countries (Source: constructed by the authors)

From the standpoint of state support for the tourism industry, the variability of scenarios for the development of the economic attractiveness of the sphere of hospitality is evaluated according to a general indicator (C_{ov}^{ea}), which is calculated as the sum of the coefficients for all important economic and social components (formula (1)) (Pereguda and Kryvoberets, 2022; Trusova et al., 2020b; Trusova et al., 2023b):

$$C_{ov}^{ea} = C_{erp} + C_{av} + C_{il} + C_{lp} + C_{ed} \quad (1)$$

where, C_{ov}^{ea} – is the general indicator of the economic attractiveness of the sphere of hospitality; C_{erp} – coefficient of employment of the population in places of temporary residence of tourists; C_{av} – coefficient of added value of the sphere of hospitality; C_{il} – coefficient of the income level of the employed population in places of temporary residence of tourists; C_{lp} – labor productivity coefficient of the employed population in places of temporary residence of tourists; C_{ed} – coefficient of development of entrepreneurship in the sphere of hospitality.

The coefficient of employment of the population in places of temporary residence of tourists (C_{erp}) reflects the level of importance of the sphere of hospitality on the labor market in the region (country) (formula (2)) (Matsola, 1997; Melnychenko and Buryak, 2014; Melnychenko and Kudlai, 2016; Pavlotskyi, 2017):

$$C_{erp} = \frac{N_{fh}^{pw}}{N_{ep}^{rca(c)}} \quad (2)$$

where, C_{erp} – coefficient of employment of the population in places of temporary residence of tourists; N_{fh}^{pw} – the number of people working in the sphere of hospitality; N_{ep} – the number of employed population in the region (country).

The coefficient of added value of the sphere of hospitality (C_{av}) reflects the participation of the sphere of hospitality in the creation of added value in the gross regional product or gross domestic product of the country (formula (3)) (Matsola, 1997; Melnychenko and Buryak, 2014; Melnychenko and Kudlai, 2016; Pavlotskyi, 2017):

$$C_{av} = \frac{A_{fh}^{av}}{TV_{rca(c)}^{av}} \tag{3}$$

where, C_{av} – coefficient of added value of the sphere of hospitality; A_{fh}^{av} – volume of added value created in the sphere of hospitality; $TV_{rca(c)}^{av}$ – the total volume of added value in the region (country).

The coefficient of the income level of the employed population in places of temporary residence of tourists (C_{il}) reflects the social aspects of the functioning of the sphere of hospitality – it's calculated as the ratio of the average monthly salary of employees in the sphere of hospitality to the average monthly salary in the region (country), (formula (4)) (Matsola, 1997; Melnychenko and Buryak, 2014; Melnychenko and Kudlai, 2016; Pavlotskyi, 2017).

$$C_{il} = \frac{S_{fh}^{ams}}{A_{rca(c)}^{ms}} \tag{4}$$

where, C_{il} – coefficient of the income level of the employed population in places of temporary residence of tourists; S_{fh}^{ams} – the size of the average monthly salary in the sphere of hospitality; $A_{rca(c)}^{ms}$ – the size of the average monthly salary in the region (country). The coefficient of labor productivity of the employed population in places of temporary residence of tourists (C_{lp}) shows the ratio of the volume of services provided by one employee in the hospitality sphere to a similar indicator calculated on average for the region (country) (formula (5)) (Matsola, 1997; Melnychenko and Buryak, 2014; Melnychenko and Kudlai, 2016; Pavlotskyi, 2017).

$$C_{lp} = \frac{L_{fh}^{lp}}{AL_{rca(c)}^{lp}} \tag{5}$$

where, C_{lp} – coefficient of labor productivity of the employed population in places of temporary residence of tourists; L_{fh}^{lp} – the level of labor productivity in the sphere of hospitality; $AL_{rca(c)}^{lp}$ – the average level of labor productivity in the region (country). The coefficient of development of entrepreneurship in the sphere of hospitality (C_{ed}) reflects the ratio of the growth rate of the number of business entities in the sphere of hospitality to the average indicator in the region (country) (formula (6)) (Matsola, 1997; Melnychenko and Buryak, 2014; Melnychenko and Kudlai, 2016; Pavlotskyi, 2017).

$$C_{lp} = \frac{G_{fh}^{nbe}}{G_{rca(c)}^{nbe}} \tag{6}$$

where, C_{ed} – coefficient of development of entrepreneurship in the sphere of hospitality; G_{fh}^{nbe} – rate of growth of the number of business entities in the sphere of hospitality; $G_{rca(c)}^{nbe}$ – the average level of labor productivity in the region (country).

If the value is equal to $C_{ov}^{ea} \geq 1$, then the sphere of hospitality is economically attractive for the state; if the value is equal to $C_{ov}^{ea} \leq 1$, then the development of other industries is more dynamic, and the sphere of hospitality needs additional investments and the development of strategic directions for stimulating its economic attractiveness. In this case, cause-and-effect relationships are made between important elements of the general indicator of economic attractiveness, which are both stabilizers and destabilizes of the development of the sphere of hospitality for the recovery of the tourism industry in the country (Matsola, 1997; Melnychenko and Buryak, 2014; Melnychenko and Kudlai, 2016; Pavlotskyi, 2017).

In this sense, the most significant is the hospitality destination attractiveness index I_{ad}, which increases with increasing distance between hospitality tourist destinations in a country and is used when comparing tourism markets between countries or when comparing several tourist tours with selected target markets. However, it does not take into account the

general potential of the target tourist market of a separate region with attractive natural recreation areas. Therefore, it is necessary to use the integral index of the attractiveness of the hospitality destination (C_{ad}), which indicates the relative share of tourists of the target tourist market visiting the place of temporary destination (C_{ad_1}) or which characterizes the specific weight of tourists who annually stay overnight (C_{ad_2}) (Matsola, 1997; Melnychenko and Buryak, 2014; Melnychenko and Kudlai, 2016; Pavlotskyi, 2017). This ratio makes it possible to compare actual hospitality of the tourist destination with potential visits. The higher the value of the integral index, the more attractive the territory is for the target tourist market of the region. At the same time, this index does not take into account potential visitors of the target tourist market who did not travel during the studied period (due to economic, medical, family or other reasons), as well as those residents who stayed with friends and relatives or those who were not accommodated in the point destination in general (visiting during sight-seeing excursions in several directions). Such an index can be calculated by formula (7) (Gerasimenko, 2017):

$$C_{ad} = \frac{\sum Nv_i}{TP_{TM\,i}} \quad (7)$$

where, C_{ad} – attractiveness index hospitality of the tourist destination with the target tourist market of a certain region of the country; Nv_i – the number of visitors to the tourist destination of hospitality from the target market of a certain region of the country, who arrived at the places of temporary accommodation during the i-th period; $TP_{TM\,i}$ – is the total population of the target tourist market of the country in the i-th period. Accordingly, the attractiveness index hospitality of the tourist destination with the target tourist market in the region is calculated according to formula (8) (Gerasimenko, 2017; Pavlotskyi, 2017):

$$LAC = \frac{\sum AD_{c_i}}{IAH_{dc}} \quad (8)$$

where, AD_{c_i} – the attractiveness of the place of temporary destination (calculated by multiplying the coefficients of providing the potential needs of tourists according to each criterion of the target tourist market in the region); IAH_{dc} – benchmark of the level of attractiveness of hospitality of the tourist destination of according to the target tourist market of the country (calculated by multiplying the maximum values of the coefficients for meeting the potential needs of tourists according to each criterion of the target tourist market in the country); are displayed on a rating scale.

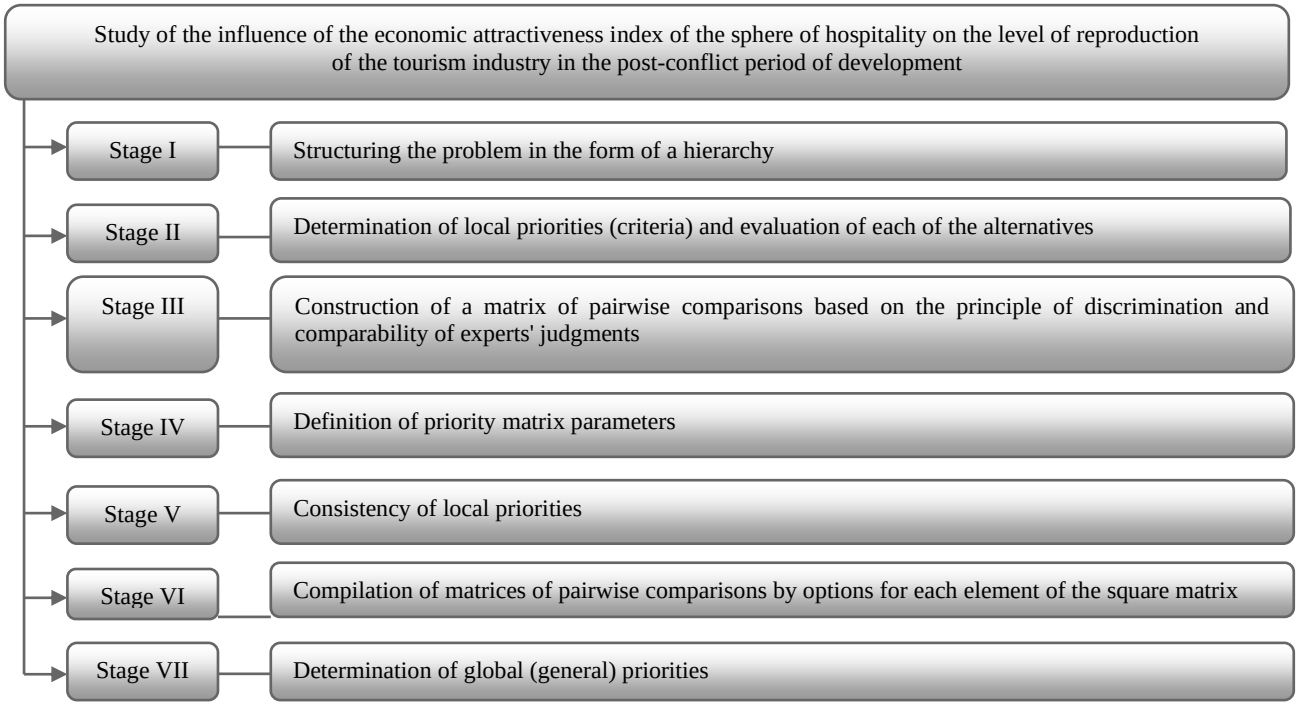


Figure 3. Assessment of the influence of the economic attractiveness index of the sphere of hospitality on the level of reproduction of the tourism industry in the post-conflict period of development (based on the Method of Analysis of Hierarchies (MAH) (Source: constructed by the authors based on data (Asian Development Bank, 2023; Gerasimenko, 2017; Holod, 2017; International Airlines Group, 2020; Pavlotskyi, 2017)

From the standpoint of a strategic approach, the development of the sphere of hospitality in the short-, medium-, and long-term post-conflict period of reproduction of the tourism industry is provided by a set of complex guidelines, methods, methods, and mechanisms for increasing the level of its competitiveness on the domestic and global markets. At the same time, the harmonization of the interaction of the subjects of the sphere of hospitality with the subjects of tourist services in the post-conflict period is strengthened under the condition of the institutionalization of the business environment, which unites the hotel and transport infrastructure in the interregional system of the tourism industry with target indicators of the

stabilization of the ecosystem of territories (Internationl Airlines Group, 2020; Asian Development Bank, 2023; Gerasimenko, 2017; Holod, 2017; Internationl Airlines Group, 2020; Pavlotskyi, 2017; Bulgakova, 2020). A strategy can be effective only if it is not just a defined plan of action, but also takes into account possible changes from the outside. It should also correspond to the resources of the tourism industry – financial, investment, production, labor, etc.

Therefore, the assessment of the economic attractiveness of the sphere of hospitality, from the state's point of view, is formed on the basis of a significant array of statistical data characterizing the cause-and-effect relationship between the negative factors of the deviation of the level of recovery of the tourism industry and the determined regulatory and stimulating instruments of the functioning of the sphere of hospitality in the current and strategic period of development. These requirements are met by Saati's method of analysis of hierarchies (MAH), with a clearly defined mathematical tool of analysis, which ranks expert judgments in a hierarchical sequence, which are presented in the form of a matrix of pairwise comparisons. The result is a pronounced relative degree (intensity) of the interaction of elements in the hierarchy. MAH includes several stages (Figure 3). To quantitatively assess the importance of priorities (criteria) when comparing them in pairs, use the scale of relative importance (Table 1).

Table 1. The scale of the relative importance of the criteria for the influence of the economic attractiveness index of the sphere of hospitality on the level of reproduction of the tourism industry in the post-conflict period of development (Source: grouped by authors according to data (Asian Development Bank, 2023; Gerasimenko, 2017; Holod, 2017; Internationl Airlines Group, 2020; Pavlotskyi, 2017)

Intensity of relative weight	Definition
Unequivocal (exact) assessment	
1	Equivalent weight
3	Moderate advantage
5	Average advantage
7	Above average advantage
9	A significant advantage
Compromise cases (intermediate decisions between two adjacent estimates)	
2	Between equal weight and moderate preference
4	Between moderate and average advantage
6	Between average advantage and above average advantage
8	Between an above-average advantage and a significant advantage

Solving the economic problem (the cause-and-effect relationship between the negative factors of the deviation of the level of recovery of the tourism industry and the defined regulatory and stimulating tools for the functioning of the sphere of hospitality in the current and strategic period of development) can be defined as a step-by-step process of stabilization of the directions of development of the tourism industry in the country according to the appropriate criteria (Carlisle et al., 2016; Trusova et al., 2020a; Trusova et al., 2023a):

1). Assessment of the economic attractiveness of the sphere of hospitality from the perspective of an investor. From the point of view of the activation of the investment activity of the subjects, among the set of indicators that determine the reasons for fluctuations in the economic attractiveness index of the sphere of hospitality in the region and that have a direct impact on the level of reproduction of the tourism industry in the country, the following are highlighted: the number of additional jobs created; development of industrial and social infrastructure; the amount of investment to create jobs; the degree of risk from carrying out investment activities; net economic benefits, etc. The vast majority of the listed indicators determine the volume of positive externalities not for the investor, but for the society where the hospitality destination is located together with the field of tourist services. At the same time, on the part of the investor, the priority criterion is the justification and decision-making regarding the investment of a significant amount of investment for the development and diversification of the activities of the subjects of the sphere of hospitality, obtaining additional financial benefits; increasing the level of economic attractiveness is only an additional incentive for investment. It is quite logical that the economic activity of the subjects of the sphere of hospitality from the point of view of a potential investor is economically attractive, if the maximum level of profitability is ensured at the minimum level of risk according to the β-coefficient criterion, which is determined by formula (9), (Holod, 2017; Kozmenko et al., 2015; Trusova et al., 2020b):

$$\beta_i = \frac{Cov(D_i, D_m)}{\sigma^2(D_m)} \quad (9)$$

where, Di, D_m – the investor's profitability from investing funds in the development of the sphere of hospitality of the i-th subject in the region and the average profitability of the tourist services industry from investing in the country; $Cov(Di, D_m)$ – the covariance of the investor's return in the i-th region and the average return of the tourist services industry from investing in the country; $\sigma^2(D_m)$ – dispersion of the average profitability of the tourist services industry from investments in the country. The level of activation of the investment flow for the development of the field of hospitality and the realization of the opportunities of the recreation of the consumers of tourist services with the involvement of state institutions in this process, is considered normal when the risk of losing investment investments is low ($\beta \le 0$) or moderate ($0 \le \beta \le 1$),and therefore is attractive for investors. The coefficient ($\beta \ge 1$) indicates a high level of risk for the recovery of opportunities in the sphere of hospitality, and the momentum of activation aimed at the recovery of

the tourism industry in the country is unstable and prone to fluctuations (Holod, 2017; Kozmenko et al., 2015; Trusova et al., 2020a). We presented of the scale "profitability - risk" for the realization of the economic opportunities of tourist recreations on the basis of the activation of investment flows (Table 2). Activation of the investment opportunities of the subjects of the sphere of hospitality under the conditions of a high level of risk (that is, the transition from the stage of determining the volume of the investment flow to the stage of its transaction in the crisis conditions of the country's economic development (wartime) creates additional guarantees of the return of the investor's investments under state guarantees (Carlisle et al., 2016; Kozmenko et al., 2015; Trusova et al., 2020a; Trusova et al., 2023b).

Table 2. A scale "profitability - risk" for the realization of the economic opportunities of tourist recreations on the basis of the activation of investment flows (Source: created by the authors based on data (Holod, 2017; Kozmenko et al., 2015; Trusova et al., 2020b)

Profitability	Risk level		
	Low ($\beta \le 0$)	Medium ($0 \le \beta \le 1$)	Tall ($\beta \ge 1$)
Low	Not very attractive	Not very attractive	Unattractive
Medium	Very attractive	Attractive	Attractive
Tall	Very attractive	Very attractive	Very attractive

2). Assessment of the economic attractiveness of the sphere of hospitality from the point of view of the consumer of tourist services – the client. The attractiveness of a tourist destination of hospitality is determined by the feeling, conviction, opinion and solvency of a tourist who is able to consciously choose a place of temporary destination (accommodation) to meet personal needs on vacation (Holod, 2017; Malska and Pandyak, 2009).

At the same time, an important group of factors taken into account by consumers in the process of choosing a certain accommodation facility is: the first group – the cultural value of the accommodation area (availability of historical and other monuments, tourist products, means of recreation); the second group – quality of services and their range – quantitative assessment of the level of quality of hotel or restaurant services (the number of stars of the establishment), and expert assessment – determining the level of consumer satisfaction with the services provided (questionnaire); the third group – the state of infrastructure and related services (transportation, communications, other communications, financial institutions, medical facilities, etc.); the fourth group is the cost of services, which takes into account both the cost of accommodation and the cost of related (supporting) services. The construction of a general system of indicators makes it possible to assess the economic attractiveness of the sphere of hospitality of the region from the position of three main stakeholders (state, investor and consumer) to fulfill the main mission – the restoration of the tourism industry in the country, according to the level of significance of the parameters of business introduction in tourist destinations with a developed rating network of natural recreations, resort and entertainment, hotel and restaurant sites. Taking into account the available information network of tourist destinations, groups of priorities (criteria) for assessing the economic attractiveness of the sphere of hospitality for the recovery of the tourist industry are identified (Table 3).

Table 3. Priorities (criteria) for assessing the economic attractiveness of the sphere of hospitality for the recovery of the tourism industry Source: grouped by authors according to data (Carlisle et al., 2016; Holod, 2017; Kozmenko et al., 2015; Malska and Pandyak, 2009; Trusova et al., 2020a; Trusova et al., 2023b)

Index of economic attractiveness	Indicators	Priorities (criteria)
For the state	The level of hotel infrastructure development (H)	The number of hotel places per thousand population of the region, hotels/ 1 thousand population (h_1)
		The level of the criminogenic situation in the region (the number of crimes committed per thousand of the region's population), (h_2)
		The level of emissions of harmful substances into the atmospheric air per km^2 (h_3)
	Level of development of transport infrastructure (T)	Specific weight of paved roads in the total length by region, % (t_1)
		Density of public railway tracks, km per 1 thousand km^2 of territory (t_2)
		Internet coverage, subscribers/ 1 thousand population, (t_3)
		Mobile coverage of the territory (number of subscribers to the total population of the territory), (t_3)
For the investor	Development of hospitality enterprises in the tourist location recreation (D)	Number of hotel places per thousand population of the region, units (d_1)
		Number of food establishments per thousand population, (d_2)
		The number of guests visiting tourist facilities in the region per thousand population, people (d_3)
		Volume of services per thousand population, thousand USD (d_4)
	Economic efficiency of the development of enterprises in the sphere of hospitality in tourist recreation from the position of an investor (I)	Profitability of hospitality enterprises, % (i_1)
		Specific weight of profitable enterprises of the industry, % (i_2)
		The volume of capital investments per employee in the industry, thousand USD (i_3)
		Average service level, % (i_4)
For the consumer	Costs of the consumer (C)	The average price of accommodation within the selected segment in the tourist recreation, USD (c_1)
		The average price of food, USD (c_2)

The most common approach to the assessment of the network of natural recreation, resort-entertainment, hotel-restaurant sites in the structure of the tourist destination of the country's regions is a rating assessment. The total rating for

each of the indicators of relative deviations of the level of development of the territory allows determining an integral indicator that characterizes the rank of the tourist destination of the tourist recreation and its place among other tourist destinations in the country (Trusova et al., 2020a). The rating assessment in connection with the benchmarking approach (Khudaverdiyeva et al., 2022; Tkachenko, 2006) allows you to determine the potential development opportunities of the region's hospitality sphere compared to the national average (on a 100% scale) and to form strategic priorities for the recovery of the tourism industry as a whole. For integral evaluation, a simple additive weighting method is proposed, which takes into account the sum of the values of the normalized coefficients, taking into account their priority (weight) in the evaluation system. The representativeness of the results and the flexibility of the assessment are carried out in two stages. At each stage, groups of indicators may change, by expanding or narrowing them (extraction) in the calculation when the value of the weighting factor changes. At the first stage, taking into account the initial variables of the assessment of the economic attractiveness of the sphere of hospitality in the tourist recreation, standardized priorities (criteria) are determined within individual groups of indicators according to the formula of maximum distances: for indicators, the maximum value of which is an advantage for the evaluation subject (formula (10)) (Sedarati et al., 2018):

$$\overline{n_{ir}} = \frac{n_{ir}}{n_{\max}} \times 10 \tag{10}$$

for indicators, the minimum value of which is an advantage for the evaluation subject (formula 11) (Sedarati et al., 2018):

$$\overline{n_{ir}} = \frac{n_{\min}}{n_{ir}} \times 10 \tag{11}$$

where, $\overline{n_{ir}}$ – standardized single criterion for assessing the economic attractiveness of the sphere of hospitality of the i-th tourist recreation; n_{ir} – value of the i-th priority (criterion) in the tourist recreation; $n_{\max}(n_{\min})$ – the maximum (minimum) value of the priority (criterion) achieved in the tourist recreation of the comparative population.

The methodical approach assumes a combination of quantitative and qualitative evaluation parameters, which sets the task of reducing the evaluated indicators to a single measurement. In this regard, it is proposed to translate the uniform indicators into a 10-point scale, which simplifies the multidimensional assessment of the attractiveness of certain services and allows them to be clustered in accordance with the needs of consumers and to display the specified objects or groups of objects on the relevant geo-information platforms. A qualitative assessment for their introduction into the system can also be determined on a 10-point scale based on the opinions of experts or surveys of a target group of consumers. This will make it possible to use the appropriate mathematical tools according to the given formulas (10) - (11) and to determine the state of individual indicators of the economic attractiveness of the region's sphere of hospitality compared to the optimal values within the compared population for the period of the study.At the second stage, a normalized index of the economic attractiveness of the sphere of hospitality is determined, taking into account the importance of each priority (criterion) in accordance with individual preferences or the purpose of evaluation according to formula (12) (Sedarati et al., 2018):

$$\overline{N_{ir}} = \sum_{i=1}^{n} \overline{n_{ir}} \times k_{ni} \tag{12}$$

where, $\overline{N_{ir}}$ – normalized weighted index of the economic attractiveness of the sphere of hospitality of the i-th tourist recreation; k_{ni} – coefficient of significance (individual preference) of priority (criterion) $(\sum k_{n_i} = 1)$.

The weighting factor is determined depending on individual preferences or the purpose of the evaluation. To simplify the process of approbation of the proposed methodology, the weighting factor is determined based on the average value according to formula (13) (Sedarati et al., 2018):

$$k_{n_i} = 1/n \tag{13}$$

where, n – number of priority evaluation criteria.

Note that the clusters provide a conceptual description of the model from the standpoint of stronger or weaker connections between tourist recreations, with a developed hotel business network by Euclidean distance and correspond to the scaling of the sphere of hospitality by the level of connectivity between pairs of clusters.The methodical approach presented on the basis of the conceptual description of the cluster model provides: the use of grouping methods to increase the probability of introducing innovations in the network of the sphere of hospitality in the original aggregated result; the creation of complex operating systems that arise without the initial connection of the hotel business association between regions; the involvement of experts in the process of researching the sphere of hospitality for the most effective use of it with any potential synergistic effect; the introduction of mathematical tools that allow diffuse, multidimensional constructions to be transformed into models of actions or operational programs, acting as a bridge between qualitative information (experts) and strictly numerical calculations, by placing them in the form of points on the map of ideas that have been developed.

RESULTS

The impact of the tourism industry on the economy of the state, carried out in many countries of the world, revealed stunning results, because due to the low level of imports and the intensive use of local raw resources, this industry exceeds the volume of industrial production. From the perspective of development of the sphere of hospitality the Western region of Ukraine is one of the most promising in the country. A unique territorial location, a developed transport infrastructure, unique natural and recreational resources an existing tourist base – all this forms a powerful potential for the development of the

sphere of hospitality, makes it attractive for investors and consumers of services. The growth of domestic and foreign tourism, the attractiveness of a tourist destination positively affects the development of other systemic elements of the sphere of hospitality, such as the hotel industry and the development of accommodation facilities, entertainment business, etc. An important parameter for assessing the dynamics of the development of the sphere of hospitality in the Western region of Ukraine is the study of its structure in terms of the number of subjects of accommodation, catering, transport infrastructure and the sphere of recreation (recreation), which are divided into two groups: temporary accommodation and organization of catering (providing places for short-term accommodation, as well as providing ready meals and drinks for on-site consumption); arts, sports, entertainment and recreation (a wide range of activities in the sphere of culture, entertainment and recreation, including stage performances, museum operations, gambling, sports and leisure activities). The number of subjects in the sphere of hospitality from according to the above-mentioned groups in the Western region of Ukraine is shown in Figure 4-5.

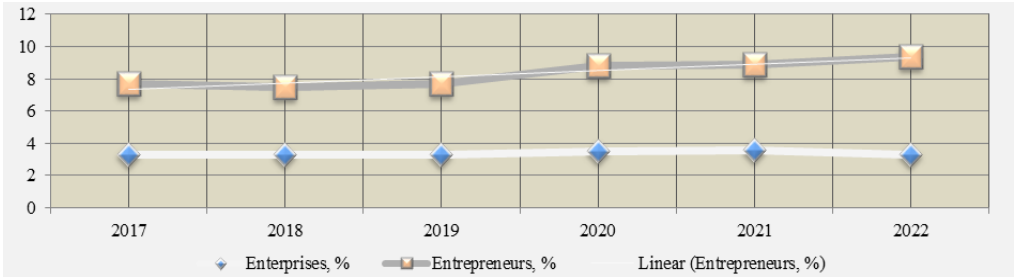


Figure 4. The number of enterprises of the sphere of hospitality from temporary accommodation and catering in the Western region of Ukraine for 2017-2022, % (Source: constructed by the authors based on data (DART, 2016; NSTS, 2021; Interfax Ukraine, 2022; Stejka, 2016; State Statistics Service of Ukraine, 2020)

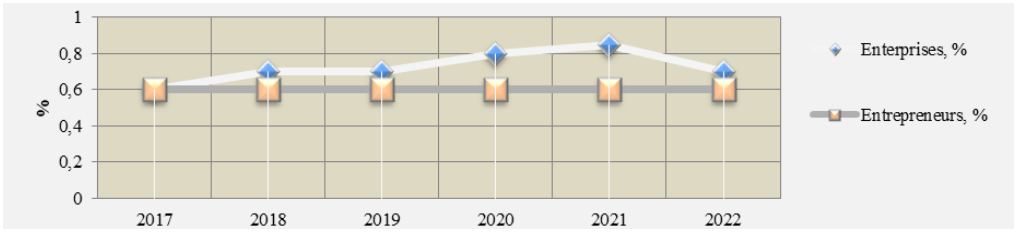


Figure 5. The number of entrepreneurs of the sphere of the art, sports, entertainment and recreation in the Western region of Ukraine for 2017-2022, % (Source: constructed by the authors based on data (DART, 2016; NSTS, 2021; Interfax Ukraine, 2022; Stejka, 2016; State Statistics Service of Ukraine, 2020)

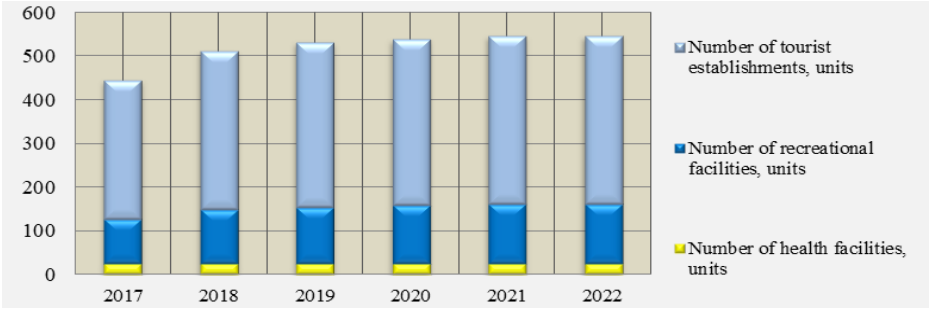


Figure 6. Dynamics of the number of tourist establishments in the Western region of Ukraine for 2017-2022, units. Source: constructed by the authors based on data (DART, 2016; NSTS, 2021; Interfax Ukraine, 2022; *Stejka, 2016*; *State Statistics Service of Ukraine, 2020*)

It should be noted that the main share (93-94% of the total population) of subjects of the sphere hospitality are entrepreneurs. This testifies to the significant role of the sphere of hospitality in the organization of self-employment of the region's population. The network of health, recreational and tourist facilities in the Western region of Ukraine in 2022 included 546 facilities, of which 23 were health facilities, 138 were recreational, and 385 were tourist facilities (Figure 6).

The first place in terms of the number of hotels and accommodation facilities in the Western region is occupied by the Lviv tourist recreation – 277 units; the second – Ivano-Frankivsk tourist recreation (244 units); the third – Zakarpattia (209 units), the fourth – Chernivtsi (75 units). Comparing the structure of the hotel fund and accommodation facilities in the Western region of Ukraine, it can be stated that from 2020 to 2021, the number of rooms of the highest, second and third categories increased (the highest category – from 18.4% to 18.9%, the second – from 15.1% to 16.3%), the third – from 12.1% to 12.4%), while the number of rooms of the first category decreased from 54.2% to 52.4%. However, they made up the main part of the number structure. The Carpathian tourist destination is the most dynamic indicator of the volume of services provided by hospitality entities in the Western region of Ukraine (Figure 7 and 8). In 2022, hotels provided 74.0% of services from the total number of accommodated tourists in the Carpathian tourist destination. The level of services in tourist bases, mountain shelters and student summer camps is equal to 22.0%, in hostels – 2.3%, motels – 1.6% and dormitories for visiting – 0.1%. In 2021 the services of hotels and accommodation facilities of the Carpathian tourist

destination 237.9 thousand travelers used, which is 16.4% more than in 2020. Of them, 208.1 thousand travelers are citizens of Ukraine and 29.8 thousand travelers are foreigners. In 2022, the number of vacationers (only citizens of Ukraine) decreased to 102.41 thousand people; foreign tourists did not visit this destination due to the war situation in the country. In the Carpathian destination, approximately 80-90% of the income is provided by passenger transportation services for tourists. The geographical location of this region of Ukraine and its proximity to the borders with European countries in terms of the number of transit tourists ensures the development of the transport network and contributes to the acceleration of integration into the international tourist space. This improves the country's attractiveness for foreign motoring tourists and generates interest in the peripheral areas and remote natural recreations of the region. However, assessing the state of passenger transport in the Carpathian tourist destination, it can be noted that the number of passengers transported by rail, road (buses) and air transport decreases every year. Thus, in 2017, the number of transportation by all the above-mentioned modes of transport was 62.6 million passengers, in 2018 – 58.1 million passengers, in 2019 – 50.7 million passengers, in 2020 – 48.9 million passengers, in 2021 2018 – 48.3 million passengers, in 2022 – 39.4 million passengers (Figure 9).

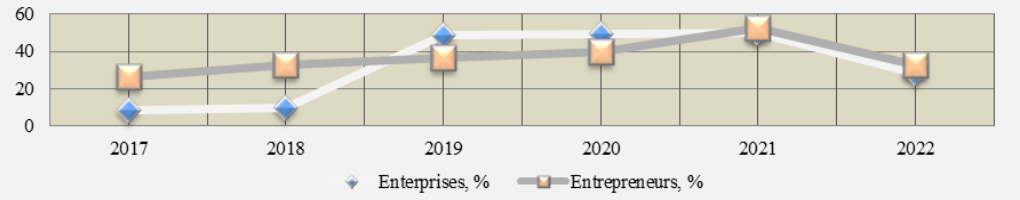


Figure 7. The volume of services provided by hospitality enterprises for temporary accommodation and organization food in the Carpathian tourist destination of Ukraine for 2017-2022, %. Source: constructed by the authors based on data (DART, 2016; NSTS, 2021; Interfax Ukraine, 2022; *Stejka, 2016*; *State Statistics Service of Ukraine, 2020*)

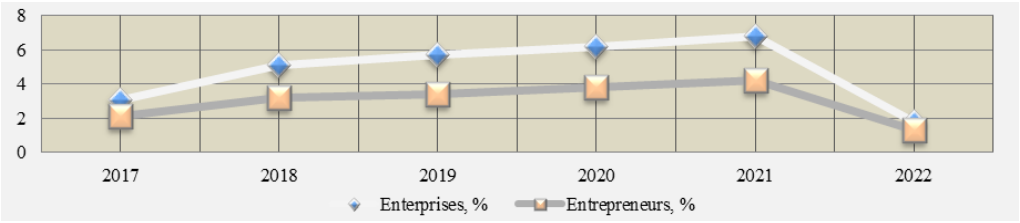


Figure 8. The volume of services provided by hospitality entrepreneurs of the sphere of art, sports, entertainment and recreation in the Carpathian tourist destination of Ukraine for 2017-2022, %. Source: constructed by the authors based on data (DART, 2016; NSTS, 2021; Interfax Ukraine, 2022; *Stejka, 2016*; *State Statistics Service of Ukraine, 2020*)

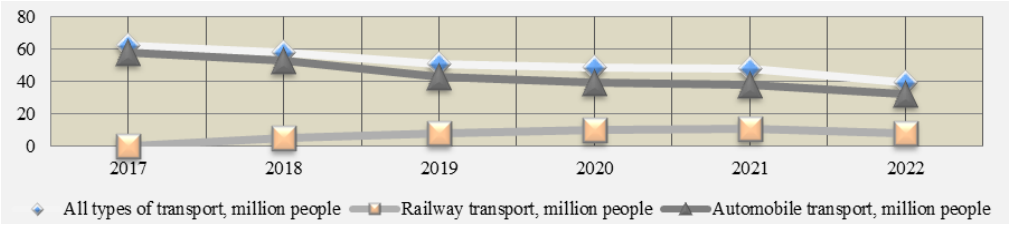


Figure 9. The volume of passenger transport by mode of transport in the Carpathian tourist destination of Ukraine for 2017-2022, million people. Source: constructed by the authors based on data (Asian Development Bank, 2023; CAPA, 2022; International Air Transport Association, 2022; Internationl Airlines Group, 2020)

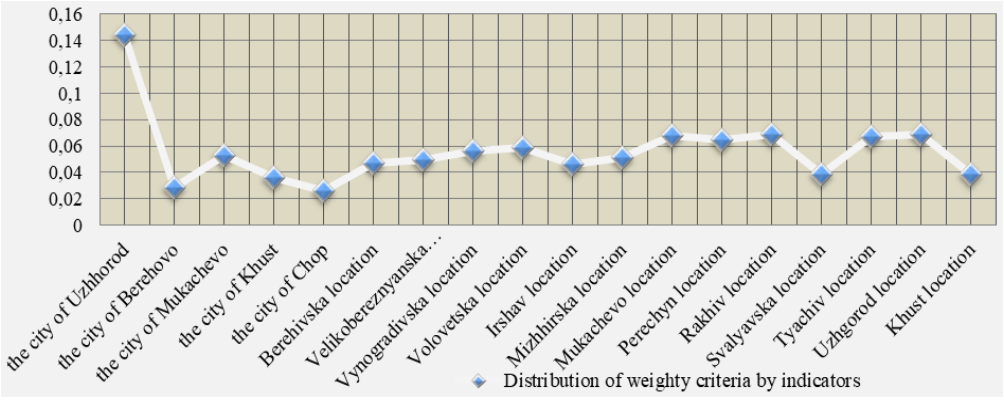


Figure 10. Integral index of the attractiveness of the sphere of hospitality of the Carpathian tourist destination of Ukraine according to average weight criteria in 2022 (Source: constructed and calculated by the authors)

An integral assessment of the economic attractiveness of the sphere of hospitality using the method of hierarchical analysis allows ranking the business activity of subjects in the Carpathian tourist destination and building hierarchical

criteria for comparing alternative options that cluster connections with a limited comparison of objects (Trusova et al., 2020b). Correlation of the relationship between the original data was carried out (museums, theaters, club facilities, activities of restaurants and other enterprises providing mobile food services, number of collective accommodation facilities, total number of places in collective accommodation facilities, number of collective accommodation facilities with rooms for the disabled, emissions in local ecosystem by sources of pollution, passenger turnover of buses in cities and tourist locations, the length of public highways with a hard surface) and the eigenvectors of the matrices of pairwise comparisons regarding the relative consistency of the indicators. The results of the weight criteria calculation are presented in Figure 10. Since the alternatives in the Carpathian tourist destination are cities and tourist locations, and the sum of the alternatives is equal to 1, then the average weight criteria of the attractiveness of the hospitality sphere (Figure 10) should be interpreted as follows:

- in the city of Uzhhorod, the state of hospitality for tourists is the best due to the maximum number of museums, theaters, collective accommodation facilities, seats in collective accommodation facilities, passenger turnover – the weight criterion is 0.144;
- the weight criterion of the city of Chop is 0.026, which is 5.5 times lower than in the city of Uzhhorod, due to the minimal number of club and hospitality establishments. However, in this tourist location, pollution of the ecosystem is minimal;
- the Uzhhorod tourist location is inferior to the city of Uzhhorod due to the high level of emissions of pollutants into the ecosystem. The average weight criterion for Uzhhorod, Svalyav, Vynogradiv, Tyachiv tourist locations is 0.07;
- for Mukachivska, Velikobereznyanska, Mizhhirska tourist locations – an average of 0.06. the city of Mukachevo, as well as Rakhivska, Irshavska, Berehivska, Perechynska tourist locations have an average weight criterion in the hierarchy of alternatives (0.05);
- the city of Khust, as well as the Khust and Volovetska tourist locations, respectively, at the level of 0.04, the city of Berehovo – 0.03.

Table 5. Weighted indicators of the economic attractiveness of the sphere of hospitality in terms of tourist recreations of the Carpathian destination in 2023 (Source: calculated by the authors)

Indicators, criteria		Weight criterion	Tourist location recreation in the Carpathian destination			
N_i	n_i	k	Zakarpattia	Lviv	Ivano-Frankivsk	Chernivtsi
The level of hotel infrastructure development (H)	h_1	0.25	2.5	2.5	2.5	2.5
	h_2	0.25	2.0	2.5	1.6	2.2
	h_3	0.25	2.2	2.5	1.8	1.8
	h_4	0.25	2.3	2.5	2.3	2.5
Integrated indicator *(H)*		*1*	*8.7*	*10*	*8.2*	*9.6*
Level of development of transport infrastructure (T)	t_1	0.25	2.5	2.5	2.5	2.5
	t_2	0.25	2.5	1.9	1.7	1.9
	t_3	0.25	2.2	2.6	2.2	2.5
	t_4	0.25	2.8	3.0	2.3	1.9
Integrated indicator *(T)*		*1*	*9.7*	*10*	*8.7*	*8.8*
Development of hospitality enterprises in the tourist location recreation (D)	d_1	0.25	2.4	2.1	2.5	1.6
	d_2	0.25	0.5	2.8	0.5	0.4
	d_3	0.25	0.5	2.7	1.7	1.1
	d_4	0.25	0.5	2.4	0.7	0.4
Integrated indicator *(D)*		*1*	*3.9*	*10*	*5.3*	*3.5*
Economic efficiency of the development of enterprises in the sphere hospitality in tourist recreation from the position of an investor (I)	i_1	0.25	2.4	2.5	1.7	1.0
	i_2	0.25	2.3	2.6	1.8	1.7
	i_3	0.25	1.7	1.9	2.2	1.2
	i_4	025	2.0	3.0	2.2	1.7
Integrated indicator *(I)*		*1*	*8.1*	*10*	*7.9*	*5.6*
Costs of the consumer (C)	c_1	0.5	5.8	6.2	5.4	4.2
	c_2	0.5	3.8	3.8	4.3	3.8
Integrated indicator *(C)*		*1*	*9.6*	*10*	*9.7*	*8.0*

The proposed methodological approach, which takes into account the qualitative criteria of the objects of comparison of the economic attractiveness of the subjects of the sphere of hospitality in the Carpathian tourist destination, was considered from the point of view of investors as alternative areas for investment, and from the point of view of consumers of services – as alternative tourist location for recreation. On the basis of the selected indicators for assessing the economic attractiveness of hospitality entities of the Carpathian destination in 2022, their weighted and normalized criteria in tourist recreation for 2023 were determined (Table 5, Table 6). Forecast calculations show that in terms of the level of development of hotel and transport infrastructure, the Carpathian destination in 2023 will not have disproportions between tourist recreations, since the maximum deviation for a group of indicators is equal to 3.8 points. The leading positions in almost all groups of indicators (10 points) will be occupied by Lviv tourist recreation, in terms of the level of development of the network of tourist facilities and enterprises in the sphere of hospitality. At the same time, its weak point is the high level of prices for accommodation and food, which will persist in the future in comparison with other local tourist recreations.

Zakarpattia tourist recreation occupies a leading position in terms of road infrastructure. In 2023, the operational profitability of hospitality enterprises will increase by 11% compared to 2022, which has a positive effect on the indicators of the economic development of the tourism industry in this area. The level of implementation of hotel and restaurant services per capita, as well as the number of tourists visiting tourist locations will have an average value of 2.2 points.

When developing strategic programs for the development of tourism in Zakarpattia tourist recreation, the existing potential of the sphere of hospitality in the structure of tourist recreation (the number of hotel places per capita) will be 8.7 points.

Table 6. Standardized criteria for the economic attractiveness of the sphere of hospitality in terms of tourist recreations of the Carpathian destination in 2023 (Source: calculated by the authors)

Indicators, criteria		Tourist location recreation in the Carpathian destination			
N_i	n_i	Zakarpattia	Zakarpattia	Zakarpattia	Чернівецька
The level of hotel infrastructure development (H)	h_1	10.0	9.8	8.0	8.0
	h_2	8.1	10.0	6.2	8.8
	h_3	7.3	10.0	7.3	7.1
	h_4	9.2	8.7	9.1	10.0
Level of development of transport infrastructure (T)	t_1	10.0	9.7	8.0	8.0
	t_2	8.9	10.0	7.2	9.6
	t_3	8.8	10.0	8.4	8.7
	t_4	9.8	10.0	8.0	9.7
Development of hospitality enterprises in the tourist location recreation (D)	d_1	9.6	8.6	10.0	6.4
	d_2	2.0	10.0	1.8	1.6
	d_3	2.0	10.0	2.7	1.4
	d_4	1.9	10.0	2.7	1.4
Economic efficiency of the development of enterprises in the sphere hospitality in tourist recreation from the position of an investor (I)	i_1	9.6	10.0	4.7	4.0
	i_2	9.3	8.3	10.0	6.9
	i_3	3.5	4.6	10.0	0.2
	i_4	8.1	10.0	9.0	6.7
Costs of the consumer (C)	c_1	5.8	6.2	5.4	4.2
	c_2	3.8	3.8	4.3	3.8

Identification of opportunities for the development of the sphere of hospitality with strategic changes in the ecosystem of the tourism industry, provided by investment cycles for the restoration of the Carpathian tourist destination, in conditions of stability of local components (hotel infrastructure (H), transport infrastructure (T), development (D), economic efficiency (I), consumer spending (C)) allows you to allocate resources in a forecast profile, in order to use the "corridor" of possibilities of the investigated tourist services in temporary tourist accommodation facilities. The meaning of the "corridor" of opportunities in relation to the unique, marginal and average level of opportunities for the development of the sphere of hospitality in the Carpathian tourist destination is summarized in Figure 11. The assessment of the unique level of opportunities for the development of the sphere of hospitality with strategic changes in the tourist industry ecosystem for 2023-2026, which is transformed in the investment cycles of the recovery of the Carpathian tourist destination, demonstrates its growth by almost 2.76 times. This is the result of the growth of all local tourist components. The greatest increase in the unique opportunities of the researched tourist services in temporary tourist accommodation facilities will occur due to strategic changes in the ecosystem of the tourism industry, in the process of which labor resources (1.78 times), fixed assets (1.55 times increase), investment resources (1.48 times increase) are involved, financial resources (1.14 times increase).

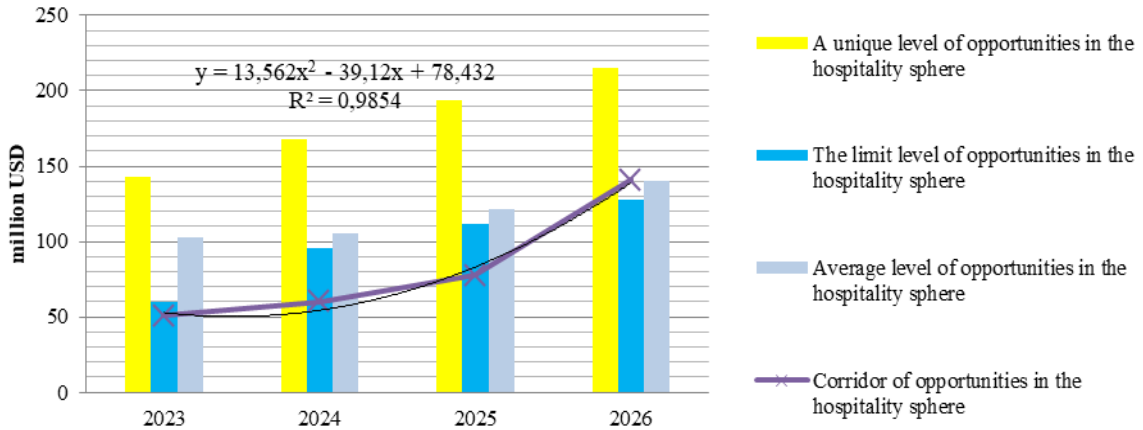


Figure 11. Corridor of opportunities in the sphere of hospitality with strategic changes of the ecosystem of the tourism industry of the Carpathian tourist destination for 2023-2026, million USD (Source: calculated by the authors)

So, in 2023-2026, the maximum level of opportunities for researched tourist services in temporary tourist accommodation facilities will increase 2.12 times. The space of local components indicates progressive strategic changes in the ecosystem of the tourism industry, in the process of which more labor resources will be involved – by 2.26 times and material circulating resources – by 1.95 times. During this period, the increase in the average level of opportunities in temporary accommodation facilities for tourists will increase by 1.5 times. The change in its local components will increase 1.68 times due to labor resources and 1.31 times due to fixed assets. The efforts of the subjects of the sphere of hospitality and the state during the period of the military conflict with the aggressor country are directed to the reproduction of their own potential and the formation of sustainable competitive advantages to ensure the dynamic development of the tourism

industry in the strategy of post-conflict economic recovery, which determines the level of attractiveness of the territory in the long-term period of the withdrawal of Ukraine from crisis. The investment type of strategic changes in the tourism industry of the Western region of Ukraine in the long-term development of the sphere of hospitality will go beyond theoretical concepts and will become the main driving force for achieving competitive advantages both in the domestic and international tourism markets. The multi functionality of investment cycles in the tourism recreation ecosystem of the Western region of Ukraine will provide the optimal resource distribution vector for improving consumer service in temporary tourist accommodation facilities. This will require the state and investors to clearly coordinate actions to accelerate the economic attractiveness of the sphere of hospitality in the modern realities of the post-conflict period of Ukraine, whose economic prosperity will contribute to the development of the level of economic security of tourist recreation in the border areas. The priority measures the strategy of the sphere of hospitality development in the border tourist recreations of the Western region, in the conditions of the post-conflict period of recovery of the tourist industry of Ukraine, should ensure:

- increasing the competitiveness of tourist locations and strengthening their resource potential;
- implementation, at the level of tourist recreation, of stimulating levers that accelerate the productivity of economically active human resources;
- the development of cooperation between tourist recreations for the protection of cultural and historical heritage, the fight against poverty, the consequences of military conflict and the change of the ecosystem;
- achievement of European and world parameters of the ratio of quality of services and prices in the sphere of hospitality, based on the requirements of standardization of the level of service quality, increase of economic stimulation of enterprises of temporary accommodation facilities for tourists to attract foreign investments to the implementation of the regional development program;
- restoration of investment projects for the development of hotel infrastructure;
- maintenance of recreational flows through the development of transport infrastructure in resort and recreation activities and the service sector;
- creation of an attractive tourist image of tourist recreations and promotion of the tourist product on the international tourist market;
- development of the material and technical base and infrastructure of sports and health tourism (modernization with bringing the material and technical base of existing sanatorium and resort health facilities and objects of the tourism industry to the level of world standards);
- commissioning of newly built recreational facilities based on the development of an economic mechanism for stimulating investment activities in the sphere of hospitality, taking into account the improvement of the quality of tourist reception and service;
- bringing the restaurant service to the international level;
- implementation of system marketing of tourist services;
- creation of favorable conditions for investments, tax and customs regulation of the development of the Western region.

DISCUSSION

Any military and political aggravation is a serious problem for the development of the sphere of hospitality in the structure of the tourism industry, as an international industry that has recently suffered more and more from terrorist acts and armed conflicts (attacks on airports, hotels, public transport, etc.) (Khudaverdiyeva et al., 2022). The military conflict of 2022 became factors of a serious decrease in tourist flows in Ukraine, which, in turn, led to a decrease in financial income to the country's balance sheet (Nosyriev et al., 2022). After the end of the military conflict, the issue of restoring economic activity in the destroyed territories, as well as the renewal of tourism, will arise. According to A. Romanova, "the political situation in the country itself determines all other dynamic factors. Crises, political instability, militarization of the economy, increased tourist formalities, changes in the exchange rate are the consequences of politics that negatively affect tourism and the image of the state. Tourists will not want to go to a country where active hostilities are taking place, even if they are localized in a certain region. The state's inability to end or control hostilities on its territory negatively changes the country's image, and the lack of a state strategy in the field of creating a positive tourist image of the country does not contribute to the development of inbound tourism" (Romanova, 2018). All this makes it difficult to assess of the economic attractiveness of the sphere of hospitality in the structure of the tourism industry. The existence of a military conflict forces us to believe that inbound foreign tourism to Ukraine will be absent for a long time. However, no matter how pessimistic the current situation with the Ukrainian tourism industry looks, there are many examples in the world when countries quickly recovered after large-scale conflicts and welcomed guests again. Upheavals caused by armed conflicts bring profound changes to the tourist "landscape" of countries. A new heritage is being created, and post-conflict "memory tourism" is eventually mixed with other directions – cultural or maritime tourism (Romanova, 2018).

The study of the experience of the revival of tourism in post-war (and in the period after war) countries is important from the point of view of understanding and analyzing the strategies applied in the context of the recovery of the tourism industry after conflicts or crisis events. This is essential for many reasons. Tourism is an important sector of the economy for many countries, and the recovery of the tourism industry can significantly contribute to economic recovery. After the Second World War, tourism became the steadiest and fastest growing economic sector and a regular part of life for broad population strata, proving individual and collective success in the post-war society. In particular, tourism in France and Germany was crowned with success. Tour operators, selling package tours as a standardized, assembled and serialized product, as well as tourist leaflets offering air travel would greatly contribute to this. As the railways were destroyed in post-war Europe, air travel became the only fast way to get to the place. Given the fact that the airspace in Ukraine is

currently closed to aircraft, the opening of airports after the war would significantly improve the tourism situation in the country. In addition, the lack of Ukrainian tourism branch offices overseas causes a number of issues for Ukrainian tour operators, and as a result, little is known about the state of tourism in Ukraine.

In Switzerland, there is an Advisory Commission on Tourism, which brings together representatives of 5 federal ministries that are in any way related to the tourism sector, as well as the Swiss Central Office for Tourism, the Hospitality Credit Society and 12 of the country's largest tourism associations and enterprises. Development by the Federal Government of the general concept of conducting policy in the tourism industry is the prerogative of the State Service for Economic Affairs under the Federal Department of Economics, Education and Research. Its tasks include cooperation and support in the opening of a tourist enterprise, advertising tourism, participation in the activities of international tourist organizations. One indicator of the nation's success in the tourism industry is the sheer number of hotel brands it boasts – more than any other country in Europe. In 2020 almost 4,000 hotels with 117.5 rooms worked (Hurin, 2023). It is worth noting that the development of domestic tourism with a high level of service is the main prerequisite for promoting the image of countries on international tourist markets. That is, not only the government but also local people should be interested in the development of tourism and the attraction of tourists. Thus, there is no region in Switzerland that does not seek to develop tourism in itself any form. Moreover, many mobile applications have been created with the help of which tourists will be able to navigate in transport, local landmarks, hotels and restaurants, museums, popular tourist routes and places of rest, etc.

Tourism in Croatia practically stopped during the war. After its end, a massive advertising campaign of the country and its tourist “highlights” was launched. Croatian beaches began to receive “blue flags” for their environmental friendliness and cleanliness. Large cruise companies, international tour operators and chain hotels have become interested in the country. The growth of tourism has had a significant impact on the Croatian the sphere of hospitality and the economy as a whole. In Croatia is about 10 million tourists annually bring significant income at the country and generate about 15% of GDP (Ivaniš, 2011). Some historical revival of tourism in post-war Germany is also interesting. The task for the tourist business of Germany has become the organization of high-quality trips both within the country and abroad, at reasonable prices for the population with low incomes. Such steps have significantly boosted the domestic tourism market.

In the post-war years in Germany, tourism companies that focused on the mass segment of the market and on package offers achieved the greatest success (Ivaniš, 2011). Due to the full-scale Russian invasion of the territory of Ukraine, tour operators were forced to announce a temporary suspension of operational activities on the territory of the country. Since the closure of the airspace, it has become impossible to carry out passenger transportation. The result of negotiations with foreign partners was the export of tourists to countries bordering Ukraine. Before departure, for all those who needed it, the consulates in these countries took care of free extension of accommodation in more budget hotels, or provided an opportunity to stay in hotels at special prices. Friendly European operators provided Ukrainian tourists with free flights to Germany and Austria from resorts in Egypt. Most of the tourists were sent to Poland. Some tourists traveled independently through other countries; others decided to stay in the country of temporary stay until the situation normalizes (CAPA, 2022; International Air Transport Association, 2022). From this point of view, we have to agree with the position of scientists Yu.

Pereguda and Yu. Kryvoberets, who note that it’s necessary to take into account the significant multiplicative effect from of the hospitality sphere in the structure of the tourism industry of tourism, namely the development of related types of economic activity and employment growth provided that the tourist business is settled in the country. At the same time, the regulation and duration of the use of advertising in travel companies begins to bring benefits only at a certain minimum threshold of economic effect the development of the sphere of hospitality. Unfortunately, with the current situations, measures to promote the national tourist product cannot significantly change the parameters of the existing tourist flow for a temporary stay in recreation facilities in the Ukraine. Therefore, country should be widening represented at major international tourist exhibitions and fairs (Pereguda and Kryvoberets, 2022). After the end of the war Ukraine will have the opportunity to develop tourism, in addition, a new direction of tourism may appear – military tourism. The purpose of such tourism is to visit the area associated with military actions: visiting historical places and museums, visiting various objects and training grounds, and visiting the sites of combat operations” (Dvorska, 2022).

Scientists et al. (2022), note that “we should expect an increase in motivation to visit Ukraine among citizens of European partner countries: Poland, Great Britain, Latvia, Lithuania, Estonia, etc. This will provide an opportunity to turn Ukraine into a popular tourist country not only of Eastern Europe, but also of the entire European continent. It is worth thinking today about the tour programs that can be offered to foreign tourists after the end of the war. Along with the traditional tours already developed earlier, there will also be a demand for those that will include settlements that have experienced significant military aggression (Irpin, Bucha, Mariupol, Chernihiv, Chornobayivka, Kyiv, Kharkiv, Mykolaiv, Kherson, Severodonetsk). Excursion locations of new military tourism routes will appear in these territories. But the interest of foreign tourists in Ukraine will not be limited to visiting places where military actions took place or thematic museums. Tourists from other countries will be interested in the history and culture of the Ukrainian people. Therefore, the program of tours in Ukraine should include visits to both the traditional most popular tourist places and tourist centers, as well as military tourism facilities in Ukraine” (Nosyriev et al., 2022).

CONCLUSIONS

Thus, the economic attractiveness of the sphere of hospitality in the structure of the tourism industry should develop in parallel and in conjunction with other sectors of the economy. The recreational and touristic potential, in the presence of all the components of an independent branch of the Ukrainian economy, must be developed under a clear state policy in the of the sphere of hospitality and a coordinated mechanism for its implementation. After the war, it will change in any case, because it is the sphere of hospitality that should become the locomotive of the post-conflict recovery of the tourist industry of Ukraine.

The restoration of tourism in connection with other sectors of the economy will require large capital investments for the reconstruction of infrastructure and the restoration of air flights. The best scenario for the development of the sphere of hospitality at the stage of the country's revival will be domestic tourism, where the accelerated location of partnership will take place. Changing the financial determinant of investment flows in tourist recreation to a balanced value of their target use will ensure the activation of the opportunities of temporary accommodation facilities for clients, where the feature of the investment process itself will be the distribution of own and borrowed resources. Despite the difficulties in implementing the strategy due to the lack of full-fledged financial support from state institutions in Ukraine for the development of the sphere of hospitality in the post-conflict period, it is necessary to gradually strengthen budgetary investment and subsidize tourist locations within one destination according to the parameters of the forecasted investment flows of tourism service entities. For this purpose, it is necessary to create special funds of investment capital in tourist destinations to expand the opportunities for reproduction of tourist products. A careful risk assessment of the investment opportunities of the hospitality industry entities eliminates the irrational use of resources based on the geographical location of tourist locations in the regions of the country.

Diversification of investments and support of each individual subject of the hospitality sphere will be more productive, from the standpoint of timeliness and control over the targeted use of funds by state institutions and investment partners, with the provision of benefits to individual enterprises that will implement "soft response" measures, provided compliance with the relevant operating parameters of temporary accommodation facilities for tourists. At present, there is evident planning and initiative from both State Agency for Tourism Development of Ukraine (SATD), Ukrainians itself and the international community, including the United Nations, in efforts to rejuvenate tourism within Ukraine. Simultaneously, amidst the ongoing conflict, domestic tourism in Ukraine has played a crucial role in sustaining the tourism sector. Ukrainians have started venturing to unfamiliar destinations, uncovering the undiscovered charms of their country, and acknowledging that tourism within Ukraine remains viable even amid military activities. Consequently, the conflict has acted as a catalyst for the growth of domestic tourism, marking a potential fresh start for the industry.

Author Contributions: Conceptualization, Yu. K. and V.H.; methodology, Yu. K. and V.H.; software, K.N. and V.K.; validation, Yu. K. and V.H.; formal analysis, I.S. and V.K.; investigation, V. K. and K. N.; data curation, V.G. and V.K..; writing - original draft preparation, M.G. and M.G.; writing - review and editing, H.G. and H.G.; visualization, M.G. and I.S.; supervision, V.H.; project administration, V.K. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Asian Development Bank (2023). *Central Asian regional economic strategy of cooperation (CAREC) in the field of tourism until 2030*. https://www.adb.org/sites/default/files/institutional-document/668406/carec-tourism- strategy-2030-ru.pdf

Babushko, S., & Opanasiuk, N. (2023). Directions for Improving Ukrainian Legislation on Tourism in Post-War Times. *Studia Regionalne i Lokalne*, 2023, 110-117.

Bulgakova, D.A. (2020). International law on space tourism implementation. *Legal horizons*, 20(33), 119-128. http://www.doi.org/10.21272/legalhorizons.2020.i20.p119

Buntova, N.V. (2016). *Prospects of Ukraine's integration into the international market of hotel services*. I.I. Mechnikova Bulletin of Odessa National University, 4(46), 16-19.

Buryak, T.V. (2014). *Hotel chains: Evolution and formation*. Business Inform, 8, 179-183.

Borushchak, M. (2006). *Problems of forming a strategy for the development of tourist regions*. Lviv: IRD of the National Academy of Sciences of Ukraine, 288 p.

Carlisle, S., Johansen, A., & Kunc, M. (2016). Strategic foresight for (coastal) urban tourism market complexity: The case of Bournemouth. *Tourism Management*, 54, 81-95. https://doi.org/10.1016/j.tourman.2015.10.005

CAPA (2022). *Airports: Ukraine's way back to tourism after the war*. https://centreforaviation.com

Causevic, S., & Lynch, P. (2013). Political (in) stability and its influence on tourism development. *Tourism Management, 34*, 145-157. https://doi.org/10.1016/j.tourman.2012.04.006

DART (2022). DART publishes large-scale tourism research. https://www.tourism.gov.ua/news-and-announcements

Dyadechko, L.P. (2007). *Economics of tourist business*. Kyiv: Center for Educational Literature, 224 p.

Dvorska, I. (2022). *The tourism industry after the war: is resuscitation and anti-crisis management possible?* https://blog.liga.net/user/idvorskaya/article/44952

Galasyuk, S.S., & Shikina, O.V. (2015). *Organizational and economic principles of functioning of small hotels*. Odesa: Atlant, 281 p.

Gerasimenko, V.G. (2017). Key indicators of the hotel enterprises development in Odesa region. *Pryazovsky Economic Bulletin*, 2(02), 42-46.

Halasiuk, K.A. (2012). *Hotel chains in the modern hospitality industry.* Scientific Bulletin of Odessa National University of Economics, 21(173), 127-135.

Holod, A. (2017). *Security of regional tourism systems: Theory, methodology and guarantee problems*. Lviv: LDUFK, 340 p.

Horina, G.O. (2009). The essence and specifics of the operation of hotel chains. *Economics: Problems of Theory and Practice*, 6(4), 1343-1348.

Hurin, A.S. (2023). *The structure and organization of the national tourist system (using the example of Switzerland).* Kyiv: National Aviation University, 91 p.

International Air Transport Association (2022). War in Ukraine and air transport. Retrieved from: https://www.iata.org
Internationl Airlines Group (2020). Aviation Strategy of Ukraine 2030. Retrieved from: https://www.iairgroup.com
Ingram, P.L. (1996). The rise of hotel chains in the United States. New York and London: Garland Publishing, 11 p.
Interfax Ukraine (2022). State Tourism Development Agency of Ukraine. Retrieved from: https://cutt.ly/pGgqHNN
Ivaniš, M. (2011). General Model of Small Entrepreneurship Development in Tourism Destinations in Croatia. *Tourism and Hospitality Management,* 17(2), 231-250. SSRN: https://ssrn.com/abstract=2061705
Kalinina, L.E. (2006). State policy in the field of tourism: tourist and recreational special economic zones. *Tourism: Law and Economics*, 5, 23-27.
Khudaverdiyeva, V., Merchanskyi, V., Chuyko, N., & Voronkova, A. (2022). Strategy of economic adaptation of the tourism and recreation sphere of Ukraine to the international tourist market. *Journal of Innovations and Sustainability*, 6(2), 68 p. https://doi.org/10.51599/is.2022.06.02.02
Kokkranikal, J., Cronje, P., & Butler, R. (2011). Tourism Policy and Destination Marketing in Developing Countries: The Chain of Influence. *Tourism Planning & Development, 8*(4), 359-380. https://doi.org/10.1080/21568316.2011.603885
Kozmenko, O., Poluliakhova, O., & Iastremska, O. (2015). Analysis of countries' investment attractiveness in the field of tourism industry. *Investment Management and Financial Innovations, 12*(3), 56-63. https://doi.org/10.21511/imfi.12(3-1).2015.01
Kvasnii, L., Moravska, O., Malyk, L., Shulzhyk, Y., Orlova, O., & Scherban, O. (2023). Scenarios of the development of enterprises of the tourist industry of Ukraine in the conditions of the war and post-war periods. *Financial and Credit Activity: Problems of Theory and Practice, 2*(49), 313-325. https://doi.org/10.55643/fcaptp.2.49.2023.3999
Liubytseva, O.O. (2002). *Market of tourist services (geospace aspects).* Kyiv: Alterpres, 436 p.
Lyubitseva, O.O., Pankova, E.V., & Stafiychuk, V.I. (2007). *Tourist resources of Ukraine*. Kyiv: Alterpress, 369 p.
Malska, M.P., & Pandyak, I.G. (2009). *Hotel business: Theory and practice*. Kyiv: Center of educational literature, 472 p.
Matsola, V.I. (1997). *Recreational and tourist complex of Ukraine*. Lviv, "VITA", 259 p.
Melnychenko, S.V., & Buryak, T.V. (2014). *Hotel chains on the tourist services market of Ukraine*. Kyiv National Technical University Bulletin, 3, 5-15.
Melnychenko, S.V., & Kudlai, T.V. (2016). *Hotel operators: competitiveness on the national market*. Scientific Bulletin of Uzhhorod University. Series "Economics", 1(47), 171-175.
Milashovska, O. (2008). *Regional policy of socio-economic development of border regions*. Uzhhorod: Carpathians, 512 p.
NSTS (2021). Analytics and infographics. Retrieved from: https://www.ntoukraine.org/nsts_analytics_ua.html
Nosyriev, O., Dedilova, T., & Tokar, I. (2022). Tourism and hospitality industry development in the Ukrainian economics strategy of post-conflict reconstruction. *Socio-Economic Problems and the State*, *26*(1), 55-68.
Pandyak, I., Kushniruk, H., & Telish, P. (2023). Hotel chains in Ukraine: structural and spatial organization and the trends in the hotel business corporatization. *Eonomics and Region*, 1(88). https://doi.org/10.32782/mer.2023.99.07
Parfinenko, A.Y. (2015). *International tourism in Ukraine: geopolitical aspects of a global phenomenon*. Actual Problems of International Relations, 126(1), 12-23.
Pavlotskyi, V.Y. (2017). Statistical evaluation of quantitative indicators of regional markets of organized tourism. *Bulletin of Socio-Economic Research*, 1(62), 116-127. https://doi.org/10.33987/vsed.1(62).2017.116-127
Pereguda, Y., & Kryvoberets, M. (2022). State support of enterprises in the tourism industry in the conditions of martial law and post-war recovery. *Entrepreneurship and Innovation*, 23, 16-20. https://doi.org/10.37320/2415-3583/23.3
Rodak, K. (2022). *What tourism looks like during the War*. https://zaxid.net /statti_tag50974
Romanova, A.A. (2018). Management of the development of the tourism sphere in the conditions of armed conflicts. *Modern Economics*, 9, 93-104. https://doi.org/10.31521/modecon.V9(2018)-12
Sedarati, P., Santos, S., & Pintassilgo, P. (2018). System Dynamics in Tourism Planning and Development. *Tourism Planning & Development*, 1-25. https://doi.org/10.1080/21568316.2018.1436586
Shikina, O.V., & Merezhko, K.A. (2017). Analysis of indicators of Ukraine's development in international tourism. *Global and National Problems of the Economy*, 20, 85-92.
Shupik, B.V. (2020). *Foreign experience in tourism regulation*. Odesa: Odesa State Ecological University, 48 p.
Smirnov, I., & Lyubitseva, O. (2020). *Tourism business during the COVID-19 pandemic: global and Ukrainian experience*. Bulletin of the Kyiv National University of Culture and Arts. Series: Tourism, 3(2), 196-208. https://doi.org/10.31866/2616-7603.3.2.2020.221278
State Statistics Service of Ukraine (2020). *Tourist streams.* http://www.ukrstat.gov.ua/operativ/operativ2007/tyr/tyr_u/potoki2006_u.htm
Stejka (2016). *Tourist portal of Ukraine*. http://www.stejka.com/ukr.
Tkachenko, T.I. (2006). *Sustainable development of tourism: Theory, methodology, business realities*. Kyiv: Kyiv National University of Trade and Economics., 537 p.
Trusova, N.V., Kyrylov, Y.Y., Hranovska, V.H., Prystemskyi, O.S., & Sakun, A.Z. (2020a). The imperatives of the development of the tourist services market in spatial polarization of the regional tourist system. *GeoJournal of Tourism and Geosites, 29*(2), 565-582. https://doi.org/10.30892/gtg.29215-490
Trusova, N.V., Cherniavska, T.A., Pasieka, S.R., Hranovska, V.H., Prystemskyi, O.S., & Demko, V.S. (2020b). Innovative clustering of the region in the context of increasing competitive positions of the enterprises of the tourist-recreational destination. *GeoJournal of Tourism and Geosite, 33*(3), 1126-1134. https://doi.org/10.30892/gtg.31326-549
Trusova, N.V., Tsviliy, S.M., Mykhailyk, D.P., Ogloblina, V.O., & Marusei, T.V. (2023a). Innovative incentives of the tourism industry in the period of post-conflict reconstruction of Ukraine. *Review of Economics and Finance, 21,* 1237-1248.
Trusova, N., Tsviliy, S., Gurova, D., Demko, V., & Samsonova, V. (2023b). Budget instruments for stimulating the development of the investment potential of the tourism industry in Ukraine. *Economic Affairs*, 68(01s), 253-269.
Yasnolob, I., Demianenko, N., Galych, O., Gorb, O., Yehorova, O., Lipskyi, R., Borovyk, T., Mykolenko I., & Protsiuk, N. (2023). Tourism of Ukraine as a Type of Business before and during the War. *Journal of Environmental Management and Tourism, 14*(2), 417-424. https://doi.org/10.14505/jemt.14.2(66).11
Zayed, N.M., Edeh, F.O., Darwish, S., Islam, K.M.A., Kryshtal, H., Nitsenko, V., & Stanislavyk, O. (2022). Human resource skill adjustment in service sector: Predicting dynamic capability in post COVID-19 work environment. *Journal of Risk and Financial Management, 15*(9). https://doi.org/10.3390/jrfm15090402

Article history: Received: 09.10.2023 Revised: 06.11.2023 Accepted: 04.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1692-1702
DOI 10.30892/gtg.514 spl10-1165

IMPACT OF DESTINATION SOCIAL RESPONSIBILITY ON DESTINATION BRAND EQUITY AND REVISIT INTENTION AT DESTINATIONS IN THE SOUTHEAST REGION, VIETNAM

Pham Ngoc Kim KHANH
Faculty of Business Administration, Industrial University of Ho Chi Minh, Ho Chi Minh, Vietnam, e-mail: phamngockimkhanh@iuh.edu.vn

Nguyen Thanh LONG*
Faculty of Business Administration, Industrial University of Ho Chi Minh, Ho Chi Minh, Vietnam, e-mail: nguyenthanhlong@iuh.edu.vn

Citation: Khanh, P.N.K., & Long, N.T. (2023). IMPACT OF DESTINATION SOCIAL RESPONSIBILITY ON DESTINATION BRAND EQUITY AND REVISIT INTENTION AT DESTINATIONS IN THE SOUTHEAST REGION, VIETNAM. *GeoJournal of Tourism and Geosites*, 51(4spl), 1692–1702. https://doi.org/10.30892/gtg.514spl10-1165

Abstract: This study aims to examine the impact of destination social responsibility on destination brand equity and revisit intention at destinations in the Southeast region, Vietnam. Combining qualitative and quantitative research methods with a 593-tourist survey at the destinations. The results show that destination social responsibility positively affects destination brand equity and the revisit intention at the destinations. Destination social responsibility also affected revisit intention through destination brand equity as a moderating factor. From these findings, some managerial implications were proposed for tourism managers, destinations, and enterprises to be more interested in destination social responsibility activities and destination brand equity to improve the revisit intention of tourists in the Southeast region, Vietnam.

Key words: destination social responsibility, destination brand equity, revisit intention, tourism, southeast region in Vietnam

* * * * * *

INTRODUCTION

Currently, most countries worldwide are interested in the tourism industry, which they orient tourism as a sustainable industry. However, tourism practices could occur negative impacts on the environment, social, and communities, such as health, people live. Therefore, the impact would be minimized by realizing social responsibility practices, attracting more tourists. Corporate social responsibility is a definition attracting more interest from all enterprises, even those operating in any industry. Day to day, more enterprises invest in corporate social responsibility activities to build their brand, especially since the global COVID-19 pandemic. In addition, human lives are approaching the 4.0 technological revolution, and life quality is also increasing day by day. Hence, consumers always demand and expect any brand to provide a high-quality good or service. According to Kuokkanen and Sun (2020), a good new marketing tool is corporate social responsibility, which differentiates a brand from other brands. Additionally, from corporate social responsibility concepts, Su et al., (2018) introduced the definition of destination social responsibility, which meant the efforts of the stakeholders at destinations to engage in socially responsible practices. On the other hand, some scholars have developed destination brand equity concept from brand equity concept, such as Boo et al. (2009); Liu (2020); Lu et al. (2015); or Phung and Huynh (2022).

The destination value, well responses with destination brand, and brand commitment have been built-up by the positive tourist perception of the destination (Chi et al., 2020). The destination brand equity would create more values, or meaning that tourists could perceive about the destination, which it could lead to their revisit intention (Lim and Weaver, 2014).

Vietnam tourism would be the leading attractive tourist destination in the Southeast Asia to affirm the destination brand and competitiveness (Vietnam National Administration of Tourism, 2023a). Vietnam tourism welcomes millions of tourists both domestic and foreign. In the first five months of 2023, Vietnam welcomed about 4.6 million international tourists (Vietnam National Administration of Tourism, 2023b). The tourism development strategy of Vietnam in 2020, with a vision to 2030, stated that the Southeast region of Vietnam was one of seven key tourism regions (Vietnam.gov.vn, 2020).

The Southeast region includes six municipality and provinces, Hochiminh city, Dong Nai, Vung Tau, Binh Duong, Tay Ninh and Binh Phuoc. As one of the vital tourism regions in Vietnam, the Southeast has many potentials and strengths to develop diverse and attractive tourism categories such as forest and eco-tourism, sea-island tourism, community tourism, cultural tourism, or cuisine with a 350-km coastline and mountain landscape. In addition, Thanh Long and Khoa Tran (2023) stated that Vietnam had been focusing on the tourism development last years, however, the tourism brand was weak in tourists' minds due to inconsistent tourism brand development. Numerous studies have explored destination social responsibility affecting destination brand equity, destination perception or tourist behavior.

This study examines the impact of destination social responsibility on both destination brand equity and tourist behavior – revisit intention via empirical study, which is the first study related to this context. The Southeast region should develop tourism linking with environmental perspectives, socially responsible perspectives. In addition, the destination brand equity and destination perception in the Southeast region would be improved via socially responsible practices to develop

* Corresponding author

Southeast tourism rapidly and sustainably. Therefore, this study aims to explore and examine destination social responsibility on destination brand equity and revisit intention at the destinations in the Southeast region, Vietnam, to propose some managerial implications for the destination developing sustainably, which no author, no previous study mentioned this topic in the research about the Southeast region, Vietnam before. This study is organized as follows: section 1 – Introduction presents the research context. Section 2 – Literature review describes theoretical background; previous studies on destination social responsibility, destination brand equity, and revisit intention; research model and hypotheses. Section 3 – Methodology shows what methods were applied in this study. Section 4 – Research results and section 5 – Discussion and managerial implications illustrate result analysis, result discussion, and managerial implications. Section 6 shows the conclusion. Finally, section 7 describes limitations and future research directions.

LITERATURE REVIEW

Destination social responsibility

Destination social responsibility was defined as focusing on the efforts of the destination's stakeholders and the community's consciousness. To minimize economic, environmental, and social risks were stakeholders' obligations, which it was destination social responsibility (Azinuddin et al., 2023; He et al., 2022; Lee et al., 2021a; Su and Huang, 2018). Destination social responsibility also needed to generate economic benefits for community and residents (Azinuddin et al., 2023; He et al., 2022; Lee et al., 2021a; Long et al., 2023; Su and Huang, 2018). Destination social responsibility was mentioned again as the obligation and responsibility of stakeholders, including government, tourist communities, organizations, tourists, and local communities, was to play an important role in carrying out social activities (Azinuddin et al., 2023; Lee et al., 2021; Su and Huang, 2018). At the same point, (Nguyen et al., 2019) also stated that there were many aspects relating to destination social responsibility of stakeholders, such as tax payment, worker and customer rights and benefits, environment, supplier benefits, and hygiene and food safety prevention. According to Ma et al. (2013), destination social responsibility was defined as a perception of social responsibility of stakeholders, including investors, suppliers, competitors, local competitors, tourists, employees, and government via status and activities.

Destination social responsibility was developed from corporate social responsibility concept of Carroll (1991), including economic, ethical, legal and philanthropic responsibility. From these findings, destination social responsibility included economic, social, environmental, and stakeholder responsibilities (Dahlsrud, 2008). Ma et al. (2013) defined destination social responsibility as including economic, social, philanthropic and environmental responsibility. Azinuddin et al. (2023) and Su and Huang (2018) found that there were economic, environmental, legal, ethical, and social responsibilities of destination social responsibility. This study continues exploring the destination social responsibility concept, including economic, environmental, legal, and ethical responsibilities as a second-order construct.

Brand equity and destination brand equity

Brand equity was defined as an intangible asset of an enterprise through marketing. Keller (1993) stated that the concept of customer-based brand equity was a positive response from customers with brand knowledge from marketing. Organizations or enterprises should constantly improve and optimize these assets to build a strong brand in customers' sight (Wang et al., 2021). Brand equity concept was divided into 5 aspects: brand awareness, brand association, perceived quality, brand loyalty and other proprietary brand assets (Aaker, 1991). However, in later studies, researchers rejected the last aspect – other proprietary brand assets because they were unrelated to customer perception. Hence, the studies mentioned four aspects of concept of Aaker (1991), such as Yoo and Donthu (2001). In addition, these aspects also needed to depend on the research contexts and business categories (Bose et al., 2022; Tran et al., 2021).

Tourism seems to be a special industry. Therefore, tourists would evaluate these aspects of brand equity through both physical and psychological perspectives. Hence, the brand equity concept of Aaker (1991) had been developed by many scholars to be suitable for tourism context. Scholars combined the concept of brand equity and the definition of destination to define the destination brand equity concept. This concept was divided into four aspects, including brand awareness, brand image, perceived quality and brand loyalty (Liu, 2020; Lu et al., 2015; Phung et al., 2019) In contrast, Aktan et al. (2021) stated that destination brand equity included five aspects: brand awareness, brand image, brand quality, brand loyalty and brand value. Hence, conflict opinions appeared between the scholars. However, from the above findings, most researchers agreed that destination brand equity had included brand awareness, brand image, perceived quality, and brand loyalty. This study would use destination brand equity as a second-order construct embedded with brand awareness, brand image, perceived quality, and brand loyalty.

Revisit intention

According to Chen and Funk (2010), tourist behavior was divided into three stages, including pre-visit – during-visit – post-visit. Intention behavior had a key role in predicting a consumer's possible behavior, which it also expressed whether the actual behavior occurs or not (Bagozzi and Phillips, 1982). Simultaneously, Mat Som et al. (2012) stated that tourist behavior included destination choice, evaluation, and plans. Yang et al., 2020 stated that the revisit intention would be a positive support for destinations or organizations. Tourists's evaluation meant what values and satisfaction tourists received. The future plan was an activity that meant tourists would be willing to revisit the destination where they experienced and to reccomend for others.

Tourists would come back to destinations relating to what they had experienced, such as affective and pre-behavioral elements, especially their real feelings, emotions or evaluation when they had experienced (Cachón Rodríguez et al.,

2019). Ajzen (1991) pointed out the closed connection between the intention and decision behavior of consumers. Therefore, when tourists have a positive attitude towards a destination, they will choose that destination for their next vacation as the first choice without looking for another one (Blanco-Gonzalez et al., 2020). Positive attitude depends on satisfaction with destination image(Chen and Tsai, 2007; Lee, 2009), environment, famous places, travel costs, climate (Park and Njite, 2010), territory, personal services, and human factors (Maunier and Camelis, 2013).

Hypotheses and research model

Destination social responsibility is a concept that has developed from corporate social responsibility concept in recent years. When building destination brand equity, destinations should understand which values are brought for customers and which values they need. In addition, tourists have been interested in environment, social responsibilities (Azinuddin et al., 2023). Destination social responsibility has been generated by all stakeholders of destinations (Azinuddin et al., 2023; Jones, 2005; Lee et al., 2021b; Ma et al., 2013; Su et al., 2018; Su and Huang, 2018; Su and Swanson, 2017). Therefore, when the destination satisfied tourists that it meant its destination brand equity would be more valuable. (Henderson, 2007) and (Nicolau, 2008) pointed out that destinations had affected negatively on the natural environment, culture-society and so on. Hence, social responsibilities would be a critical term that tourists and communities would expect. Corporate social responsibility has been a key role in the economic market, recently, especially when the global has faced with economic recessions (Bhattacharya and Sen, 2003).

Furthermore, currently, research on destination social responsibility is quite limited. However, with previous research on this factor, destination social responsibility has been developed, expanded, and applied the main principles of corporate social responsibility in other contexts such as museums, heritage sites, and tourist attractions. Similarly, this study develops research on the impact of destination social responsibility on destination brand equity through previous studies on corporate social responsibility and brand equity in fields close to the tourism field, such as research by Gutiérrez Rodríguez et al. (2017); Martínez and Nishiyama (2019); Phung and Huynh (2022). Hence, this study proposed the hypothesis as follows:

H_1: Destination social responsibility has a positive influence on destination brand equity

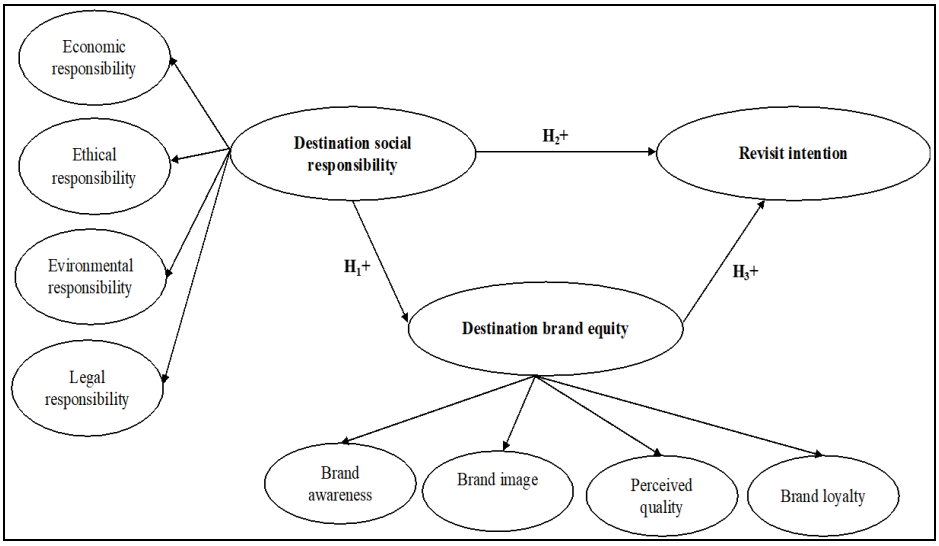


Figure 1. Research model

Yang et al. (2020) stated that tourists' revisit intention would positively support the enterprise development. In the previous studies, corporate social responsibility and revisit intention were tested through mediating variables such as customer satisfaction or reputation. However, the findings illustrated that the revisit intention was influenced highly by corporate social responsibility activities (Chernev and Blair, 2015; Lee et al., 2018; Tong, 2014). Destination social responsibility has developed from the corporate social responsibility concept. There are less previous studies relating clearly to destination social responsibility and revisit intention. However, the influence of destination social responsibility on revisit intention was pointed out by Hassan and Soliman (2021); Su and Huang (2018).

Customer loyalty would be raised well when the organizations or destinations had operated responsibly, which it would increase the relationship quality between customers and the organizations or destinations (Nyadzayo et al., 2016). The tourists' feeling and perception getting from their past vacations was an important factor affecting their revisit intention (Horng et al., 2012). Accordingly, the second hypothesis states as follows:

H_2: Destination social responsibility has a positive influence on revisit intention

Tourist experiences have affected strongly on overall destination loyalty through the perceived value of their revisit intention. According to Aaker (1991), the perceived value was how consumers would engage with a brand.

Chi et al. (2020) and He et al. (2022) stated that the perceived quality of the destination was a tool for increasing and improving tourist behavior. Hence, the tourist's perception of destination brand equity would lead to their revisit intention.

Some previous studies pointed out that revisit intention was affected by the destination brand equity, such as Salehzadeh et al. (2016); Chi et al. (2020); Kurniawan (2020); Rahman et al. (2022); He et al. (2022) and Shi et al. (2022). Hence, this study proposed the third hypothesis as follows:

H_3: Destination brand equity has a positive influence on revisit intention

METHODOLOGY

In order to achieve the research objectives, the study approached qualitative and quantitative methods

This study is measured and analyzed via variables which almost was adopted from existing studies relating to this study. The authors modified slightly items to appropriate with the study context. Destination social responsibility concept and destination brand equity were approached as the second-order construct through four dimensions as mentioned above. Destination social responsibility was measured with 16 items, including Economic responsibility – 4 items; Environmental responsibility – 4 items; Legal responsibility – 4 items; and Ethical responsibility – 4 items, which all were apoted from Lee and Kim (2013) and Tamajón and Font (2013). While a 16-item scale was used to measure the destination brand equity concept, which it was separated into a 4-item scale for each dimension, including brand awareness, perceived quality, brand image, and brand loyalty, which all were adopted from Boo et al. (2009) and Frías Jamilena et al. (2017).

In addition, revisit intention was measured through 4 items adopted from Su et al. (2020). This study was measured via Likert 5 from 1 – strongly disagree, 2 – disagree, 3 – average, 4 – agree, and 5 – strongly agree. The questionnaire was designed into two parts, including the information part – age range, income range, occupation, travel frequency, and travel hobbies; and main part – the scale for measuring the main concept of the study relating to tourists' opinion. Observations were collected by in-paper and online via Google form. This study used non-probability sampling by collecting data from tourists. Hence, to minimize the rate of invalid responses, respondents had to answer the filter question, which it was "Have you ever visited destinations in the Southeast region, Vietnam?" Only observations were answered yes to this question, then respondents would complete the rest of the questionnaire depending on their experience. This questionnaire was designed in English and Vietnamese for foreign and domestic tourists. The sample size must be greater or equal *n x 5*, with n being the number of observed variables. Hence, this study must have at least 180 observations with 36 items. However, to ensure reliability, authors distributed 700 online and offline questionnaires, but only 612 were collected. Among them, there were only 593 valid responses, and the remainder was to have many blank cells without answers.

RESEARCH RESULTS

As mentioned above, this study included two multidimensional factors with four dimensions per factor. Hence, this study applied the two-stage approach (Sarstedt et al., 2019) to measure and analyze the data through 2 steps. Step 1 was the embedded two-stage approach by standard repeated indicator approach to measure higher-order construct, while step 2 was the disjoint two-stage approach to measure lower-order construct. To analyze these data, structural models, and test hypotheses through PLS-SEM via SmartPLS software. According to Hair et al. (2016), the measurement model would been estimated by the reliability, convergent validity, and discriminant validity of the research instrument. In addition, hypotheses and the structural model would be analyzed through the bootstrapping results with P-Value ≤ 0.05 was accepted.

Respondent demographic profile

This study delivered 700 questionnaires to tourists. However, there were only 612 completed responses. Among them, only 593 questionnaires were valid, and the remainder was invalid. Among 593 valid questionnaires, there were 348 females (58.7%), while the rate of males was 245 respondents (41.3%). Regarding age, there were 95 people in 18-25 (16.0%), 317 people in 26-35 (53.5%) and the remainder in over 35 (30.5%) (Figure 2). Only 96 foreign tourists (16.2%) visited destinations in the Southeast region, Vietnam, and answered the questionnaires; the remainder of responses was domestic tourists (83.8%). Income range was also collected from respondents, specifically as below, 89 people answered income range under 10 million Vietnamdong (VND) or $500 U.S. dollar (USD) (15.0%), 113 people had an income range 10 million VND to 25 million VND or over $500 to $1,100 (19.1%), 298 respondents were over 25 million VND to 35 million VND or over $1,100 to $1,500 (50.3%), the remainder was over 35 million VND or $1,500 (15.7%) (Figure 3).

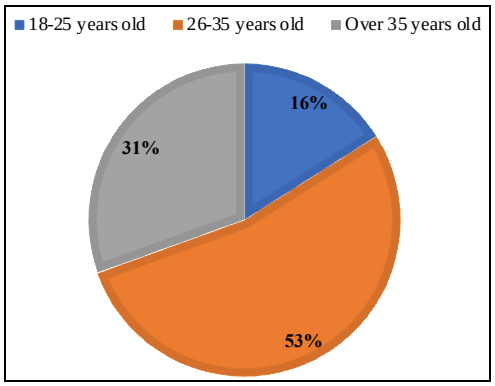


Figure 2. Age of respondents

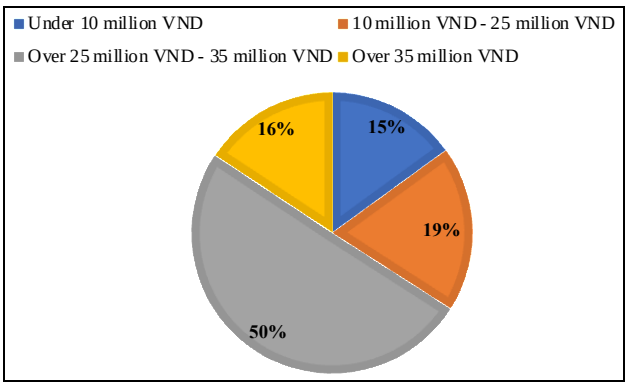


Figure 3. Income of respondents

(Source: Authors collected and analysed)

Scale Reliability Tests

As shown in Table 1, and Table 2, all Cronbach's alpha coefficients of the scales were more significant than 0.6 (Nunnally and Bernstein, 1994), meaning that all was accepted. In addition, the corrected item-total correlation coefficients are more significant than 0.3. This study used the Partial Least Square (PLS) algorithm, which tested the research model and hypotheses. Table 1 and Table 2 would present the internal consistency, convergent and discriminant validity, and internal consistency of the reliability test. According to Hair et al. (2013), concerning internal consistency and convergent validity, composite reliability (CR) exceeds should be 0.4 – 1.0 in the specific context. Hence, all indicators in Table 1 and Table 2 were accepted.

Table 1. Reliability and the result of CFA – higher-order construct (Source: Authors collected and analysed)
Note: ECO: Economic responsibility; ETH: Ethical responsibility; EVI: Evionmental responsibility;
LEG: Legal responsibility; BA: Brand awareness; BI: Brand image; BL: Brand loyalty; PQ: Perceived quality

	Cronbach's alpha	OL	AVE	CR		Cronbach's alpha	OL	AVE	CR
Destination social responsibility					**Destination brand equity**				
ECO	**0.840**		**0.675**	**0.893**	**BA**	**0.837**		**0.672**	**0.891**
ECO1		0.826			BA1		0.828		
ECO2		0.819			BA2		0.839		
ECO3		0.824			BA3		0.834		
ECO4		0.818			BA4		0.776		
ETH	**0.868**		**0.716**	**0.910**	**BI**	**0.720**		**0.549**	**0.827**
ETH1		0.865			BI1		0.655		
ETH2		0.841			BI2		0.836		
ETH3		0.844			BI3		0.621		
ETH4		0.835			BI4		0.827		
EVI	**0.885**		**0.744**	**0.921**	**BL**	**0.913**		**0.794**	**0.939**
EVI1		0.859			BL1		0.861		
EVI2		0.860			BL2		0.894		
EVI3		0.863			BL3		0.912		
EVI4		0.867			BL4		0.896		
LEG	**0.845**		**0.685**	**0.897**	**PQ**	**0.907**		**0.783**	**0.935**
LEG1		0.776			PQ1		0.895		
LEG2		0.887			PQ2		0.896		
LEG3		0.845			PQ3		0.875		
LEG4		0.797			PQ4		0.872		

Table 2. Reliability and the result of CFA – lower-order construct (Source: Authors collected and analysed)

	Cronbach's alpha	OL	AVE	CR
Destination social responsibility	**0.670**		**0.503**	**0.802**
Economic responsibility		0.691		
Ethical responsibility		0.734		
Environmental responsibility		0.702		
Legal responsibility		0.709		
Destination brand equity	**0.797**		**0.628**	**0.869**
Brand awareness		0.653		
Perceived quality		0.791		
Brand image		0.812		
Brand loyalty		0.894		
Revisit intention	**0.914**		**0.794**	**0.939**
RI1		0.888		
RI2		0.907		
RI3		0.885		
RI4		0.884		

Partial least squares structural equation modeling (PLS-SEM)

PLS-SEM is used to estimate the complex relationships of the causes – effects model with latent variables and observed variables. In addition, it is also enable to estimate multiple constructs, indicator variables and structural paths. This study used PLS-SEM with the two-stage approach to estimate the second-order constructs of destination social responsibility and destination brand equity. According to Fornell and Larcker (1981), the convergent validity would be greater than 0.5, and all the constructs need to meet the AVE criterion. With cross-loading, loading coefficient of observation must higher loadings on its parents constructs than other constructs (Chin, 2010).

Table 3 and Table 4 illustrated cross-loading which all the factor loading coefficients (Marked bold values in Table 3 and Table 4) are greater than 0.5 and higher than other constructs in this study. This results showed that the scales have discriminant validity in both higher-order construct and lower-order construct. The PLS-SEM algorithm illustrates the structural model's estimate and validation in Figure 4 and Figure 5. There was no multicollinearity in the higher-order construct and lower-order construct, which all indicators with VIF were less than 5 (VIF < 5).

Table 3. Outer loadings and cross loadings for the higher-order construct (Source: Authors collected and analysed)

Items	BA	BI	BL	PQ	ECO	ETH	EVI	LEG	RI
BA1	**0.828**	0.353	0.426	0.345	0.174	0.279	0.356	0.193	0.455
BA2	**0.839**	0.385	0.483	0.338	0.308	0.390	0.373	0.209	0.495
BA3	**0.834**	0.373	0.467	0.361	0.242	0.364	0.338	0.236	0.448
BA4	**0.776**	0.298	0.363	0.252	0.269	0.257	0.327	0.134	0.406
BI1	0.211	**0.655**	0.484	0.406	0.258	0.378	0.410	0.577	0.510
BI2	0.395	**0.836**	0.685	0.547	0.399	0.423	0.860	0.416	0.674
BI3	0.310	**0.621**	0.516	0.413	0.281	0.865	0.390	0.341	0.540
BI4	0.346	**0.827**	0.619	0.451	0.380	0.417	0.767	0.358	0.610
BL1	0.479	0.707	**0.861**	0.612	0.394	0.567	0.677	0.498	0.775
BL2	0.470	0.739	**0.894**	0.631	0.423	0.544	0.681	0.503	0.806
BL3	0.453	0.665	**0.912**	0.604	0.492	0.537	0.637	0.436	0.768
BL4	0.495	0.684	**0.896**	0.638	0.447	0.559	0.644	0.446	0.749
PQ1	0.342	0.568	0.621	**0.895**	0.324	0.443	0.536	0.406	0.661
PQ2	0.384	0.591	0.686	**0.896**	0.336	0.430	0.569	0.400	0.702
PQ3	0.333	0.493	0.574	**0.875**	0.315	0.466	0.455	0.331	0.623
PQ4	0.344	0.525	0.585	**0.872**	0.309	0.458	0.475	0.423	0.631
ECO1	0.253	0.370	0.394	0.295	**0.826**	0.279	0.331	0.237	0.415
ECO2	0.229	0.350	0.390	0.272	**0.819**	0.288	0.354	0.189	0.429
ECO3	0.224	0.354	0.364	0.278	**0.824**	0.261	0.352	0.198	0.381
ECO4	0.288	0.410	0.473	0.348	**0.818**	0.338	0.415	0.262	0.464
ETH1	0.310	0.621	0.516	0.413	0.281	**0.865**	0.390	0.341	0.540
ETH2	0.319	0.578	0.556	0.451	0.323	**0.841**	0.438	0.425	0.594
ETH3	0.359	0.553	0.514	0.414	0.304	**0.844**	0.424	0.367	0.556
ETH4	0.349	0.529	0.509	0.441	0.292	**0.835**	0.376	0.379	0.553
EVI1	0.389	0.700	0.614	0.498	0.393	0.429	**0.859**	0.385	0.620
EVI2	0.395	0.836	0.685	0.547	0.399	0.423	**0.860**	0.416	0.674
EVI3	0.339	0.692	0.636	0.490	0.351	0.391	**0.863**	0.375	0.624
EVI4	0.346	0.827	0.619	0.451	0.380	0.417	**0.867**	0.358	0.610
LEG1	0.271	0.494	0.461	0.413	0.192	0.370	0.384	**0.776**	0.480
LEG2	0.211	0.655	0.484	0.406	0.258	0.378	0.410	**0.887**	0.510
LEG3	0.167	0.553	0.439	0.320	0.242	0.363	0.378	**0.845**	0.464
LEG4	0.137	0.449	0.360	0.323	0.194	0.367	0.296	**0.797**	0.395
RI1	0.519	0.685	0.745	0.651	0.451	0.605	0.630	0.499	**0.888**
RI2	0.497	0.741	0.824	0.688	0.480	0.609	0.671	0.509	**0.907**
RI3	0.473	0.750	0.802	0.680	0.455	0.624	0.691	0.524	**0.885**
RI4	0.474	0.641	0.725	0.618	0.445	0.525	0.620	0.461	**0.886**

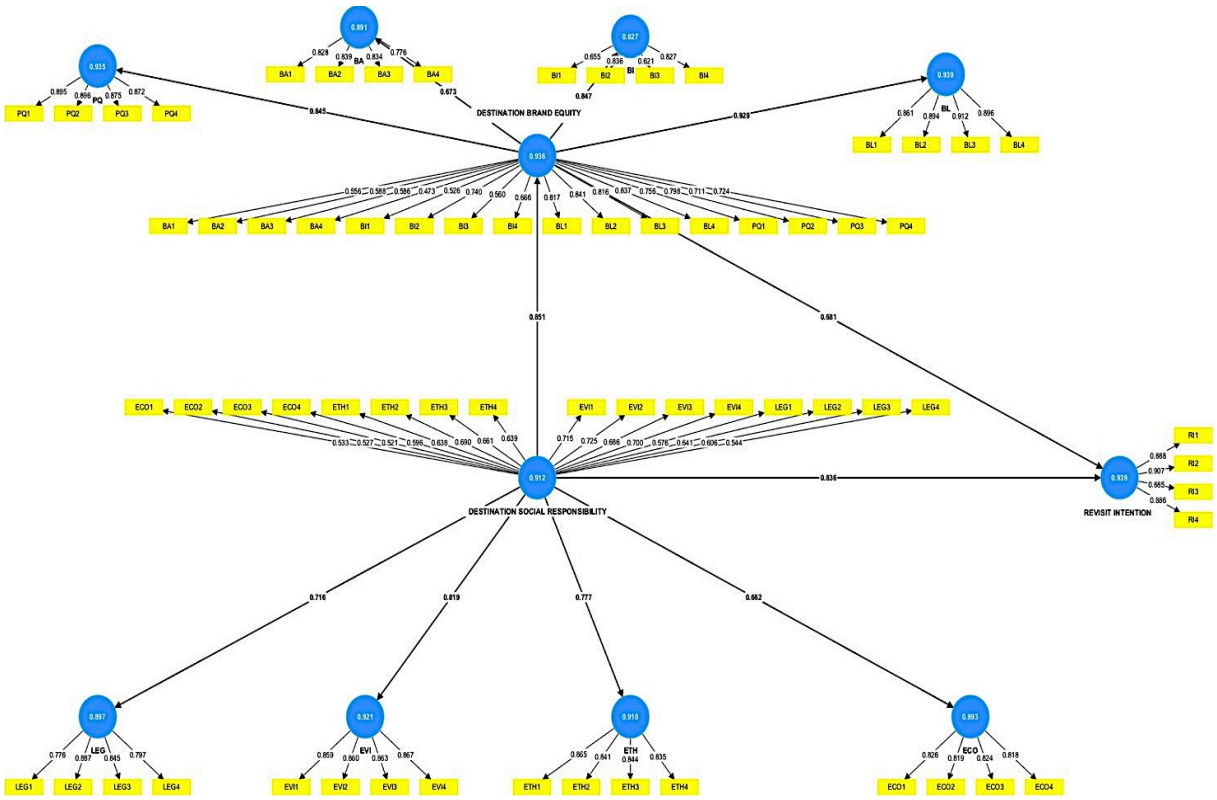


Figure 4. PLS-SEM – Higher-order construct (Source: Authors collected, analysed from SmartPLS software)
Note: ECO: Economic responsibility; ETH: Ethical responsibility; EVI: Evironmental responsibility; LEG: Legal responsibility; BA: Brand awareness; BI: Brand image; BL: Brand loyalty; PQ: Perceived quality

Table 4. Outer loadings and cross loadings for the lower-order construct
(Source: Authors collected and analysed) Note (Table 3 and table 4): ECO: Economic responsibility; ETH: Ethical responsibility; EVI: Evionmental responsibility; LEG: Legal responsibility; BA: Brand awareness; BI: Brand image; BL: Brand loyalty; PQ: Perceived quality; RI1, RI2, RI3, RI4: revisit intention items; and others are items of each

	DBE	DSR	RI
BA	**0.653**	0.400	0.513
BI	**0.812**	0.791	0.736
BL	**0.894**	0.669	0.754
PQ	**0.791**	0.509	0.677
ECO	0.455	**0.691**	0.497
ETH	0.517	**0.734**	0.575
EVI	0.683	**0.702**	0.630
LEG	0.495	**0.709**	0.500
RI1	0.742	0.673	**0.888**
RI2	0.813	0.728	**0.907**
RI3	0.790	0.717	**0.885**
RI4	0.695	0.651	**0.886**

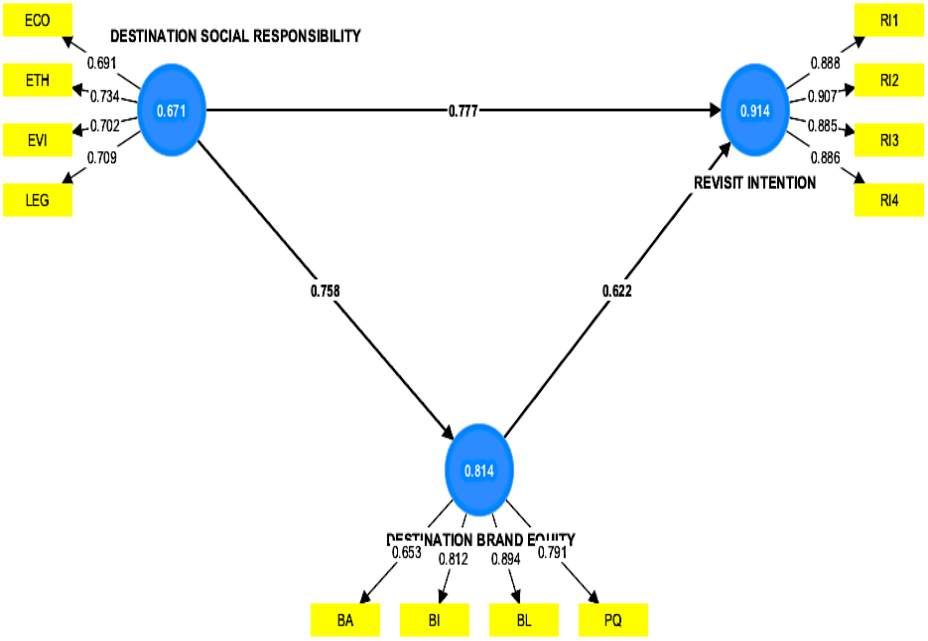


Figure 5. PLS-SEM – Lower-order construct (Source: Authors collected, analysed from SmartPLS software)
Note: ECO: Economic responsibility; ETH: Ethical responsibility; EVI: Evionmental responsibility; LEG: Legal responsibility; BA: Brand awareness; BI: Brand image; BL: Brand loyalty; PQ: Perceived quality

Hypothesis Testing

Hypothesis testing was realized so that the study examine the structural equation modeling (SEM) to accept or reject hypotheses. The path coefficients was used to identify the relationship between constructs in this study. After bootstrap procedure, the P-values less than 0.05, and T-values greater than 1.96.

The parameters were calculated using a 5000-sample bootstrap procedure; they were relevant in all cases (P-values < 0.05) (Table 5). In other words, The PLS-SEM model's result is illustrated as Table 5, in which all hypotheses are accepted. The influence of destination social responsibility on destination brand equity and revisit intention is positive (β = 0.854 and β = 0.225). In addition, destination brand equity is also to affect revisit intention (β = 0.655) positively.

Table 5. Path coefficients (Source: Authors collected, analysed from SmartPLS software)
Note: DSR: Destination social responsibility; DBE: Destination brand equity; RI: Revisit intention

Path	Coefficients	Standard deviation	T-values	P-values	Hypotheses
DBE -> RI	0.655	0.047	13.953	0.000	Accepted H_3
DSR -> DBE	0.854	0.015	56.054	0.000	Accepted H_1
DSR -> RI	0.225	0.052	4.334	0.000	Accepted H_2

DISCUSSION AND MANAGERIAL IMPLICATIONS

Discussion

This study showed that destination social responsibility affected destination brand equity and revisit intention. Although the destination social responsibility concept has developed from the corporate social responsibility concept in recent years, previous studies extended the research scope to museums, heritage sites, and tourist attractions. From the

findings of previous studies on corporate social responsibility and brand equity in fields close to the tourism field, there were studies of Martínez and Nishiyama (2019), He et al. (2022); ChunYang et al. (2020), Esmaeilpour and Barjoei (2016), Gutiérrez Rodríguez et al. (2017); and Phung and Huynh (2022). This finding is appropriate with the research results of the mentioned studies that destination social responsibility influenced destination brand equity. On the other hand, the research results also showed the impact of destination social responsibility on revisit intention. This result is similar to findings from the previous studies of Hassan and Soliman (2021); and Su and Huang (2018).

However, almost all these studies examined destination social responsibility through three dimensions such as economic responsibility, ethical and legal responsibility, and discretionary (Gutiérrez Rodríguez et al., 2017); economics responsibility, ethical responsibility, and social responsibility (Phung and Huynh, 2022); and economics responsibility, ethical responsibility, and legal responsibility (Esmaeilpour and Barjoei, 2016), which studies were examined destination social responsibility and destination brand equity. Moreover, with the impact of destination social responsibility and revisit intention, the authors measured destination social responsibility through 5 items (Su and Huang, 2018) and six items (Hassan and Soliman, 2021). However, this study's findings showed a new contribution that destination social responsibility was measured through 4 dimensions, including economic responsibility, environmental responsibility, ethical responsibility, and legal responsibility, based on the literature review.

In addition, this study also pointed out the impact of destination brand equity on revisit intention. This finding is appropriate with the previous studies of Salehzadeh et al. (2016); Chi et al. (2020); Kurniawan (2020); Rahman et al. (2022) and Shi et al. (2022). However, to measure the impact of destination brand equity on revisit intention, this study measured four dimensions of destination brand equity, including brand awareness, brand image, brand loyalty, and perceived quality based on the literature review while (Shi et al., 2022) measured destination brand equity through destination brand knowledge, destination perceived value and quality. Moreover, some previous study only examined the impact of destination social responsibility on destination brand equity, destination social responsibility on revisit intention, or destination brand equity on revisit intention, but no study has examined the destination social responsibility affecting both destination brand equity and revisit intention. Therefore, this study results also have shown the new contribution that destination brand equity and revisit intention were affected by destination social responsibility.

Managerial implications

First, destination social responsibility affects both destination brand equity and the revisit intention of tourist. Hence, destination managers in the Southeast region need to generate more activities relating to social responsibilities connecting with economy, ethics, legal, and environment, which would build up well destination brand equity and improve their revisit intention. The destinations should improve and update the service or product quality, which they are to make tourists remember places and recommend to others. In addition, the destinations should realize campaigns that encourage tourists and residents to consume or use unique or local products to improve the local economy. Then, the destinations should replace, use, and offer environmentally friendly products or tours, and organize the protect environment programs in local communities to spread the environmental attitude such as "No Waste Day" or "Earth Hour Day." Next, the destination in the Southeast region, Vietnam, should also carry out legal responsibilities with the government such as tax or policies; protect tourists; and improve customer services to resolve service problems promptly. Finally, the destinations should be interested in advertising without exaggerated and false advertisements by providing information on full and accurate products or services and ensuring a healthy and safe environment.

Second, destination brand equity has a positive influence on revisit intention. Therefore, destination managers in the Southeast region should focus on planning strategies to improve the destination brand equity in tourists' minds via four aspects, including brand awareness, brand image, perceived quality, and brand loyalty. The managers should have strategies to rebuild or build up the destination brand equity through long-term investments. The destinations should frequently organize special traditional activities, advertise local services or products, and be interested in digital marketing via social media platforms to approach and increase brand awareness in tourists' minds. Boo et al. (2009) stated that brand image has been an important aspect in destination brand equity.

Hence, the managers should "spread" the unique image, cuisines, and activities at the destinations through advertisements to differentiate with other competitors or destinations and to attract tourists. In addition, the destinations should attach much importance to the perceived quality by training employees and staffs carefully to understand how important services are, evaluating the service or product quality frequently, innovating and investing more in facilities to maintain good quality. Finally, the managers should focus on tourist loyalty by launching promotions and discount policies for tourists who have visited the destination to increase revisit intention capacities. It also brings good experiences for tourists when they visit the destinations now and in the future.

CONCLUSION

This research aims to examine the impact of destination social responsibility on destination brand equity and revisit intention of tourists at the destination in the Southeast region, Vietnam. The findings of this study are (1) destination social responsibility affecting destination brand equity, (2) destination social responsibility affecting revisit intention, and (3) destination brand equity affecting revisit intention. In addition, this study also emphasized the tourism advantages of the Southeast region, Vietnam appropriating to develop diverse tourism categories such as forest and eco-tourism, sea-island tourism, community tourism, cultural tourism, or cuisine with a 350-km coastline and mountain landscape. Therefore, tourism managers should focus there and plan sustainable development strategies to enhance all the region's advantages.

Finally, this study has proposed some managerial implications for the destinations that should implement strategies relating to destination social responsibility and brand equity to enhance tourists' revisit intention.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Although this study had findings and contributions, it has several limitations as follows. First, this study did not explore the influence of each dimension of destination social responsibility on destination brand equity and revisit intention, which examined the impact of destination social responsibility and destination brand equity as a whole. Second, this study was conducted only from the destination perspective of the tourism industry, so it should be explored in more perspective. Third, the authors only researched the destinations in the Southeast region, Vietnam. Therefore, future research should contribute more for the sustainable tourism development as Vietnam's tourism development strategy in 2020, vision 2023. It will examine the impact of each dimension of destination social responsibility on destination brand equity and revisit intention to illustrate which dimension of each concept needs destination focus on. In addition, the research context will be extended to other perspectives of tourism, such as hotels, or restaurants, and other regions in Vietnam.

Author Contributions: Conceptualization, P.N.K.K. and N.T.L.; methodology, P.N.K.K. and N.T.L.; software, P.N.K.K.; validation, P.N.K.K. and N.T.L.; formal analysis, P.N.K.K.; investigation, P.N.K.K. and N.T.L.; data curation, P.N.K.K. and N.T.L.; writing - original draft preparation, P.N.K.K.; writing - review and editing, P.N.K.K.; visualization, P.N.K.K. and N.T.L.; supervision, N.T.L.; project administration, P.N.K.K. and N.T.L. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Aaker, D. (1991). *Managing Brand Equity. Capitalizing on the Value of a Brand Name*. Free Press, 63-67.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Aktan, M., Zaman, U., & Nawaz, S. (2021). Examining destinations' personality and brand equity through the lens of expats: moderating role of expat's cultural intelligence. *Asia Pacific Journal of Tourism Research*, *26*(8), 849–865. https://doi.org/10.1080/10941665.2021.1925314

Azinuddin, M., Hanafiah, M.H., Mior Shariffuddin, N.S., Kamarudin, M.K.A., & Mat Som, A.P. (2023). An exploration of perceived ecotourism design affordance and destination social responsibility linkages to tourists' pro-environmental behaviour and destination loyalty. *Journal of Ecotourism*, *22*(4), 518–541. https://doi.org/10.1080/14724049.2022.2085283

Bagozzi, R.P., & Phillips, L.W. (1982). Representing and Testing Organizational Theories: A Holistic Construal. *Administrative Science Quarterly*, *27*(3), 459. https://doi.org/10.2307/2392322

Bhattacharya, C.B., & Sen, S. (2003). Consumer–Company Identification: A Framework for Understanding Consumers' Relationships with Companies. *Journal of Marketing*, *67*(2), 76–88. https://doi.org/10.1509/jmkg.67.2.76.18609

Blanco-Gonzalez, A., Diéz-Martín, F., Cachón-Rodríguez, G., & Prado-Román, C. (2020). Contribution of social responsibility to the work involvement of employees. *Corporate Social Responsibility and Environmental Management*, *27*(6), 2588–2598. https://doi.org/10.1002/csr.1978

Boo, S., Busser, J., & Baloglu, S. (2009). A model of customer-based brand equity and its application to multiple destinations. *Tourism Management*, *30*(2), 219–231. https://doi.org/10.1016/j.tourman.2008.06.003

Bose, S., Pradhan, S., Bashir, M., & Roy, S.K. (2022). Customer-Based Place Brand Equity and Tourism: A Regional Identity Perspective. *Journal of Travel Research*, *61*(3), 511–527. https://doi.org/10.1177/0047287521999465

Cachón Rodríguez, G., Prado Román, C., & Zúñiga-Vicente, J.Á. (2019). The relationship between identification and loyalty in a public university: Are there differences between (the perceptions) professors and graduates? *European Research on Management and Business Economics*, *25*(3), 122–128. https://doi.org/10.1016/j.iedeen.2019.04.005

Carroll, A.B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Business Horizons*, *34*(4), 39–48. https://doi.org/10.1016/0007-6813(91)90005-G

Chen, C.F., & Tsai, D. (2007). How destination image and evaluative factors affect behavioral intentions? *Tourism Management*, *28*(4), 1115–1122. https://doi.org/10.1016/j.tourman.2006.07.007

Chen, N., & Funk, D.C. (2010). Exploring Destination Image, Experience and Revisit Intention: A Comparison of Sport and Non-Sport Tourist Perceptions. *Journal of Sport & Tourism*, *15*(3), 239–259. https://doi.org/10.1080/14775085.2010.513148

Chernev, A., & Blair, S. (2015). Doing Well by Doing Good: The Benevolent Halo of Corporate Social Responsibility. *Journal of Consumer Research*, *41*(6), 1412–1425. https://doi.org/10.1086/680089

Chi, H.K., Huang, K.C., & Nguyen, H.M. (2020). Elements of destination brand equity and destination familiarity regarding travel intention. *Journal of Retailing and Consumer Services*, *52*, 101728. https://doi.org/10.1016/j.jretconser.2018.12.012

Chin, W.W. (2010). How to Write Up and Report PLS Analyses. In *Handbook of Partial Least Squares* (pp. 655–690). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-32827-8_29

ChunYang, W., Li Wenjun, & Feng Zhijing. (2020). Influence of tourism destination social responsibility on tourism destination brand equity – mediating effects and moderating effects. *Tourism Tribune*. https://www.cabdirect.org/cabdirect/abstract/20203335001

Dahlsrud, A. (2008). How corporate social responsibility is defined: an analysis of 37 definitions. *Corporate Social Responsibility and Environmental Management*, *15*(1), 1–13. https://doi.org/10.1002/csr.132

Esmaeilpour, M., & Barjoei, S. (2016). The impact of corporate social responsibility and image on brand equity. *Global Business and Management Research*. https://www.semanticscholar.org/paper/The-Impact-of-Corporate-Social-Responsibility-and-Esmaeilpour-Barjoei/cb70baa54d7abf0ed33004d49c1d8b3cb78d6618

Fornell, C., & Larcker, D.F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, *18*(3), 382. https://doi.org/10.2307/3150980

Frías Jamilena, D.M., Polo Peña, A.I., & Rodríguez Molina, M.Á. (2017). The Effect of Value-Creation on Consumer-Based Destination Brand Equity. *Journal of Travel Research*, *56*(8), 1011–1031. https://doi.org/10.1177/0047287516663650

Gutiérrez Rodríguez, P., Cuesta Valiño, P., & Vázquez Burguete, J.L. (2017). The effects of corporate social responsibility on customer-based brand equity: Spanish hypermarket case. *Economic Research-Ekonomska Istraživanja*, *30*(1), 290–301. https://doi.org/10.1080/1331677X.2017.1305797

Hair, J.F., Ringle, C.M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1–2), 1–12. https://doi.org/10.1016/j.lrp.2013.01.001

Hair, Jr., J.F., Sarstedt, M., Matthews, L.M., & Ringle, C.M. (2016). Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I – method. *European Business Review*, *28*(1), 63–76. https://doi.org/10.1108/EBR-09-2015-0094

Hassan, S.B., & Soliman, M. (2021). COVID-19 and repeat visitation: Assessing the role of destination social responsibility, destination reputation, holidaymakers' trust and fear arousal. *Journal of Destination Marketing & Management*, *19*, 100495. https://doi.org/10.1016/j.jdmm.2020.100495

He, X., Cheng, J., Swanson, S.R., Su, L., & Hu, D. (2022). The effect of destination employee service quality on tourist environmentally responsible behavior: A moderated mediation model incorporating environmental commitment, destination social responsibility and motive attributions. *Tourism Management*, *90*, 104470. https://doi.org/10.1016/j.tourman.2021.104470

Henderson, J.C. (2007). Corporate social responsibility and tourism: Hotel companies in Phuket, Thailand, after the Indian Ocean tsunami. *International Journal of Hospitality Management*, *26*(1), 228–239. https://doi.org/10.1016/j.ijhm.2006.02.001

Horng, J.S., Liu, C.H., Chou, H.Y., & Tsai, C.Y. (2012). Understanding the impact of culinary brand equity and destination familiarity on travel intentions. *Tourism Management*, *33*(4), 815–824. https://doi.org/10.1016/j.tourman.2011.09.004

Jones, R. (2005). Finding sources of brand value: Developing a stakeholder model of brand equity. *Journal of Brand Management*, *13*(1), 10–32. https://doi.org/10.1057/palgrave.bm.2540243

Keller, K.L. (1993). Conceptualizing, Measuring, and Managing Customer-Based Brand Equity. *Journal of Marketing*, *57*(1), 1–22. https://doi.org/10.1177/002224299305700101

Kuokkanen, H., & Sun, W. (2020). Companies, Meet Ethical Consumers: Strategic CSR Management to Impact Consumer Choice. *Journal of Business Ethics*, *166*(2), 403–423. https://doi.org/10.1007/s10551-019-04145-4

Kurniawan, R. (2020). The Effect of Online Experience on Revisit Intention Mediated with Offline Experience and Brand Equity. *Proceedings of the 2nd International Seminar on Business, Economics, Social Science and Technology (ISBEST 2019)*. https://doi.org/10.2991/aebmr.k.200522.020

Lee, C.K., Olya, H., Ahmad, M.S., Kim, K.H., & Oh, M.J. (2021a). Sustainable intelligence, destination social responsibility, and pro-environmental behaviour of visitors: Evidence from an eco-tourism site. *Journal of Hospitality and Tourism Management*, *47*, 365–376. https://doi.org/10.1016/j.jhtm.2021.04.010

Lee, C.K., Olya, H., Ahmad, M.S., Kim, K.H., & Oh, M.J. (2021b). Sustainable intelligence, destination social responsibility, and pro-environmental behaviour of visitors: Evidence from an eco-tourism site. *Journal of Hospitality and Tourism Management*, *47*, 365–376. https://doi.org/10.1016/j.jhtm.2021.04.010

Lee, M., & Kim, W. (2013). The Effect of Perceived Corporate Social Responsibility on Hotel Employee's Attitude and Behavior toward the Organization. *International Journal of Tourism Sciences*, *13*(3), 51–74. https://doi.org/10.1080/15980634.2013.11434680

Lee, T.H. (2009). A Structural Model to Examine How Destination Image, Attitude, and Motivation Affect the Future Behavior of Tourists. *Leisure Sciences*, *31*(3), 215–236. https://doi.org/10.1080/01490400902837787

Lee, Y.J., Yoon, H.J., & O'Donnell, N.H. (2018). The effects of information cues on perceived legitimacy of companies that promote corporate social responsibility initiatives on social networking sites. *Journal of Business Research*, *83*, 202–214. https://doi.org/10.1016/j.jbusres.2017.09.039

Lim, Y., & Weaver, P.A. (2014). Customer-based Brand Equity for a Destination: the Effect of Destination Image on Preference for Products Associated with a Destination Brand. *International Journal of Tourism Research*, *16*(3), 223–231. https://doi.org/10.1002/jtr.1920

Liu, C.H. (2020). Integration of different perspectives of culinary brand equity. *Journal of Hospitality and Tourism Management*, *45*, 152–161. https://doi.org/10.1016/j.jhtm.2020.08.007

Long, N.T., Hai, P.H., Khoa, T.D., Khanh, P.N.K., Kieu, L.T., & Danh, L.X. (2023). Impacts of destination social responsibility on destination image and tourist revisit intention: An empirical study at tourism destinations in the Mekong delta, Vietnam. *International Journal of Applied Economics, Finance and Accounting*, *17*(2), 325–336. https://doi.org/10.33094/ijaefa.v17i2.1167

Lu, A.C.C., Gursoy, D., & Lu, C.Y. (2015). Authenticity perceptions, brand equity and brand choice intention: The case of ethnic restaurants. *International Journal of Hospitality Management*, *50*, 36–45. https://doi.org/10.1016/j.ijhm.2015.07.008

Ma, B., Su, L., Ding, Y., & Hu, X. (2013). Understanding the Relationships among Destination Social Responsibility, Resident Benefits, Trust and Support for Tourism Development. *Information Technology Journal*, *12*(20), 5947–5954. https://doi.org/10.3923/itj.2013.5947.5954

Martínez, P., & Nishiyama, N. (2019). Enhancing customer-based brand equity through CSR in the hospitality sector. *International Journal of Hospitality & Tourism Administration*, *20*(3), 329–353. https://doi.org/10.1080/15256480.2017.1397581

Mat Som, A.P., Marzuki, A., Yousefi, M., & AbuKhalifeh, A.N. (2012). Factors Influencing Visitors' Revisit Behavioral Intentions: A Case Study of Sabah, Malaysia. *International Journal of Marketing Studies*, *4*(4). https://doi.org/10.5539/ijms.v4n4p39

Maunier, C., & Camelis, C. (2013). Toward an identification of elements contributing to satisfaction with the tourism experience. *Journal of Vacation Marketing*, *19*(1), 19–39. https://doi.org/10.1177/1356766712468733

Nguyen, T.Q., Long, N.T., & Nguyen, T.L. (2019). Impacts of corporate social responsibility on the competitiveness of tourist enterprises: An empirical case of Ben Tre, Vietnam. *Tourism Economics*, *25*(4), 539–568. https://doi.org/10.1177/1354816618805318

Nicolau, J.L. (2008). Corporate Social Responsibility. *Annals of Tourism Research*, *35*(4), 990–1006. https://doi.org/10.1016/j.annals.2008.09.003

Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill, Inc.

Nyadzayo, M.W., Leckie, C., & McDonald, H. (2016). CSR, relationship quality, loyalty and psychological connection in sports. *Marketing Intelligence & Planning*, *34*(6), 883–898. https://doi.org/10.1108/MIP-08-2015-0148

Park, Y., & Njite, D. (2010). Relationship between Destination Image and Tourists' Future Behavior: Observations from Jeju Island, Korea. *Asia Pacific Journal of Tourism Research*, *15*(1), 1–20. https://doi.org/10.1080/10941660903510024

Phung, M.T., Ly, P.T.M., & Nguyen, T.T. (2019). The effect of authenticity perceptions and brand equity on brand choice intention. *Journal of Business Research*, *101*, 726–736. https://doi.org/10.1016/j.jbusres.2019.01.002

Phung, T.T., & Huynh, G.T.T. (2022). Impact of corporate social responsibility on brand equity with the mediating role of customer trust and customer participation - a case study in the vietnamese hotel industry. *Science & Technology Development Journal - Economics - Law and Management*. https://doi.org/10.32508/stdjelm.v6i3.1057

Rahman, M.S., Bag, S., Hassan, H., Hossain, M.A., & Singh, R.K. (2022). Destination brand equity and tourist's revisit intention towards health tourism: an empirical study. *Benchmarking: An International Journal*, *29*(4), 1306–1331. https://doi.org/10.1108/BIJ-03-2021-0173

Salehzadeh, R., Khazaei Pool, J., & Soleimani, S. (2016). Brand personality, brand equity and revisit intention: an empirical study of a tourist destination in Iran. *Tourism Review*, *71*(3), 205–218. https://doi.org/10.1108/TR-02-2016-0005

Sarstedt, M., Hair, J.F., Cheah, J.H., Becker, J.M., & Ringle, C.M. (2019). How to Specify, Estimate, and Validate Higher-Order Constructs in PLS-SEM. *Australasian Marketing Journal*, *27*(3), 197–211. https://doi.org/10.1016/j.ausmj.2019.05.003

Shi, H., Liu, Y., Kumail, T., & Pan, L. (2022a). Tourism destination brand equity, brand authenticity and revisit intention: the mediating role of tourist satisfaction and the moderating role of destination familiarity. *Tourism Review*, *77*(3), 751–779. https://doi.org/10.1108/TR-08-2021-0371

Shi, H., Liu, Y., Kumail, T., & Pan, L. (2022b). Tourism destination brand equity, brand authenticity and revisit intention: the mediating role of tourist satisfaction and the moderating role of destination familiarity. *Tourism Review*, *77*(3), 751–779. https://doi.org/10.1108/TR-08-2021-0371

Su, L., Gong, Q., & Huang, Y. (2020). How do destination social responsibility strategies affect tourists' intention to visit? An attribution theory perspective. *Journal of Retailing and Consumer Services*, *54*, 102023. https://doi.org/10.1016/j.jretconser.2019.102023

Su, L., Huang, S., & Huang, J. (2018). Effects of Destination Social Responsibility and Tourism Impacts on Residents' Support for Tourism and Perceived Quality of Life. *Journal of Hospitality & Tourism Research*, *42*(7), 1039–1057. https://doi.org/10.1177/1096348016671395

Su, L., & Huang, Y. (2018). How does Perceived Destination Social Responsibility Impact Revisit Intentions: The Mediating Roles of Destination Preference and Relationship Quality. *Sustainability*, *11*(1), 133. https://doi.org/10.3390/su11010133

Su, L., & Swanson, S.R. (2017). The effect of destination social responsibility on tourist environmentally responsible behavior: Compared analysis of first-time and repeat tourists. *Tourism Management*, *60*, 308–321. https://doi.org/10.1016/j.tourman.2016.12.011

Tamajón, L.G., & Font, X. (2013). Corporate social responsibility in tourism small and medium enterprises evidence from Europe and Latin America. *Tourism Management Perspectives*, *7*, 38–46. https://doi.org/10.1016/j.tmp.2013.03.002

Thanh Long, N., & Khoa Tran, D. (2023). Factors affecting brands and competitiveness of tourism destinations: an analysis of the Mekong Delta. *The Singapore Economic Review*, 1–20. https://doi.org/10.1142/S0217590823500510

Tong, C. (2014). The Influences of Corporate Social Responsibility to Customer Repurchases Intentions, Customer Word-of-Mouth Intentions and Customer Perceived Food Quality of Fast-Food Restaurants in Hong Kong and the Mediating Effects of Corporate Reputation. *British Journal of Economics, Management & Trade*, *4*(11), 1655–1678. https://doi.org/10.9734/BJEMT/2014/11311

Tran, P.K.T., Nguyen, V.K., & Tran, V.T. (2021). Brand equity and customer satisfaction: a comparative analysis of international and domestic tourists in Vietnam. *Journal of Product & Brand Management*, *30*(1), 180–194. https://doi.org/10.1108/JPBM-08-2019-2540

Wang, L., Togtokhbuyan, L., & Yadmaa, Z. (2021). Visual analysis of the international wellness tourism WOS literature from 1992 to 2019. *International Journal of Spa and Wellness*, *4*(1), 1–16. https://doi.org/10.1080/24721735.2020.1830527

Yang, S., Isa, S.M., Ramayah, T., Blanes, R., & Kiumarsi, S. (2020). The Effects of Destination Brand Personality on Chinese tourists' Revisit Intention to Glasgow: An Examination across Gender. *Journal of International Consumer Marketing*, *32*(5), 435–452. https://doi.org/10.1080/08961530.2020.1717400

Yoo, B., & Donthu, N. (2001). Developing and validating a multidimensional consumer-based brand equity scale. *Journal of Business Research*, *52*(1), 1–14. https://doi.org/10.1016/S0148-2963(99)00098-3

Article history: Received: 06.10.2023 Revised: 07.11.2023 Accepted: 05.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1703-1716
DOI 10.30892/gtg.514 spl11-1166

THE ENVIRONMENTAL EFFECTS OF TOURISM: ANALYZING THE IMPACT OF TOURISM, GLOBAL TRADE, CONSUMPTION EXPENDITURE, ELECTRICITY, AND POPULATION ON ENVIRONMENT IN LEADING GLOBAL TOURIST DESTINATIONS

Santus Kumar DEB
Department of Tourism and Hospitality Management, University of Dhaka, Dhaka, Bangladesh, e-mail:santus@du.ac.bd

Mihir Kumar DAS
Module Leader & Lecturer, Business and Enterprise, Global Banking School, London, UK, e-mail:drmihirecon12@gmail.com

Liton Chandra VOUMIK
Department of Economics, Noakhali Science and Technology University, Noakhali, Bangladesh, e-mail:litonvoumik@gmail.com

Shohel Md. NAFI
Department of Tourism and Hospitality Management, Noakhali Science and Technology University, Noakhali, Bangladesh, e-mail: smnafi13@gmail.com

Mamunur RASHID
Department of Information Technology, School of Business & Technology, Emporia State University, Emporia, USA, e-mail: mrashid1210@gmail.com

Miguel Angel ESQUIVIAS*
Faculty of Economics and Business, Airlangga University, Surabaya, Indonesia, e-mail: miguel@feb.unair.ac.id

Citation: Deb, S.K., Das, M.K., Voumik, L.C., Nafi, S.M. Rashid, M., & Esquivias, M.A. (2023). THE ENVIRONMENTAL EFFECTS OF TOURISM: ANALYZING THE IMPACT OF TOURISM, GLOBAL TRADE, CONSUMPTION EXPENDITURE, ELECTRICITY, AND POPULATION ON ENVIRONMENT IN LEADING GLOBAL TOURIST DESTINATIONS. *GeoJournal of Tourism and Geosites*, 51(4spl), 1703–1716. https://doi.org/10.30892/gtg.514spl11-1166

Abstract: The study analysed the impact of tourism, trade, consumption expenditure, electricity usage, and population on carbon dioxide emissions (CO_2) in leading tourist destinations. The study uses a panel dataset of 32 countries from different continents between 2001 and 2020 and applies the generalized method of moments (GMM) and Quantile Regression approaches. The results suggest that tourism (arrivals and revenues) can reduce environmental degradation, and that CO_2 emissions increase due to factors such as GDP per capita, electricity consumption, and population growth. Trade openness can reduce CO_2 emissions, and controlling for final consumption also indicates a decrease in CO2 emissions. The study suggests that sustainable tourism practices, responsible consumption, and larger international integration may play a role in mitigating CO_2 emissions. Leading tourist destinations should develop sustainable urban areas to accommodate population growth, and embrace eco-friendly technologies, infrastructure, and consumption patterns to promote sustainable economic growth while reducing CO_2 emissions.

Key words: CO2 Emissions, Tourist Destinations, Quantile Regression, Tourism, Sustainable Development

* * * * * *

INTRODUCTION

Tourism, which encompasses activities such as travel, leisure, relaxation, and exploration over a short period, plays a substantial role in global Gross Domestic Product (GDP) (Rahman et al., 2023). It brings a multitude of benefits to host nations, spanning social, economic, cultural, and environmental aspects, which is widely recognized by scholars (Uzuner et al., 2020). Tourism creates jobs, attracts foreign direct investment (FDI), enhances infrastructure development, and elevates service sector standards (Zuo and Huang, 2018). According to the World Tourism Organization (WTO), tourism contributes to 10% of global GDP and 7% of global trade, and supports one in ten jobs, with the potential to align with 17 Sustainable Development Goals (UNWTO, 2018; Shi et al., 2019). Given its profound influence on economic growth, numerous countries have shifted their focus toward the tourism sector, seeking to harness new avenues of economic expansion, foreign exchange income, job generation, and enhanced living standards. The global reach of the tourism industry is extensive, bolstering tax revenues, income streams, and employment prospects (Shi et al., 2019). However, the surge in tourist numbers in recent decades has raised concerns regarding environmental degradation (Adedoyin et al., 2021), which occurs in tandem with the industry's economic benefits. Tourism is recognized as a significant factor that can influence both the environmental and economic conditions of an economy (Ozturk et al., 2023).

The global temperature is rising, which is a cause for concern and is influenced by various factors, such as greenhouse gases, unplanned infrastructure, climate change, trade, and overpopulation (Alola et al., 2019). These factors are interconnected and

* Corresponding author

contribute to carbon emissions, which can be exacerbated by tourism. Some studies suggest that tourism promotes trade and increases human mobility, leading to increased consumption and GDP growth, which, in turn, raises CO_2 emissions (Akadiri et al., 2020; Pata et al., 2023). This indicates that tourism operations consume substantial energy, drive economic growth, and result in higher CO_2 emissions, posing challenges to achieving sustainable development goals. Nosheen et al., (2021) stated that CO_2 has a detrimental effect on sustainable economic growth and harms human health and the environment. Tourism has emerged as a sector with potential to contribute to GDP growth in both developed and developing countries (Ozturk et al., 2023; Durani et al., 2023). However, this potential varies, with some cases yielding both economic and environmental benefits (Sun et al., 2023), whereas in other instances, economic gains may come at the expense of significant environmental costs (Irfan et al., 2023). This highlights the importance of identifying sustainable strategies that support the expansion of global tourism and transportation (Onifade and Haouas, 2023; Zaman et al., 2017) while preserving the environment.

The study examined the linkages between tourism, trade, population growth, consumption, and CO_2 emissions in the top 32 tourist arrival countries from six world regions. In 2019, tourism accounted for nearly 9.1% of the GDP in Europe, 8.8% in North America, 8.1% in Latin America, 8.4% in Asia, 7.5% in Africa, and 11.7% in Oceania. France, with over 90 million visitors in 2019, was the most popular travel destination, followed by Spain, the US, China, Italy, Turkey, Mexico, Thailand, Germany, and the UK (CEPAL, 2022). In the past, Europe and the US dominated global carbon emissions, but in the second half of the 20th century, Asia became the leading emitter. In 2019, Europe emitted 2.52 billion tons of CO_2, North America excluding the US emitted 1.24 billion tons, Latin America emitted 1.07 billion tons, Asia excluding India and China emitted 7.53 billion tons, Africa emitted 1.47 billion tons, and Oceania emitted 470.36 million tons (Dohlman et al., 2022). Notably, several of the top 32 tourist destinations are among the leading CO_2-emitting nations, indicating the need to assess the impact of tourism on the environmental quality of these countries, whether positive or negative. China is the largest source of CO_2 emissions, contributing 10.74 billion tons, followed by the US with 5.26 billion tons, and India with 2.63 billion.

The annual trends of the various study variables are displayed in panels (a) – (d) in Figure 1 below. The graph illustrates the significant increase in GDP per capita and CO_2 emissions. Conversely, there are fluctuations observed in tourist arrivals, tourist receipts, and trade openness. During the period in question, CO_2 emissions increased by nearly 60%, with Asia experiencing the most significant expansion. Both Europe and Asia saw substantial growth in tourism arrivals. Between 2000 and 2020, GDP per capita nearly doubled, with Asian countries recording the most significant gains.

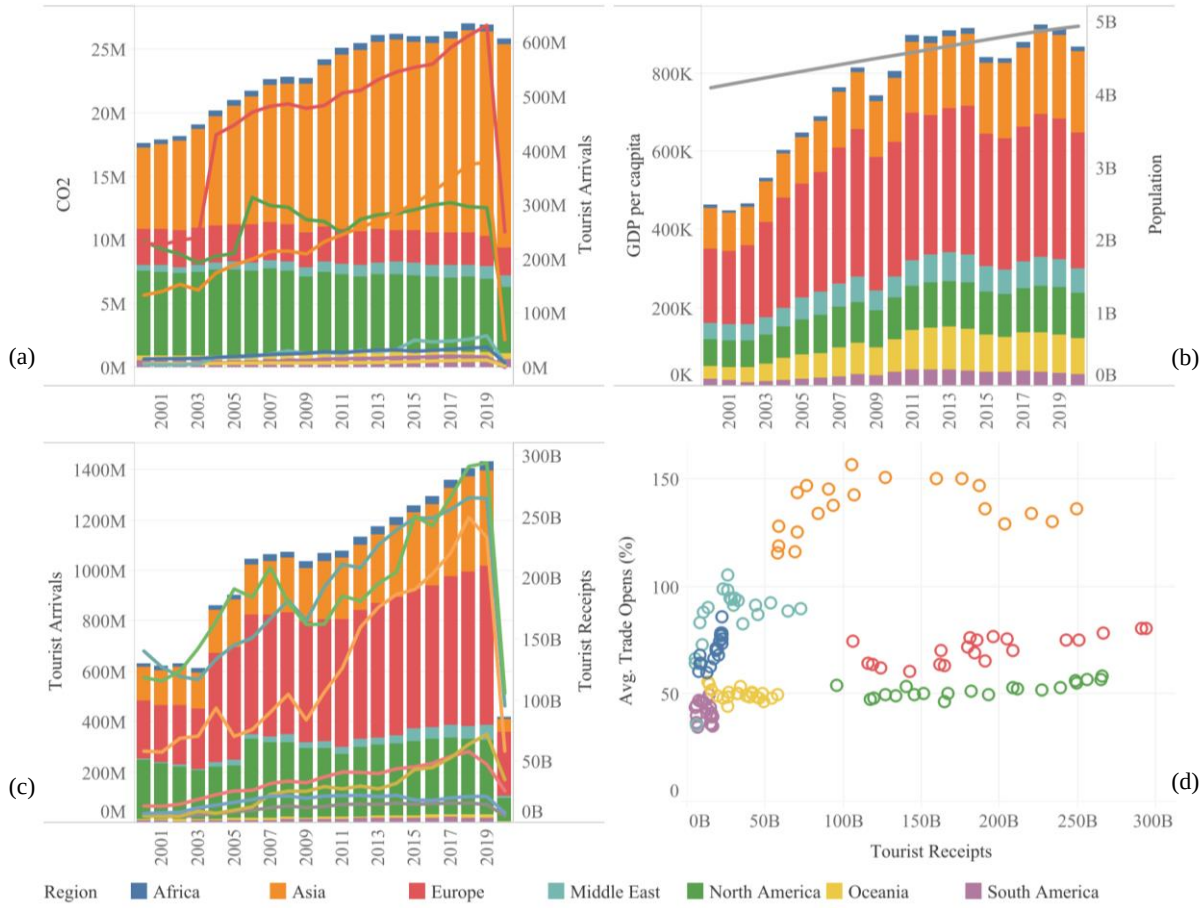


Figure 1. Annual trends of the study variables (a) CO_2 emission (CO2 emissions, kt) and Tourism Arrivals (number of Arrivals Millions) (b) GDP per capita (current US$) and Total Population (Million) (c) Tourist Arrivals (Millions) and Tourists receipts (US Billion, Current) (d) Trade openness and Tourism Receipts

In terms of tourism receipts, Asian, European, and North American countries experienced the largest growth. Interestingly, Europe and North America have relatively lower levels of trade openness compared to other regions, despite

experiencing the highest growth in receipts. In contrast, Asian countries are highly open to trade and have rapidly expanded their tourism receipts, suggesting a different approach to tourism growth compared to Western countries.

The objective of this research is to examine the impact of various factors, including tourism, trade, consumption expenditure, electricity consumption, income, and population, on CO_2 emissions in top tourist nations. By analyzing these interrelationships, the study aims to provide insights into the sustainable environment of the tourism industry and the factors that contribute to environmental degradation. The research utilizes a panel dataset containing 32 countries from various continents spanning from 2001 to 2020. The measurement of tourism is based on both the number of tourist arrivals and corresponding revenue generated. The analysis employs the Generalized Methods of Moments (GMM) and Quantile Regression methodologies. To avoid potential biases, a two-step System GMM approach with differencing variables is implemented. Additionally, the study excludes five countries with the highest and lowest tourist arrivals to assess whether the primary findings are affected by the extreme observations in the sample.

This study makes a valuable contribution to the literature on CO_2 emissions in several ways. Firstly, it enhances our understanding of the factors that influence CO_2 emissions, particularly in the context of tourism-related activities such as trade, population, final consumption, electricity consumption, and GDP. Additionally, the research included two variables related to tourism activities: tourism revenue and foreign tourists' arrivals. This is important, as the literature has shown inconclusive results when either revenue or arrival is used as a proxy for tourism (Farooq et al., 2023; Ansari and Villanthenkodath, 2022). Secondly, our analysis broadens the scope of the study by incorporating data from 32 leading tourist countries across six distinct continents. This addresses a notable gap in the literature, as many studies tend to focus solely on individual top tourist destinations or specific regions, often overlooking multi-regional considerations. Thirdly, the paper employed advanced analytical techniques, including Quantile Regression and GMM, which enhance the robustness of the findings. The use of differencing variables and the two-step System GMM approach further minimized potential biases. Additionally, the paper used Quantile Regression, which can handle extreme values that are often encountered in diverse country samples and have the potential to exert a disproportionate influence on the results. Fourthly, there were two kinds of robustness tests used in this work. Quantile regression was used in the study to estimate robustness. However, in order to assess the research's robustness, the top five and bottom five tourist countries were excluded from the list of 32 tourist destinations. The structure of this paper is as follows. In Section 2, the paper will present a comprehensive literature review. In Section 3, the paper will provide an overview of the data and methodology used in this study. The results and findings will be described and discussed in Section 4. In Section 5, the paper will have a discussion on the study's findings. Finally, the conclusions and policy implications will be explained in Section 6. In Section 7, the paper will discuss the limitations and scope of this study. This paper has two appendices. The list of nations is in Table 9, while the list of abbreviations is in and Table 10.

LITERATURE REVIEW

Over the past two decades, the impact of travel and tourism on the economy has received significant attention, leading to a surge in theoretical and empirical research. This body of work has comprehensively examined the complex correlation between CO_2 emissions, economic growth, and energy consumption on a global scale. The relationship between tourism and CO_2 emissions has been thoroughly analyzed from various perspectives. International travel is one of the most energy-intensive aspects of tourism, with energy consumed across tourism destinations for activities such as transportation, shipping, waste management, and the importation of goods, making it an energy-demanding endeavour (Ali, 2023; Zaman et al., 2017). Additionally, amusement parks, ski resorts, entertainment, and shopping centers, which are largely automated, exhibit substantial energy consumption patterns (Zhao et al., 2023; Dwyer et al., 2010). It is worth noting that in regions with milder climates, CO_2 emissions can have disproportionate effects on tourism, as demonstrated by the adverse consequences observed in Buttke et al. (2023), Gössling et al. (2015), and Hamilton et al. (2005).

Prior research suggests that tourism can serve as an agent of environmental conservation when managed effectively by promoting the adoption of eco-friendly technologies and transportation methods (Ahmad et al., 2023c; Koçak et al., 2020; Leal Filho et al., 2023). This shift towards sustainability can involve measures such as reducing gasoline consumption, enhancing road infrastructure, expanding safer highways, and bolstering rail transportation, which can contribute to the reduction of CO_2 emissions (Ghosh et al., 2023; Polcyn et al., 2023; Umurvzako et al., 2023). Constructing eco-friendly infrastructure to support the tourism sector, including airports, railways, roads, and telecommunications, can mitigate the environmental impact of tourism and simultaneously stimulate economic growth (Jahanger et al., 2023; Khan et al., 2022a; 2022b).

Several countries, including Indonesia, Malaysia, China, India, Colombia, and Brazil, have observed a positive correlation between an increase in GDP per capita and a rise in the number of foreign visitors (Esquivias et al., 2022; Hor and Thaiprasert, 2015; Silva et al., 2023). Danish and Wang (2018) examined the complex relationship between the tourism industry and economic growth in BRICS nations from 1995 to 2014, noting that tourism has contributed significantly to economic expansion while also leading to adverse environmental consequences. In particular, they identified an Environmental Kuznets Curve (EKC) within BRICS economies, which suggests a curvilinear relationship between income levels and CO_2 emissions. Furthermore, Porto et al. (2023) confirmed the presence of an extended EKC hypothesis for tourist destinations in the Americas and Asia-Oceania, underscoring the urgent need for environmental policies to ensure the sustainability of tourism in highly polluted and rapidly expanding destinations. Sghaier et al. (2019) examined the environmental consequences of tourism and discovered contrasting outcomes in Egypt and Tunisia. Although Egypt experienced adverse environmental effects, Tunisia showed improvements in its environmental quality. Porto et al. (2023) found that while the Americas and Asian destinations suffered negative environmental impacts from tourism activities, European destinations experienced enhancements in their environmental quality. These discrepancies across nations

suggest varying relationships between CO_2 emissions and income levels, with some displaying an inverted U-shaped correlation and others demonstrating a U-shaped pattern. Shaheen et al. (2019) confirmed the existence of the EKC hypothesis (inverted U-shaped curve) based on data spanning 1995 to 2016, encompassing the top ten tourist-receiving countries. Similarly, Wang (2014) arrived at a similar conclusion using panel data from 2001 to 2010 for the top 20 tourist destinations. Variations in the environmental impact of tourism often depend on multiple factors, such as the adoption of sustainable tourism development practices (Nematpour et al., 2022), the effectiveness of environmental regulations and policies (Hovelsrud et al., 2023), the sophistication of tourism infrastructure and technology (Balsalobre-Lorente et al., 2023), commitment to environmental conservation (Durani et al., 2023), energy sources (Zheng et al., 2023), the energy efficiency of tourism facilities (Rahman et al., 2022), and numerous other considerations (Wei and Lihua, 2023).

Research has uncovered a critical aspect of the complex interaction between economic activity, emissions, and the tourism sector in specific country groupings (Gössling et al., 2015). Tourism has the capacity to stimulate energy demand, leading to environmental consequences. Brahmasrene and Lee (2017) examined the long-term implications of CO_2 emissions, tourism, industrial development, urbanization, globalization, and economic growth in Southeast Asian countries.

They found that in the top ten most-visited nations, real GDP and tourism tend to increase emissions, but the use of renewable energy sources can decrease pollution levels. Similarly, Razzaq et al. (2023) conducted a study on the top 10 rich countries and revealed the dual impact of global tourism, fostering economic expansion while concurrently leading to amplified CO_2 emissions. Geo et al. (2021) reported similar results in their study on Mediterranean countries, confirming the connection between tourism activity and CO_2 emissions. Additionally, Qureshi et al. (2017) found that domestic tourism tends to curb greenhouse gas emissions, whereas international travel has a positive influence on energy demand, GDP, trade, and CO_2 emissions. This complex web of relationships is further intensified by the crucial roles of trade openness and economic growth, which contribute to an increase in inbound tourism (Deb, 2021).

The relationship between a country's tourism activities and their environmental impact has led to energy consumption being identified as a critical factor. Theoretical and empirical studies have established a clear connection between the increasing scope of tourism-related activities, such as travel, dining, and lodging, and rising energy demand, primarily driven by fossil fuels (Katircioglu, 2014). Several geographic contexts have been explored, including the European Union (EU) by Xia et al. (2022), Turkey by Katircioglu (2014), China by Irfan et al. (2023), and OECD countries by Banga et al. (2022). These studies arrive at a common conclusion that energy utilization plays a crucial role in driving tourism expansion. Building on this perspective, Doan et al. (2017) confirm that real GDP and tourism exert upward pressure on emissions in the top ten tourist-receiving countries, while the integration of renewable energy sources serves to mitigate pollution. Additionally, Zaman et al. (2017) found an association between per capita income growth and increased CO_2 emissions, which further aggravates environmental challenges in the top 10 tourist destination nations. In the pursuit of environmental sustainability, it is crucial for popular tourist destinations to carefully evaluate the impact of various socioeconomic and technological factors. Among these factors, population density, population growth, and urbanization have been identified as primary determinants of CO_2 emissions (Fethi and Senyucel, 2021; Begum et al., 2015; Umurvzako et al., 2023). While an increase in population density leads to higher overall CO_2 emissions, it also results in lower per-capita emissions.

However, previous research has produced conflicting results regarding population growth's impact on CO_2 emissions (Gao et al., 2021; Begum et al., 2015). Conversely, Owusu (2018) argues that population growth is positively correlated with CO2 emissions, which is supported by the findings of Sun et al. (2023) for 30 countries, Nathaniel et al. (2023) for emerging markets, and Farooq et al. (2023) for Gulf countries. This complexity underscores the need for comprehensive and region-specific assessments to address environmental sustainability in the context of tourism. After reviewing prior research, it is evident that the environmental impacts of tourism have been examined through a variety of methodologies, including direct surveys using questionnaires (Tovar and Lockwood, 2008), input-output analysis (Jones, 2023; Hartono et al., 2023), computed general equilibrium (CGE) assessments (Dwyer et al., 2010), and econometric-based investigations.

The majority of econometric studies have shown that tourism tends to increase CO_2 emissions. For example, Solarin (2013) found this pattern in Malaysia, while Katircioglu et al. (2014) documented similar results in the European context, supporting a common theme in the literature. Notably, Paramati et al. (2017) proposed that implementing sustainable tourism policies could raise awareness of environmental conservation and strengthen efforts to combat ecological degradation. Given these theoretical foundations, it is plausible to argue that tourism's influence on CO_2 emissions may either mitigate or exacerbate the situation in top tourist destinations. Still, in a study using an input-output methodology and focusing on Wales in the UK, Jones (2023) highlighted the slow pace of decarbonization efforts, indicating that the tourism sector has not yet made a substantial transition toward climate responsibility. Corroborating these results, Hartono et al. (2023) pointed out that activities associated with tourism, such as transportation, have experienced substantial growth in recent years. This trend suggests that the increase in tourist arrivals is contributing to the significant rise in CO_2 emissions.

METHODOLOGY

In the following Figure 2, all of the methodological steps are explained. The research methodology adopted a multi-step approach to thoroughly examine the impact of variable selection, data selection, and econometric model choice on the outcomes of econometric analysis. Initially, a stringent variable selection process was implemented to recognize the most relevant and statistically significant variables for the analysis. Moreover, three unit root tests, namely Harris-Tzavalis, Im-Pesaran-Shin (IPS), and Levin, Lin, and Chu (LLC), were employed to assess the stationarity of the time series data. Next, an suitable econometric model, the Generalized Method of Moments (GMM), was carefully chosen to analyze the dynamic relationships between the variables of interest. Finally, quantile regression was utilized as a robustness check to validate the findings of the baseline GMM model.

1. Data and Variable Selection

Environmental degradation is influenced by tourism, trade, GDP per capita, per capita electricity consumption, population, and consumption expenditure. This study offers empirical evidence of the variables influencing CO_2 emissions in the top 32 tourist countries. These countries were selected as top tourist-receiving countries from six different continents. Data were collected from 32 countries: Austria, France, Germany, Italy, Portugal, Switzerland, Spain, Turkey, the UK, Canada, Mexico, the USA, Brazil, Argentina, Chile, China, Hong Kong, India, Indonesia, Japan, Singapore, South Korea, Saudi Arabia, the UAE, Thailand, Vietnam, Egypt, Morocco, South Africa, Tunisia, Australia, and New Zealand.

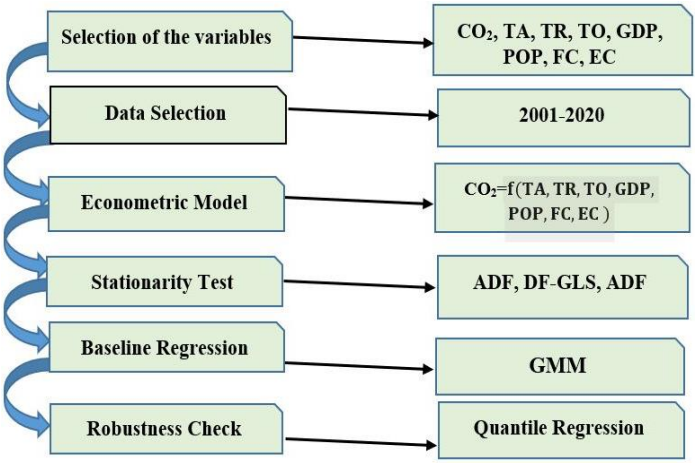


Figure 2. Flowchart of methodology

Table 1 outlines the variables utilized in this research. All variables are expressed in logarithmic format (ln), which can help in mitigating skewness and normalizing the distribution of the data. These variables will be investigated for their associations with carbon emissions in the selected tourist countries using econometric techniques, such as GMM and quantile regression. Table 2 provides the descriptive statistics for the required variables used in the study. These statistics offer insights into the mean, standard deviation, and range of each variable. For instance, the mean total CO_2 emissions (lnCO2) is 12.52 with a standard deviation of 1.089, indicating a moderate level of variability around the mean value. Similarly, other variables such as international tourism arrivals (lnTA) and international tourism receipts (lnTR) exhibit distinct ranges and variability, providing a foundation for further analysis of their environmental implications in leading 32 global tourist destinations.

Table 1. Variables List

Variables name	Log format	Indicator Name
CO_2	lnCO_2	Total CO_2 emissions
TA	lnTA	International tourism, number of arrivals
TR	lnTR	International tourism, receipts (current US$)
GDP	lnGDP	GDP per capita (current US$)
TO	lnTO	Trade (% of GDP)
POP	lnPOP	Population, total
FC	lnFC	Final consumption expenditure (% of GDP)
EC	lnEC	Electric power consumption (kWh per capita)

Table 2. Descriptive Statistics

Variable Name	Mean	SD	Min	Max
lnCO_2	12.52	1.089	10.32	15.57
lnTA	16.75	1.221	14.46	19.17
lnTR	23.45	1.064	20.91	26.19
lnTO	4.252	0.697	3.084	6.093
lnGDP	9.611	1.222	6.003	11.13
lnPOP	17.63	1.162	15.01	19.61
lnEC	8.280	1.001	5.789	9.756
lnFC	4.301	0.138	3.735	4.587

2. Econometrics equations

This study selects two tourism-related variables to obtain a robust picture of our research. The two tourism-related variables are the number of international tourist arrivals and international tourism receipts (current US $). The research incorporates the relevant explanatory variables and CO_2 emissions into the following Equation (1).

Equation (1) represents the conceptual framework of the study, highlighting the relationship between environmental degradation and related factors, including tourism, socioeconomic aspects, technological advancements, population, and potentially other influencing elements. The equation suggests that environmental degradation is not solely determined by tourism but is rather a complex phenomenon influenced by a mixture of various factors.

Environmental Degradation = *f* (Tourism, Population, Socio-economic, Technological, and other factors) (1)

The research employed the STIRPAT model, which is ideally suited for this study as it can empirically examine the complex relationship between tourism and carbon emissions. By accounting for population, consumption expenditure, and technological factors, the STIRPAT model provides a comprehensive framework for quantitatively assessing the impact of tourism on environmental sustainability. Its logarithmic transformations allow for nonlinear relationships and robust regression analysis, enabling us to isolate the specific impacts of tourism-related variables on carbon emissions.

Equations (2)–(4) show the details of the model. The following Equation (2) and (3) represents the core concept of the STIRPAT model, capturing the notion that environmental impact (Impact) is a function of Population (P), Affluence or Asset (A), and Technological improvements (T). This simple yet powerful framework underscores the interconnectedness of these factors in shaping environmental outcomes. Equation (4) explicitly defines the dependent variable, CO_2 emissions, as a function of tourism, population, GDP, trade openness, final financial consumption, and electricity consumption. This comprehensive equation encompasses the key factors influencing CO_2 emissions, allowing for a nuanced understanding of the environmental implications of tourism and other contributing factors.

$$\text{Impact} = \text{PAT} \quad (2)$$

$$\text{Impact on Environment} = \text{Population}^* \text{ Affluence}^* \text{ Technologies} \quad (3)$$

$$CO_2 = f(\text{Tourism, Population, GDP, Trade, Financial Consumption, Electricity Consumption}) \quad (4)$$

Equation (5) shows the baseline equation for CO_2, tourist arrivals, and the interconnectedness of other attributes.

$$CO_{2i,t} = \alpha + \beta TA_{i,t} + \gamma X_{i,t} + \mu_i + \delta_t + \varepsilon_{i,t} \quad (5)$$

$$CO_{2it}= \beta_0+ \beta_1 TA_{it} + \beta_2 TO_{it}+ \beta_3 GDP_{it} + \beta_4 POP_{it} + \beta_5 FC_{it} + \beta_6 EC_{it} + \varepsilon_{it} \quad (6)$$

Equation (6) is the STIRPAT format and is the detailed form of Equation (5). In Equation (6), CO_{2it} represents the carbon dioxide emissions for the country "i" at a time "t." β0 is the intercept term, representing the baseline level of CO_2 emissions when all the independent variables are zero. β1, β2, β3, β4, β5, and β6 are coefficients associated with the independent variables in Equation (6).Equation (7) is the baseline equation for international tourist receipts (current US$). Equation (8) is the detailed form of the STIRPAT format and equation mentioned above.

Equation (9) is the log form of Equation (6). Equation (10) is the log form of Equation (8).

$$CO_{2i,t}= \alpha + \beta TR_{i,t}+ \gamma X_{i,t}+\mu_i+\delta_t+\varepsilon_{i,t} \quad (7)$$

$$CO_{2it}= \beta_0+ \beta_1 TR_{it} + \beta_2 TO_{it}+ \beta_3 GDP_{it} + \beta_4 POP_{it} + \beta_5 FC_{it} + \beta_6 EC_{it} + \varepsilon_{it} \quad (8)$$

$$\ln CO_{2it}= \beta_0+ \beta_1 \ln TA_{it} + \beta_2 \ln TO_{it}+ \beta_3 \ln GDP_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln FC_{it} + \beta_6 \ln EC_{it} + \varepsilon_{it} \quad (9)$$

$$\text{In}CO_{2it}= \beta_0+ \beta_1 \ln TR_{it} + \beta_2 \ln TO_{it}+ \beta_3 \ln GDP_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln FC_{it} + \beta_6 \text{ln}ECit + \varepsilon it \quad (10)$$

In these above Equations, TR represents international tourism receipts as a percentage of GDP for a country "i" at a time "t." Coefficient β_1 captures the relationship between tourism receipts and $\ln CO_2$ emissions, indicating how changes in tourism receipts affect $\ln CO_2$ emissions. TA indicates tourism arrivals. TOit represents trade as a percentage of GDP for the country "i" at a time "t." In similar way, GDPit refers to ln GDP per capita, POPit represents the total population, FCit represents final consumption expenditure as a percentage of GDP, and ECit refers to electric power consumption per capita. Εit represents the error term or residual, capturing the unexplained variation in CO2 emissions that the independent variables in the model do not account for. The coefficients (β_1 to β_6) provide insights into the magnitude and direction of these relationships (between TR, TA, TO, GDP, POP, FC, and EC towards CO_2), whereas the error term (Εit) captures any unexplained variability in CO_2 emissions.

3. Generalized Method of Moments (GMM)

Several econometric techniques, including the system GMM econometric approach, were used to attain our research objective. The total period is T = 21 years, from 2000 to 2020, smaller than the number of cross-sectional (N = 32 countries) cross-sections. According to Baltagi (2008), the dynamic nature of data is useful. Compared to other GMM econometric methodologies, the system GMM method yields more accurate and reliable estimations. Furthermore, our strategy addresses the expected link between the error term and country-fixed effects. The problem is more pronounced in dynamic punitive data because there is less time and more cross-sections (Nickell, 1981).

A system GMM methodology can be used to avoid endogeneity and heterogeneity issues. Our analysis may have a problem of reverse causality with carbon dioxide emissions because the independent variables are institutional and macroeconomic variables. Abdouli and Hammami (2017) also addressed the omitted variable bias using a GMM system and produced an estimate of its dependability. Arellano and Bover (1995) offered a specific solution, which Blundell and Bond (1998) expanded. The two-step GMM approach generates more accurate estimators than the one-step system. The Hansen test (Hansen, 1982) or the Sargan test should be used to determine the instrument's validity (Sargan, 1958) and be more suitable (Iqbal and Daly, 2014). The decision to use two-step GMM is for the following reasons: (1) the number of countries in our sample (N) is greater than the number of years (t); (2) the correlation between dependent variables and their lag is greater than 0.8; (3) the simultaneity and omitted variable bias problems in the estimates from the mean regression estimator; and (4) the two-step system GMM corrects biases that emerge while differentiating variables. The research estimates the following requirements at level and the first differences, as follows: Equations (11) and (12) are the two-step System GMM for total international tourist arrivals:

$$\ln CO2_{i,t} = \alpha_0 + \alpha_1 \ln CO2_{i,t-t} + \alpha_2 \ln TA_{i,t} + \sum^4_{k=1} \Phi_3 \ln X_{k,i,t-t} + \varepsilon_{i,t} \quad (11)$$

$$\ln CO2_{i,t} - \ln CO2_{i,t-t} = \alpha_1 \ln CO2_{i,t-t} - \ln CO2_{i,t-2t} + \alpha_2 \ln TA_{i,t} - \ln TA_{i,t-t} + \sum_{k=1}^4 \Phi_3 \ln X_{k,i,t-t} - \ln X_{k,i,t-2t} + \varepsilon_{i,t} - \varepsilon_{i,t-t} \quad (12)$$

Equations (13) and (14) are the two-step System GMM for International tourism receipts (current US $):

$$\ln CO2_{i,t} = \alpha_0 + \alpha_1 \ln CO2_{i,t-t} + \alpha_2 \ln TR_{i,t} + \sum^4_{k=1} \Phi_3 \ln X_{x,i,t-t} + \varepsilon_{i,t} \quad (13)$$

$$\ln CO2_{i,t} - \ln CO2_{i,t-t} = \alpha_1 \ln CO2_{i,t-t} - \ln CO2_{i,t-2t} + \alpha_2 \ln TR_{i,t} - \ln TR_{i,t-t} + \sum^4_{k=1} \Phi_3 \ln X_{k,i,t-2t} + \varepsilon_{i,t} - \varepsilon_{i,t-t} \quad (14)$$

Where CO_2 it is the total carbon emissions in the ith country in year t, TA signifies foreign tourist arrivals in selected countries, TR signifies the amount received from tourists, X signifies the vector of control variables, τ signifies the auto-regression parameter, and ε signifies a disturbance term. Asongu and Odhiambo (2018) state that the GMM estimator has been used in several types of research to investigate how tourism, wealth, and information and communications technology (ICT) affect financial development, economic growth, and sustainability (Umurzakov et al., 2022).

4. Quantile Regression (QR)

The paper also applies the QR method to examine the relationship between CO_2 emissions and the other independent variables at 25%, 50%, and 75%. These quantiles provide a good estimate of CO_2 emissions.

Equation (15) is the quantile model for international tourist arrival.

$$QR_{i,t} = \alpha_i^q + \beta_i^q{}_{,\ln TAit} QR_{\ln TAit} + \beta^q{}_{i,\ln TOit} QR\ln_{TOit} + \beta^q{}_{i,\ln GDPit} QR_{\ln GDPit} + \beta^q{}_{i,\ln POPit} QR_{\ln POPit} + \beta^q{}_{i,\ln FCit} QR_{\ln FCit} + \beta^q{}_{i,\ln EC} QR_{\ln EC,it} \ldots \ldots \ldots \ldots \quad (15)$$

Equation (16) is the quantile model for international tourism receipts (current US$):

$$QR_{i,t} = \alpha_i^q + \beta^q{}_{i,\ln TRit} QR_{\ln TRit} + \beta_i^q{}_{,\ln TOit} QR_{\ln TOit} + \beta_i^q{}_{,\ln GDPit} QR_{\ln GDPit} + \beta_i^q{}_{,\ln POPit} QR\ln_{POPit} + \beta_i^q{}_{,\ln FCit} QR_{\ln FCit} + \beta_i^q{}_{,\ln ECit} QR_{\ln ECit} \ldots \ldots \ldots \ldots \quad (16)$$

RESULTS

Table 3 displays the pairwise correlations between the dataset variables, all in a logarithmic form. The correlations range from -1 to 1 and provide insights into the strength and direction of the relationships between the variables. These correlations provide initial perceptions of the relationships between variables, such as $lnCO_2$ and lnTA, lnTR, lnGDP, lnPOP, lnFC and lnEC, suggesting that these variables may be positively associated with CO_2 emissions. In contrast, the negative correlation between $lnCO_2$ and lnTO indicates a potentially negative relationship between trade and CO_2 emissions. However, further analysis and modelling are necessary to determine the strength and significance of these relationships and account for other potential factors influencing CO_2 emissions. Panel data analysis uses the panel unit root test to determine whether the dependent and independent variables are stationary or non-stationary. Various panel unit root tests are available in the literature. Table 4 provides the data as the level or first difference for the unit root test of the dependent and independent variables. There is a unit root in H0, but none in H1, which is a nonstationary process. The table shows that all variables are stationary at I (1). Therefore, this study applies GMM and QR models.

Table 3. Correlation (Source: authors calculation) *** p<0.01, ** p<0.05, * p<0.1

Variables	$InCO_2$	InTA	InTR	InTO	InGDP	InPOP	InFC	InEC
$InCO_2$	1.000							
InTA	0.585***	1.000						
InTR	0.666***	0.800***	1.000					
InTO	-0.501***	-0.016	-0.058	1.000				
InGDP	0.301***	0.450***	0.570***	0.066	1.000			
InPOP	0.718***	0.291***	0.264***	-0.604***	-0.382***	1.000		
InFC	0.349***	0.169***	0.066	-0.667***	-0.167***	0.493***	1.000	
InEC	0.290***	0.342***	0.451***	0.079	0.931***	-0.440***	-0.145**	1.000

Table 4. Unit Root Test Result (Source: Author's Calculation)
Note: ***, **, and *denote significance at the 1 %, 5 %, and 10% levels. Presume as trend and intercept

	At Level			At 1st Difference		
Variables	Harris-Tzavalis	Im-Pesaran-Shin	Levin, Lin and Chu	Harris-Tzavalis	Im-Pesaran-Shin	Levin, Lin and Chu
$InCO_2$	0.258	0.826	-0.471	-30.35***	-8.765***	-5.613***
InTA	1.52	2.194	4.70	-32.44***	-9.13***	-7.29***
InTR	-1.18	-0.636	-0.559	-31.93***	-9.177***	-7.82***
InTO	-0.236	-0.663	-0.373	-30.19***	-11.33***	-15.88***
InGDPpc	0.911	1.045	.362	-32.10***	-8.956***	-5.15***
InPOP	-0.536	-0.763	-0.073	-38.19***	-9.33***	-7.88***
InFC	-1.18	-0.636	-0.559	-31.93***	-9.177***	-7.82***
InEC	-1.11	0.517	0.545	-37.52***	-9.769***	-7.72***

Table 5 presents the log-log model with the dynamic panel data estimate. Columns 1, 2, and 3 indicate the various two-step System-GMM models. As a precaution, this study excluded the top five tourist-receiving countries with the highest and lowest adjusted tourist arrivals (Columns 2 and 3, respectively). As a result, five of the most visited countries dropped from Model 2, whereas the bottom five countries dropped from Model 3. Table 5 provides information on the effects of various independent variables on $lnCO_2$ in each model. $InCO_2$ (logarithm of CO_2 emissions) was the dependent variable in all models. The independent variables in the various models were compared as follows: This variable represents the lagged value of $lnCO_2$ that accounts for the impact of previous CO_2 emissions on current levels. In all three models, the $L.lnCO_2$ coefficient is uniformly significant and positive. This implies that past CO_2 emissions had a positive effect on CO_2 emissions. LnTA represents the logarithm of international visitor arrivals. The coefficient for lnTA is consistently negative and statistically significant in all three models. This finding suggests a relationship between higher foreign visitor arrivals and reduced CO_2 emissions. The logarithm of the trade-to-GDP ratio is lnTO, and in none of the models is the coefficient of lnTO statistically significant, indicating that trade does not have a significant effect on $lnCO_2$. This suggests that in the context of overall tourist arrivals, CO_2 emissions are not significantly influenced by trade levels. GDP per capita is represented by lnGDP, and the coefficient of lnGDP is positive and statistically significant in all the three models.

This suggests that higher GDP per capita is associated with higher CO_2 emissions. The logarithm of the total population is lnPOP, and the coefficient of lnPOP is consistently positive and statistically significant in all three models. The final consumption expenditure logarithm, expressed as a proportion of GDP, is lnFC, and the coefficient of lnFC is consistently negative and statistically significant in all three models. This suggests that reducing final consumption spending as a percentage of GDP leads to lower CO_2 emissions. The logarithm of the electric power consumption per person is lnEC. In Models 1 and 3, but not in Model 2, the coefficient of lnEC is positive and statistically significant.

Although the relevance varies across models, increasing electric power usage per capita may be positively correlated with CO_2 emissions. None of the models' constant terms (intercepts) is statistically significant, implying that the independent variables have a more substantial influence on $lnCO_2$ than the constant term itself. A comparison of the three models demonstrates that the effects of foreign tourist arrivals (lnTA), GDP per capita (lnGDP), population size (lnPOP), and final consumption expenditure (lnFC) on CO_2 emissions (lnCO2) are consistent with each other. Elevated CO_2 emissions result from tourism and increased economic activities. Nonetheless, emissions can be lowered by adopting sustainable consumption habits, underscoring the need for further research and robustness tests.

Table 6. Two-step System GMM model for international tourism receipts (current US$)
(Source: Calculation by the author) Robust standard errors in parentheses- *** p<0.01, ** p<0.05, * p<0.1

Variables	Model 1	Model 2	Model 3
L.lnCO2	0.847***(0.0484)	0.897***(0.0484)	0.869***(0.0484)
lnTR	-0.0435***(0.0141)	-0.0416***(0.0141)	-0.0445***(0.0141)
lnTO	-0.0117(0.0290)	-0.0156(0.0290)	-0.0126(0.0290)
lnGDP	0.0341(0.0179)	0.0441(0.0169)	0.0352(0.0169)
lnPOP	0.146***(0.0492)	0.146***(0.0492)	0.146***(0.0492)
lnFC	-0.0190(0.0689)	-0.0190(0.0689)	-0.0190(0.0689)
lnEC	0.0962**(0.0463)	0.0962**(0.0463)	0.0962**(0.0463)
Constant	-1.456*(0.835)	-1.456*(0.835)	-1.456*(0.835)
Excluded	None	Top-5	Bottom-5
AR(1)	0.00	0.00	0.00
AR(2)	0.08	0.12	0.18
Hansen Test	0.34	0.35	0.29
Number of ids	32	27	27

Table 5. Two-step System GMM model for total tourist arrivals (dependent variable is LCO_2)
(Source: Calculation by the author) Robust standard errors in parentheses- *** p<0.01, ** p<0.05, * p<0.1

Variables	Model 1	Model 2	Model 3
L.lnCO_2	0.848***(0.0602)	0.848***(0.0602)	0.848***(0.0602)
lnTA	-0.0265***(0.0109)	-0.0255***(0.0109)	-0.0281***(0.0109)
lnTO	-0.0298(0.0255)	-0.0298(0.0255)	-0.0298(0.0255)
lnGDP	0.0359*(0.0188)	0.0348*(0.0168)	0.0357*(0.0177)
lnPOP	0.140**(0.0617)	0.142**(0.0617)	0.138**(0.0617)
lnFC	-0.141**(0.0633)	-0.143**(0.0633)	-0.152**(0.0633)
lnEC	0.113*(0.0537)	0.104*(0.0537)	0.1054*(0.0537)
Constant	-0.543(0.840)	-0.543(0.840)	-0.543(0.785)
Excluded	None	Top-5	Bottom-5
AR(1)	0.00	0.00	0.00
AR(2)	0.08	0.12	0.18
Hansen Test	0.34	0.35	0.29
Number of ids	32	27	27

As presented in Table 6, feature CO_2 emissions ($lnCO_2$) as the dependent variable. This table examines the effects of several independent variables on $lnCO_2$ (the logarithm of CO_2 emissions) and compares three distinct models (Model 1, Model 2, and Model 3). The following is a comparison of the models and an explanation of the effects of each independent variable: All three models incorporate the lagged value of $lnCO_2$ (past CO_2 emissions), which has a statistically significant and favorable effect on lnCO2 (present CO_2 emissions). This suggests that historical CO_2 emissions consistently influence current emissions across all models. The independent variable in this model is lnTR (international tourism receipts), whereas earlier models employed lnTA (international tourist arrivals). The coefficient for lnTR is consistently negative and statistically significant in all three models. This indicates that lower CO_2 emissions are associated with increased international tourism receipts. Tourism-related activities with higher revenue streams may have lasting environmental impacts.

In none of the models, lnTO, which represents trade as a percentage of GDP, has a statistically significant effect on $lnCO_2$. The coefficient for lnGDP, which represents GDP per person, is not statistically significant in any of the models. This suggests that GDP per capita does not have a significant impact on CO_2 emissions in the context of international tourism receipts. In all three models, the logarithm of the total population (lnPOP) consistently has a positive and statistically significant effect on lnCO2. This shows that a larger population size is linked to increased CO_2 emissions, regardless of the revenue generated by international tourism. None of the models lnFC, which represents final consumption spending as a percentage of GDP, has a statistically significant effect on $lnCO_2$. This implies that when taking foreign tourism receipts into account, the ratio of final consumption spending to GDP does not significantly affect CO_2 emissions. The coefficient for lnEC, which represents electric power consumption per person, is consistently positive and statistically significant in all three cases. This suggests that energy consumption patterns should be considered when analyzing the correlation between revenue from international tourists and CO_2 emissions as it has detrimental effects for environmental quality. The results of the comparison of the three models indicate that the effects of electric power consumption per capita, total population, and international tourist receipts on CO_2 emissions are consistent. The significance of factors such as GDP per capita and final consumption spending varies among the models, underscoring the necessity of considering multiple variables and conducting further research to fully understand the complex relationship between international tourism receipts and CO_2 emissions.

Table 7 displays the results of the quantile regression analysis for international tourist arrivals, considering different quantiles: Q25 (25th percentile), Q50 (50th percentile), and Q75 (75th percentile). The table shows the coefficients and their corresponding standard errors for each independent variable at each quantile. Here is an explanation of the findings: The coefficient for lnTA (international tourist arrivals) is negative and statistically significant at the 25th and 50th percentiles. This suggests that higher international tourist arrivals are associated with lower CO_2 emissions for countries at

these quantiles. However, at the 75th percentile, the coefficient is negative and statistically significant at a higher level, indicating an even stronger negative relationship between tourist arrivals and CO_2 emissions.

The coefficient for trade as a percentage of GDP (lnTO) is negative and statistically significant at all levels, indicating that a higher proportion of trade relative to GDP is associated with lower CO_2 emissions across all levels. The negative coefficient becomes more pronounced at higher levels, suggesting a stronger negative relationship between trade and CO_2 emissions for countries with higher levels of tourist arrivals. The coefficient for GDP per capita (lnGDP) is not statistically significant, indicating that GDP per capita does not significantly impact CO2 emissions for international tourist arrivals at all levels. The coefficient for total population (lnPOP) is positive and statistically significant at all levels, implying that a larger population size is associated with higher CO_2 emissions for countries at all levels of international tourist arrivals. The coefficient for final consumption expenditure as a percentage of GDP (lnFC) is negative and statistically significant at the 50th and 75th percentiles, indicating that a higher proportion of final consumption expenditure relative to GDP is associated with lower CO_2 emissions for countries at these quantiles. However, the negative coefficient is not statistically significant at the 25th percentile. The coefficient for electric power consumption per capita (lnEC) is positive and statistically significant at all levels, suggesting that higher electric power consumption per capita is associated with higher CO_2 emissions across all levels of international tourist arrivals. The quantile regression results indicate that the association between independent variables and CO_2 emissions varies with the level of international tourist arrivals. Some variables, such as lnTA, lnTO, lnPOP, and lnEC, consistently display significant effects, but the impact of lnGDP and lnFC fluctuates based on the quantile. These findings underscore the significance of accounting for the varying effects of independent variables at different levels of tourist arrivals when examining the determinants of CO_2 emissions.

Table 7. Quantile Regression for international tourist arrivals Models (Source: Calculation by the author) Standard errors in parentheses- *** p<0.01, ** p<0.05, * p<0.1

Variables	Q25	Q50	Q75
lnTA	-0.0597**(0.0227)	-0.0577***(0.0133)	-0.0817**(0.0358)
lnTO	-0.0590***(0.0109)	- 0.104***(0.0339)	-0.246***(0.0656)
lnGDP	0.0459(0.0816)	0.0348(0.0255)	0.0676(0.0493)
lnPOP	1.093***(0.0510)	1.093***(0.0159)	1.014***(0.0308)
lnFC	-0.513(0.471)	-0.630***(0.147)	-0.983***(0.285)
lnEC	0.860***(0.0910)	0.751***(0.0284)	0.715***(0.0550)
Constant	-11.49***(2.663)	-10.54***(0.832)	-6.471***(1.610)
Observations	462	462	462

Table 8. Quantile Regression for International tourism receipts (current US$) (Source: Calculation by the author) Standard errors in parentheses- *** p<0.01, ** p<0.05, * p<0.1

Variables	Q25	Q50	Q75
InTR	-0.057**(0.02760)	-0.0629**(0.0273)	-0.0391***(0.0147)
InTO	- 0.143***(0.034)	-0.153***(0.0480)	- 0.245***(0.0835)
InGDP	0.191(0.121)	0.0154(0.0433)	0.0666(0.0753)
InPOP	1.030***(0.0696)	1.007***(0.0250)	0.994***(0.0434)
InFC	-0.926(0.563)	-0.889***(0.202)	-0.958***(0.351)
InEC	0.950***(0.120)	0.733***(0.0432)	0.762***(0.0750)
Constant	-9.867***(3.051)	-8.512***(1.096)	-5.792***(1.905)
Observations	478	478	478

Table 8 presents the findings of a quantile regression analysis for international tourism receipts. Instead of utilizing lnTA as an independent variable, the analysis employs lnTR (international tourist receipts). At the 25th and 50th percentiles, the coefficient for lnTR is negative and statistically significant, indicating that lower CO_2 emissions are associated with higher international tourism receipts for countries in these quantiles. The coefficient is negative and statistically significant at a lower level at the 75th percentile, but the correlation between tourism receipts and CO_2 emissions is weaker. The results of the quantile regression analysis demonstrate the impact of multiple variables on CO_2 emissions for international tourism revenues at different quantiles. While lnGDP and lnFC do not consistently show significant effects across all quantiles, the variables lnTR, lnTO, lnPOP, and lnEC do.

DISCUSSION

The study's findings suggest that tourists' arrivals and revenues have a negative correlation with CO_2 emissions. There are various reasons that contribute to reduced CO_2 emissions in the tourism sector. Technological advancements in transportation and accommodation, such as fuel-efficient aircraft, hybrid and electric vehicles, and energy-saving practices in hotels and resorts, have led to a reduction in carbon intensity. The transportation sector is the primary source of CO_2 emissions, accounting for almost 70% of total emissions. The tourism industry has also placed a greater emphasis on sustainable practices and policies in recent years. Many destinations, tourism organizations, and businesses have implemented sustainability initiatives to minimize their ecological footprint and conserve natural resources. These programs cover trash reduction and recycling campaigns, energy and water conservation, community involvement, and the promotion of regional and organic goods. Overall, the tourism industry's efforts towards sustainability have contributed to a reduction in CO_2 emissions. Our findings are consistent with previous research, which has demonstrated that tourism

activity can lead to reduced environmental degradation in destinations such as the Middle East (Voumik et al., 2023a), G7 Countries (Ahmad et al., 2022), top visited destinations (Ansari and Villanthenkodath, 2022), selected top tourist destinations (Fethi and Senyucel, 2021), and countries participating in the Belt and Road initiative (Umurzakov et al., 2023). However, our results contradict those of Gao et al. (2021) for Mediterranean countries, Balsalobre-Lorente et al. (2023) for OECD countries, Farooq et al. (2023) in Gulf countries, Irfan et al. (2023) in China, Onifade et al. (2023) in the Middle East, Rahman et al. (2022) in Malaysia, and Nathaniel et al. (2023) in emerging markets.

In line with Ozturk et al. (2023), Jahanger et al. (2023), and Banga et al. (2023), variations in the relationship between CO_2 emissions and tourism can be attributed to differences in policies, energy sources, tourist attractions, transportation, technology, and other environmental regulations. This underscores the significance of actively promoting environmentally responsible practices. Plausible explanations include the inclusion of countries in the top 32 list that have increased the use of renewable energy, such as Austria, France, Germany, Italy, Portugal, Switzerland, Spain, the UK, Canada, and New Zealand. These countries have made significant investments in renewable energy and have a substantial share of renewables in their energy mix. Additionally, emerging destinations have shifted their economic activities from sectors with higher energy intensity to services and tourism, which typically have lower energy intensity. Furthermore, improvements in energy efficiency, implementation of new energy policies, and growing demand for sustainable destinations are likely to contribute to tourism's positive impact on environmental quality. The study suggests that rising CO_2 emissions are associated with population growth. As the population increases, CO_2 emissions have risen due to two primary factors: the need for energy to power homes, transportation networks, businesses, and other sectors has climbed alongside the population. When fossil fuels, such as coal, oil, and natural gas, are burned to provide energy, they release CO_2 into the atmosphere. Furthermore, population expansion is often accompanied by changes in consumer habits and lifestyles, leading to an increase in transportation-related emissions. For example, a growing population may result in more transportation-related emissions (Hartono et al., 2023). The findings in Sun et al. (2023) for 30 tourist destinations, Nathaniel et al. (2023) for emerging markets, and Farooq et al. (2023) for Gulf countries support the positive correlation between population and CO_2 emissions.

The study suggests that trade can lead to a reduction in CO_2 emissions, primarily due to the development and innovation that it spurs, resulting in cleaner and more energy-efficient production methods. This may lead to a shift towards greener energy sources, increased manufacturing energy efficiency, and the adoption of environmentally friendly business practices. Technological improvements can help decrease the carbon intensity of trade-related activities, which would reduce CO_2 emissions. Trade agreements and environmental legislation can also help promote sustainable trading practices and reduce CO_2 emissions. The study also indicates that rising CO_2 emissions are linked to power generation, with the high reliance on fossil fuels such as coal, oil, and natural gas being a significant contributor to the increase in emissions from power production. Thermal power stations primarily use these fossil fuels to generate electricity, which is becoming increasingly necessary, particularly in rapidly developing countries where the use of fossil fuels in energy production is on the rise. This reliance on fossil fuels leads to increased CO_2 emissions, exacerbating the issue of climate change. According to Durani et al. (2023), when environmental regulations become less strict, the number of tourists visiting a country decrease. Therefore, countries should take unique steps to encourage tourism while enforcing strict environmental rules. Additionally, tourists should be offered incentives to counterbalance the negative effects of these regulations. To ensure sustainable tourism destinations thrive, it is crucial to complement them with sustainable urban areas, transportation systems, and infrastructure that collectively reduce the overall environmental footprint of tourism.

Overall, the findings of our study shed light on the intricate relationship between various socio-economic factors and their influence on CO_2 emissions in leading global tourist destinations. Notably, tourist arrivals, tourism receipts, and trade openness exhibit negative coefficients, indicating that an increase in these variables is associated with a decrease in CO_2 emissions. This suggests that a thriving tourism sector, coupled with an open economy, may contribute to environmental sustainability by reducing CO_2 emissions. Conversely, our analysis reveals that variables such as population and electricity consumption have positive and significant impacts on CO_2 emissions, signifying that higher population density and increased energy consumption tend to elevate environmental footprints. Interestingly, while GDP exhibits a positive coefficient on CO_2 emissions, it is not statistically significant, implying that economic prosperity alone may not be a dominant driver of environmental impact in these destinations. Additionally, final consumption expenditure emerges as a noteworthy factor, displaying a negative and significant impact on environment. This underscores the potential of mindful consumption patterns in mitigating environmental harm, highlighting a promising avenue for sustainable tourism practices. These findings contribute to a nuanced understanding of the multi-faceted dynamics between tourism, economic variables, energy, and environmental outcomes, offering valuable insights for policymakers and stakeholders seeking to foster environmentally responsible tourism development.

CONCLUSION

The current study investigates the connection between tourism and carbon emissions, as it has a significant impact on top tourist destinations. Furthermore, the study examines the relationship between trade, consumption, GDP, and population variables. The findings suggest that tourism can both positively and negatively impact the environment, with CO_2 emissions increasing due to factors such as GDP growth, per capita electricity consumption, and population growth. Additionally, trade openness and final consumption can also reduce CO_2 emissions. The study also discovered that the effects of the two models are the same, but the coefficients of the two models are different. Previous research by Udemba et al. (2020) found a positive correlation between CO_2 emissions and factors such as energy consumption, FDI, and population, which negatively impacts GDP. The study has shown that high levels of energy consumption, GDP growth, and

population growth lead to increased CO_2 emissions. Furthermore, these factors are interrelated, with population growth driving the need for urbanization and increased energy use, which in turn leads to higher CO_2 emissions. However, GDP growth is supported by industrialization and the extreme use of power and energy, which also contributes to increased CO_2 emissions. The findings suggest that trade liberalization has a significant impact on CO_2 emissions, and the importance of trade openness varies depending on the level of CO_2 emissions. This is supported by a previous study conducted by Chen et al. (2021).

The study revealed a negative correlation between tourism-related CO_2 emissions, with the top 32 tourism destinations from six world regions. These nations have well-developed tourism industries, which may use contemporary equipment and engage in sustainable tourism. Tourism businesses prioritize technology innovation in their daily operations, contributing to the reduction of CO_2 emissions. These findings suggest the need for legislative interventions and sustainable practices in the travel and tourism sector to minimize the negative environmental effects of tourist-related activities. Promoting eco-friendly products, sustainable consumption habits, and carbon-offset programs could be efficient ways to reduce CO_2 emissions while fostering the growth of the tourism industry. Overall, this research contributes to the larger discussion on sustainable tourism development and environmental management by providing valuable information about the complex relationship between international tourism, CO_2 emissions, and various factors.

Policy Implications

The environmental threat posed by CO_2 emissions is a significant concern for countries (Voumik et al., 2023b), and it is crucial for studied countries to take it seriously. This study offers theoretical implications for future research and practical policies for sustainable tourism and economic growth. The novelty of this study provides a comprehensive understanding of the relationship between tourism, economic growth, and environmental degradation, which will aid in generating further research. The study found that in top tourist destinations, CO_2 emissions increased due to population growth in a destination, but technological advancements and a shift to renewable energies may have led to increased energy efficiency and reduced carbon intensity. Additionally, the transportation sector is the primary source of CO_2 emissions.

Furthermore, Koçak et al. (2020) suggest that the economies of the region should rely more on renewable energy sources to offset CO_2 emissions resulting from population growth and GDP expansion and to support the sustainable growth of the tourism industry (Shaheen et al., 2019). Policymakers can promote economic growth and tourism while reducing environmental degradation by decreasing the use of coal-based energy sources and increase the use of environmentally friendly sources like wind and solar power (in line with Fethi and Senyucel, 2021). The study suggests that the government should embrace climate-friendly technology to reduce CO_2 emissions, enhance sustainable tourism, promote sustainable population growth, and responsible consumption. Additionally, to reduce environmental destruction in the tourism sector, it is important to raise awareness among tourists and local communities about sustainable tourism practices (Halim et al., 2022). Furthermore, policymakers can gain sustainable technological knowledge from developed countries and use it to support sustainable tourism development in developing countries through Foreign Direct Investment (FDI) (Deb, 2021; Koçak and Şarkgüneşi, 2018). This will provide policymakers and future researchers with a clear understanding of the relationship between tourism and CO_2 emissions.

Table 9. Countries List

Continents	Countries
Europe	Austria, France, Germany, Italy, Portugal, Switzerland, Spain, Turkey, The UK
North America	Canada, Mexico, The USA
South America	Brazil, Argentina, Chile
Asia	China, Hong Kong, India, Indonesia, Japan, Singapore, South Korea, Saudi Arabia, The UAE, Thailand, Vietnam,
Africa	Egypt, Morocco, South Africa, Tunisia
Oceania	Australia, New Zealand

Table 10. Abbreviations

Abbreviation	Details
ARDL	Autoregressive Distributed Lag
CO_2	Carbon-dioxide
CSD	Cross-sectional dependence
CIPS	Cross-section Im-Pesaran-Shin
DOLS	Dynamic Ordinary Least Square
EFP	Ecological Footprint
EKC	Environmental Kuznets Curve
FOS	Fossil fuel
FMOLS	Fully Modified Ordinary Least Square
GDP	Gross Domestic Product
G20	Group of 20
GMM	Generalized Method of Moments
HO	Health outcome
IMF	International Monetary Fund
PMG-ARDL	Panel Mean Group Autoregressive Distributed Lag
QR	Quantile Regression
REC	Renewable Energy Consumption
R&D	Research & Development
TA	Tourists' Arrival
TO	Trade openness
TR	Tourism Receipts
WB	World Bank

Limitations and Future Scope of Study

The limitations of the study are related to the availability and quality of data. The study relies on the provided data, and there may be constraints regarding data coverage, accuracy, and consistency among nations. To enhance the validity of the findings, future studies can benefit from access to larger and more reliable datasets. Although econometric methods are used to examine the relationships between variables, it is important to remember that the analysis is correlational and does not establish causality. Moreover, unreported factors may influence international tourism and CO_2 emissions, potentially causing endogeneity issues. Future studies can address these issues by using alternative methods or experimental layouts, and by carefully choosing variables and model specifications. Future research has several avenues for exploration, such as alternative model specifications, incorporating other influential variables like environmental policies, infrastructure development, and cultural factors, and conducting comparative analyses across different countries or regions to better understand the relationship between tourism and CO_2 emissions. Additionally,

sector-specific evaluations of tourism sub-sectors, such as accommodation, transport, and attractions, could provide insight into the contributions of each sub-sector to CO_2 emissions, allowing decision-makers and stakeholders to focus environmental interventions and sustainability initiatives on specific geographic areas. It is important to note that the research findings cannot be generalized to other situations due to the specific group of nations and period studied.

Author Contributions: Conceptualization, S.K.D. and M.K.D.; methodology, L.C.V. and S.M.N.; software, M.K.D. and S.M.N.; validation, M.K.D. and S.M.N.; formal analysis, L.C.V. and M.R.; investigation, S.K.D. and M.R.; data curation, M.R.; writing - original draft preparation, M.R. and M.K.D.; writing - review and editing, L.C.V. and M.A.E.; visualization, M.A.E.; supervision, S.K.D.; project administration, M.A.E. All authors have read and agreed to the published version of the manuscript.

Funding: The APC was Supported by Airlangga University.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The original contributions presented in the study are included in the article; further inquiries can be directed to the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

REFERENCES

Abdouli, M., & Hammami, S. (2017). Investigating the causality links between environmental quality, foreign direct investment, and economic growth in MENA countries. *International Business Review*, 26(2), 264-278. https://doi.org/10.1016/j.ibusrev.2016.07.004

Adedoyin, F.F., Agboola, P.O., Ozturk, I., Bekun, F.V., & Agboola, M.O. (2021). Environmental consequences of economic complexities in the EU amidst a booming tourism industry: accounting for the role of brexit and other crisis events. *Journal of Cleaner Production*, *305*, 127117. https://doi.org/10.1016/j.jclepro.2021.127117

Ahmad, N., Youjin, L., & Hdia, M. (2022). The role of innovation and tourism in sustainability: why is environment-friendly tourism necessary for entrepreneurship?. *Journal of Cleaner Production*, *379*, 134799. https://doi.org/10.1016/j.jclepro.2022.134799

Ahmad, S., Baiocchi, G., & Creutzig, F. (2015). CO2 emissions from direct energy use of urban households in India. *Environmental science & technology*, 49(19), 11312-11320. https://doi.org/10.1016/j.jclepro.2022.134799

Akadiri, S.S., Lasisi, T.T., Uzuner, G., & Akadiri, A.C. (2020). Examining the causal impacts of tourism, globalization, economic growth, and carbon emissions in tourism island territories: bootstrap panel Granger causality analysis. *Current Issues in Tourism*, 23(4), 470-484. https://doi.org/10.1080/13683500.2018.1539067

Ali, A. (2023). Estimating the recreational value of mountain tourism to shape sustainable development in Gilgit-Baltistan, Pakistan. *Journal of Cleaner Production*, 138990. https://doi.org/10.1016/j.jclepro.2023.138990

Alola, A.A., Bekun, F.V., & Sarkodie, S.A. (2019). The dynamic impact of trade policy, economic growth, fertility rate, renewable and non-renewable energy consumption on the ecological footprint in Europe. *Science of the Total Environment*, 685, 702-709. https://doi.org/10.1016/j.scitotenv.2019.05.139

Ansari, M.A., & Villanthenkodath, M.A. (2022). Does tourism development promote ecological footprint? A nonlinear ARDL approach. *Anatolia*, *33*(4), 614-626. https://doi.org/10.1080/13032917.2021.1985542

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. https://doi.org/10.1016/0304-4076(94)01642-D

Asongu, S.A., & Odhiambo, N.M. (2018). ICT, financial access and gender inclusion in the formal economic sector: evidence from Africa. *African Finance Journal*, 20(2), 45-65. https://hdl.handle.net/10520/EJC-139fe7e407

Balsalobre-Lorente, D., Abbas, J., He, C., Pilař, L., & Shah, S.A.R. (2023). Tourism, urbanization and natural resources rents matter for environmental sustainability: The leading role of AI and ICT on sustainable development goals in the digital era. *Resources Policy*, *82*, 103445. https://doi.org/10.1016/j.resourpol.2023.103445

Baltagi, B.H. (2008). Forecasting with panel data. *Journal of Forecasting*, 27(2), 153-173. https://doi.org/10.1002/for.1047

Banga, C., Deka, A., Kilic, H., et al. (2022). The role of clean energy in the development of sustainable tourism: does renewable energy use help mitigate environmental pollution? A panel data analysis. *Environ Sci Pollut Res*, 29, 59363–59373 https://doi.org/10.1007/s11356-022-19991-5

Begum, R.A., Sohag, K., Abdullah, S.M.S., & Jaafar, M. (2015). CO2 emissions, energy consumption, economic and population growth in Malaysia. *Renewable and Sustainable Energy Reviews*, 41, 594-601. https://doi.org/10.1016/j.rser.2014.07.205

Blasuttigh, N., Pastore, S., Scorrano, M., Danielis, R., & Pavan, A.M. (2023). Vehicle-to-ski: A V2G optimization-based cost and environmental analysis for a ski resort. *Sustainable Energy Technologies and Assessments*, *55*, 102916. https://doi.org/10.1016/j.seta.2022.102916

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143.

Brahmasrene, T., & Lee, J.W. (2017). Assessing the dynamic impact of tourism, industrialization, urbanization, and globalization on growth and environment in Southeast Asia. *International Journal of Sustainable Development and World Ecology*, 24(4), 362-371. https://doi.org/10.1080/13504509.2016.1238021

Buttke, D.E., Raynor, B., & Schuurman, G.W. (2023). Predicting climate-change induced heat-related illness risk in Grand Canyon National Park visitors. *Plos one*, *18*(8), e0288812. https://doi.org/10.1371/journal.pone.0288812

CEPAL, N. (2022). Repercussions in Latin America and the Caribbean of the war in Ukraine: how should the region face this new crisis?

Chen, F., Jiang, G., & Kitila, G.M. (2021). Trade openness and CO2 emissions: the heterogeneous and mediating effects for the belt and road countries. *Sustainability*, 13(4), 1958. https://doi.org/10.3390/su13041958

Danish & Wang, Z. (2018). The dynamic relationship between tourism, economic growth, and environmental quality. *Journal of Sustainable Tourism*, 26(11), 1928-1943. https://doi.org/10.1080/09669582.2018.1526293

Deb, S.K. (2021). Proposing the eTourism adoption model (eTAM) in the context of Bangladesh, in Hassan, A. (Ed.), *Technology Application in the Tourism and Hospitality Industry of Bangladesh*, Springer Nature, Singapore, 3-24, https://doi.org/10.1007/978-981-16-2434-6_1

Dohlman, E., Hansen, J., & Boussios, D. (2022). *USDA Agricultural Projections to 2031*, 1962-2022-1414. http://dx.doi.org/10.22004/ag.econ.323859

Durani, F., Cong, P.T., Syed, Q.R., & Apergis, N. (2023). Does environmental policy stringency discourage inbound tourism in the G7 countries? Evidence from panel quantile regression. *Environment, Development and Sustainability*, 1-15. https://doi.org/10.1007/s10668-023-03239-4

Dwyer, L., Forsyth, P., Spurr, R., & Hoque, S. (2010). Estimating the carbon footprint of Australian tourism. *Journal of Sustainable Tourism*, 18(3), 355–376. https://doi.org/10.1080/09669580903513061

Esquivias, M.A., Sugiharti, L., Rohmawati, H., & Sethi, N. (2021). Impacts and implications OF a pandemic on tourism demand in Indonesia. *Economics and Sociology*, 14(4), 133-150. https://doi.org/10.14254/2071-789X.2021/14-4/8

Farooq, U., Tabash, M.I., Anagreh, S., et al. (2023). Economic growth, foreign investment, tourism, and electricity production as determinants of environmental quality: empirical evidence from GCC region. *Environ Sci Pollut Res*, 30, 45768–45780. https://doi.org/10.1007/s11356-023-25545-0

Fethi, S., & Senyucel, E. (2021). The role of tourism development on CO2 emission reduction in an extended version of the environmental Kuznets curve: Evidence from top 50 tourist destination countries. *Environment, Development and Sustainability*, 23, 1499-1524. https://doi.org/10.1007/s10668-020-00633-0

Gao, J., Xu, W., & Zhang, L. (2021). Tourism, economic growth, and tourism-induced EKC hypothesis: Evidence from the Mediterranean region. *Empirical Economics*, *60*, 1507-1529. https://doi.org/10.1007/s00181-019-01787-1

Ghosh, S., Hossain, M.S, Voumik, L.C., Raihan, A., Ridzuan, A.R., & Esquivias, M.A. (2023). Unveiling the Spillover Effects of Democracy and Renewable Energy Consumption on the Environmental Quality of BRICS Countries: A New Insight from Different Quantile Regression Approaches. *Renewable Energy Focus*, 2023, ISSN 1755-0084, https://doi.org/10.1016/j.ref.2023.06.004

Gössling, S., Scott, D., & Hall, C.M. (2015). Inter-market variability in CO2 emission-intensities in tourism: Implications for destination marketing and carbon management. *Tourism Management*, 46, 203-212. https://doi.org/10.1016/j.tourman.2014.06.021

Halim, M.A., Mawa, J., Deb, S.K., & Nafi, S.M. (2022). Local Community Perception about Tourism Impact and Community Support for Future Tourism Development: A Study on Sylhet, Bangladesh. *GeoJournal of Tourism and Geosites*, 44(4), 1260-1270. https://doi.org/10.30892/gtg.44410-942

Hamilton, J.M., Maddison, D.J., & Tol, R.S.J. (2005). Effects of climate change on international tourism. *Climate Research*, 29(3), 245–254.

Hansen, L.P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica: Journal of the econometric society*, 50, 1029-1054.

Hartono, D., Dachlan, A.N., Hastuti, S.H. et al. (2023). The Impacts of Households on Carbon Dioxide Emissions in Indonesia. *Environ. Process.* 10, 54. https://doi.org/10.1007/s40710-023-00666-3

Hor, C., & Thaiprasert, N. (2015). *Analysis of international tourism demand for Cambodia*. In: Huynh V-N, Kreinovich V, Sriboonchitta S, Suriya K, editors. Econometrics of risk. Switzerland: Springer International Publishing; p. 415–425.

Hovelsrud, G.K., Olsen, J., Nilsson, A.E., Kaltenborn, B., & Lebel, J. (2023). Managing Svalbard Tourism: Inconsistencies and Conflicts of Interest. *Arctic Review on Law and Politics*, *14*, 86–106. https://www.jstor.org/stable/48722456

Irfan, M., Ullah, S., Razzaq, A., Cai, J., & Adebayo, T.S. (2023). Unleashing the dynamic impact of tourism industry on energy consumption, economic output, and environmental quality in China: A way forward towards environmental sustainability. *Journal of Cleaner Production*, *387*, 135778. https://doi.org/10.1016/j.jclepro.2022.135778

Iqbal, N., & Daly, V. (2014). Rent seeking opportunities and economic growth in transitional economies. *Econ Model*, 37, 16–22. https://doi.org/10.1016/j.econmod.2013.10.025

Jahanger, A., Hossain, M.R., Awan, A., Adebayo, T.S., & Chishti, M.Z. (2023). Linking tourist's footprint and environmental tragedy through transportation, globalization and energy choice in BIMSTEC region: Directions for a sustainable solution using novel GMM-PVAR approach. *Journal of Environmental Management*, *345*, 118551. https://doi.org/10.1016/j.jenvman.2023.118551

Jones, C. (2023). The carbon footprint of regional tourism trips: insights from environmentally extended regional input output analysis. *Journal of Sustainable Tourism*, 1-16. https://doi.org/10.1080/09669582.2023.2254949

Katircioglu, S.T. (2014). International tourism, energy consumption, and environmental pollution: The case of Turkey. *Renewable and Sustainable Energy Reviews*, 36, 180-187. https://doi.org/10.1016/j.rser.2014.04.058

Katircioglu, S.T., Feridun, M., & Kilinc, C. (2014). Estimating tourism-induced energy consumption and CO2 emissions: The case of Cyprus. *Renewable and Sustainable Energy Reviews*, 29, 634–640. https://doi.org/10.1016/j.rser.2013.09.004

Khan, S.A.R., Yu, Z., Umar, M., Zia-ul-haq, H.M., Tanveer, M., & Janjua, L.R. (2022a). Renewable energy and advanced logistical infrastructure: Carbon-free economic development. *Sustainable Development*, *30*(4), 693-702. https://doi.org/10.1002/sd.2266

Khan, S.A.R., Godil, D.I., Yu, Z., Abbas, F., & Shamim, M.A. (2022b). Adoption of renewable energy sources, low-carbon initiatives, and advanced logistical infrastructure - an step toward integrated global progress. *Sustainable Development*, *30*(1), 275-288. https://doi.org/10.1002/sd.2243

Koçak, E., Ulucak, R., & Ulucak, Z.Ş. (2020). The impact of tourism developments on CO2 emissions: An advanced panel data estimation. *Tourism Management Perspectives*, 33, 100611. https://doi.org/10.1016/j.tmp.2019.100611

Koçak, E., & Şarkgüneşi, A. (2018). The impact of foreign direct investment on CO2 emissions in Turkey: new evidence from cointegration and bootstrap causality analysis. *Environmental Science and Pollution Research*, 25, 790-804. https://doi.org/10.1007/s11356-017-0468-2

Leal Filho, W., Ng, A.W., Sharifi, A., Janová, J., Özuyar, P.G., Hemani, C., & Rampasso, I. (2023). Global tourism, climate change and energy sustainability: assessing carbon reduction mitigating measures from the aviation industry. *Sustainability Science*, *18*(2), 983-996. https://doi.org/10.1007/s11625-022-01207-x

Nathaniel, S.P., Solomon, C.J., Ajide, K.B., Ahmed, Z., & Fakher, H.A. (2023). Striving towards carbon neutrality in emerging markets: the combined influence of international tourism and eco-friendly technology. *International Journal of Sustainable Development & World Ecology*, 1-16. https://doi.org/10.1080/13504509.2023.2195831

Nematpour, M., Khodadadi, M., Makian, S., & Ghaffari, M. (2022). Developing a competitive and sustainable model for the future of a destination: Iran's tourism competitiveness. *International Journal of Hospitality & Tourism Administration*, 1-33. https://doi.org/10.1080/15256480.2022.2081279

Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica: Journal of the econometric society*, 49(6), 1417-1426.

Nosheen, M., Iqbal, J., & Khan, H.U. (2021). Analyzing the linkage among CO2 emissions, economic growth, tourism, and energy consumption in the Asian economies. *Environmental Science and Pollution Research*, 28(13), 16707-16719. https://doi.org/10.1007/s11356-020-11759-z

Onifade, S.T., & Haouas, I. (2023). Assessing environmental sustainability in top Middle East travel destinations: insights on the multifaceted roles of air transport amidst other energy indicators. *Environmental Science and Pollution Research*, 1-16. https://doi.org/10.1007/s11356-023-29183-4

Owusu, E.L. (2018). *The relationship between energy consumption, CO2 emission, population growth, and economic growth: An empirical multivariate causal linkage from Ethiopia. The relationship between energy consumption, CO2 emission, population growth and economic growth: an empirical multivariate causal linkage from Ethiopia*, 225-239, accessed 14.01.2023. https://ideas.repec.org/a/fan/efeefe/vhtml10.3280-efe2018-001010.html

Ozturk, I., Sharif, A., Godil, D.I., Yousuf, A., & Tahir, I. (2023). The Dynamic Nexus Between International Tourism and Environmental Degradation in Top Twenty Tourist Destinations: New Insights From Quantile-on-Quantile Approach. *Evaluation Review*, 47(3), 532-562. https://doi.org/10.1177/0193841X221149809

Paramati, S.R., Sudharshan, R., Alam, M.S., & Chen, C.F. (2017). The effects of tourism on economic growth and CO2 emissions: A comparison between developed and de-developing economies. *Journal of Travel Research*, 56(6), 712–724. https://doi.org/10.1177/0047287516667848

Pata, U.K., Ahmed, Z., Eryilmaz, S., Zeren, F., & Gencer, Y.G. (2023). Analyzing the environmental Kuznets curve for transportation modes in European countries. *Transportation Research Part D: Transport and Environment, 122*, 103893. https://doi.org/10.1016/j.trd.2023.103893

Polcyn, J., Voumik, L.C., Ridwan, M., Ray, S., & Vovk, V. (2023). Evaluating the Influences of Health Expenditure, Energy Consumption, and Environmental Pollution on Life Expectancy in Asia. *Int. J. Environ. Res. Public Health*, 20, 4000. https://doi.org/10.3390/ijerph20054000

Porto, N., Pitetti, D.A., & Ciaschi, M. (2023). A worldwide tourism-extended Environmental Kuznets Curve. New approaches in a comparative analysis. *Journal of Sustainable Tourism*, *31*(9), 2100-2118. https://doi.org/10.1080/09669582.2021.2023165

Qureshi, M.I., Hassan, M.A., Hishan, S.S., Rasli, A.M., & Zaman, K. (2017). Dynamic linkages between sustainable tourism, energy, health and wealth: Evidence from top 80 international tourist destination cities in 37 countries. *Journal of cleaner production*, 158, 143-155. https://doi.org/10.1016/j.jclepro.2017.05.001

Rahman, A.R.A., Shaari, M.S., Masnan, F., & Esquivias, M.A. (2022). The impacts of energy use, tourism and foreign workers on CO2 emissions in Malaysia. *Sustainability*, *14*(4), 2461. https://doi.org/10.3390/su14042461

Rahman, M.H., Voumik, L.C., Nafi, S.M., & Zimone, G. (2023). Effects of tourism and other macroeconomic variables on women's employment in agricultural, industry and service sectors: evidence from African countries. *Current Issues in Tourism.* https://doi.org/10.1080/13683500.2023.2227767

Razzaq, A., Fatima, T., & Murshed, M. (2023). Asymmetric effects of tourism development and green innovation on economic growth and carbon emissions in Top 10 GDP Countries. *Journal of Environmental Planning and Management*, 66(3), 471-500. https://doi.org/10.1080/09640568.2021.1990029

Sargan, J.D. (1958). The estimation of economic relationships using instrumental variables. *Econometrica: Journal of the econometric society*, 393-415. https://doi.org/10.1063/1.4800207

Sghaier, A., Guizani, A., Ben Jabeur, S., & Nurunnabi, M. (2019). Tourism development, energy consumption, and environmental quality in Tunisia, Egypt, and Morocco: A trivariate analysis. *GeoJournal*, 84, 593-609. https://doi.org/10.1007/s10708-018-9878-z

Silva, T.C., da Silva Neto, P.V., & Tabak, B.M. (2023). Tourism and the economy: evidence from Brazil. Current Issues in Tourism, 26(6), 851-862. https://doi.org/10.1080/13683500.2022.2048804

Shaheen, K., Zaman, K., Batool, R., Khurshid, M.A., Aamir, A., Shoukry, A.M., & Gani, S. (2019). Dynamic linkages between tourism, energy, environment, and economic growth: evidence from top 10 tourism-induced countries. *Environmental Science and Pollution Research*, 26, 31273-31283. https://doi.org/10.1007/s11356-019-06252-1

Shi, H., Li, X., Zhang, H., Liu, X., Li, T., & Zhong, Z. (2019). Global difference in the relationships between tourism, economic growth, CO2 emissions, and primary energy consumption. *Current Issues in Tourism*, 23(9), 1122-1137. https://doi.org/10.1080/13683500.2019.1588864

Solarin, S.A. (2013). Tourist arrivals and macroeconomic determinants of CO2 emissions in Malaysia. *Anatolia*, 25(2), 1–14. https://doi.org/10.1080/13032917.2013.868364

Sun, X., Qing, J., Shah, S.A.A., & Solangi, Y.A. (2023). Exploring the Complex Nexus between Sustainable Development and Green Tourism through Advanced GMM Analysis. *Sustainability*, *15*(14), 10782. https://doi.org/10.3390/su151410782

Tovar, C., & Lockwood, M. (2008). Social impacts of tourism: An Australian regional case study. *International Journal of Tourism Research*, 10(4), 365-378. https://doi.org/10.1002/jtr.667

Udemba, E.N., Magazzino, C., & Bekun, F.V. (2020). Modeling the nexus between pollutant emission, energy consumption, foreign direct investment, and economic growth: new insights from China. *Environmental science and pollution research*, 27(15), 17831-17842. https://doi.org/10.1007/s11356-020-08180-x

Umurvzako, U., Tosheva, S., & Salahodjaev, R. (2023). Tourism and sustainable economic development: Evidence from Belt and Road countries. *Journal of the Knowledge Economy*, 14(1), 503-516. https://doi.org/10.1007/s13132-021-00872-0

UNWTO. (2018). UNWTO *Annual Report 2017*. Madrid, Spain. https://www.e-unwto.org/doi/pdf/10.18111/9789284419807

Uzuner, G., Akadiri, S.S., & Lasisi, T.T. (2020). The asymmetric relationship between globalization, tourism, CO2 emissions, and economic growth in Turkey: implications for environmental policymaking. *Environmental Science and Pollution Research*, 27(26), 32742-32753. https://doi.org/10.1007/s11356-020-09190-5

Voumik, L.C., Nafi, S.M., Bekun, F.V., & Haseki, M.I. (2023a). Modeling Energy, Education, Trade, and Tourism-Induced Environmental Kuznets Curve (EKC) Hypothesis: Evidence from the Middle East. *Sustainability*, 15, 4919. https://doi.org/10.3390/su15064919

Voumik, L.C., Islam, M.A., & Nafi, S.M. (2023b). Does tourism have an impact on carbon emissions in Asia? An application of fresh panel methodology. *Environment, Development, and Sustainability*. https://doi.org/10.1007/s10668-023-03104-4

Wang, Y.S. (2014). Effects of budgetary constraints on international tourism expenditures. *Tourism Management*. 41, 9–18. https://doi.org/10.1016/j.tourman.2013.08.006

Zaman, K., Moemen, M.A.E., & Islam, T. (2017). Dynamic linkages between tourism transportation expenditures, carbon dioxide emission, energy consumption, and growth factors: evidence from the transition economies. *Current Issues in Tourism*, 20(16), 1720-1735. https://doi.org/10.1080/13683500.2015.1135107

Zhao, E., Wu, J., Wang, S., Sun, S., & Wang, S. (2023). Factors Influencing Energy Consumption from China's Tourist Attractions: A Structural Decomposition Analysis with LMDI and K-Means Clustering. *Environmental Modeling & Assessment*, 1-19. https://doi.org/10.1007/s10666-023-09898-x

Zheng, C., Wu, S., Teng, Y.P., Wu, S., & Wang, Z. (2023). Natural resources, tourism resources and economic growth: A new direction to natural resources perspective and investment. *Resources Policy*, *86*, 104134. https://doi.org/10.1016/j.resourpol.2023.104134

Zuo, B., & Huang, S. (2018). Revisiting the tourism-led economic growth hypothesis: The case of China. *Journal of Travel Research*, 57(2), 151–163. https://doi.org/10. 1177/0047287516686725.

Xia, W., Doğan, B., Shahzad, U., et al. (2022). Xia, W., Doğan, B., Shahzad, U., Adedoyin, F.F., Popoola, A., & Bashir, M.A. (2022). An empirical investigation of tourism-led growth hypothesis in the european countries: evidence from augmented mean group estimator. *Portuguese Economic Journal*, 21, 239–266. https://doi.org/10.1007/s10258-021-00193-9

Article history: Received: 02.10.2023 Revised: 08.11.2023 Accepted: 06.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1717-1727
DOI 10.30892/gtg.514 spl12-1167

STUDY OF THE IMPACT OF UNESCO HERITAGE SITES ON SUSTAINABLE TOURISM DEVELOPMENT: A CASE STUDY OF THE MAUSOLEUM OF KHOJA AHMED YASAWI, TURKESTAN

Yerlan ISSAKOV
Abai Kazakh National Pedagogical University, Institute of Natural Sciences and Geography, Department of Geography and Ecology, Almaty, Kazakhstan, e-mail: erlan.issakov@gmail.com

Aliya AKTYMBAYEVA
Al-Farabi Kazakh National University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: aliya.aktymbayeva@kaznu.edu.kz

Zhanna ASSIPOVA
Al-Farabi Kazakh National University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: zhanna.inal@mail.ru

Yeldar NURULY
Al-Farabi Kazakh National University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: yeldar.nuruly@kaznu.edu.kz

Akmaral SAPIYEVA
Al-Farabi Kazakh Hational University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: akmaral.sapiyeva@kaznu.edu.kz

Aiman SHAKEN
Al-Farabi Kazakh Hational University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: aiman.shaken@kaznu.edu.kz

Liudmila PAVLICHENKO
Al-Farabi Kazakh Hational University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: lmp.170946@yandex.ru

Aida KALIYEVA
Al-Farabi Kazakh Hational University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: Kaliyeva.Aida@kaznu.kz

Roman PLOKHIKH
Al-Farabi Kazakh Hational University, Faculty of Geography and Environmental Sciences, Almaty, Kazakhstan, e-mail: rvplokhikh@gmail.com

Lóránt Dénes DÁVID*
John von Neumann University, Faculty of Economics and Business, Kecskemét, Hungary; Hungarian University of Agriculture and Life Sciences, Institute of Rural Development and Sustainable Economy, Gödöllő, Hungary, e-mail: david.lorant.denes@gtk.uni-neumann.hu

Citation: Issakov, Y., Aktymbayeva, A., Assipova, Z., Nuruly, Y., Sapiyeva, A., Shaken, A., Pavlichenko, L., Kaliyeva, A., Plokhikh, R. & Dávid, L.D. (2023). STUDY OF THE IMPACT OF UNESCO HERITAGE SITES ON SUSTAINABLE TOURISM DEVELOPMENT: A CASE STUDY OF THE MAUSOLEUM OF KHOJA AHMED YASAWI, TURKESTAN. *GeoJournal of Tourism and Geosites*, 51(4spl), 1717–1727. https://doi.org/10.30892/gtg.514spl12-1167

Abstract: Globally, cultural heritage tourism (CHT) is an effective way to achieve economic benefits by preserving and sharing a city's heritage and culture with visitors. Therefore, it is very important to study the impact of historical and cultural heritage sites on the sustainable development of local tourism. The aim of this study was to investigate the impact of the Khoja Ahmed Yasawi Mausoleum, a UNESCO heritage site in Kazakhstan, on sustainable tourism development in Turkestan. The study was based on a survey aimed at identifying the goals of tourists (respondents) visiting Turkestan city, the main objects they would like to see as a tourist destination, and their opportunities for sustainable development of urban tourism. The questionnaire responses were analysed based on the coding of respondents (R1-R328) who were randomly selected. As a result, 40.8% of respondents from near and far abroad (47) and Kazakhstan (281) found that the purpose of the visit was historical and cultural tourism. 78.7% of respondents assessed the tourism potential of the Mausoleum of Khoja Ahmed Yasawi as high in terms of sustainable tourism development in Turkestan. Thus, being one of the most famous architectural monuments of Central Asia and an example of modern Kazakh

* Corresponding author

architecture, the mausoleum of Khoja Ahmed Yasawi is a cultural and historical object that affects the sustainable development of tourism in Turkestan. This study will help to solve the problems of sustainable tourism development in Turkestan.

Key words: Cultural heritage tourism, UNESCO, sustainable tourism development, Khoja Ahmed Yasawi Mausoleum, Turkestan.

*** * * * * ***

INTRODUCTION

Nowadays, CHT has become an important part of the tourism industry as one of the fastest growing types of attraction tourism in the world (Maaiah and Wouhoush, 2020). Therefore, it is necessary to assess the sustainability of CHT types for tourism development (Weng et al., 2019). In particular, it is necessary to consider the multi-stakeholder relationship between resource management, tourist, local community, enterprise as the main value for CHT destinations (Laitamaki et al., 2016; Ismail et al., 2014; Setiawan et al., 2021). CHT fulfils the most important functions of integrating cultural communications into the world space, ensuring cultural and human security (Adhika and Putra, 2020). It also forms a unique cultural landscape of the territory based on culture and natural environment. In this context, the restoration and conservation of architectural monuments inscribed on the World Heritage List is becoming increasingly important and one of the main directions in the preservation of cultural heritage (Fadli and AlSaeed, 2019). However, the length of time it takes to identify the causes of destruction of cultural monuments related to the preservation of architectural monuments and the need to allocate additional resources were identified as the main challenges faced (Taher Tolou Del et al., 2020).

In this regard, the involvement of cultural heritage sites in tourism planning will lead to the achievement of sustainability and growth of the local economy (Akbar et al., 2020). That is, local participation in World Heritage site conservation and tourism planning helps to improve the quality of life of local people and make the conservation plan sustainable (Friedman et al., 2009). In general, sustainable development is a multidimensional concept related to the environment and resources, as well as industry and agricultural production (Cornel and Mirela, 2008).

This is because sustainable development is defined as an overarching concept that predicts all aspects of human endeavour and to which all peoples of the world should be engaged (Zaharia et al., 2010; Ogutu et al., 2023). Tourism sustainability is a complex concept as it is latent, relative and multidimensional in nature (Fernández and Rivero, 2009). The multidimensional nature of tourism sustainability is based on three different dimensions of sustainability: environmental, social and economic sustainability (Mikulić and Kožić, 2011; El Archi et al., 2023a). Nowadays, defining the sustainability of CHT has become an important topic in the field of tourism management. After all, one of the main challenges of achieving sustainable tourism is to fill the gap between the planning and implementation phases.

It is therefore very important to study the impact of World Cultural Heritage sites on international and domestic tourist flows, the impact on sustainable development, as well as opportunities for cultural tourism development. In this context, Du Cros (2001) argues that there is a natural link between tourism and cultural heritage management, although there is little debate between them on the sustainability of heritage tourism. Thus, Lee et al. (2008) recognise that there is a clear conflict between heritage protection and tourism development in developing countries, while McKercher et al. (2005) identified seven possible scenarios for the relationship between tourism and CHT, as well as a number of mitigating factors.

Also among the world studies that aim to identify the factors that constitute the social value of heritage in relation to sustainable tourism, the works of Dans and González (2019); Wondirad et al. (2008); Kim et al. (2019); Eslami et al. (2019); El Archi et al. (2023b); Lai et al., 2022; Canale et al. (2019) and Megeirhi et al. (2019) are valuable. Among Kazakhstani scholars, Mamirkulova et al. (2020) believes that the new opportunities of the Silk Road infrastructure will improve the quality of life of the population of Kazakhstan, and Mamutova (2020) identifies the relevance of implementing a management model of destination management organisation for sustainable tourism development in Kazakhstan. Also Akbar et al. (2019) on the example of Aksu-Zhabagly natural heritage site in Kazakhstan found that the negative political environment of the tourist route has a negative economic impact on the realisation of sustainable tourism development in Kazakhstan. In her study, Chang (2019) examines the complexity of cultural and historical heritage conservation, economic development, tourism and global transnational heritage within the framework of sustainability. Thus, the impact of the sites included in the list of UNESCO cultural heritage sites in Kazakhstan on the sustainable development of tourism is not yet fully explored. Thus, the impact of UNESCO heritage sites on sustainable tourism development in Kazakhstan, although mentioned in the study, remains understudied. Therefore, the aim of this study was to investigate the impact of Khoja Ahmed Yasawi Mausoleum, a UNESCO heritage site in Kazakhstan, on sustainable tourism development in Turkestan. This is because the mausoleum of Khoja Ahmed Yasawi is an example of authentic regional architecture, which is the main symbol of local cultural and construction traditions as the spatial environment of Turkestan (Figure 1).

The concept of cultural policy of the Republic of Kazakhstan for 2023-2027 states that the national cultural brand of the country will be formed by outstanding objects of historical and cultural heritage of Kazakhstan - Altyn Adam, mausoleum of Khoja Ahmed Yasavi, Otrar complex, petroglyphs Tamgaly, Bozok, Botay, Turkestan (Concept of cultural policy of the Republic of Kazakhstan for 2023-2027). After all, the mausoleum of Khoja Ahmed Yasawi is one of the most famous architectural monuments of Central Asia and is a cultural and historical object that influences the formation of unique features of modern Kazakh architecture (Abdrassilova et al., 2021). In addition, the amazing architectural masterpiece, built in the XIV century by order of Emir Timur, is considered a sacred place for Muslims. Famous Kazakh khans Esim (1628), Zhangir (1652), Tauke (1715), Bulat (1723), Sameke (1738), Zholbarys (1740), Abilmambet (1771), Abylai (1781) and

Bokey (1819) are buried here (Bartold, 1914). The first President of the Republic of Kazakhstan Nazarbayev (2015) says about it as follows: "every time I come to the sacred Turkestan land, I feel a special admiration. Khans, bi, batyrs, baglans who lived thinking about the country of Kazakhstan and tomorrow will always be remembered here". In 2022, the current President Tokayev K. K. specially visited the mausoleum of Khoja Ahmed Yasawi, where he familiarised himself with the condition of the mausoleum and instructed to strictly control the preservation of the monument. He also noted the importance of developing the city of Turkestan as a centre of cultural tourism (Official website of the president of the Republic of Kazakhstan, 2022). The city of Turkestan is one of the oldest cities in Kazakhstan with a centuries-old history. Its favourable geographical position on the ancient caravan route along the Great Silk Road, as well as the visit of religious people to the mausoleum of the great Sufi poet and preacher Khoja Ahmed Yassaui contributed to its development and lively trade. The city of Turkestan plays an important role in the historical, cultural, spiritual and tourist life not only of Kazakhstan but also of the whole Central Asian region (Baipakov, 2007).

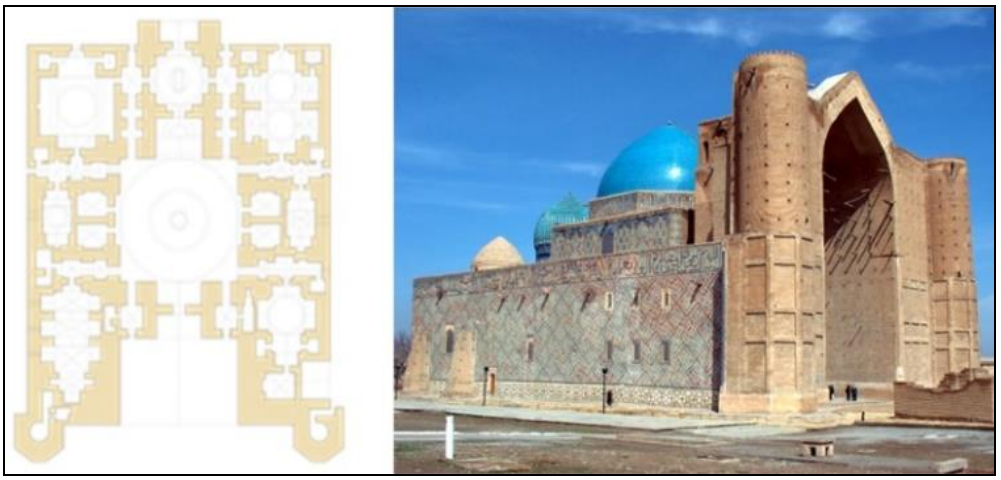
a)  b)

Figure 1. Mausoleum of Khoja Ahmed Yasawi, Turkestan (1385-1405)
a) drawing of the mausoleum; b) a view from the south (Source: Wikipedia, 2023)

Thus, based on the fact that the city of Turkestan is the most valuable historical and cultural monument of architecture and the eternal home of Kazakh good and kind people, the mausoleum of Khoja Ahmed Yasawi was chosen as the object of the study. The study was based on a questionnaire survey aimed at determining the main purpose of tourists (respondents) visiting Turkestan city, the main places they would like to see as a tourist destination, and the impact of UNESCO heritage sites (the mausoleum of Khoja Ahmed Yasawi) on sustainable tourism developmentThis is because the primary purpose of each tourist arrival specifically affects the sustainable development of local tourism. The survey was also aimed at identifying the impact of cultural tourism in Turkestan and the mausoleum of Khoja Ahmed Yasawi on the sustainable development of urban tourism. This study is a supportive tool to help identify the impact of UNESCO heritage sites on sustainable tourism development and to address the challenges of local cultural tourism development. This is due to the fact that there are few studies on the impact of the Mausoleum of Khoja Ahmed Yasawi, a UNESCO heritage site, on sustainable tourism development in the city of Turkestan. Even the existing studies do not consider the possibilities of sustainable development of the specific city of Turkestan. For example, Assan (2013) focused on the opportunities for tourism development in the city of Turkestan and analysed the volume of work and services performed by tourism firms in the regions of Kazakhstan. Meanwhile, Çalişkan and Özer (2021) investigated the intuition of Turkestan residents about the economic, socio-cultural and environmental impacts of tourism and their supportive views on tourism development. However, Akbar and Yang (2022), studying the distribution of tourism income and the impact of constraints on sustainable tourism development in the Aksu-Zhabagly Nature Reserve, a UNESCO heritage site, found that most residents were not satisfied with tourism development and their participation in tourism was relatively low. It also found that tourism and related income sharing with local communities has become a common strategy for realising sustainability at the global level in reserves or protected areas. Therefore, for the development of tourism in Turkestan city, which has socio-economic importance, it is important to conduct applied research works (Nurmukhamedova and Myrzakhan, 2023). Especially, the digital transformation is changing tourism education, so the 3D tour of the state historical and cultural museum-reserve of Azret Sultan in Turkestan is very beneficial in future research (Issakov et al., 2023a; Marcel et al., 2023). This paper aims to study the impact of the Mausoleum of Khoja Ahmed Yasawi, a UNESCO heritage site in Kazakhstan, on sustainable tourism development in the city of Turkestan.

MATERIALS AND METHODS

Inscribed on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity with a view to safeguarding and promoting elements of the intangible cultural heritage that constitute the heritage of world civilisation (UNESCO, 2021; Debarbieux et al., 2023). The UNESCO World Heritage List includes 10 monuments of history and culture of Kazakhstan, presented in three nominations: architectural masterpieces - "Mausoleum of Khoja Ahmed Yasawi",

"Tamgaly" - petroglyphs of archaeological landscape and "The Great Silk Road: Chang'an-Tian Shan Corridor Line". The main factor in the preservation of historical and cultural heritage is research and scientific restoration work (Aldybayev et al., 2021). Therefore, the outstanding historical and cultural heritage of Kazakhstan - the mausoleum of Khoja Ahmed Yasawi, the Otrar, Tamgali, Bozok, Botai, Turkestan and Altyn-Adam petroglyphic complexes are considered to be the unique heritage forming the national cultural brand of the country (Akbar et al., 2021).

Mausoleum of Khoja Ahmed Yasawi is an architectural structure erected at the end of XIV century, located in Turkestan, one of the oldest cities of the Republic of Kazakhstan (Figure 2). Currently, the mausoleum of Khoja Ahmed Yasawi is one of the most important landmarks of CHT in Kazakhstan. The mausoleum is a domed structure with a large portal that is 46.5 metres wide and 65 metres long (Kemelbekova et al., 2022). This structure, symmetrically compact in appearance, houses 35 large and small halls and rooms, all connected to each other by 8 two-storey corridors and various staircases of transition (Baiteinova, 2012). The mausoleum of Khoja Ahmed Yasawi, located in the southern part of the country, is the spiritual centre of the Turkic world (Kudaibergenov et al., 2019). Turkestan was the capital of the Kazakh Khanate in the XVI-XVIII centuries. Since the second half of the twentieth century it has been one of the industrial, agricultural, educational, cultural and tourist centres of Kazakhstan (Abzhalov and Kozha, 2022; Issakov et al., 2022). In Turkestan, along with the mausoleum of Khoja Ahmed Yasawi, there are the best monuments of archeology, history, architecture and fine arts, such as the Great Kiluet (underground mosque, XII century), octagonal mausoleum (XIV-XVI), mausoleum of Ulugbek's daughter, wife of Abulkhair Khan Rabigi Begim (XV), eastern bath (XVI-XVII), mausoleum of Esimkhan, Zhuma Mosque. The total area of the territory occupied by the reserve-museum is 90 hectares (Baltabayeva et al., 2019).

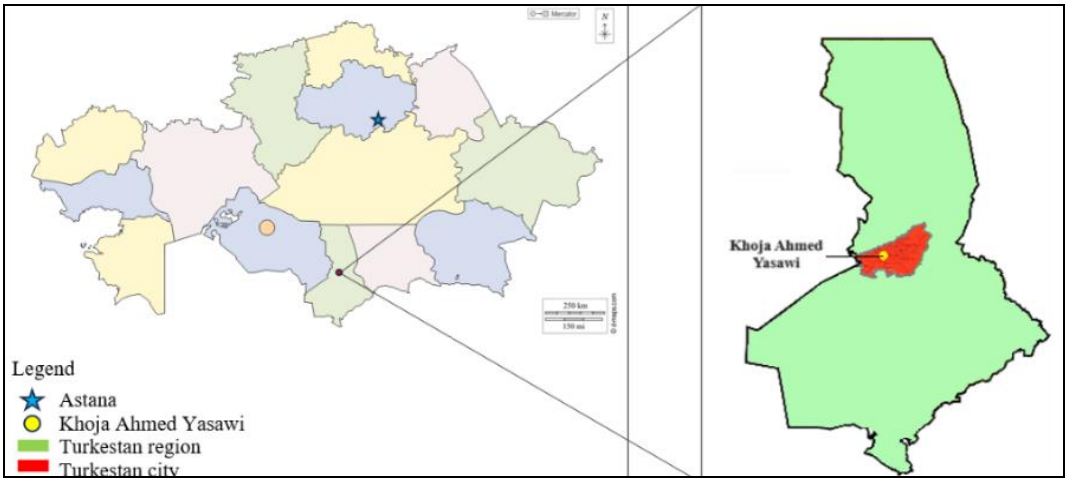


Figure 2. Location of the mausoleum of Khoja Ahmed Yasawi (Source: compiled by the authors)

The architecture of the mausoleum of Khoja Ahmed Yassawi is a unique structure with a clear and coherent plan, including various rooms: a central hall (boiler room), a viewing platform, a mosque, a library, a meeting hall (large and small Aksaray), a dining room, and living quarters for pilgrims. Besides cultural-historical and spiritual significance, the monuments of architecture also have real economic importance (Nakhipbekova et al., 2023). The revival of the Great Silk Road tourist route in Central Asia serves as an impetus for economic development. The tourist route starts in the Republic of Uzbekistan from the pearl of Khorezm Zhazira - the city of Khiva. The tourist route then passes through Bukhara, Navoi, Samarkand, Zhizak, Tashkent, one of the oldest cities in Central Asia and continues to Turkestan in the Republic of Kazakhstan (Sevim, 2016; Garda, 2022). Highly revered by the peoples of Central Asia, the mausoleum of Khoja Ahmed Yasawi has been included in the UNESCO World Heritage List as a monument of architecture of the 14th century since 2003 (Kuralbayev et al., 2017). Also in 2017, the international organisation of Turkic culture (TURKSOY) recognised the city of Turkestan as a cultural and spiritual centre of the Turkic world and became a venue for international events (Tuyakbayev et al., 2021). Over the past twenty years, the city of Turkestan has witnessed rapid development of tourism. In this regard, in accordance with the purpose of the study, we received a questionnaire aimed at identifying the impact of Khoja Ahmed Yasawi Mausoleum on the sustainable development of tourism in Turkestan city.

The content of the questionnaire focused on the main purpose of tourists visiting Turkestan city, the main places they would like to see as a tourist attraction, and the opportunities for sustainable tourism development in Turkestan city. We believe that the main purpose and desire of tourists to come to Turkestan affect the sustainable development of city tourism. Proceeding from the fact that every tourist when choosing a destination thinks about the satisfaction of his/her needs, we have prepared a questionnaire specifically for tourists in 3 languages (Kazakh, Russian, English).

The survey was conducted from 5 to 12 March 2023 and a total of 342 questionnaires were distributed. However, due to the fact that 14 answer sheets did not meet the qualitative requirements, the answers of 328 respondents (tourists) were accepted. Respondents from 12 countries represented 7% of the total number of tourists, 93% were Kazakhstani respondents. The survey was conducted by the faculty of Al-Farabi Kazakh National University in a paper survey in front of the mausoleum of Khoja Ahmed Yasawi. The analysis was based on the coding of respondents (R1-R328). The sampling method was random and respondents over 16 years old participated in the study. The full Flowchart of the study is shown below (Figure 3).

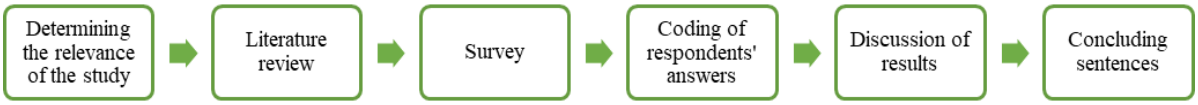


Figure 3. Research Flowchart (Source: compiled by the authors)

RESULTS AND DISCUSSION

As a result of the study, referring to tourists who came to see the main tourist attractions of Turkestan (Figure 4), it was found that out of 328 respondents, 47 were from far and near abroad, and the remaining 281 respondents were local tourists. From the results of the survey, we can highlight some points worth noting. For example, the largest share of foreign respondents came from border countries: 24% - China, 13% - Uzbekistan, 11% - Kyrgyzstan. Among Kazakhstani respondents: 31% (87) -Turkestan, 13.9% (39) - Kyzylorda, 11.7% (33) - Zhambyl, 9.3% (26) - Almaty, 4.6% (13) - Aktobe, 3.6% (10) - Karaganda, 2.1% (6) - Mangistau, 2.5% (7) - Atyrau, 1, 8% (5) - West Kazakhstan, 1.4% (4) - Pavlodar, 0.7% (2) - Kostanai, 1% (3) - Abay, 1.4% (4) - from Akmola region, 7.8% (22) – Shymkent, 4.3% (12) - Almaty and 2.9% (8) – from Astana city.Majority of the respondents in the study were aged 36-45 years (112; 34.1%), followed by respondents aged 16-25 years (85; 25.9%), 26-35 years (72; 22%), 46-55 years (41; 12.5%) and respondents above 56 years (18, 5.5%). In terms of gender, 53% of respondents were female and 47% were male. In response to the main questions of the questionnaire: "what is your purpose of coming to Turkestan? "40.8% of respondents stated that they came for cultural and cognitive purposes. It was found that 18% of respondents came for children's tourism, 11% for business purposes (congress, fair), 3% for entertainment, 4.9% for sports, 6.8% for ethnic and 15.5% for religious purposes. In addition, "which object in the State Historical and Cultural Museum-Reserve of Azret Sultan has a high tourist potential?". 78.7% of respondents named the mausoleum of Khoja Ahmed Yasawi, which is included in the list of UNESCO heritage sites (Figure 5 and 6).

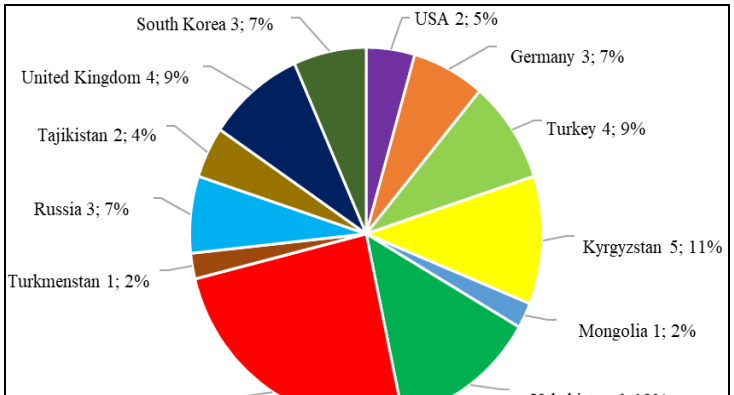


Figure 4. Respondents from foreign countries, number and percentage, %

1. Mausoleum of Khoja Ahmed Yasawi
2. Kiluet underground madrassa
3. Friday mosque
4. Turkestan bath
5. Mausoleum of Yesimkhan
6. Octagonal Sagana
7. Mausoleum of Rabiya Sultan Begim
8. Shildekhana
9. Unknown well dug wide and deep
10. Unknown New well dug wide and deep
11. Barrow
12. Citadel Mound of the city
13. Musalla Gate
14. Ancient city of Kultobe
15. Khan Orda
16. Underground mosque of Kumshikata
17. Turkestan Historical Museum
18. Canteen, souvenir shop
19. Toilet
20. Car park
21. Office

Figure 5. Objects of the state historical and cultural museum-reserve of Azret Sultan (Source: compiled by the authors)

The respondents were asked: "What is the impact of the Mausoleum of Khoja Ahmed Yasawi on the development of cultural tourism in Turkestan city?". The answers to the question were as follows: R1: Turkestan is the spiritual capital of the Turkic world. Every guest or tourist who has visited Turkestan will not return without seeing the mausoleum of Khoja Ahmed Yassawi, R4: Due to the fact that it is included in the list of UNESCO heritage sites, there are a large number of tourists who come to see it, so perhaps the social situation will be affected, R11: I think that a tourist coming to Turkestan will definitely come to see the mausoleum of Khoja Ahmed Yasawi.

Therefore, I believe that the main tourist object of the city of Turkestan is, R29: This has a positive impact on the socio-economic situation of the population of Turkestan, R51: Several Kazakh khans are buried in the mausoleum of Khoja Ahmed Yasawi, so Kazakhs are always coming here to see it, R118: Tourists come from Europe to see taikazan, R131: I believe that Kazakhstan is a major tourist destination, where a large number of foreign tourists come. Of course, this will lead to economic development, stability, P157: A historic site known as a sacred place, R172: We have to make sure that the environmental issue does not arise because of the large number of tourists!, R196: One of the main directions of activity in the field of protection and study of historical and cultural heritage is integration of unique historical and cultural monuments of Turkestan city into the world space, R204: As one of the most famous architectural monuments of Central Asia, I think it will contribute to the development of tourism as an interesting place for tourists, R235: Cultural heritage sites influence international and domestic tourist flows, R247: For sustainable development of cultural tourism in Turkestan it is necessary to limit the deterioration of the mausoleum of Khoja Ahmed Yasawi. For this purpose it is necessary to take measures in advance, R251: Located along the Great Silk Road, it is one of the priority areas for the development of cultural and cognitive tourism in the country and is a major tourist destination, R263: As a place of special cultural and historical significance for the Turkic world, I think that thanks to the incoming tourists, the quality of life of the locals will increase, R315: As the mausoleum of Khoja Ahmed Yasawi is an architectural structure built at the end of the 14th century, it is important to preserve this architectural monument in its original form. As a historically and culturally significant tourist site, it should be handed down from generation to generation. Besides, what cultural places in Turkestan city did you visit? analysing the answers to the questions 98.8% of respondents reported that they visited the complex "Caravan-sarai" (Table 1). This complex is one of the main centres attracting tourists to the region after the mausoleum of Khoja Ahmed Yasawi, which has no analogues in Central Asia. Due to the fact that all the objects of the caravanserai are connected through the water channel, the locals have given this place the name "Venice of Kazakhstan".

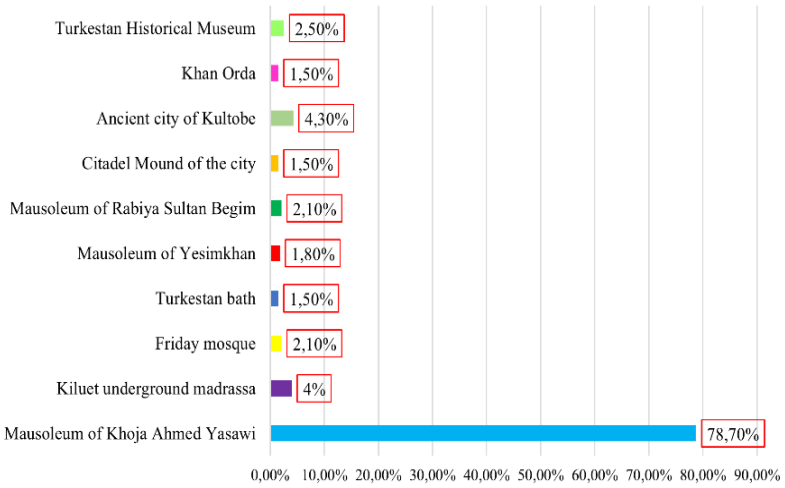


Figure 6. The main object with high tourist potential, the attitude of respondents, % (Source: compiled by the authors)

Table 1. Cultural sites of Turkestan city

№	Cultural sites	Percentage %	Respondents number
1	Vizit Center	84.1	276
2	Center "Uly Dala"	64.9	213
3	Yasawi Museum	75.3	247
4	Turkestan Musical Drama Theatre	66.5	218
5	International University of Tourism and Hospitality	36.9	121
6	Multidisciplinary complex "Congress Hall"	53.4	175
7	Yassawi Museum	67.9	223
8	Schoolchildren's Palace	23.8	78
9	Alatau Media Center	18.9	62
10	Caravan-sarai complex	98.8	324
11	Farab library	73.5	241
12	Botanical Garden	58.8	193

Table 2. Hotel where respondents were accommodated, N = 328

№	Hotel name	%	Number of respondents	Minimum price, euro	Hotel category
1	Karavansaray Khaganate Hotel	9.5	31	74	5*
2	Royal Grand Hotel Turkestan	5.8	19	30	4*
3	Boutique Hotel Silk Way	6.7	22	60	-
4	Hampton by Hilton Turkistan	8.2	27	68	3*
5	EDEM Hotel	6.1	20	36	3*
6	Hotel Khanaka	4.6	15	48	4*
7	Almaty City	7	23	34	3*
8	Rixos Turkistan	5.5	18	134	5*
9	Emir Plaza Hotel & Restaurant	6.7	22	48	3*
10	Grand Villa	6.4	21	26	-
11	Olympic Hotel	4.9	16	56	4*
12	Khan Palace	3.7	12	34	4*
13	Ramada by Wyndham Turkistan	7.3	24	80	4*
14	Hostels	11.8	39	16	-
15	Relatives' home	5.8	19	-	-

To determine the share and social aspects of accommodation facilities that contribute to the sustainable development of tourism in Turkestan, to the question "In which hotel did you stay"? 9.5% of respondents answered "in the hotel of the Karavansaray Khaganate Hotel. The share of those who stayed in the most expensive hotel "Rixos Turkistan" was 5.5%. In general, the specifics of respondents' location turned out to be the same as below (Table 2).

In the course of the study for the integrated and effective development of the activities of the mausoleum of Khoja Ahmed Yasawi, the possibility of improving the integration processes taking place in the State Historical and Cultural Museum-Reserve of Azret Sultan, as well as ensuring the stability of cultural services and quality education for tourists through the use of innovative, information, communication technologies was assessed. To assess the historical and cultural heritage of the mausoleum of Khoja Ahmed Yasawi and access to museum expositions in virtual format "have you seen the State Historical and Cultural Museum-Reserve of Azret Sultan (including the mausoleum of Khoja Ahmed Yasawi) in 3D tour? What is the quality of the 3D tour?". In response to this question, 78% of respondents said they had not seen a 3D

tour, while 22% of respondents said they had seen a 3D tour and that it was very useful in recognising objects and museum displays. The responses of respondents who viewed the 3D tour were as follows: R38: The Mausoleum of Khoja Ahmed Yasawi was interesting to me, as it was my first time in Kazakhstan. So last night I viewed the 3D tour on the official website, I liked it (Figure 7), R54: After learning from the hotel maid that there is a virtual tour, I checked out the tourist sites in the city. I would say that the 3D tour was useful to me. I give it a good rating, R146: I saw the 3D tour on the official website, but unfortunately it was hard to understand due to the lack of information in English, R267: I previewed the museum's exhibits with a 3D tour, R272: This allowed you to see the museum's exhibits up close, R84: Watched the full 3D tour of the Azret Sultan Museum-Reserve, not bad overall, and R306: The quality is excellent.

Figure 7. 3D tour of the state historical and cultural museum-reserve of Azret Sultan
(Source: Official website of the State Historical and Cultural Museum-Reserve of Azret Sultan, 2023)

To date, the State Historical and Cultural Museum-Reserve of Azret Sultan envisages the creation of a virtual tour, the transfer of museum funds into electronic format and the implementation of the main activities of the museum at the expense of the state as part of the phased implementation of a set of measures for the transition to advanced digital technologies. Such work is being actively carried out by republican museums, and it is also expected that these processes will be revitalised among regional museums (Sakhiyeva, 2021; Herman et al., 2023). Today, 3D world tours provide public access to cultural treasures (Beták et al., 2023; Herman et al., 2020). Constant replenishment of the museum's funds is carried out through the acquisition of valuable museum exhibits, collection during scientific archeological and ethnographic expeditions, and donations to the museum.

CHT fulfils the most important functions of ensuring cultural and human security in the conditions of the country's integration into the world space of cultural communications, fierce competition of cultural and historical ties (Doskhozhina and Yessekeyeva, 2019). Their huge national economic potential as tourism objects is also evident, thanks to which it is possible to increase the recognition of the country abroad and increase the flow of tourists (Issakov et al., 2023b; Koshim et al., 2023). Scientific research, modernisation, reconstruction and preservation of historical and cultural heritage sites play an important role in improving the mechanisms of interaction between state and civil institutions (Ilieș et al., 2023).

In this regard, we received the following answers from the respondents to the question "What is the state of conservation and environmental condition of the Khoja Ahmed Yasawi Mausoleum?": R6: I liked the mausoleum. I didn't see an environmental problem, R23: The surface of some of the building materials of the mausoleum was covered with salt deposits. As far as I know, this is very dangerous, R31: If we talk about the general condition of the mausoleum, we must admit that it has begun to wear out, R65: The condition of the Khoja Ahmed Yasawi Mausoleum is alarming and restoration work is not going well, R82: I have seen places in the rooms of the mausoleum that are damaged or defaced, R127: The inside of the mausoleum dome shows traces of water dripping from the ceiling with large yellowish spots, R154: Salt has formed on the surface of the stones at the base of the boiler and walls and is destroying them, R194: This site is protected by the state and UNESCO, so I think it should be monitored, R207: As a domestic tourist, I visit the mausoleum of Khoja Ahmed Yasawi a lot. For the last 2-3 years, I have noticed that due to excessive humidity inside the building, dark spots have appeared on the surface of the dome, R285: Salt began to appear on some parts of the Mausoleum. We received answers that the reason for this, in my opinion, is landscaping and artificial landscaping of the area in front of the Mausoleum.

The answers to the questionnaires showed that in recent years, the change of historical districts of Turkestan city in accordance with the requirements of time, types and speed of processes related to this have a negative impact on the historical and cultural heritage. Natural impacts and anthropogenic factors can lead to the destruction or complete destruction of the monument. Colossal damage to the mausoleum is caused by the phenomena of natural disasters that have occurred over the centuries, and technogenic changes in the environment in recent times, the impact of various industrial processes. It should be noted that the studied mausoleum cannot withstand external exogenous impacts, especially atmospheric precipitation saturated with pollutants of various nature, harsh waters with high salt content and other factors (Sainova et al., 2023; Dávid, 2009). From year to year, with the development of industry, the number of anthropogenic factors worsening the state of the environment increases, which not only leaves no attention to the monuments of architecture, but also leads to their destruction (Makish et al., 2021; Nasib et al., 2023). Therefore, it is necessary to pay timely attention to this problem, carry out the necessary scientific research and take concrete measures.

Thus, as a result of the study it was found that UNESCO promotes the popularisation of elements of intangible cultural heritage of Kazakhstan and their access to the level of the world spiritual heritage of humanity, preservation of national mentality and identity. Taking into account global trends, it is promising to develop tourism by creating tourism products, infrastructure and brands on the basis of objects of historical and cultural heritage. The first steps in this direction are the "Gaukhar-Ana", "Sauran", "Saraishyk", "Issyk" and "Ordabasy" visit centres created on the territory of the republican museum-reserves. The positive development of Kazakhstan's cultural brand will be promoted by holding events aimed at the development of cultural tourism to the holy places of Kazakhstan, the sale of products in tourist places, and the sale of national brand products in tourist places. For this purpose, the popularisation of the historical and cultural heritage of the country should be promoted by large-scale information and propaganda activities in the media and on Internet sites (Tiberghien, 2019). Ultimately, CHT relies on culture, natural environment, tries to use its own mechanisms of traditional forms, forming a unique cultural landscape of the territory (Richards, 2018; Hall et al., 2016). The heart of CHT - cultural heritage itself - is a spiritual, cultural, economic and social capital with irreplaceable value (Santa and Tiatco, 2019). Heritage fuels modern science, education and culture. Therefore, cultural tourism - of course - builds on the diversity of a country's heritage and pays special attention to the world's natural and cultural heritage as the highest level of recognition of the significance of sites of unique, outstanding value, not limited to the boundaries of a single state (Mousazadeh et al., 2023). Special attention to sites is now required to protect heritage globally and nationally or to use it for local history purposes (Issakov et al., 2023c). International conventions, recommendations, resolutions and other heritage documents that existed at the time when the concept of the world natural and cultural heritage was formed, presuppose the preservation of unique sites in the eyes of the peoples of the world, regardless of their nationality (de Oliveira et al., 2022).

Thus, CHT has become the main income sector of many countries, the stability of which determines the issue of heritage protection (Ballantyne et al., 2014; Arumugam et al., 2023). Sustainability assessment studies tend to examine resource management, community, tourist relations, while the role of the tourism enterprise is consistently overlooked (Ng et al., 2017). Therefore, assessing the sustainability of CHT becomes an important topic in the field of tourism management. Most of the research is oriented towards assessing the sustainability of CHT destinations, for which a series of evaluation indicator systems have also been developed (Poria et al., 2003; Bhowmik, 2021). It was shown that current research has been conducted mainly in the context of ecotourism development, which does not necessarily report on assessing the sustainability of CHT destinations when distinguishing between ecotourism and CHT (Jitpakdee and Thapa, 2012; Leka et al., 2023).

CONCLUSIONS

Thus, this study aims to identify the impact of the Khoja Ahmed Yasawi Mausoleum, a UNESCO heritage site in Kazakhstan, on the sustainable development of tourism in the city of Turkestan. The main purposes of tourists' visit to Turkestan city, the main objects they want to see as tourist attractions and the opportunities for sustainable development of urban tourism were identified. "The purpose of visiting the city of Turkestan" was cultural and cognitive tourism for 40.8% of respondents. In addition, 78.7% of respondents believe that the mausoleum of Khoja Ahmed Yasawi has a high tourism potential. Thus, having studied the impact of the mausoleum of Khoja Ahmed Yassawi on the development of cultural tourism in Turkestan city, the priority areas for sustainable development of CHT, capable of meeting the needs of the domestic and foreign market, were identified:

- creation of recreational and tourist infrastructure, providing for improved tourist services;
- establishment of risk zones for the management of the tourism cluster and related cultural heritage sites and the development of basic norms to minimise their impact;
- successful formation of sustainable development of the city's economy through the formation of small and medium-sized tourism business;
- construction of hotels, tourist complexes, accommodation of restaurants, facilities providing entertainment, recreation and visitor services as part of them;
- creation of a trade and logistics centre of the New Silk Road, a major transport hub;
- organising the improvement of the education system for the training of qualified personnel, service staff, marketing specialists for the organisation, management and operation of tourist establishments;
- study of all tourist resources of Turkestan city and its surroundings (historical, cultural and spiritual riches - objects) at a high level;
- participation in important tourism exhibitions, promotion of the Turkestan region;
- improving the quality of tourism and hotel services in accordance with the established requirements of the technical regulation system. Reduction of hotel prices.

These priority areas necessitate the preparation of economic mechanisms that enhance service competition of the tourism industry. It allows to solve many issues so that mechanisms can fully meet the requirements of tourist customers despite price changes.

Therefore, the mausoleum of Khoja Ahmed Yasawi, one of the most famous architectural monuments of Central Asia, is a cultural and historical object that affects the sustainable development of tourism in Turkestan. This study is an auxiliary tool in solving the problems of sustainable tourism development in Turkestan.

Author Contributions: Conceptualization, Y.I. and L.D.D.; methodology, Y.I. and L.D.D.; software, Y.I. and L.D.D.; validation, Y.I. and L.D.D. and A.A.; formal analysis, Y.I. and L.D.D. and Z.A.; investigation, Y.I. and L.D.D. and Y.N.;

data curation, Y.I. and L.D.D. and A.S. and A.S.; writing - original draft preparation, Y.I. and P.R. and L.D.D.; writing - review and editing, L.P. and A.K. and A.S. and A.A.; visualization, Z.A. and Y.N. and A.S. and L.P. and A.K.; supervision, Y.I. and L.D.D. and A.A. and Z.A. and P.R.; project administration, Y.I. and L.D.D. All authors have read and agreed to the published version of the manuscript.

Funding: This article was prepared with funding from the Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan within the framework of the project AP08855888 "Ensuring sustainable development of Kazakhstan's national parks through the territorial organization of ecological tourism".

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: We thank the staff of the State Historical and Cultural Museum-Reserve of Azret Sultan for their help in organising the study.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abdrassilova, G.S., Murzagaliyeva, E.T., & Kuc, S. (2021). Mausoleum of Khoja Akhmed Yassawi as the element of regional identity formation in modern architecture of Kazakhstan. *Periodicals of Engineering and Natural Sciences,* 9(1), 127-138. http://dx.doi.org/10.21533/pen.v9i1.1783

Abzhalov, S., & Kozha, M. (2022). Architectural Complex of Ahmed Yasawi During the History and Culture of Central Asia. *Türk Kültürü ve Hacı Bektaş Veli Araştırma Dergisi,* (102), 143-170. https://dergipark.org.tr/en/pub/tkhcbva/issue/70334/1131992

Adhika, I.M., & Putra, I.D.G.A.D. (2020). Reinvigorating cultural landscapes for planning cultural tourism in Bali. *GeoJournal of Tourism and Geosites*, 33, 1462-1469. https://doi.org/10.30892/gtg.334spl03-594

Akbar, I., Yang, Z., Han, F., & Kanat, G. (2019). The influence of negative political environment on sustainable tourism: A study of Aksu-Jabagly world heritage site, Kazakhstan. *Sustainability,* 12(1), 143. https://doi.org/10.3390/su12010143

Akbar, I., Yang, Z., Mazbayev, O., Seken, A., & Udahogora, M. (2020). Local residents'participation in tourism at a world heritage site and limitations: a case of Aksu-Jabagly natural world heritage site, Kazakhstan. *GeoJournal of Tourism and Geosites,* 28(1), 35-51. https://doi.org/10.30892/gtg.28103-450

Akbar, I., Myrzaliyeva, Z.K., Tazhekova, A.Z., Saulembayev, A.T., & Kenzhebay, R.N. (2021). Evaluation of the community-based ecotourism development status in the Aksu-Jabagly nature reserve, Kazakhstan. *Geo Journal of Tourism and Geosites*, 35(2), 381-389. https://doi.org/10.30892/gtg.35216-662

Akbar, I., & Yang, Z. (2022). The influence of tourism revenue sharing constraints on sustainable tourism development: A study of Aksu-Jabagly nature reserve, Kazakhstan. *Asian Geographer*, 39(2), 133-153. https://doi.org/10.1080/10225706.2021.1894462

Arumugam, A., Nakkeeran, S., & Subramaniam, R. (2023). Exploring the Factors Influencing Heritage Tourism Development: A Model Development. *Sustainability,* 15(15), 11986. https://doi.org/10.3390/su151511986

Aldybayev, B., Gubarenko, A., Imangulova, T., Ussubaliyeva, S., & Abdikarimova, M. (2021). Popularization of objects of the cultural and historical Heritage of the republic of Kazakhstan as a factor for the development of ethnocultural tourism of the country. *GeoJournal of Tourism and Geosites,* 39, 1450-1460. https://doi.org/10.30892/gtg.394spl16-789

Assan, D.S. (2013). *Түркістан қаласындағы туристік қызметті дамыту мүмкіндіктері [Opportunities for the development of tourism activities in Turkestan].* Vestnik KazNU Series economic, 4, 98, 30-34. (In Kazakh). https://be.kaznu.kz/index.php/math/article/view/366/344

Ballantyne, R., Hughes, K., Ding, P., & Liu, D. (2014). Chinese and international visitor perceptions of interpretation at Beijing built heritage sites. *Journal of Sustainable Tourism,* 22(5), 705-725. https://doi.org/10.1080/09669582.2013.861469

Baipakov, K.M. (2007). *Great Silk Road on the territory of Kazakhstan*, Almaty: Adamar LLP.

Baiteinova, N. (2012). *Khoja Ahmet Yassaui - founder of the Turkic branch of Sufism.* Kazinform. (In Russian). https://articlekz.com/article/8096

Bartold, V.V. (1914). *To the History of Irrigation of Turkestan.* St. Petersburg: Department of Land Improvements.

Baltabayeva, A.Y., Yesbalayeva, R.Z., Shaikhystamova, M.B., Yildiz, N., & Beskempirova, A.U. (2019). Development of Turkestan From the Great Silk Road. *Bulletin of the National Academy of Sciences of the Republic of Kazakhstan*, 6 (382), 24 – 33. https://doi.org/10.32014/2019.2518-1467.142

Beták, N., Csapó, J., Horváth, Á., & Dávid, L.D. (2023). Virtual tour as a virtual experience of destination management organisations in Slovakia. *GeoJournal of Tourism and Geosites*, 47(2), 508–514. https://doi.org/10.30892/gtg.47218-1050

Bhowmik, P. (2021). Heritage tourism: a bibliometric review. *Anatolia,* 32(3), 387-403. https://doi.org/10.1080/13032917.2021.1875250

Bhowmik, C. (2019). Archaeological sites, cultural heritage, and sustainable development in the Republic of Kazakhstan. *Education, Human Rights and Peace in Sustainable Development*, 87, 1-8. https://doi.org/10.5772/intechopen.86916

Canale, R.R., De Simone, E., Di Maio, A., & Parenti, B. (2019). UNESCO World Heritage sites and tourism attractiveness: The case of Italian provinces. *Land use policy,* 85, 114-120. https://doi.org/10.1016/j.landusepol.2019.03.037

Çalişkan, U., & Özer, Ö. (2021). Relationship between local residents' perceptions of tourism and support attitudes in post-communist countries: case of Turkestan (Kazakhstan). *Tourism Planning & Development,* 18(5), 573-593. https://doi.org/10.1080/21568316.2020.1837228

Cornel, L., & Mirela, L. (2008). The quantification of the sustainable development at local level. *WSEAS Transactions on Business and Economics,* 6(5), 310-319. http://www.wseas.us/e-library/transactions/economics/2008/27-458.pdf

Dans, E.P., & González, P.A. (2019). Sustainable tourism and social value at World Heritage Sites: Towards a conservation plan for Altamira, Spain. *Annals of Tourism Research*, 74, 68-80. https://doi.org/10.1016/j.annals.2018.10.011

Dávid, L. (2009). Environmental Impacts of Events. In Raj, R. & James, M. (Eds.): *Event Management and Sustainability,* 66-75, CABI, Wallingford, UK.

De Oliveira, R.A., Baracho, R.M.A., & Cantoni, L. (2022). The perception of UNESCO World Heritage Sites' managers about concepts and elements of cultural sustainability in tourism. *Journal of Cultural Heritage Management and Sustainable Development*. https://doi.org/10.1108/JCHMSD-03-2021-0058

Debarbieux, B., Bortolotto, C., Munz, H., & Raziano, C. (2023). Sharing heritage? Politics and territoriality in UNESCO's heritage lists. *Territory, Politics, Governance, 11*(3), 608-624. https://doi.org/10.1080/21622671.2020.1854112

Doskhozhina, Z., & Yessekeyeva, E. (2019). Symbolic nature of Turkestan city and the mausoleum of Khoja Ahmed Yassawi: the experience of field research. *Bulletin of KazNU. Series of philosophy, cultural studies and political science*, 66(4), 14-22. https://bulletin-philospolit.kaznu.kz/index.php/1-pol/article/view/905/870

Du Cros, H. (2001). A new model to assist in planning for sustainable cultural heritage tourism. *International journal of tourism research*, 3(2), 165-170. https://doi.org/10.1002/jtr.297

El Archi, Y., Benbba, B., Kai, Z., El Andaloussi, Z., László, P., & Dávid, L.D. (2023a). Mapping the Nexus between Sustainability and Digitalization in Tourist Destinations: A Bibliometric Analysis. *Sustainability*, 15 (12), 9717. https://doi.org/10.3390/su15129717

El Archi, Y., Benbba, B., Nizamatdinova, Z., Issakov, Y., Vargáné, G.I., & Dávid, L.D. (2023b). Systematic Literature Review Analysing Smart Tourism Destinations in Context of Sustainable Development: Current Applications and Future Directions. *Sustainability*, 15(6), 5086. https://doi.org/10.3390/su15065086

Eslami, S., Khalifah, Z., Mardani, A., Streimikiene, D., & Han, H. (2019). Community attachment, tourism impacts, quality of life and residents' support for sustainable tourism development. *Journal of Travel & Tourism Marketing*, 36(9), 1061-1079. https://doi.org/10.1080/10548408.2019.1689224

Fadli, F., & AlSaeed, M. (2019). Digitizing vanishing architectural heritage; The design and development of Qatar historic buildings information modeling [Q-HBIM] platform. *Sustainability*, 11(9), 2501. https://doi.org/10.3390/su11092501

Fernández, J.I.P., & Rivero, M.S. (2009). Measuring tourism sustainability: proposal for a composite index. *Tourism Economics*, 15(2), 277-296. https://doi.org/10.5367/000000009788254377

Friedman, H.S., Prados, M.D., Wen, P.Y., Mikkelsen, T., Schiff, D., Abrey, L.E., Yung, W.K.A., Paleologos, N., Nicholas, M.K., Jensen, R., Vredenburgh, J., Huang, J., Zheng, M., & Cloughesy, T. (2009). Bevacizumab alone and in combination with irinotecan in recurrent glioblastoma. *Journal of clinical oncology*, 27(28), 4733-4740. https://doi.org/10.1200/JCO.2008.19.8721

Garda, B. (2022). An Investigation on the Urban Tourism Marketing Potential of Turkestan. *Balkan & Near Eastern Journal of Social Sciences (BNEJSS)*, 8(2). https://www.ibaness.org/bnejss/2022_08_02/06_Garda.pdf

Hall, C.M., Baird, T., James, M., & Ram, Y. (2016). Climate change and cultural heritage: conservation and heritage tourism in the Anthropocene. *Journal of Heritage Tourism*, 11(1), 10-24. https://doi.org/10.1080/1743873X.2015.1082573

Herman, G.V., Caciora, T., Ilies, D.C., Ilies, A., Deac, A., Sturza, A., & Nistor, S. (2020). 3D Modeling of the cultural heritage: Between opportunity and necessity. *Journal of Applied Engineering Sciences*, 10(1), 27-30. https://doi.org/10.2478/jaes-2020-0005

Herman, G.V., Grama, V., Ilieș, A., Safarov, B., Ilieș, D.C., Josan, I., Buzrukova, M., Janzakov, B., Privitera, D., & Dehoorne, O. (2023). The Relationship between Motivation and the Role of the Night of the Museums Event: Case Study in Oradea Municipality, Romania. *Sustainability*, 15(2), 1738. https://doi.org/10.3390/su15021738

Ilieș, D.C., Marcu, F., Caciora, T., Indrie, L., Ilieș, A., Albu, A., Costea, M., Burtă, L., Baias, Ș., & Ilieș, M. (2021). Investigations of Museum Indoor Microclimate and Air Quality. Case Study from Romania. *Atmosphere*, 12, 286. https://doi.org/10.3390/atmos12020286

Issakov, Y., Laiskhanov, S., Mazbayev, O., Ussenov, N., Zheldibayev, A., Kamelkhan, G., & Dávid, L.D. (2022). Opportunities to use mobile GIS applications in the formation of tourist and local lore competencies in students: case study in Almaty, Kazakhstan. *GeoJournal of Tourism and Geosites*, 41(2), 597-605. https://doi.org/10.30892/gtg.41234-868

Issakov, Y., Aktymbayeva, B., Artemyev, A., Kubessova, G., Abdreyeva, S., Surina, A., Tuyebekova, Z., El Archi, Y., Benbba, B., & Dávid, L.D. (2023a). Digital transformation reshaping tourism education: investigating the influence of moocs on teaching tourism fundamentals and local lore. *GeoJournal of Tourism and Geosites*, 49(3), 1015–1026. https://doi.org/10.30892/gtg.49317-1101

Issakov, Y., Kamelkhan, G., Imanbekova, B., Zhoya, K., Zheldibayev, A., Molzhigitova, D., & Dávid, L.D. (2023b). Study of the Problems and Prospects of Small Tourism Business Development in the City of Almaty. *GeoJournal of Tourism and Geosites*, 46(1), 293–303. https://doi.org/10.30892/gtg.46133-1027

Issakov, Y., Imanbekova, B., Beisembinova, A., Moldgaliyeva, A., Abisheva, Z., Ussenov, N., & Dávid, L. (2023c). Study of the effectiveness of tourism and local lore activities of geography teachers in Kazakhstan. *GeoJournal of Tourism and Geosites*, 48(2spl), 741–750. https://doi.org/10.30892/gtg.482spl08-1074

Ismail, N., Masron, T., & Ahmad, A. (2014). *Cultural heritage tourism in Malaysia: Issues and challenges.* In SHS Web of Conferences 12, 01059, EDP Sciences. https://doi.org/10.1051/shsconf/20141201059

Jitpakdee, R., & Thapa, G.B. (2012). Sustainability analysis of ecotourism on Yao Noi island, Thailand. *Asia Pacific Journal of Tourism Research*, 17(3), 301-325. https://doi.org/10.1080/10941665.2011.628328

Kemelbekova, E., Baidabekov, A., & Yeziyeva Nehir, M. (2022). *Study of the Basic Geometric Dimensions of the Mausoleum of Hodja Ahmed Yassawi in Central Asia.* In International Conference on Geometry and Graphics, 986-993, Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-13588-0_86

Kim, S., Whitford, M., & Arcodia, C. (2019). Development of intangible cultural heritage as a sustainable tourism resource: The intangible cultural heritage practitioners' perspectives. *Journal of Heritage Tourism*, 14(5-6), 422-435. https://doi.org/10.1080/1743873X.2018.1561703

Koshim, A., Sergeyeva, A., Kakimzhanov, Y., Aktymbayeva, A., Sakypbek, M., & Sapiyeva, A. (2023). Sustainable Development of Ecotourism in "Altynemel" National Park, Kazakhstan: Assessment through the Perception of Residents. *Sustainability*, 15(11), 8496. https://doi.org/10.3390/su15118496

Kudaibergenov, S., Ismagambetova, Z., & Abirova, B. (2019). Architectural Importance of the Ahmed Yassawi Memorial-Complex. *Bulletin of KazNU, Series Religious Studies*, 17(1), 29-36. https://doi.org/10.26577/EJRS-2019-1-198

Kuralbayev, A., Sevim, B., & Myrzaliev, B. (2017). Tourism Perception of Turkestan Residents and Their Attitudes Towards Tourism. *Bulletin of Karaganda University. Economy Series*. 87 (3). 30-40. https://www.elibrary.ru/download/elibrary_44675197_12231271.pdf

Laitamaki, J., Hechavarría, L.T., Tada, M., Liu, S., Setyady, N., Vatcharasoontorn, N., & Zheng, F. (2016). Sustainable tourism development frameworks and best practices: Implications for the Cuban tourism industry. *Managing Global Transitions*, 14(1), 7. https://www.fm-kp.si/zalozba/issn/1581-6311/14-1.pdf#page=9

Lai, D., Lew, S.L., & Ooi, S.Y. (2022) Mobile Interactive System in Virtual Classroom based on TPACK: A Study from Students' Perspectives. *Journal of Logistics, Informatics and Service Science*, 9 (3). 159-171. https://doi.org/10.33168/LISS.2022.0312

Leka, A., Tsigarda, N., & Stratigea, A. (2023). *Assessing Tourism Environmental Sustainability in Mediterranean Insular Destinations–Case Study Zakynthos Island.* In International Conference on Computational Science and Its Applications, 371-390, Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-37123-3_27

Li, M., Wu, B., & Cai, L. (2008). Tourism development of World Heritage Sites in China: A geographic perspective. *Tourism Management*, 29(2), 308-319. https://doi.org/10.1016/j.tourman.2007.03.013

Maaiah, B.S., & Wouhoush, O.N. (2020). Jordanian culture and traditions as a driving force for attracting dutch tourists. *Geo Journal of Tourism and Geosites*, 33, 1450-1455. https://doi.org/10.30892/gtg.334spl01-592

Makish, N., Yerzhanov, S., Lapin, V., & Kassenov, D. (2021). *Strength and Deformability of the Dome of the Mausoleum of Khoja Ahmed Yasawi.* In Technological Advancements in Construction: Selected Papers (pp. 137-148). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-83917-8_13

Mamirkulova, G., Mi, J., Abbas, J., Mahmood, S., Mubeen, R., & Ziapour, A. (2020). New Silk Road infrastructure opportunities in developing tourism environment for residents better quality of life. *Global Ecology and Conservation*, 24, e01194. https://doi.org/10.1016/j.gecco.2020.e01194

Mamutova, K. (2020). Destination Management Approach for Sustainable Tourism Development in Kazakhstan. *Eurasian Journal of Economic and Business Studies*, 2(56), 29-48. https://doi.org/10.47703/ejebs.v2i56.15

Marcel Ramadhan, A., Trisetyarso, A., Abdurachman, E., & Zarlis, M. (2023). Digital Transformation Adoption: An Extended Step-by-Step Framework. *Journal of System and Management Sciences*, 13, 2, 45-63. https://doi.org/10.33168/JSMS.2023.0204

Megeirhi, H.A., Woosnam, K.M., Ribeiro, M.A., Ramkissoon, H., & Denley, T.J. (2020). Employing a value-belief-norm framework to gauge Carthage residents' intentions to support sustainable cultural heritage tourism. *Journal of Sustainable Tourism*, 28(9), 1351-1370. https://doi.org/10.1080/09669582.2020.1738444

McKercher, B., Ho, P.S., & Du Cros, H. (2005). Relationship between tourism and cultural heritage management: evidence from Hong Kong. *Tourism management*, 26(4), 539-548. https://doi.org/10.1016/j.tourman.2004.02.018

Mikulić, J., & Kožić, I. (2011). An exploratory assessment of tourism sustainability in Croatian coastal destinations. *EFZG working paper series*, (04), 1-12. https://hrcak.srce.hr/file/201690

Mousazadeh, H., Ghorbani, A., Azadi, H., Almani, F.A., Zangiabadi, A., Zhu, K., & Dávid, L.D. (2023). Developing Sustainable Behaviors for Underground Heritage Tourism Management: The Case of Persian Qanats, a UNESCO World Heritage Property. *Land*, 12(4), 808. https://doi.org/10.3390/land12040808

Nakhipbekova, S., Sadykov, Z., Abdiqadyr, N., Dzhaksilikov, A., & Kazakbayeva, T. (2023). Determination of the Role of Elements Affecting the Formation of the City Image of Turkestan. *Eurasian Journal of Economic and Business Studies*, 67(3), 72–84. https://doi.org/10.47703/ejebs.v3i67.266

Nasib, Syaifuddin, & Rusiadi. (2023). Modeling the Impact of Tourism Brand Love and Brand Trust on Increasing Tourist Revisit Intention: An Empirical Study. *Journal of System and Management Sciences*, 13, 4, 399-415. https://doi.org/10.33168/JSMS.2023.0424

Nazarbayev, N. (2015). *We are the heirs of the Great Steppe*. Kazakh sound, 37 (691), 237.

Ng, S.I., Chia, K.W., Ho, J.A., & Ramachandran, S. (2017). Seeking tourism sustainability–A case study of Tioman Island, Malaysia. *Tourism Management*, 58, 101-107. https://doi.org/10.1016/j.tourman.2016.10.007

Nurmukhamedova, S.S., & Myrzakhan, N.D. (2023). *Түркістан қаласындағы туристік объектілердің бүгіні мен болашағы [Present and future of tourist attractions in Turkestan]*. Bulletin of the International University of Tourism and Hospitality, 1, 1, 86-98. https://journal.iuth.edu.kz/index.php/main/article/view/21/19 (In Kazakh).

Ogutu, H., El Archi, Y., & Dénes Dávid, L. (2023). Current trends in sustainable organization management: A bibliometric analysis. *Oeconomia Copernicana*, 14(1), 11–45. https://doi.org/10.24136/oc.2023.001

Poria, Y., Butler, R., & Airey, D. (2003). The core of heritage tourism. *Annals of tourism research*, 30(1), 238-254. https://doi.org/10.1016/S0160-7383(02)00064-6

Richards, G. (2018). Cultural tourism: A review of recent research and trends. *Journal of Hospitality and Tourism Management*, 36, 12-21. https://doi.org/10.1016/j.jhtm.2018.03.005

Sainova, G.A., Aubakirov, N.P., Akbasova, A.D., Yuldashbek, D.H., & Sunakbaeva, D.K. (2023). *The Influence of Salt Deposits on the Preservation of the Historical and Architectural Monument of the Mausoleum of Khoja Ahmed Yasawi.* Available online: https://vestnik.kazgasa.kz/frontend/web/uploads/personal-documents/1694774149_nhRmhd.pdf

Sakhiyeva, A.S.K. (2021). The Museum System of Modern Kazakhstan: Classification and Typology of Museums. *MUzeológia*, 79. https://www.ceeol.com/search/article-detail?id=1008232

Santa, E.D., & Tiatco, A. (2019). Tourism, heritage and cultural performance: Developing a modality of heritage tourism. *Tourism Management Perspectives*, 31, 301-309. https://doi.org/10.1016/j.tmp.2019.06.001

Setiawan, P., Moaaz, K., Vasa, L., Pallás, E.I., & Dávid, L.D. (2021). Reviving an Unpopular Tourism Destination through the Placemaking Approach: Case Study of Ngawen Temple, Indonesia, *Sustainability* 13(12), 1-21. https://doi.org/10.3390/su13126704

Sevim, B. (2016). Tourism perception of Turkestan residents and their attitudes towards tourism. 11. 5574-5583. http://dx.doi.org/10.3923/sscience.2016.5574.5583

Taher Tolou Del, M.S., Saleh Sedghpour, B., & Kamali Tabrizi, S. (2020). The semantic conservation of architectural heritage: the missing values. *Heritage Science*, 8, 1-13. https://doi.org/10.1186/s40494-020-00416-w

Tiberghien, G. (2019). Managing the planning and development of authentic eco-cultural tourism in Kazakhstan. *Tourism Planning & Development*, 16(5), 494-513. https://doi.org/10.1080/21568316.2018.1501733

Tuyakbayev, M., Saipov, A., & Dmitriyev, Yu. (2021). Architectural and construction characteristics of the old Turkestan pantheon buildings for their dating and identification. *Industrial Technology and Engineering*, 2(39), 53-63. https://www.elibrary.ru/item.asp?id=46344146

UNESCO, (2021). *Mausoleum of Khoja Ahmed Yasawi.* Retrieved from UNESCO World Heritage Convention: https://whc.unesco.org/en/soc/4086

Weng, L., He, B.J., Liu, L., Li, C., & Zhang, X. (2019). Sustainability assessment of cultural heritage tourism: Case study of pingyao ancient city in China. *Sustainability*, 11(5), 1392. https://doi.org/10.3390/su11051392

Wondirad, A., Tolkach, D., & King, B. (2020). Stakeholder collaboration as a major factor for sustainable ecotourism development in developing countries. *Tourism Management*, 78, 104024. https://doi.org/10.1016/j.tourman.2019.104024

Zaharia, R.M., Stancu, A., Stoian, C., & Diaconu, M. (2010). Commercial activity's contribution to sustainable development by social responsability actions: A vision of SMEs. *Amfiteatru Economic*, 12(27), 155-167. https://www.amfiteatrueconomic.ro/temp/Article_939.pdf

***Concept of cultural policy of the Republic of Kazakhstan for 2023-2027. https://adilet.zan.kz/kaz/docs/P2300000250 (In Kazakh).

***Official website of the president of the Republic of Kazakhstan. https://www.akorda.kz/kz/memleket-basshysy-kasym-zhomart-tokaev-kozha-ahmet-yasaui-kesenesine-ziyarat-etti-1752319 (In Kazakh).

***Official website of the State Historical and Cultural Museum-Reserve of Azret Sultan, (2023). https://azretsultan.kz/ (In Kazakh).

***Wikipedia, (2023). Mausoleum of Khoja Ahmed Yasawi. kk.wikipedia.org (In Kazakh).

Article history: Received: 15.09.2023 Revised: 09.11.2023 Accepted: 07.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1728-1737
DOI 10.30892/gtg.514 spl13-1168

SCENARIOS OF THE AREA DEVELOPMENT AS A TOOL FOR TOURISM DESIGN: AN APPROACH TO DEVELOPMENT

Evgeniya M. TABAKAEVA*
Altai State University, Department of Recreational Geography, Service, Tourism and Hospitality, Institute of Geography, Barnaul, Russia, e-mail: tabaken86@gmail.com

Nurgul Y. RAMAZANOVA
L. N. Gumilyov Eurasian National University, Department of Physical and Economic Geography, Astana, Kazakhstan, e-mail: nurgulram@gmail.com

Alexandr N. DUNETS
Altai State University, Department of Scientific and Innovative Development, Barnaul, Russia, e-mail: dunetsalexandr@gmail.com

Citation: Tabakaeva, E.M., Ramazanova, N.Y. & Dunets, A.N. (2023). SCENARIOS OF THE AREA DEVELOPMENT AS A TOOL FOR TOURISM DESIGN: AN APPROACH TO DEVELOPMENT. *GeoJournal of Tourism and Geosites*, 51(4spl), 1728–1737. https://doi.org/10.30892/gtg.514spl13-1168

Abstract: The development of tourist areas occurs under changing conditions; design solutions can quickly become outdated. The purpose of the study is to develop a method of adaptive scenario planning applicable for the design of tourist areas. The theoretical foundation of the study is a systematic and integrated approaches to the study of tourist areas, and the concepts of the recreation and tourism opportunity spectrum. The research materials include scientific works, cartographic data on sample areas, and the results of a stakeholder survey. We used observation, survey, and cartographic methods. The scenario development process includes 6 stages. The result is the creation of 3 types of interrelated scenarios: 1) spatial scenarios at the level of tourist opportunity zones, 2) spatial scenarios at the level of functional zones, 3) program scenarios. We studied examples of 4 types of tourist areas in the foothill and low-mountain regions of Altai; identified a range of basic tourist opportunities, including 11 types of spatial zones, as well as the features of a set of tourist opportunities for each sample territory. The proposed method for developing scenarios makes it possible to ensure the competitiveness for tourist areas in the future. This is due to having the widest possible provision of opportunities on the territory for different categories of visitors, as well as through monitoring and making changes to program and spatial scenarios at the level of functional zones.

Key words: scenario planning, tourism design, destination, site, recreation opportunity spectrum, tourism opportunity spectrum, adaptive management

* * * * * *

INTRODUCTION

For design tourism areas at the destinations and sites level, it is important to develop a coherent development concept that takes into account the interests of different stakeholders (Pomeroy and Douvere, 2008; Clark et al., 2016). At the same time, the area development occurs in constantly changing conditions (the level of demand, the preferences of visitors, etc. change). In order to maintain the competitiveness of tourist areas it is necessary to adapt to these changes. One of these ways to adapt to changing conditions is to design scenarios for the tourist areas development. Scenario planning in economics and politics has received active development since the middle of the last century.

Sondeijker (2009) describes three phases in the development of futures study and scenario planning, each leading to a specific type of scenarios. *The first generation of scenarios*, developed since the mid-40s. last century, were based on a statistical approach and used quantitative methods such as trend analysis, trend extrapolation, cross-impact analysis to construct them. Initially these scenarios have been applied at the public policy level. *During the second phase* which began in the 1970s scenario planning entered the world of business and corporate strategic planning.

Forecasting has been replaced by foresighting, a more exploratory and prospective approach. Key uncertainties of the business environment that drive the future of the business are used as a framework to delimit multiple alternative futures, each illustrating a direction to which the business could evolve. *The third generation of scenarios* is related to sustainable development. Such scenarios must simultaneously solve environmental, social and economic problems and this requires using a holistic, systemic, integrative, participatory, reflexive, comprehensive and anticipative as well as adaptive approaches when developing them (Postma, 2002; Postma et al., 2013; Sondeijker, 2009).

In tourism futures studies and scenario planning are still in its infancy. The second generation of scenarios for tourism began to develop only in the early 2000s (Postma, 2015). The European Tourism Futures Institute makes a significant contribution to the development of tourism scenario planning. Institute staff are developing an approach to creating scenarios based on identifying driving forces and uncertainties (Postma, 2015). Scenario development is viewed as a

* Corresponding author

cyclical process that includes research and monitoring drivers, scenario development / compilation, policy and innovations (based on scenarios), impact analysis and evaluations. In this process neither trends nor extrapolations of trends are taken as a starting point, but uncertainties instead. The experience of developing scenarios for the tourism industry on a national scale is described (Enger et al., 2015). Wyatt et al. (2021) presented the experience of developing sustainable scenarios for the development of territories based on participatory mapping. The authors proposed activity-specific scenarios that include the following types: "Business as Usual", "Conservation", "Sustainable Prosperity", "Intensive Development". Seyitoğlu F. and Costa C. completed the systematic review of scenario planning studies in tourism and hospitality research (Seyitoğlu and Costa, 2022). It showed that there is still a need for scenario planning studies in tourism and hospitality. There are still a number of unresolved methodological issues when creating scenarios in tourism, such as methods of applying adaptive planning for the area development, procedures for assessing the social, economic and environmental consequences of scenarios at different levels (organizations, destinations). In addition, the issues of translating scenarios into specific actions and decisions that underlie the design of tourist areas are of particular importance. In this research, we set a goal to develop a methodology for creating scenarios for tourist areas. It would be applicable when designing such areas at the levels of destination and sites and would be consistent with adaptive planning. We chose foothill and low-mountain territories of Altai as sample territories for the study. These areas have a good transport accessibility and tourism has been developing intensively here in recent years. In particular, new territories are beginning to be developed here as tourist areas. It requires their coordinated development. The plans and main indicators of territorial development are reflected, as a rule, in strategic planning documents at the regional and municipal levels.

Investment projects for the tourist areas development include schemes for the placement of infrastructure and tourism facilities, functional zones and quantitative indicators of development. There are scientific publications devoted to the analysis of approved territorial planning projects of the Altai Mountains. These articles aim to determine the priority placement of tourism facilities and solve the problem of balanced urban development taking into account environmental and economic goals (Skryabin, 2019; Otto and Kulikova, 2021). Among the studies devoted to the design of tourist areas in the Altai, the following can be noted, which are useful in developing scenarios. There is a study on the analysis of tourist resources, level of facilities development, population demand for recreation and the volume of investment in the tourism sector in the Altai (Minaev, 2021). An assessment of the tourist and recreational potential of the Altai territory was carried out for the purposes of architectural design (Pomorov and Pomorov, 2021). A number of works are devoted to the study of the architectural and planning organization of existing tourist complexes. In particular, the types of tourist complexes have been identified depending on the planning organization in the Altai Republic (Ganzha and Tenova, 2019).

We chose zoning as the main tool for developing scenarios, since this is the tool that is best suited for creating place-based development planning scenarios. Zoning is widely used in tourism (Fertas et al., 2022; Mukayev et al., 2022; Pathmanandakumar et al., 2023; Waiyasusri and Tananonchai, 2022). However, the criteria underlying the allocation of zones may vary. There is experience in functional zoning of the transitional area from the plains to the mountains in the Altai taking into account recreational capacity (Prudnikova and Baryshnikova, 2009). In our work, when developing scenarios, we used zoning based on the tourism and recreational opportunity spectrum. Similar work has not been carried out for Altai, with the exception of our work on the classification of the tourist areas in Bolshaya Belokurikha (Tabakaeva et al., 2023). The present research is to contribute to the literature on the application of a recreation and tourism opportunity spectrum concept for creating tourist areas development scenarios. The way we propose to create scenarios is different in that the development of scenarios takes into account not only the spatial component as zones with different opportunities, but also the functional component within each opportunity, as well as the behavioral component.

MATERIALS AND METHODS

The theoretical and methodological basis of the research was a systematic and integrated approaches to the study of tourist areas, as well as the theoretical foundations of recreational geography, including the structure of recreational activities, the principles of creating recreation programs (Preobrazhensky, 1975; Zorin and Kvartalnov, 2000), the concept of fixed images “place-function” (Nikolaenko, 2001), sense of place concept (Datel and Dingemans, 1984; Hang et al., 2023). Works on the structure and evolution of tourist and recreational space had great importance when carrying out the research (Preobrazhensky, 1975; Butler, 2006; Lunkar, 2014; Aleksandrova, 2020, etc.).

The methodological basis for creating scenarios of area development is the Recreation Opportunity Spectrum (Clark and Stankey, 1979) and the Tourism Opportunity Spectrum concepts (Boyd and Butler, 1996; Butler and Waldbrook, 2003; Carroll and Hession, 2015). Recreational opportunity is understood as a combination of physical, biological, social, and managerial conditions that give value to a place for visitors, and kinds of activities and the experiences they desire. Tourism opportunity is based tangentially off of the recreation opportunity, but differ in a specific set of opportunity factors. In this paper, we use the term “tourism opportunity” that includes not only recreational opportunities.

The features that need to be taken into account when developing scenarios for the tourist areas are primarily the spatial heterogeneity of the distribution of tourist resources and attractions, as well as the diversity of recreational and tourist opportunities expected by visitors. Therefore, we chose zoning as the main method for scenario development process. We carried out zoning at two levels: 1) at the level of the opportunity spectrum with the development of a series of spatial scenarios (zones with a certain opportunity), 2) at the level of functional zones located within a zone of the opportunity spectrum. Such functional zones include the zone of hospitality enterprises, trade, transport, business activity, natural, cultural, entertainment, sports, and medical zones (Morozova, 2012; Zhukova, 2013). In addition, there are zones for the protection of natural and cultural-historical sites, where there are restrictions on visiting. Thus, the spatial scenario for the area development

is aimed at creating the necessary conditions on the territory to meet the needs of a certain category of tourists. It includes requirements for the created tourist facilities, the level of improvement and transport accessibility of the territory, as well as for management actions to maintain the necessary conditions. A set of spatial scenarios forms the tourism opportunity spectrum of a destination. In addition to spatial scenarios, based on field observation data, we identified scenarios for visitor behavior in sample areas. We propose to call them program scenarios. Program scenarios are sets of interrelated and significant for tourists elementary recreational activities. They can be implemented both within one and in several zones of tourist opportunities.

We chose to study sample areas in the foothill and low-mountain regions of Altai, which belong to the following types: 1) long-term development areas with a predominance of short-term tourism - in the vicinity of Lake Aya, 2) long-term resort development areas - the federal resort city of Belokurikha and adjacent territories, 3) new development areas based on development tools - a special economic zone of the tourist and recreational type "Biryuzovaya Katun", 4) pioneer development areas - the natural and archaeological complex "Denisova Cave". The research materials included sets of cartographic data for the sample areas, websites of tourism projects, and the results of surveys of stakeholders. In addition, data on the spatial behavior of tourists obtained using UAVs and video recordings, published previously, were used (Dunets et al., 2023). We studied current tourism use in selected sample areas, including forms of recreational settlement, features of tourism facilities, ongoing tourism projects, and spatial behavior of tourists. Data collection was carried out using observational methods, stakeholder interviews, and analysis of available published text and map data. The stakeholder survey included questions regarding the experience of visiting the functional zones, missing elements of tourism infrastructure in each functional zone, the preferred set of opportunities in the destination, as well as descriptions of visitor behavior scenarios. The questionnaires were posted on the website https://geo.asu.ru/structure/economgeo/projects/altai_tourism/. In addition, a typological analysis of tourist facilities was used both on the ground and on the basis of cartographic materials. The collected data allowed for participatory mapping among stakeholders and the uploading of aggregated results into Web-GIS, as well as the development of a set of spatial scenarios for each sample area (Figure 1).

RESULTS AND DISCUSSION

An analysis of the tourism projects development in selected sample areas in the foothill and low-mountain regions of Altai showed that there are a number of problems in their implementation. Among them is the lack of coordinated actions among stakeholders in the areas development, which leads to chaotic development and the emergence of various conflicts in the land use. In some cases, there is a violation of the stages of project implementation due to mistakes in the design. For example, large tourist complexes are being created that do not meet the current volume and needs of the market. This leads to problems with attracting investors. As a result, imbalances arise in the development of supporting and tourism infrastructure, which ultimately leads to the impossibility of effective implementation of projects. All this confirms the importance of taking into account changing conditions when planning the development of tourist areas. In addition, this necessitates the need to present the process of creating scenarios for the tourist area development in the form of successive stages (Figure 2).

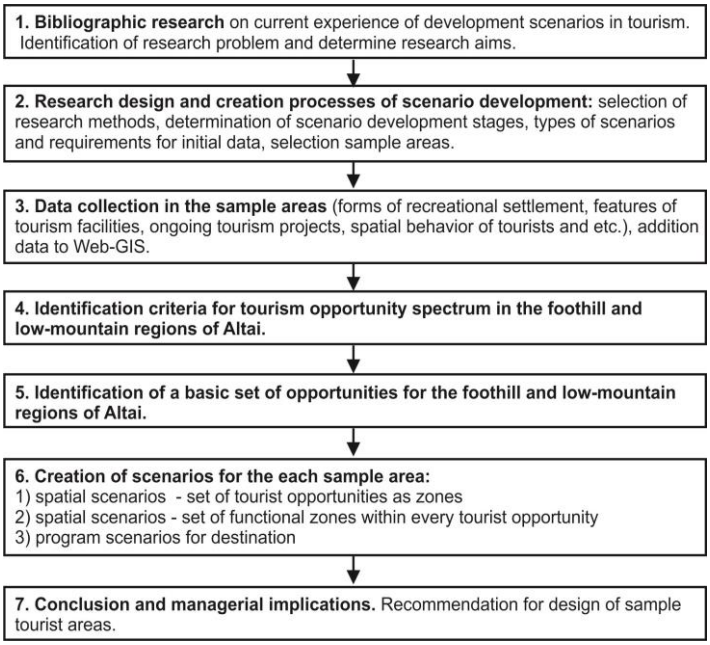


Figure 1. Research flow chart (developed by authors)

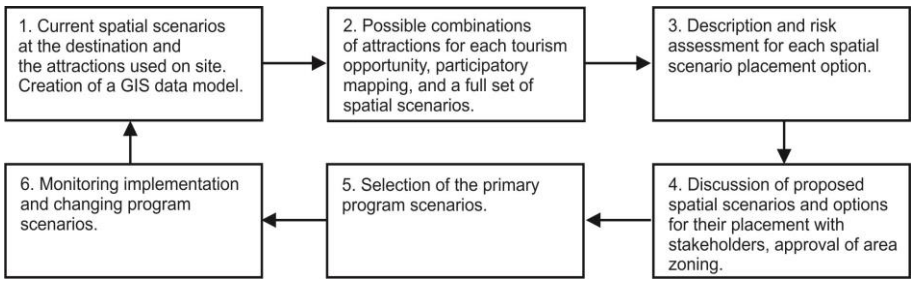


Figure 2. The process of creating scenarios for the development of a tourist area (developed by the authors)

At the first stage of the scenario development process, it is necessary to collect data on the current tourist use of the destination and the set of attractions at the place level. The outcome of this stage is a geoinformation model of the designed area, which includes a variety of date in the form of Web-GIS layers: tourist and supporting infrastructure, attractions, development restrictions, sensitivity of landscapes to recreational loads, tourist flows, types of tourist activities, etc. The task of the first stage is to identify which spatial and program scenarios are currently being implemented on the area, or what prerequisites and where exist if the area has not yet been developed. As an example,

we created a Web-GIS for the pioneer development area - the natural-archaeological complex "Denisova Cave" (http://geomixer.asu.ru/api/index.html?10F1770A61CB4D4F95E4BA1016DD3446).

The tasks of the second stage are to identify possible combinations of attractions for each tourist opportunity, assess the suitability of areas for different types of tourist activities. Another important task is participatory mapping to collect stakeholders' opinions on the necessary infrastructure in each functional area, as well as the expected set of tourism opportunities in the destination. Based on these data, conclusions can be drawn about what tourism opportunities are still missing or underdeveloped. The outcome of this stage is the development of a complete set of spatial scenarios - the tourism opportunity spectrum of the destination, as well as program scenarios, reflecting them in Web-GIS.

At the third stage, it is necessary to identify and assess the risks for each option for placing spatial scenarios, as well as program scenarios. Risks in the implementation of any scenario on the area are considered in the environmental, economic and social spheres. To assess them, the criteria of the probability of causing damage and the level of damage are used. The probability of causing damage is assessed on a scale: very likely, likely, possible, unlikely, extremely unlikely, the level of damage is assessed as catastrophic, significant, medium, low, insignificant. The outcome of this stage is the selection of location options for spatial scenarios with the lowest risks. At the fourth and fifth stages, a final discussion of the proposed spatial and program scenarios and options for their placement is organized with stakeholders. If necessary, they are adjusted. The outcome of the stage is the approval of the area zoning and the creation of scenario maps of tourist activities.

The final stage of the scenario development process for tourist area is associated with monitoring the implementation of scenarios and making changes to program scenarios or spatial scenarios at the level of functional zones within any tourist opportunity. The main task of monitoring is to track the demand by visitors for tourist facilities and program scenarios within the tourism opportunities, as well as to analyze the factors influencing this demand. The basis for the development of monitoring indicators can be a number of indicators proposed in 2023 for the tourism industry data model by the Federal State Statistics Service of the Russian Federation: coefficient of use of available places in collective accommodation facilities (%); number of persons staying in individual accommodation facilities; number of natural and cultural-historical attractions, routes (by type) within tourist opportunity; number of tourist facilities by type within tourist opportunity; number of visitors of tourist facilities/tourist attractions by type (average, peak)(people); load of tourism facilities by type/object (average, peak)(%); consumer satisfaction with tourist services (by type, object, season).

For each indicator, standards are established in the form of minimum acceptable values for these indicators, taking into account economic, environmental and social consequences. Monitoring can be carried out both in terms of program scenarios and spatial scenarios at the level of tourist opportunities (zones). To identify spatial scenarios, we conducted field research, surveys of visitors and tourism industry experts, and the study of cartographic materials. The criteria for identifying spatial scenarios at the level of tourist opportunities were the type of access to the area, the type and number of accommodation facilities, the level of contacts with other visitors, and types of tourist activities. We have identified the following types of tourism opportunities for the foothill and low-mountain areas of Altai, which represent basic spatial scenarios:

I. The urban area is characterized by the highest level of contacts between visitors and the availability of comfortable accommodation facilities, which are represented by stationary hotel-type accommodation facilities.

II. Tourist complexes - a comfortable stay in hotels with a high level of landscaping and amenities, the level of meetings with other visitors is from high to average. Hotels can be located in intersettlement or natural areas in relative proximity to urban areas.

III. Sanatorium zone - the use of the sanatorium territory for treatment and recreation, a high level of meetings with other visitors.

IV. Holidays in rural areas are distinguished by an average level of amenities, accommodation in guest houses or cottages. Characterized by a high level of contact with other visitors.

V. Public recreational areas for short-term recreation with a high level of contact with other visitors. A variety of service facilities, without accommodation facilities.

VI. Natural areas with roads provide quick and short-term access to nature in comfortable conditions. Accommodation in campgrounds with cabins in areas adjacent to locality. The zone is characterized by an average level of amenities and a high level of contact with other visitors. There are opportunities for car, motorcycle, and bicycle trips on paved roads, as well as short walks at stopping places.

VII. Pedestrian zones are areas with specially equipped walking recreational routes (hiking trails, running paths, fitness areas), located near highly developed areas with a high level of contact with other visitors.

VIII. Areas of public recreation located near water bodies. Here you can relax on the beach, as well as water activities.

IX. An area for remote, comfortable recreation in nature with the possibility of using means of transport. Accommodation is organized in glamping camps or at remote campgrounds with cabins.

X. Hiking zone - these are remote areas of hiking routes for walking without overnight stays.

XI. Trekking zones are remote natural areas for long hiking trips with a backpack and overnight stays in a primitive campsites using a tent.

In addition, features of spatial and program scenarios were identified for selected typical destinations in the foothill and low-mountain regions of Altai. **The tourist destination "Aya"** belongs to the type of long-term development areas. It has been a popular destination for children and families since the 1950s. The most active development of tourist facilities has occurred in the last 25 years. Here is one of the warm lakes of Altai with water temperatures in July from +24 to +26°C. A large complex of swimming pools "Altai Riviera" was built next to the lake. The level of accommodation facilities in the destination varies significantly from comfortable hotels and small inns to campgrounds with cabins and summer guest houses.

Spatial scenarios for this destination are shown in Table 1. The survey revealed different points of view of stakeholders on the use of the southern and southwestern shores of Lake Aya. Some people prefer a pedestrian area with health routes, others would like to get around by bicycle. This territory belongs to the special protection zone of the Aya natural park. Therefore, taking into account environmental restrictions, priority is given to the use of the territory within the pedestrian zone.

Table 1. Spatial scenarios for long-term development areas with a predominance of short-term tourism. Sample area: Lake Aya area, neighboring villages Katun, Aya and the adjacent part of the Aya natural park (* - numbering is explained in the text above)

Spatial scenario type*	**Functional zones within the tourist opportunity**	**Results of the inventory of tourism opportunities / Recommendations for the development of spatial scenarios based on a survey of stakeholders**
II.	Zone of hospitality and accommodation facilities, shopping zone, business activity zone, entertainment zone, transport infrastructure zone, cultural zone	Recreational opportunity is fully developed. The chaotic allocation and the high concentration of accommodation facilities are perceived negatively by visitors. / **Recommendations:** It is necessary to develop the entertainment facilities and cultural zone.
IV.	Zone of hospitality and accommodation facilities, shopping zone, transport infrastructure zone, cultural zone	Recreational opportunity is developed. There are many rural guest houses. / **Recommendations:** It is necessary to improve the amenity of guest houses and expand the types of rural entertainment.
VI.	Transport infrastructure zone, shopping zone, zone of hospitality and accommodation facilities, natural attraction zone	Recreational opportunity is overdeveloped. It is characterized by a large concentration of summer campgrounds with cabins in areas adjacent to locality. / **Recommendations:** In some places, it is necessary to develop a road network for motorized travel, and design separate lanes on the road for cyclists. There are a few year-round accommodation facilities.
VII.	Natural attraction zone, shopping zone	Recreational opportunity are present, but underdeveloped. / **Recommendations:** It is required to develop a walking trail along the shore of Lake Aya, install navigation signs and interpretive stands, create thematic photo zones.
VIII.	Zone of hospitality and accommodation facilities, shopping zone, entertainment zone, cultural zone	Recreational opportunity are fully developed. The chaotic allocation and the high concentration of accommodation facilities are perceived negatively by visitors. / **Recommendations:** It is necessary to increase the number of navigation signs and consider measures to regulate tourist flows.
IX.	Zone of hospitality and accommodation facilities, transport infrastructure zone, natural attraction zone	Recreational opportunities are present, but underdeveloped. **/ Recommendations:** A road network for motorized travel is required. There are a few navigation signs.
X.	Natural attraction zone	Recreational opportunity is poorly developed (other uses of the area limit its use). / **Recommendations:** The recreational opportunity is in demand by local residents. There are a few navigation signs. Trails are required.
XI.	Natural attraction zone	Recreational opportunity is poorly developed (other uses of the area limit its use). / **Recommendations:** It is necessary to create a network of trails with the campsites.

Several program scenarios have been identified in the destination. The target scenario may include visiting accessible natural sites: the banks of the Katun River, Lake Aya, *viewing platform* near the Devil's Finger rock, relaxing at campgrounds with cabins (using bath complexes and barbecue areas). In summer, swimming and water activities on Lake Aya, in the pools on the campgrounds area, are of particular interest. Important tourist facilities that require improvement are the creation of public places for short-term recreation (gazebos, restrooms). There is a need to create a visitor center for the Aya Natural Park. It can be located near the bridge over the Katun, where the main flow of vehicles passes. Almost all program scenarios in the destination include visits to various small retail outlets and souvenir booth. Another attracting factor is small cafes that attract visitors with music in the evening.

In addition to walking, the target scenario includes close routes by car, ATV or horseback. Rafting is the most popular offer for guests of campgrounds with cabins in the summer. Traditional are 1.5 - 2 hour routes along the Katun in the form of an excursion. Campgrounds with cabins often offer services: velvet antler and herbal baths, saunas, massages, herbal teas. However, at present there is a request for the creation of *viewing* platforms and photo zones in places of walking to the Devil's Finger rock and to the top of the town of Negodyayka, etc. The destination needs to create parking areas. A successful example is the parking lot near the swimming pool complex near Lake Aya. In addition, it is recommended to create information stands showing options for movement around the destination and popular attractions.

In the Altai region, **the Belokurikha resort town** belongs to the long-term resort development areas. The resort area of Belokurikha is a separate part of the Belokurikha city, which stretches along the valley of the river of the same name. Currently, there are 16 sanatoriums and 25 hotels in Belokurikha. Additional hospitality facilities includes restaurants and cafes. Spatial scenarios for this destination are presented in Table. 2.

Among the program scenarios, the target scenario is stay in a sanatorium and treatment in accordance with an individual recommendations. Additional program scenarios may include walking around the sanatoriums area, visiting attractions in the resort area and historical places, relaxing in a park area near the Belokurikha River. Most tourists visit health paths and climb the cable car to Mount Tserkovka, buy souvenirs in local market and try dishes in cafes and restaurants. We conducted a survey of 200 respondents about the possibilities of developing health tourism as the main activity in the Belokurikha resort (link to the questionnaire http://docs.google.com/forms/d/1y1NGf-XKd1aWedaa1P2 DzrkOVOarW-T5wKV249YiaWw/edit). It was revealed that among related types of tourist activities in health tourism, priorities are associated with massage, visiting saunas (bath complexes), swimming pools or open reservoirs in the summer, as well as health paths and excursions. Activities are arranged in order of importance for visitors: massage, sauna, walking, swimming pool, historical and botanical excursions, special meals, outdoor recreation, creative activities, etc. The use of water

procedures is one of the most attractive recreational activities for tourists. In addition, about 80% of respondents are ready to participate in health routes. Such routes will be determined taking into account acceptable physical activity (in accordance with the level of health). Tourists will be able to visit natural and historical attractions.

Table 2. Spatial scenarios for long-term resort development areas. Sample area: Belokurikha resort town, Belokurikha 2 Gornaya and nearby attractions to tourists (* - numbering is explained in the text above)

Spatial scenario type*	Functional zones within the tourist opportunity	Results of the inventory of tourism opportunities / Recommendations for the development of spatial scenarios based on a survey of stakeholders
I.	Zone of hospitality and accommodation facilities, shopping zone, sports zone, transport infrastructure zone, cultural zone	The opportunity is developed quite fully. The hotels have a small area and are combined with shops, they are located close to the shopping area. / **Recommendations:** It is necessary to connect hotels informationally and logistically with cafes and restaurants.
III.	Zone of hospitality and accommodation facilities, medical zone, sports zone, entertainment zone, cultural zone	Recreational opportunity is fully developed. 16 sanatoriums with their own territory. The largest of them have a large treatment area and park space with opportunities for recreation and entertainment. / **Recommendations:** The growing share of short-stay tourists requires more SPA treatments and entertainment for family tourists.
IV.	Zone of hospitality and accommodation facilities, shopping zone, transport infrastructure zone, cultural zone	Recreational opportunity is fully developed. / **Recommendations:** The cultural zone is poorly developed, there is practically no sports zone, there are recommendations for the development of an entertainment zone.
VI.	Transport infrastructure zone, shopping zone, zone of hospitality and accommodation facilities, natural attraction zone	Recreational opportunity is present, but underdeveloped. / **Reco-mmendations:** In some places, it is necessary to develop a road network for motorized travel and design separate lanes on the road for cyclists.
VII.	Natural attraction zone, shopping zone	Recreational opportunity is present. There are a large number of visitors. / **Recommendations:** It is necessary to develop an interpretive signs for attractions along the routes. Pedestrian trails are required.
IX.	Zone of hospitality and accommodation facilities, transport infrastructure zone, natural attraction zone	Recreational opportunity is present, but underdeveloped. / **Recommendations:** A road network for motorized trip is required.
X.	Natural attraction zone	Recreational opportunity is developed. / **Recommendations:** Few navigation and interpretive signs. Trail development is required.
XI.	Natural attraction zone	Recreational opportunity is present, but underdeveloped. There are a few equipped trails. / **Recommendations:** It is possible to create trails to Mount Sinyukha and in the valley of the Peschanaya River.

Table 3. Spatial scenarios for new development areas based on development tools. Sample area: Special economic zone of tourist and recreational type "Biryuzovaya Katun" (* - numbering is explained in the text above)

Spatial scenario type*	Functional zones within the tourist opportunity	Results of the inventory of tourism opportunities / Recommendations for the development of spatial scenarios based on a survey of stakeholders
II.	Zone of hospitality and accommodation facilities, shopping zone, transport infrastructure zone	The engineering infrastructure has been created, and the tourism facilities is at the stage of extensive development. / **Recommendations:** It is necessary to develop catering companies.
V.	Business activity zone, entertainment zone, sports zone, transport infrastructure zone	A public area has been developed in the central part of Biryuzovaya Katun. / **Recommendations:** There are a few places of social activity in other parts of the destination.
VI.	Zone of hospitality and accommodation facilities, transport infrastructure zone, natural attraction zone, cultural zone, entertainment zone, sports zone	The opportunity is quite well developed. There are a sufficient number of modern hotels and campgrounds with cabins in the river valley Katun at a short distance from the public center of Biryuzovaya Katun. / **Recommendations:** There are not enough landscaping elements at stopping places; interpretive signs are needed.
VII.	Natural attraction zone, cultural zone, sports zone	There are walking and running trails. / **Recommendations:** It is necessary to develop fitness zones, circular trails on mountain slopes, and add amenity elements (benches, gazebos, etc.).
VIII.	Shopping zone, natural attraction zone, entertainment zone, sports zone	Well-developed entertainment area near the beach of the artificial lake. / **Recommendations:** It is necessary to organize other types of entertainment during periods without swimming.
IX.	Zone of hospitality and accommodation facilities, transport infrastructure zone, natural attraction zone, entertainment zone	There is initial development of the opportunity. / **Recommendations:** It is necessary to develop a road and path network in nature specially equipped for movement by vehicles, to create interpretive signs and photo zones.
X.	Natural attraction zone, cultural zone	There are excursions along the mountain slopes and caves, trails along the banks of the Katun, and river rafting. / **Recommendations:** It is necessary to improve the trail network in nature and create interpretive signs.

The results of the survey showed the need to include in the target scenario a visit to the new tourist complex Belokurikha 2 Gornaya. It is located 5 km from the Belokurikha resort. A scenic switchback road with viewing platforms for photography leads to Belokurikha 2 Gornaya. In Belukurikha 2 Gornaya, tourists visit the landscape rocks «Buddha of Medicine» and «Ambarchiki», the museum of the old village «Andreevskaya Sloboda», as well as areas of mountain taiga

forest, etc. There are prospects for the construction of small hotels and glamping sites in the mountainous part with the opportunity to visit the natural environment. For example, the campground with wooden cabins «Lesnaya skazka» belongs to a sanatorium located at the resort. In addition, in the foothill zone, 15 km from the resort town, there is a campground in the form of a traditional village «Belokurikha Village» (renamed the rural yard «Kalina Krasnaya»), nearby is the agricultural enterprise «Altai Meadows» with a farm produce store. The program scenario for the resort visitors also includes the visitation of the surrounding rural areas: the villages of Novotyryshkino, Danilovka, Solonovka, etc. There are places for entertainment, tourists are introduced to the features of the villages and are offered traditional products.

Near the Belokurikha resort there is the Altai Foothills natural park. There are both opportunities for walking routes near the resort area, and for routes with a backpack to the highest part of the park (Mount Sinyukha) and to the Peschanaya River gorge. **The tourist destination "Biryuzovaya Katun"** belongs to the new development areas based on development tools. In 2007, a special economic zone of a tourist and recreational type was created here. Infrastructure construction has begun. Spatial scenarios for this destination are shown in Table 3.

The target spatial scenario for the development of Biryuzovaya Katun is the eco-oriented development of the territory with fragments of intensive and extensive use, as well as functional zones with a preserve regime. The Katun River is, on the one hand, an ecological corridor, and on the other, the attraction for tourists. Therefore, destination program scenarios include a linear-radial type of short eco-friendly routes. It is possible to organize radial exits from the road route along the river. Linear routes along the spurs of the Seminsky ridge above the Katun River valley will also be interesting. The karst complex "Taldinsky Caves", which has the status of a natural monument, is an attraction for eco-friendly routes, including underground ones. We have identified 4 target groups of tourists, for which program scenarios may vary:

1."Family with children": it is important to add an ecological trail to a mountain pass above the lake, a visit to the petting zoo, a family quest, relaxation in the family area near the water slides in warm weather.

2. "Youth": in addition to stay in campgrounds and recreation at the sites, it is possible to include the following activities: rafting and a visit to the near-water Ichthyander cave, cycling along the Katun, volunteer activities for the development of an eco-trail, horseback riding, extreme via ferrata route, tourist trail "speleo-emotions", mass events in the public central area.

3. "Children's educational tourism": quest on a map with tasks (team photo, geoquest); eco-educational trail with children's attractions; excursion to the apiary, educational caving route.

4. "45+": a visit to the main natural sites (Katun River, Tavdinsky Caves); culinary master classes in a restaurant, drawing courses or photography courses in the Prostor art gallery, acquaintance with medicinal plants and an apiary, relaxation and fishing by the lake, a yoga festival.

Among the pioneer development areas, **the natural and archaeological complex "Denisova Cave"** was studied. It is the oldest cave in Siberia where evidence of ancient human habitation was found. All archaeological eras are represented in Denisova Cave: Neolithic, Paleolithic, Bronze and Iron Ages, Scythian era and Turkic period. The cave gained special, including world fame, after it was discovered by scientists from the Institute of Archeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences under the leadership of Academician A.P. Derevyanko bone remains of a previously unknown species of human fossil that lived there 30–50 thousand years ago (Krause et al., 2010). This ancient human species is distinct from Neanderthals and Homo sapiens and is named after its location as "Denisovan man," or Homo altaiensis. This cave in 2022 added to the Tentative List for nomination to the UNESCO World Heritage List.

For many decades, the cave has been an tourist attraction. Currently, the concept of the natural and archaeological tourist complex "Denisova Cave" is being formed. This work is carried out by the Denisova Cave public foundation, created in 2021. The main task of the Foundation is related to maintaining a balance of interests of archaeologists, government agencies for the protection of cultural monuments and tourists, the number of which has begun to increase in recent years. To discuss scenarios for the development of this area with stakeholders, a Web GIS was created (http://geomixer.asu. ru/api/index.html?10F1770A61CB4D4F95E4BA1016DD3446). The results of the discussion showed that currently the cave without additional attractions is of interest only for a short excursion. Recommendations were made that trails and infrastructure should be developed in the surrounding areas to limit the flow of tourists into the cave. It has been revealed that currently the target type of tourists is the image of "Indiana Jones".

We have developed a concept for the development of the tourist destination Denisova Cave as a place for recreation and life for all times. There are a protected natural area with great biodiversity near the cave, that make it possible to create here opportunities for an eco-resort and comfortable recreation in the natural environment (recreation - healing - ecology - knowledge). The new concept will change the target tourists and create new scenarios for staying in the area. A significant number of tourists in Altai are characterized as visitors who are tired of the bustle of the city. They want to restore health in the natural environment and learn the history of human development. In addition to this, there are two more types of tourists. The first includes scientific tourists who go to the International Scientific Tourist Complex at Denisova Cave. The second type is represented by active tourists, who are predominantly transit tourists. They are not interested in the cave itself, but they will follow the trail above the cave or to the Shinok waterfalls. To implement the new spatial scenarios, the following functional zones have been proposed: visitor center, administrative and scientific, transport and logistics, guest accommodation, active recreation, natural landscape attractions, protection of natural resources, protection of cultural resources, agricultural activities. The list of spatial scenarios at the level of tourism opportunities is shown in Table. 4

Tourists visiting the Denisova Cave destination are primarily attracted by the natural component; excursions to the cave are of considerable interest. In 2023, with participation A.N. Dunets, a project for a new staircase to the cave was implemented. This contributed to improving the amenity of the area. In addition, program scenarios for the destination may

include the visitation the protected natural area “Cascade of Waterfalls on the Shinok River”, where the largest waterfall in the Altai Territory with a height of 72 m is located. Conducted field research and observations of tourist behavior made it possible to identify several new tourist routes, which also included in our Web-GIS project.

Table 4. Spatial scenarios for pioneer development areas. Sample area:
natural and archaeological complex “Denisova Cave” (* - numbering is explained in the text above)

Spatial scenario type*	Functional zones within the tourist opportunity	Results of the inventory of tourism opportunities / Recommendations for the development of spatial scenarios based on a survey of stakeholders
IV.	Zone of hospitality and accommodation facilities, shopping zone, transport infrastructure zone	Currently there is a small village of Tog-Altai with an apiary and several houses of villagers for tourists. / **Recommendations:** It is necessary to improve the village, create guest houses, sell local products and form a local souvenir market.
V.	Shopping zone, transport infrastructure zone, entertainment zone, sports zone	Currently there is no facilities. / **Recommendations:** It is necessary to create a public recreational area in a wide part of the Anui River valley, 3 km from Denisova Cave (the place is called the “Field of Miracles”), and to create a paleopark.
VI.	Zone of hospitality and accommodation facilities, shopping zone, entertainment zone, medical zone, transport infrastructure zone.	Campgrounds with cabins have a low camping capacity and operate only in the summer season. / **Recommendations:** It is necessary to create investment projects for accomodation facilities on reserved lands.
VII.	Natural attraction zone, cultural zone	There is one trail to the Maham cave grotto. / **Recommendations:** It is necessary to create walking trails near the Denisova Cave and along the valley of the Anuy River to the village of Tog-Altai.
IX.	Zone of hospitality and accommodation facilities, natural attraction zone	Comfortable outdoor recreation created for scientists, near to the scientific station of the Institute of Archeology and Ethnography SB RAS. / **Recommendations:** It is necessary to create glamping sites or remote campsites on the right side of the Anui River valley.
X.	Natural attraction zone	There are hiking trails to waterfalls in the canyon of the Shinok River. / **Recommendations:** It is necessary to improve existing trails in the Cascade of Waterfalls on the Shinok River reserve, and to create trails on Sosnovaya Mountain, at the foot of which is the entrance to Denisova Cave. Placement of interpretation stands.
XI.	Natural attraction zone	Currently there are only a few routes. / **Recommendations:** It is necessary to create and improve a network of trails to the Bashelaksky reserve, around Sosnovaya Mountain, and to place interpretive signs.

DISCUSSION

Comparison of the proposed approach to creating tourist area development scenarios with existing experience (Daconto and Sherpa, 2010; Page et al., 2010; Mai and Smith, 2018; Wyatt et al., 2021) allows us to draw a number of conclusions. Firstly, current scenario development cases are often based on the resource capabilities of the areas (Mai and Smith, 2018; Wyatt et al., 2021). This is definitely necessary. But it is also important to rely on the needs and expectations of different categories of visitors. Secondly, when developing scenarios, the destination is considered as a system, incl. dynamic socio-economic system. Thirdly, a prerequisite for developing scenarios is to involve and take into account the views of stakeholders. Fourthly, in most cases, when developing scenarios, one of the main tasks is to identify uncertainties and development drivers. Our approach focuses on maintaining the destination's competitiveness into the future by providing the widest possible on-site opportunities for different types of visitors. In the future, they are adapted to the changing needs of visitors based on monitoring data. The limitation of the use of the scenario approach to the area design (is the rapid obsolescence of condition prototypes (Krasheninnikov, 2017). This, in our opinion, can be avoided by monitoring and timely changes in program or partially spatial scenarios at the level of functional zones.

CONCLUSION

Our proposed approach to creating tourist area development scenarios includes 3 types of interrelated and complementary scenarios: spatial scenarios at the level of tourist opportunities, spatial scenarios at the level of functional zones within tourist opportunities and program scenarios. The scenarios at the level of tourist opportunities are based on different levels of area development, including the kind of access to the area, the type and number of accommodation facilities, and the level of contacts with other visitors.

The concept of the tourism opportunity spectrum, on which the creation of spatial scenarios is based, as well as the collected data on the current use of tourist areas, made it possible to identify 11 types of tourism opportunities for the foothill and low-mountain areas of Altai. Using the tourism opportunity spectrum also allows us to identify which opportunities are underdeveloped in a particular destinations, as well as define which opportunities are most important for the types of tourist areas, taking into account their specialization. In this work, we studied 4 types of tourist territories, identified the features of their tourist spectrum and formulated recommendations for their future development.

Lake Aya, which belongs to the long-term development areas with a predominance of short-term tourism, is characterized by overdevelopment of opportunities II, V, VI and a lack of the extreme least urbanized opportunities of the spectrum. It is necessary to develop a motorized zone. For long-term resort development areas, using the example of the Belokurikha resort, a pedestrian zone with health routes is very important, which is quite developed here. Distinctive tourist opportunities of this type of areas are the urban area and the sanatorium zone. At the same time, there is a shortage of natural areas with opportunities for motorized movement. The special economic zone of the tourist and recreational type “Biryuzovaya Katun”,

which belongs to the new development areas based on development tools is distinguished by a fairly balanced set of tourist opportunities. A special feature of Biryuzovaya Katun is the development of a public recreation area near water bodies. On the territory of the Denisova Cave natural-archaeological complex, which belongs to the pioneer development areas, tourist opportunities with a high level of amenity are currently underdeveloped. It is necessary to reserve territories for the coordinated development of various tourism opportunities in the future. Thus, the proposed method of scenario planning is a tool for strategic planning of the tourist areas development. It makes it possible to ensure the relevance of destinations in the future through the widest possible provision of opportunities on the area for different categories of visitors.

Limitations and Further Studies

A limitation of the study is the non-probability type of sample. In addition, there are still a number of issues that require further research. Among them are the automation of data updating processes in Web-GIS and the automation of some stages of the scenario development process. For this purpose, the results published in (Chow et al., 2023; Yoon and Choi, 2023) may be useful.

Author Contributions: Conceptualization, E.M.T. and A.N.D.; methodology, E.M.T. and A.N.D.; software, A.N.D. and N.Y.R.; validation, E.M.T. and A.N.D.; formal analysis, A.N.D. and E.M.T.; investigation, A.N.D. and E.M.T.; data curation, A.N.D., E.M.T. and N.Y.R.; writing - original draft preparation, E.M.T. and A.N.D.; writing - review and editing, E.M.T. and A.N.D.; visualization, A.N.D. and E.M.T.; supervision, A.N.D.; project administration, A.N.D. and N.Y.R. All authors have read and agreed to the published version of the manuscript.

Funding: This paper has been supported by the RSF within the scientific project 22-27-00245 «Theoretical and methodological foundations for the design of tourist territories in the conditions of socio-economic systems of the foothill and mountainous territories of Altai».

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Ethics approval was obtained from the Ethics Committee of Altai State University. The survey participants provided their informed consent to participate in this study

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Aleksandrova, A.Yu. (2020). Izmenenie turistskogo geoprostranstva v epokhu vseobshchei mobil'nosti [Changes of touristic geo-space in the epoch of universal mobility]. *Vestnik Moskovskogo universiteta. Seriya 5, Geografiya [Bulletin of Moscow University. Series 5, Geography]*, (2), 3-12.

Boyd, S.W., & Butler, R.W. (1996). Managing ecotourism: an opportunity spectrum approach. *Tourism Management*, 17(8), 557-566. https://doi.org/10.1016/S0261-5177(96)00076-3

Butler, R., & Waldbrook, L. (2003). A new planning tool: the tourism opportunity spectrum. *The Journal of Tourism Studies*, 14(1), 25-36.

Carroll, J., & Hession, K. (2015). Developing a Tourism Opportunity Spectrum Scale. *Journal of Tourism Insights*, 6(1), Article 2. https://doi.org/10.9707/2328-0824.1050

Chow, Y.Y., Haw, S.C., Naveen, P., Anaam, E.A., & Mahdin, H.B. (2023). Food Recommender System: A Review on Techniques, Datasets and Evaluation Metrics. *Journal of System and Management Sciences*, 13(5), 153-168. https://doi.org/10.33168/JSMS.2023.0510

Clark, W.C., Kerkhoff, L., Lebel, L., & Gallopin, G.C. (2016). Crafting usable knowledge for sustainable development. *Proceedings of the National Academy of Sciences*, 113 (17), 4570-4578. https://doi.org/10.1073/pnas.1601266113

Clark, R.N., & Stankey, G.H. (1979). The recreation opportunity spectrum: a framework for planning, management, and research, Gen. Tech. Rep. PNW-GTR-098. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, USA, 32 p.

Daconto, G., & Sherpa, L.N. (2010). Applying Scenario Planning to Park and Tourism Management in Sagarmatha National Park, Khumbu, Nepal. *Mountain Research and Development*, 30(2). https://doi.org/10.1659/MRD-JOURNAL-D-09-00047.1

Datel, R.E., & Dingemans, D.J. (1984). Environmental perception, historical preservation and sense of place. In Saarinen, T.F., Seamon, D., & Sell, J.L. (Eds), *Environmental perception and behaviour: An inventory and prospect*, 131-144. Department of Geography, University of Chicago, Research Paper 209.

Dunets, A.N., Krupochkin, E.P., Tabakaeva, E.M., & Kotelnikova, A.V. (2023). Analiz povedeniya turistov v usloviyakh razvitiya kompleksa «Biryuzovaya Katun'»: ispol'zovanie bespilotnykh apparatov [Unmanned Aerial Vehicles for Analyzing the Behavior of Tourists on the "Biruzovaya Katun"]. *Regional geosystems*, 47(1), 88-100. https://doi.org/10.52575/2712-7443-2023-47-1-88-100

Enger, A., Sandvik, K., & Iversen, E. (2015). Developing scenarios for the Norwegian travel industry 2025. *Journal of Tourism Futures*, 1 (1), 6-18. https://doi.org/10.1108/JTF-12-2014-0018

Fertas, L., Lahlah, S.S., & Briki, M.N. (2022). Test of the new approach of taxonomic of tourist resources for development, case of the Province of Setif, Algeria. *GeoJournal of Tourism and Geosites*, 43(3), 878–886. https://doi.org/10.30892/gtg.43306-900

Ganzha, S.D., & Tenova, M.M. (2019). Tipy arkhitekturno-planirovochnoi organizatsii rekreatsionno-turisticheskikh kompleksov v Respublike Altai [Types of architectural and planning organization of recreational and tourist complexes in the Altai Republic]. *Tvorchestvo i sovremennost' [Creativity and modernity]*, (2), 46-54.

Hang, N.P.T., Linh, N.H.K., & Nghi, L.D. (2023). Examining the Effect of Airportscape on Airport Image, Tourist Revisit Intention, Considering Roles of Sense of Place and Destination Image. *Journal of Logistics, Informatics and Service Science*, 10(3), 70-87. https://doi.org/10.33168/JLISS.2023.0306

Krasheninnikov, A.V. (2017). Scenario-Based Design of the Built Environment. *Architecture and Modern Information Technologies*, 4(41), 242-256.

Krause, J., Fu, Q., Good, J.M., Viola, B., Shunkov, M.V., Derevianko, A.P., & Pääbo, S. (2010). The complete mitochondrial DNA genome of an unknown hominin from southern Siberia. *Nature*, (464), 894–897. https://doi.org/10.1038/nature08976

Lunkar, I.E. (2014). Kontseptsiya postroeniya arkhitekturno-prostranstvennoi sredy turistskikh destinatsii [The concept of designing of building architectural environment of a tourist destination]. *Vestnik RIAT [RIAT Bulletin]*, (2), 108-116.

Mai, T., & Smith, C. (2018). Scenario-based planning for tourism development using system dynamic modelling: A case study of Cat Ba Island, Vietnam. *Tourism Management*, 68, 336-354. https://doi.org/10.1016/j.tourman.2018.04.005

Minaev, A.I. (2021). Prostranstvenno-vremennye aspekty razvitiya turizma v Respublike Altai [Spatiotemporal aspects of tourism development in the Altai Republic]. In *Transgranichnye regiony v usloviyakh global'nykh izmenenii: sovremennye vyzovy i perspektivy razvitiya. Materialy II Mezhdunarodnoi nauchno-prakticheskoi konferentsii [Cross-border regions in the context of global changes: modern challenges and development prospects. Materials of the II International Scientific and Practical Conference]* (42-51). Gorno-Altaisk State University, Gorno-Altaisk, RF.

Morozova, N.N. (2012). MICE-turizm v institutsional'noi infrastrukture sovremennogo biznes soobshchestva [MICE-tourism development in the modern business]. *In the World of Scientific Discoveries*, (2-5), 276-284.

Mukayev, Z., Ozgeldinova, Z., Dasturbayev, S., Ramazanova, N., Zhanguzhina, A., & Bektemirova, A. (2022). Landscape and recreational potential of the mountainous territories of the Turkestan region of the Republic of Kazakhstan. *GeoJournal of Tourism and Geosites*, 41(2), 362–367. https://doi.org/10.30892/gtg.41204-838

Nikolaenko, D.V. (2001). *Rekreatsionnaya geografiya [Recreational geography]*. Vlados, Moscow, RF, 288.

Otto, O.V., & Kulikova, A.A. (2021). Analiz programm strategicheskogo razvitiya turizma v Altaiskom krae i Respublike Altai [Analysis of programs for strategic tourism development in the Altai region and the Altai republic]. *Nauka i turizm: strategii vzaimodeistviya [Science and tourism: interaction strategies]*, (13), 75-85.

Page, S.J., Yeoman, I., Connell, J., & Greenwood, C. (2010). Scenario planning as a tool to understand uncertainty in tourism: the example of transport and tourism in Scotland in 2025. *Current Issues in Tourism*, 13 (2), 99-137. https://doi.org/10.1080/13683500802613519

Pathmanandakumar, V., Goh, H.C., & Chenoli, S.N. (2023). Identifying potential zones for ecotourism development in Batticaloa district of Sri Lanka using the GIS-based AHP spatial analysis. *GeoJournal of Tourism and Geosites*, 46(1), 252–261. https://doi.org/10.30892/gtg.46128-1022

Pomeroy, R., & Douvere, F. (2008). The engagement of stakeholders in the marine spatial planning process. *Marine Policy*, 32(5), 816-822. https://doi.org/10.1016/j.marpol.2008.03.017

Pomorov, S.B., & Pomorov, F.S. (2021). Altai transgranichnyi - mul'tikul'turnoe prostranstvo dlya turizma [Altai cross-border - a multicultural space for tourism]. In *Mirovaya khudozhestvennaya kul'tura XXI v. Predmetno-prostranstvennaya sreda i problemy kul'turnoi identichnosti. Tom 2 [World artistic culture of the 21st century. Subject-spatial environment and problems of cultural identity. Volume 2]* (91-95). Stroganov Moscow State University of Arts and Industry, Moscow, RF.

Postma, A. (2002). An approach for integrated development of quality tourism. In Andrews, N., Flanagan, S., & Ruddy, J. (Eds) *Tourism Destination Planning* (205-217). Tourism Research Centre, Dublin Institute of Technology, Dublin, Ireland.

Postma, A. (2013). Anticipating the future of European tourism. In Postma, A., Yeoman, I., & Oskam, J. (Eds), *The Future of European Tourism* (290-305). European Tourism Futures Institute, Leeuwarden, Netherlands.

Postma, A. (2015). Investigating scenario planning – a European tourism perspective. *Journal of Tourism Futures*, 1(1), 46-52. https://doi.org/10.1108/JTF-12-2014-0020

Preobrazhensky, V.S. (ed.) (1975). *Teoreticheskie osnovy rekreatsionnoi geografii [Theoretical foundations of recreational geography]*, Nauka, Moscow, RF, 223.

Prudnikova, N.G., & Baryshnikova, O.N. (2009). Funktsional'noe zonirovanie rekreatsionnykh territorii na primere perekhodnoi zony Altaya [Functional zoning of recreational territories by example of a transitive zone of Altai]. *Vestnik Tomskogo gosudarstvennogo universiteta [Tomsk State University Journal]*, (323), 379-382.

Seyitoğlu, F., & Costa, C. (2022). A systematic review of scenario planning studies in tourism and hospitality research. *Journal of Policy Research in Tourism, Leisure and Events.* https://doi.org/10.1080/19407963.2022.2032108

Skryabin, P.V. (2019). Problematika i napravlenie gradostroitel'nogo razvitiya rekreatsionnoi sredy Gornogo Altaya [Problems and direction of urban development of the recreational environment of Gorny Altai]. *Vestnik Belgorodskogo gosudarstvennogo tekhnologicheskogo universiteta im. V.G. Shukhova [Bulletin of BSTU named after V.G. Shukhov]*, (1), 95-102. https://doi.org/10.12737/article_5c506227404148.81595981

Sondeijker, S. (2009). *Imagining sustainability. Methodological building blocks for transition scenarios*, PhD Dissertation, Erasmus University, Rotterdam, Netherlands, 253.

Tabakaeva, E.M., Dunets, A.N., & Akimov, O.S. (2023). Low-mountain territories of Bolshaya Belokurikha: tourism design based on the recreation opportunity spectrum. *Sustainable Development of Mountain Territories*, 15(1), 182-196. https://doi.org/10.21177/1998-4502-2023-15-1-182-196

Waiyasusri, K., & Tananonchai, A. (2022). Spatio-temporal development of coastal tourist city over the last 50 years from landsat satellite image perspective in Takua Pa district, Phangnga province, Thailand. *GeoJournal of Tourism and Geosites*, 43(3), 937–945. https://doi.org/10.30892/gtg.43313-907

Wyatt, K.H., Arkema, K.K., Wells-Moultrie, S., Silver, J.M., Lashley, B., Thomas, A., Kuiper, J.J., Guerry, A.D., & Ruckelshaus, M. (2021). Integrated and innovative scenario approaches for sustainable development planning in The Bahamas. *Ecology and Society*, 26 (4), article 23 https://doi.org/10.5751/ES-12764-260423

Yoon, J., & Choi, C. (2023). Real-Time Context-Aware Recommendation System for Tourism. *Sensors*, (23), 3679. https://doi.org/10.3390/ s23073679

Zhukova, M.A. (2013). Podkhody k formirovaniyu turistskoi infrastruktury regiona na osnove potrebitel'skikh predpochtenii [Approaches to the formation of tourism infrastructure in the region based on consumer preferences]. *Vestnik universiteta [University Bulletin]*, (5), 34-40.

Zorin, I.V., & Kvartal'nov, V.A. (2000). *Entsiklopediya turizma [Encyclopedia of tourism]*, Finansy i statistika, Moscow, RF, 368.

Article history: Received: 15.09.2023 Revised: 10.11.2023 Accepted: 08.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1738-1748
DOI 10.30892/gtg.514 spl14-1169

ENHANCING SUSTAINABILITY AND REDUCING CUSTOMER TECHNOSTRESS THROUGH FOOD-ORDERING APPS

Maha S. HABOBATI
Social Studies Department, College of Arts, King Faisal University, Al Ahsa, Saudi Arabia, e-mail: mhobubarti@kfu.edu.sa

Thowayeb H. HASSAN*
Social Studies Department, College of Arts, King Faisal University, Al Ahsa 400, Saudi Arabia; Tourism Studies Department, Faculty of Tourism and Hotel Management, Helwan University, Cairo, Egypt, e-mail: thassan@kfu.edu.sa

Mohamed Y. HELAL
Hotel Management Department, Faculty of Tourism and Hotel Management, Helwan University, Cairo, Egypt, e-mail: mohamed.yossef@fth.helwan.edu.eg

Bahadur A. BILALOV
Department of Tourism Business, Azerbaijan University of Tourism and Management, Baku, Azerbaijan, e-mail: b.bilalov@atmu.edu.az

Omar M. ALI
Arabic Language Department, College of Arts, King Faisal University, Al Ahsa, Saudi Arabia, e-mail: omali@kfu.edu.sa,

Nabila N. ELSHAWARBI
Hotel Management Department, Faculty of Tourism and Hotel Management, Helwan University, Cairo, Egypt, e-mail: nabila.nabil@fth.helwan.edu.eg

Citation: Habobati, M.S., Hassan, T.H., Helal, M.Y., Bilalov, B.A., Ali, O.M., & Elshawarbi, N.N. (2023). ENHANCING SUSTAINABILITY AND REDUCING CUSTOMER TECHNOSTRESS THROUGH FOOD-ORDERING APPS. *GeoJournal of Tourism and Geosites*, 51(4spl), 1738–1748. https://doi.org/10.30892/gtg.514spl14-1169

Abstract: To investigate customer technostress antecedents and consequences of the restaurants' food-ordering apps and suggest a coping strategy (i.e., customer orientation). This qualitative study relied on twenty-three semi-structured interviews with Egyptian restaurant customers and managers to understand the customer technostress caused when using food-ordering apps. The study found that restaurant customers experience technostress due to app complexity, security and privacy concerns, frequent app changes, feelings of diminished control, and time constraints. These app-related techno stressors cause customer dissatisfaction and purchasing reluctance. The study also found that not all restaurants adopt a responsive and proactive customer orientation to reduce food-ordering app technostress. However, customers were satisfied with proactive restaurants revealing technostress from food-ordering apps. This study is the first research in the hospitality industry to use Transactional Stress Theory (TST) to investigate the antecedents and consequences and suggest a customer orientation as a coping strategy of customer technostress from food-ordering apps from the perspectives of customers and restaurant managers. As a result, restaurants can be proactive and responsively customer-oriented to overcome customer technostress from food-ordering apps by considering the customers' concerns to satisfy and retain customers and attract new ones.

Key words: sustainability, customer technostress, food-ordering apps, transactional stress theory, customer dissatisfaction customer purchase reluctance, customer orientation

* * * * * *

INTRODUCTION

Food-ordering apps are digital platforms that allow customers to use their mobile devices to browse menus, place orders, and pay for meals from restaurants (Timur et al., 2023). Restaurants use food-ordering apps because they allow customers to order food from any location, saving them time, effort, and money (Sharma et al., 2021). Food-ordering apps reduce paper use by replacing menus, brochures, and receipts with digital platforms, improving sustainability (Sharma et al., 2021). This change saves resources and makes dining greener, benefiting customers and the environment. Previous studies suggested that implementing a food-ordering app can significantly impact restaurants. Specifically, the studies found that restaurants that implemented mobile ordering systems saw an increase in customer e-satisfaction, loyalty, order accuracy, efficiency, convenience, accessibility, customization, customer spending and sales, order frequency, customer engagement, repeat business, customer feedback, trust, and brand loyalty (Alalwan, 2020; Alshreef et al., 2023; Batouei et al., 2023; Brewer and Sebby, 2021; Timur et al., 2023). However, customers may encounter technical issues such as app crashes or slow loading times, difficulty navigating the app's interface, and privacy and security concerns when using food-

* Corresponding author

ordering apps (Showkat and Choudhury, 2019; Wu et al., 2022). Thus, customers may experience technostress or compulsive use of mobile apps, resulting in adverse outcomes. Limited studies have explained the antecedents and consequences of customers' technostress from restaurant food-ordering apps and optimal coping strategies. Therefore, to bridge this gap, the study asks three research questions: What are the antecedents of customers' technostress from restaurants' food-ordering apps? What are the consequences of customers' technostress from restaurants' food-ordering apps? What is the optimal coping strategy for customers' technostress from restaurants' food-ordering apps?

Customer technostress is customers' adverse psychological and emotional reactions when using technology-based products or services (Lee et al., 2023). Customer technostress is a type of stress caused by technology, such as frustration, anxiety, confusion, and feeling overwhelmed (Kumar et al., 2022). In the context of restaurant food-ordering apps, there are several potential antecedents of technostress. These include complex interfaces, technical glitches, poor user experience design, and a lack of support (Kang and Namkung, 2019; Sharma et al., 2021). Customer technostress consequences include decreased satisfaction and loyalty, increased negative word-of-mouth, and revenue loss for the restaurant (Christ-Brendemühl and Schaarschmidt, 2020). Additionally, customers who are technologically stressed may switch to a competitor's restaurant or cancel their orders, negatively impacting the restaurant's reputation and revenue (Blut and Wang, 2019). The study uses TST, a stress theory created by Richard Lazarus (1990), to comprehend the antecedents and consequences of customer technostress. The theory states that stress is not caused by a single event but rather by the interaction between an individual and their object (Daniel, 2019).

In this vein, this study recommends a customer orientation as a method to deal with the causes of customer technostress proactively and responsively. Customer orientation is a business strategy prioritizing customer requirements, values, and challenges (Helal, 2022). A customer-oriented restaurant focuses on developing long-term customer relationships by providing great experiences and exceeding their expectations (Daradkeh et al., 2023). The theoretical contribution of this study lies in utilizing the TST to examine the antecedents, consequences, and coping strategies of customer technostress in the context of restaurant food-ordering apps. First, the study uses TST to identify the specific techno stressors customers experience when using food-ordering apps. Second, the study explains how these techno stressors can lead to negative customer consequences. Third, the study suggested a customer orientation strategy that restaurants can use to reduce customer technostress and improve the overall customer experience. In terms of practical implications, this study offers valuable insights for restaurants to improve their food-ordering apps and reduce customer technostress.

LITERATURE REVIEW

1. Theoretical background

Customer technostress is a cognitive concept derived from customers' negative interactions with new-age technologies while interacting with service or product providers (Hassanin et al., 2023; Kumar et al., 2022). Customers may experience challenges when interacting with restaurants' food-ordering apps, such as complexity, technical, and security issues, which cause technostress (Christ-Brendemühl and Schaarschmidt, 2020; Furunes and Mkono, 2019). Hence, customers' technostress can cause them to abandon food-ordering apps without making a purchase. To enhance the customer experience and keep and attract more customers, restaurants need to understand when the perception of technostress arises (Christ-Brendemühl and Schaarschmidt, 2020). Accordingly, this study uses the TST framework to explain customers' technostress antecedents, consequences, and coping strategies of restaurants' food-ordering apps.

The TST defines stress as the result of a three-stage transaction between a customer and a business (i.e., primary appraisal, secondary appraisal, and reappraisal) (Lazarus, 1990). During the preliminary evaluation phase, the customer decides whether or not a situation is stressful (Cohen et al., 2013). This evaluation is founded on the customer's perception and capacity to address the issue. Customers proceed to the subsequent stage if they perceive the situation as distressing. During the second assessment phase, customers evaluate their coping resources and strategies. They evaluate whether they have the resources and strategies to cope with the stressful situation. If they believe they have sufficient resources and coping strategies, they move on to reevaluation (Kupiek, 2021; Lazarus, 1990). Customers assess whether or not their coping strategies allow them to manage the stressor effectively. If their coping strategies had been effective, their stress levels may have decreased. However, if their coping strategies fail, they may experience more stress (Lazarus, 1990).

2. Conceptual development

2.1. Antecedents of customer technostress

The current study employs the TST to identify the technostress antecedents that customers face when utilizing restaurants' food-ordering apps. The antecedents of customer technostress are all the factors that can put a customer in a stressful situation when dealing with technology (Kumar et al., 2022). Customers may experience technostress due to several factors, including perceived complexity, perceived insecurity, perceived novelty, perceived lack of control, and perceived time pressure (Kumar et al., 2022; Peters et al., 2022). First, perceived complexity refers to the degree to which customers perceive technology to be difficult and complex (Kumar et al., 2022). Customers may feel overwhelmed and experience technostress if a transaction takes more than one step or has complicated steps, like verifying a name or processing a payment (Peters et al., 2022). Customers who think technology is challenging to use may experience technostress, leading to adverse outcomes like frustration, worry, and less willingness to purchase (Christ-Brendemühl and Schaarschmidt, 2020). Second, perceived insecurity is the degree to which customers perceive the restaurant food-ordering app to be insecure, resulting in privacy and security concerns (Chopdar and Paul, 2023). Several factors can contribute to insecurity, including the design of security features, the level of encryption used for sensitive information, and the

restaurant's reputation for safeguarding customer data (Ali et al., 2021). Third, perceived novelty refers to customers encountering unfamiliar new technologies, resulting in uncertainty and anxiety (Kumar et al., 2022). Various factors can contribute to the perception of novelty, such as introducing new features or technologies in food ordering applications or modifying the user interface design (Maier et al., 2017). For instance, if a restaurant adds a new payment method or changes the layout of its food ordering app, customers may find it unfamiliar and challenging to use.

Fourth, perceived lack of control refers to how customers perceive an absence of control over the technology used in online food ordering, resulting in helplessness and frustration (Ali et al., 2021). For instance, customers may feel helpless and frustrated if an app for ordering food from a restaurant does not allow them to customize their preferences or provide specific information about their transactions' status (Griesbach et al., 2019). Finally, perceived time pressure refers to how customers perceive a sense of urgency or time constraint when using a food ordering app, resulting in anxiety and stress (Kumar et al., 2022). Transaction processes that require customers to complete tasks rapidly or within a specified timeframe can generate the perception of time pressure (Islam et al., 2021). For instance, if a food ordering app has a limited-time offer or requires customers to complete a transaction quickly, they may feel rushed and anxious.

2.2. Consequences of customer technostress

Customers begin to experience the precursors of technostress as symptoms and then employ their strategies for coping (Christ-Brendemühl and Schaarschmidt, 2020). If these strategies are effective, customers can avoid technostress; however, if they are ineffective, customers will experience technostress, which will have a negative impact on customer experiences and restaurant revenue (Kupiek, 2021; Lazarus, 1990). Therefore, this study focuses on two main consequences of customer technostress in restaurants: customer dissatisfaction and purchase reluctance.

Customer dissatisfaction refers to the negative feelings or emotions customers experience when a product, service, or experience does not meet their expectations (Fan et al., 2019). Inadequate customer service, complexity, and unmet requirements or app insecurity that negatively impact the customer's experience can lead to customer dissatisfaction (Furunes and Mkono, 2019). Moreover, customers may not know the app's novel capabilities and fear making mistakes when placing orders (Peters et al., 2022). In addition, customers' lack of control may be caused by app crashes or the incapacity to modify an order. Customers who believe they lack control over their experience will likely be dissatisfied (Ali et al., 2021). Also, perceived time constraints can lead customers to make mistakes when using an app to order meals (Showkat and Choudhury, 2019). Dissatisfied customers can result in negative reviews, negative WOM, decreased customer loyalty, and revenue loss for the restaurant (Ji et al., 2023). The second consequence of customer technostress is a customer's reluctance, which refers to a customer's hesitation or refusal to make a purchase (Petcharat et al., 2023). The tendency of customers to purchase from a restaurant can drop if they have a negative experience with the restaurant's food-ordering app (Doeim et al., 2022). Customers may become frustrated with food ordering applications that lack a user-friendly interface or are challenging to navigate (Helal, 2023). Similarly, perceived insecurity can lead to discontent and purchase reluctance. Customers concerned about the confidentiality of their personal information may be unwilling to use a food-ordering app, opting instead for alternative ordering methods (Ali et al., 2021). As a result, restaurants can lose sales and revenue due to purchase reluctance. Therefore, restaurants must address customer concerns to overcome customer dissatisfaction and purchase reluctance and increase revenue.

2.3. Customer orientation as a coping strategy for customer technostress

Coping strategies are a variety of methods that restaurants use to deal with difficult situations (Batouei et al., 2023). Coping strategies can be proactive or reactive, involving a range of behaviors, thoughts, and emotions (Helal, 2022). Therefore, the current study suggested that restaurants can use customer orientation to provide a coping strategy for customer technostress. Customer orientation is a strategy that emphasizes understanding and serving customers' wants and preferences (Daradkeh et al., 2023). Customer orientation entails putting customers first by providing high-quality products, services, and experiences that exceed their expectations. Gathering feedback from customers, evaluating customer data, and leveraging insights to customize products and services to match customer demands are all part of customer orientation. Customer orientation is to build long-term customer loyalty and satisfaction by continually providing value to customers (Helal, 2022).

Customer orientation has two dimensions: proactive and responsive (Schulze et al., 2022). Proactive customer orientation is an approach to business that goes beyond meeting customer needs and actively seeks to anticipate and exceed them (Blocker et al., 2010). Proactive customer orientation involves proactively understanding customers' needs, preferences, and behaviors and using this information to create innovative products, services, and experiences anticipating future customer needs (Helal, 2022). Thus, proactive customer orientation will help restaurants collect customer feedback through various channels such as surveys, listening to social media, and customer service interactions about the challenges of food ordering applications and solving these challenges before they cause technostress (Daradkeh et al., 2023).

Responsive customer orientation focuses on quickly and effectively responding to customer needs and challenges, including identifying potential sources of customer technostress and taking swift action to alleviate them (Schweitzer et al., 2016). Responsive customer orientation necessitates the establishment of effective communication channels, allowing customers to report issues with food-ordering apps quickly (Shah et al., 2021). Additionally, responsive customer orientation involves a well-trained customer service team capable of handling inquiries and complaints professionally and efficiently (Daradkeh et al., 2023). Restaurants prioritizing responsive customer orientation are dedicated to speedy issue resolution and delivering satisfactory customer solutions. The ultimate objective of responsive customer orientation is to establish trust with customers by exhibiting the firm's dedication to receiving feedback and providing exceptional service

(Blocker et al., 2010). Hence, by combining proactive and responsive customer orientation, restaurants can better understand their customer's needs and address them in advance or promptly, preventing or eliminating potential sources of customer technostress (Helal, 2022). Therefore, we propose the conceptual model (Figure 1) based on previous literature and discussion.

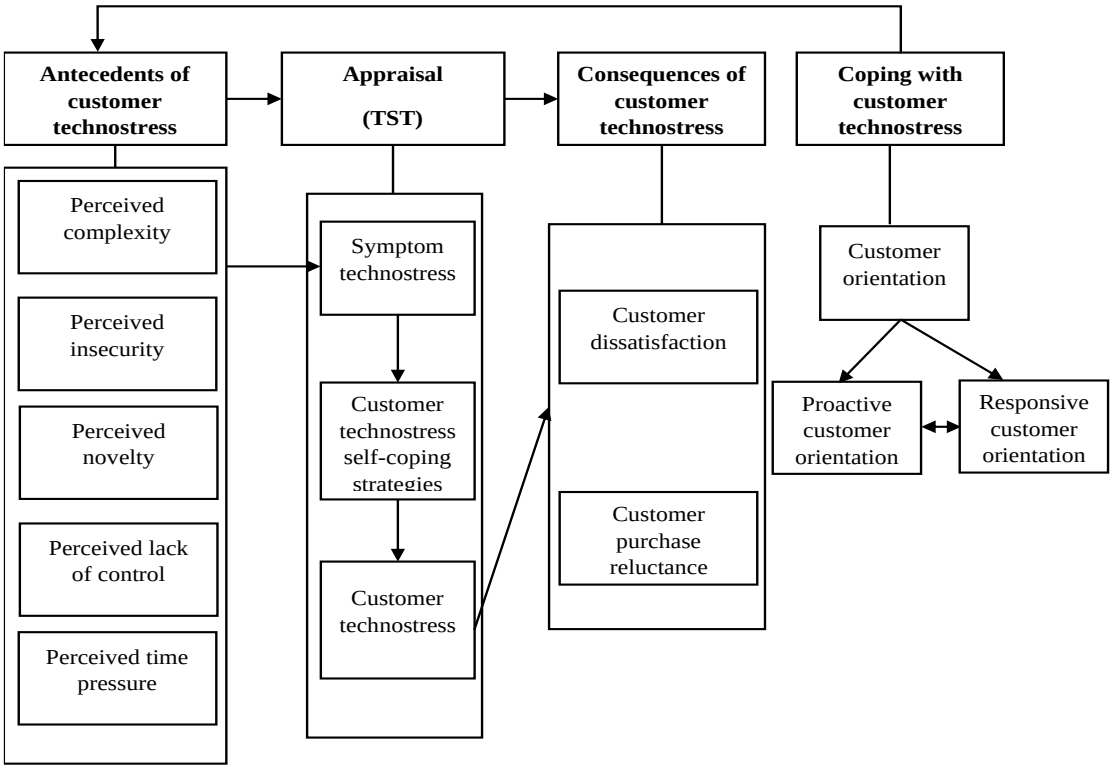


Figure 1. The conceptual framework

MATERIALS AND METHODS

We chose a qualitative approach (i.e., semi-structured interviews) since it allowed us to comprehend the significance of restaurant customers' technostress experiences with food-ordering apps. The semi-structured interviews we adopted blend the benefits of open and directed questions. This approach allowed the participants to convey their thoughts and feelings while ensuring we acquired the necessary information (Adams, 2015). To carry out our research in an organized manner, we followed the stages suggested by previous studies. Firstly, we carefully selected the participants to ensure they represented the study population (Daradkeh et al., 2023; Husband, 2020). Secondly, we developed a set of interview questions and procedures to conduct the interviews. Finally, we analyzed the results of the interviews to identify recurring themes and patterns.

1. Selection interviews

This research seeks to identify the root antecedents and consequences of customer technostress resulting from food-ordering apps and to propose customer orientation as an adaptive strategy to combat customer technostress. The research team determined that the customers to be interviewed must have been exposed to technostress and be users of restaurant food-ordering apps. Therefore, the research team searched for customer evaluations on various Egyptian restaurant food-ordering apps. A team then contacted these customers and inquired whether they would participate in the interview. Twenty-nine customers were contacted, and sixteen responded to the interview request. The researchers then contacted the managers of the same restaurants to conduct interviews with them; 7 of the managers agreed to participate.

2. Interview techniques

Table 1 contains information about the participants' profile data. There were more women than men, and most participants also had bachelor's degrees (15), secondary school diplomas (6), and graduate degrees (2). The data reveals that the participants met with two categories of restaurants: multinational and national, with most interviews taking place with multinational restaurants. Chicken is the most popular type of food among respondents, followed by burgers and pizza. The duration of an interview ranges from 50 to 70 minutes, with an average of 60 minutes. According to the data, restaurant managers who participated in the interview process are increasingly likely to work for multinational restaurants.

3. Interview questions

The research team divided the interview form into two sections to collect data from respondents. The first section includes general information for customers and restaurant management, such as gender, level of education, and restaurant type. The second section of the interview form contains questions based on the study's conceptual model as follows:

Questions to customers: Antecedents:

- What was your experience with a food ordering app being too complex to use?

- Did you feel secure and private while ordering meals from a restaurant using the app?
- How did you react to new features or modifications in food-ordering apps?
- Did you lose control when using a food ordering app due to the many options or features?
- Have you experienced time stress or anxiety while using a food ordering app?

Consequences:

- Have you ever been dissatisfied with a restaurant food-ordering app? Why?
- Have you ever avoided a purchase from a restaurant due to an unacceptable food-ordering app?

Coping:

- Have you reported any difficulties or complaints concerning food-ordering apps to restaurants? How did they respond? Did they solve your issue well?
- Was the restaurant proactively seeking to anticipate your technostress concerning food-ordering apps?

Questions to restaurant managers: Antecedents:

- Did you receive customer feedback or concerns about the complexity of your restaurant's food-ordering app?
- How did you safeguard customer information in your food-ordering app?
- Did your app undergo significant modifications that may have caused customers to endure technostress?
- Did customers feel powerless when using your restaurant's food-ordering app?
- Did customers experience time stress when using your restaurant food-ordering app?

Consequences:

- Have you noticed any differences in customers' satisfaction levels from using the restaurant food-ordering app?
- Have you noticed differences in purchase reluctance or unwillingness to use the restaurant food-ordering app?

Coping:

- Can you describe how your restaurant actively gathers customer feedback regarding their experiences with the food-ordering app?
- Do you prioritize specific channels, such as surveys, social media, or customer service interactions, for this purpose?
- How does your restaurant approach proactively address potential technostress sources for customers using the app?
- Are there instances where you've implemented changes or features based on customer feedback to enhance the overall experience?
- Could you provide insights into your restaurant's responsiveness to customer needs and challenges related to the app?

Table 1. Participants profile

Code	Position	Gender	Education	Restaurant type of food	Type of the business	Interview length
1.	Customer	Male	University degree	Pizza	National	55 minutes
2.	Customer	Male	High school degree	Chicken	Multinational	60 minutes
3.	Restaurant manager	Female	University degree	Pizza	National	65 minutes
4.	Customer	Male	University degree	Burger	National	60 minutes
5.	Customer	Male	High school degree	Chicken	Multinational	65 minutes
6.	Customer	Female	University degree	Burger	Multinational	65 minutes
7.	Restaurant manager	Male	University degree	Chicken	Multinational	55 minutes
8.	Customer	Female	University degree	Pizza	Multinational	60 minutes
9.	Customer	Male	Post-graduate degree	Chicken	Multinational	65 minutes
10.	Restaurant manager	Male	University degree	Chicken	Multinational	60 minutes
11.	Customer	Female	High school degree	Pizza	National	65 minutes
12.	Restaurant manager	Male	University degree	Burger	Multinational	55 minutes
13.	Customer	Female	Post-graduate degree	Burger	Multinational	60 minutes
14.	Restaurant manager	Female	University degree	Chicken	National	70 minutes
15.	Customer	Female	High school degree	Burger	Multinational	55 minutes
16.	Customer	Male	University degree	Burger	Multinational	65 minutes
17.	Customer	Male	Post-graduate degree	Pizza	Multinational	50 minutes
18.	Customer	Female	University degree	Burger	Multinational	65 minutes
19.	Restaurant manager	Male	Post-graduate degree	Chicken	National	55 minutes
20.	Customer	Female	Post-graduate degree	Burger	Multinational	60 minutes
21.	Customer	Female	High school degree	Chicken	Multinational	65 minutes
22.	Restaurant manager	Male	Post-graduate degree	Pizza	National	65 minutes
23.	Customer	Female	University degree	Chicken	Multinational	60 minutes

4. Interview analysis

The present study adopts a thematic analysis approach, a qualitative research method designed to uncover and comprehend patterns or themes within a dataset (Joffe, 2011). This methodological choice is well-suited for the study's aim. The thematic analysis process is a multi-stage endeavor encompassing data familiarization, initial code generation, theme identification, theme review, definition and naming of themes, and the ultimate reporting of results. In conjunction with the chosen methodology, the study framework is utilized as a guiding tool to identify and interpret trends inherent in the dataset. Tables are employed at each stage of the thematic analysis process. These tables aid researchers in structuring and visualizing the evolving codes and themes, enhancing the analysis's clarity and coherence.

The tabular representation facilitates the evaluation of codes and themes, enabling researchers to navigate between different components and grasp the fundamental aspects of each code and theme and their interconnectedness. The outcomes of this meticulous analysis validate the proposed model, which advocates for implementing customer orientation as a coping strategy to address customer technostress in the context of food-ordering apps. The study sheds light on the antecedents and consequences of technostress, drawing attention to the intricate dynamics between customers and technology. The identified themes and patterns underscore the significance of adopting a customer-centric approach to mitigate technostress and enhance the overall customer experience in food-ordering apps.

RESULTS

1. Antecedents of customer technostress from both customers' and restaurant managers' perspectives

This study examined antecedents of customer technostress by analyzing restaurant customers' and managers' food-ordering app perspectives. The study participants' feedback highlighted various dimensions of complexity in restaurant food-ordering apps, which is the first antecedent of customer technostress. Customers reported encountering challenges such as a cluttered user interface with numerous buttons, tabs, and options, leading to overwhelming navigation and frustration (Respondents No. 2, 20). Additionally, the customization process was noted to be intricate, demanding multiple non-intuitive steps, resulting in time-consuming (Respondent No. 8). Technical issues, including slow loading times and freezes, added complexity by prolonging basic tasks (Respondent No. 4). Moreover, the absence of efficient search functionality made locating specific dishes from an extensive menu laborious and irritating (Respondent No. 18). Lastly, using complex jargon and unfamiliar terminology assumed user familiarity with industry-specific terms, compounding the difficulty in comprehending options and navigating the app (Respondent No. 23).

Second, the study results indicated that the restaurants' food-ordering apps have mixed customer reviews regarding security and privacy measures. Some customers express confidence in the app's robust security measures, including encryption of payment information and personal details (Respondents No. 1, 5, 21). However, others have reservations due to occasional glitches or delays in updating personal information, which raise minor security concerns (Respondents No. 6, 8). Some customers also question the app's security due to unrelated permissions requested and lack of clear information about data usage and sharing, making them uneasy (Respondents No. 11, 16). Hence, despite the app's security claims, customers take extra precautions by using separate payment methods to minimize potential risks (Respondents No. 13, 20).

Third, the study findings revealed diverse customer responses to changes in the features of the food-ordering app these restaurants offer. On one side, numerous customer exhibit enthusiasm and inquisitiveness, relishing the opportunity to experiment with novel functionalities and eagerly anticipating how these additions will elevate their ordering encounters (Respondents No. 6, 15, 17, 18). They display a penchant for delving deeper into these fresh attributes by acquainting themselves with their functionalities and operations before making a usage decision. Consequently, customers promptly embrace new attractive features, showcasing an affinity for technological progress and seamless integration into their daily routines. Conversely, there exists a cohort of customers who approach new features with wariness and prudence, harboring concerns that such additions could complicate the app's usability or introduce confusion in the ordering process (Respondents No. 2, 21, 23). Two of these customers mentioned that when encountering a new feature that appears bewildering or superfluous, they take the initiative to offer feedback to the app's support team or draft a review to articulate their perspectives (Respondents No. 2, 21).

Fourth, this study unveiled that many customers experienced diminished control from an overabundance of choices and functionalities within the restaurant's food-ordering app (Respondents No. 1, 2, 11, 21, 23). The extensive array of categories and options within the menu contributed to decision-making challenges, resulting in protracted scrolling and prolonged deliberation. Additionally, features like order tracking, customization, reviews, and an extensive selection of available eateries and dishes compounded the sensation of being inundated. While the customization feature proved advantageous to specific customers, it became a source of stress for those who found its extent overwhelming. The application's interface, brimming with an excess of options and functionalities, transformed placing an order into a labyrinthine journey, needlessly burdening customers with stress.

The ultimate antecedent contributing to customer technostress, as articulated by customers, lies in the sensation of being overwhelmed or technostress due to perceived time constraints. For example, the app freezing when placing time-sensitive orders evoked panic and apprehension concerning punctual order fulfillment (Respondents No. 2, 16). Instances of application crashes coinciding with peak utilization hours exacerbated concerns regarding potential order delivery delays (Respondents No. 20, 23). Complications related to payment, including errors and the necessity for repetitive card input, elicited frustration and apprehension over potential erroneous charges (Respondents No. 13, 15). The ineffectiveness of the app's tracking feature in providing real-time updates left customers in a state of unease regarding the progression of their orders (Respondents No. 18, 20). The coexistence of numerous promotional offerings and uncertainty regarding their applicability to specific orders engendered supplementary anxiousness (Respondents No. 9, 15).

Lastly, instances of timeout occurrences, notably during periods of discount availability, induced anxiety surrounding potential discount forfeiture or payment processing failures (Respondents No. 6, 15). This study also investigated the restaurant managers' perspectives regarding customer technostress from their food-ordering apps. Firstly, several customers provided feedback or complaints about the complexity of the food-ordering app for the restaurant. As restaurant managers said, they were actively addressing the issue by collaborating with app developers to streamline the interface and make it more user-friendly (Respondents No. 14, 19). Some managers mentioned that while app complexity was not widespread, they took customer feedback seriously and explored ways to simplify the app,

including creating user guides or tutorials (Respondents No. 12, 22). They also acknowledged that a minority of customers, particularly older or less tech-savvy, found the app overwhelming and considered making it more intuitive.

Secondly, restaurant managers said that restaurants take several measures to ensure the security of customer data when using the food-ordering app. These measures include implementing robust data encryption protocols to protect sensitive information, conducting regular security audits and engaging third-party cybersecurity experts for assessments, enforcing strict access controls and data minimization practices, and regularly updating the app with security patches. They prioritize user authentication, provide employee training on data security, and integrate with secure payment gateways (Respondents No. 3, 10, 12). Thirdly, while changes in the restaurants' food-ordering apps aimed to enhance the app's functionality and user experience, less tech-savvy customers experienced technostress through facing challenges in adapting to the new layout, understanding loyalty program complexities, navigating through a broader range of menu options, trusting new payment methods, managing constant order tracking notifications, and sharing orders on social media (Respondents No. 7, 10, 14, 19). Thus, restaurant managers understand the importance of implementing and supporting updates during transition periods.

Fourthly, restaurant managers have noticed specific patterns and trends in how customers interact with the food ordering app, which may contribute to technostress. These include customers feeling a lack of control over the abundance of customization options and facing challenges in finding necessary information (Respondents No. 3, 10). Finally, restaurant managers have noticed that customers often feel rushed or anxious when using the food ordering app during peak hours, when they make quick selections without exploring all options when they have time-sensitive orders and want to complete the process swiftly when encountering technical issues like slow loading times or errors, and during limited-time promotions to place orders before they expire (Respondents No. 7, 12, 14).

2. Consequences of customer technostress from both customers' and restaurant managers' perspectives

The previous antecedents of customer technostress led to customer dissatisfaction consequence, as customers highlighted. Customers encountering challenges such as cluttered user interfaces, intricate customization processes, and technical issues will likely experience frustration and overwhelm, ultimately resulting in dissatisfaction with the app's complexity (e.g., respondents No. 1, 4). Additionally, the absence of efficient search functionality and complex jargon can lead to difficulty finding items and confusion, further contributing to customer dissatisfaction (e.g., respondents No. 5, 6, 11). Moreover, customers who have reservations about the app's security due to glitches, unclear data usage policies, or unrelated permissions may feel uneasy, ultimately impacting their overall experience and satisfaction (e.g., respondents No. 5, 8, 16).

The consequences of customer technostress also extend to purchase reluctance behavior. Customers who question the app's security may use alternative payment methods to minimize potential risks, which could lead to a reluctance to purchase from the restaurant food-ordering app (e.g., respondents No. 9, 13, 15). Furthermore, customers who approach new features cautiously, fearing that they might complicate the app's usability, may be reluctant to adopt these features, potentially affecting their willingness to use the app for ordering (e.g., respondents No. 2, 11, 17). The sensation of being overwhelmed by an abundance of choices and functionalities within the app can lead to a reluctance to place orders, as the complexity of the menu and decision-making process may deter customers (e.g., respondents No. 15, 18, 21). Operational disruptions, crashes, payment errors, and ineffective tracking features can create a stressful ordering experience, causing customers to hesitate before making future orders (e.g., respondents No. 13, 20, 21). Lastly, uncertainty about discounts and challenges adapting to app updates may further contribute to purchase reluctance, as customers may fear missing out on promotions or navigating the app's changes. These consequences impact the customer's overall experience and willingness to engage with the restaurant's food-ordering app.

The observed consequences of antecedents related to customer technostress, as reported by restaurant managers, encompass both dissatisfaction and reluctance behaviors. Customers may express dissatisfaction when faced with complexities in the food-ordering app's interface and customization processes, app functionality changes, understanding loyalty programs, navigating extensive menus, and feeling overwhelmed by numerous delivery options and constant order tracking notifications (Respondents No. 12, 14, 22). Additionally, purchase reluctance behavior may arise, particularly among older or less tech-savvy customers, who may hesitate to trust new payment methods or make quick selections during peak hours (Respondents No. 19, 23). Restaurant food-ordering app technical issues, such as slow loading times or errors, can also contribute to purchase reluctance, especially during time-sensitive promotions (Respondents No. 10, 12).

3. Perceptions of restaurant customer orientation in mitigating technostress from food-ordering apps

Customers' perceptions of restaurants' proactive and responsive customer orientation techniques to lessen the technological stress caused by food-ordering apps were divided. Several customers have reported that the restaurants they interacted with tended to only address their concerns and issues regarding technostress from food-ordering apps once a complaint had been made (e.g., respondents No. 2, 11, 17). However, some participants provided insights into the proactive methods employed by restaurants to collect feedback and improve user experiences on their mobile applications. For instance, participants numbered 4, 8, and 9 said that restaurants employ a variety of methods, including surveys, social media platforms, and direct customer care interactions, in order to comprehend the difficulties encountered by customers and actively solicit their feedback to enhance the operation and usability of the application.

The study revealed restaurant managers' responsive and proactive customer orientation techniques to reduce food-ordering app-related technostress. The restaurant managers said feedback collection is vital to these initiatives (e.g., respondents No. 10, 19, 22). Many different channels are used in order to seek customer input actively. Some examples of these channels include in-app surveys that accompany orders, involvement with customers on social media platforms,

and the construction of dedicated feedback sections on the website. This comprehensive feedback collection reflects the essence of responsive customer orientation, as restaurants prioritize open channels for customers to express their experiences and challenges, nurturing a customer-centric culture. Furthermore, the management of restaurants delineated proactive strategies for the prevention of technostress. The monitoring of app analytics is conducted with meticulous attention to identify patterns that may potentially induce stress (Respondents No. 3, 10, 12). Additionally, it has been stated that customer feedback frequently catalyzes tangible enhancements, such as optimizing payment processes in response to identifying customer issues (Respondents No. 14, 22).

DISCUSSIONS

This study presents a thorough assessment of the customer technostress in the context of restaurant food-ordering apps, yielding several noteworthy findings. The research identifies the inherent complexity of these applications as the primary driver of customer technostress, leading to navigation and usability challenges (Kumar et al., 2022). Notably, the study uncovers a divergence in customer perceptions regarding app security and privacy protections (Ali et al., 2021), with some expressing confidence and others voicing concerns about technical issues and data policies (Helal, 2023). Additionally, the study highlights the diversity of customer reactions to app feature changes and underscores the impact of information overload on user control and decision-making (Ali et al., 2021). Furthermore, the perceived time constraints emerge as a crucial factor in customer technostress, as various app-related issues evoke panic, frustration, and apprehension among customers (Islam et al., 2021; Kumar et al., 2022). Moreover, including restaurant managers' perspectives adds depth to the understanding of technostress, emphasizing the importance of collaboration, data security, user support, responsive design, and customer engagement strategies in optimizing the food-ordering app experience. Therefore, these findings contribute to a holistic approach to addressing technostress in restaurant apps, benefiting customers and the industry.

The antecedents of technostress give rise to inadequate coping mechanisms, which can harm customer experiences and restaurants' financial performance. The presence of inadequate coping mechanisms might result in the emergence of technostress symptoms, which in turn directly influence customer satisfaction levels and their tendency to engage in purchasing behaviors. Factors contributing to dissatisfaction include complexity, security concerns, and unmet app requirements (Fan et al., 2019; Furunes and Mkono, 2019). Purchase reluctance is driven by, for example, technical issues, customer control, security issues, and perceived time pressure, deterring customers from using the app and affecting restaurant sales (Timur et al., 2023). Hence, restaurants must enhance app usability, ensure data security, and provide a seamless experience, ultimately mitigating technostress-related dissatisfaction and reluctance.

The study reveals a divergence in customer perceptions regarding restaurants' customer orientation techniques aimed at mitigating technostress related to food-ordering apps. While some customers reported that restaurants primarily addressed technostress issues after receiving complaints, others provided insights into proactive methods employed by certain restaurants to gather feedback and enhance user experiences. As highlighted by respondents, these proactive approaches involve diverse feedback collection methods such as surveys, social media engagement, and direct customer care interactions, indicating a commitment to comprehending customer challenges and actively soliciting input for app improvement (Daradkeh et al., 2023). Similarly, restaurant managers underscored the significance of feedback collection, utilizing various channels to foster a customer-centric culture indicative of responsive customer orientation. Furthermore, proactive strategies were noted, with app analytics monitoring to identify stress-inducing patterns and tangible enhancements driven by customer feedback (Helal, 2022). However, fewer restaurants use proactive customer orientation to identify antecedents of customer orientation; instead, the restaurants wait until the customer makes the complaint. Hence, restaurant managers need to use both dimensions of customer orientation to reduce customer technostress from food-ordering apps.

1. Theoretical implications

The theoretical implications of the study elucidate the antecedents, consequences, and coping strategies associated with customer technostress in restaurant food-ordering apps. First, the study extends the TST by identifying specific techno stressors customers encounter when using food-ordering apps. Examining these technostress antecedents, namely perceived complexity, insecurity, novelty, lack of control, and time pressure, enhances the theoretical comprehension of the effects of technology-related stressors on customer experiences (Christ-Brendemühl and Schaarschmidt, 2020; Kumar et al., 2022; Peters et al., 2022). Hence, the study provides detail to the TST framework by examining how various stressors combine in restaurant food-ordering apps to cause negative results.

This theoretical contribution facilitates the comprehension of customer technostress for researchers and practitioners, enabling them to devise customized solutions to alleviate stress and enhance customer satisfaction. Second, the study explicates how these identified techno stressors can negatively affect customers. The study expands the TST framework to shed light on the knock-on consequences of technostress by investigating the connection between technostress and its outcomes, like customer dissatisfaction and purchase reluctance. Therefore, the study shows how technostress reduces customer satisfaction through frustrating digital interactions and makes online purchases hesitant, emphasizing the importance of managing technostress for individual well-being, positive customer experiences, and business success (Helal, 2023; Showkat and Choudhury, 2019). This theoretical insight adds to the knowledge of technostress's cascade consequences in food-ordering apps, reinforcing the need for confrontation strategies.

Finally, the study proposed a customer orientation strategy that restaurants can adopt to alleviate customer technostress and enhance the overall customer experience. Integrating responsive and proactive customer orientation strategies offers a novel approach to addressing techno stressors and their consequences. The study underscores the importance of responsive

customer orientation by highlighting the establishment of dedicated customer service teams and efficient communication channels. This contribution aligns with the existing literature on the significance of responsive strategies in resolving customers' concerns and enhancing their experience (Helal, 2022; Schweitzer et al., 2016). Additionally, the study introduces the concept of proactive customer orientation to anticipate and address techno stressors, thus offering insights into how restaurants can actively enhance their app features and functionalities to mitigate stressors pre-emptively.

2. Managerial implications

The study provides valuable insights for restaurant managers regarding customer technostress in food-ordering apps. The findings highlighted various antecedents contributing to customer technostress, such as complexity, security and privacy concerns, frequent app changes, diminished control, and time constraints. To address these issues, restaurant managers should improve their apps' user-friendly design and navigation (Helal, 2023). These improvements can be achieved through conducting usability tests and responsively and proactively gathering customer feedback to identify improvement areas. Addressing technical glitches and enhancing search functionalities are crucial to mitigating perceived complexity (Showkat and Choudhury, 2019; Wu et al., 2022). Second, restaurant managers must prioritize data security by implementing robust encryption, conducting regular security audits, and transparently communicating data policies and protections to address customer perceptions regarding app security and privacy (Ali et al., 2021; Furunes and Mkono, 2019).

Third, restaurant managers should proactively educate customers about new features and functionalities introduced in the food-ordering app. This practice can be done through clear communication channels, tutorials, and guides explaining these additions' benefits and usage (Shah et al., 2021). By providing customers with comprehensive information, managers can encourage them to explore and utilize new features effectively (Griesbach et al., 2019). Fourth, managers should carefully curate the menu options to avoid information overload for customers by categorizing items, providing clear descriptions, and highlighting popular or recommended choices (Yoon and Yu, 2022). By presenting a manageable selection, customers can make decisions more efficiently, reducing stress and frustration. Finally, restaurant managers should prioritize enhancing the app's performance and stability, particularly during peak utilization hours, by investing in robust servers and conducting regular maintenance and updates to prevent crashes and freezing (Wahyudin et al., 2023). By ensuring a smooth and reliable app experience, managers can alleviate customer panic and apprehension related to time-sensitive orders. Hence, implementing these practices can increase customer satisfaction and repurchase by addressing factors contributing to technostress in food-ordering apps. Further, the study highlighted the significance of proactive and responsive customer orientation strategies.

The practices of improving user-friendly design and navigation, addressing technical glitches, enhancing search functionalities, and focusing on data security are examples of responsive customer orientation. In addition, restaurants should establish dedicated customer service teams accessible through various channels (Daradkeh et al., 2023). Swift response times and innovative features such as in-app chat functionality demonstrate a commitment to addressing customer concerns and minimizing technostress (Yoon and Yu, 2022). These practices are reactive and aim to address the issues and concerns that customers are already experiencing.

On the other hand, proactive customer orientation practices include proactively educating customers about new features and functionalities, carefully curating the menu options, and enhancing app performance and stability. Also, restaurants can proactively anticipate and prevent potential sources of technostress. These practices anticipate customer needs and preferences and aim to provide an enhanced experience before customers realize or express their specific requirements (Blocker et al., 2010; Helal, 2022). This dual approach fosters an environment of trust, satisfaction, and customer well-being, ultimately enhancing their overall app experiences and creating the purchase.

CONCLUSION, LIMITATION AND FURTHER RESEARCH

In conclusion, this study employed TST to evaluate customer technostress in restaurant food-ordering apps, including antecedents, consequences, and coping strategies. In semi-structured interviews with Egyptian restaurant customers and managers, the study identified techno stressors, including app complexity, security worries, frequent changes, limited control, and time restrictions. These techno stressors would increase customer dissatisfaction and purchase hesitancy, highlighting the need for appropriate coping mechanisms. Therefore, the study suggests restaurants use a customer orientation strategy to reduce customer technostress. However, not all restaurants use this strategy, indicating an industry gap. Hence, the study recommends improving app usability, data security, and proactive customer orientation to reduce customer technostress in restaurant apps.

Moreover, there are several limitations to consider. First, the study was conducted within the context of Egyptian restaurants, so the results may not apply to other cultural contexts. Future research could examine customer technostress in diverse cultural contexts to avoid this limitation. Second, the investigation depended on self-reported data, which may have been influenced by social desirability bias. Future research could use alternative data collection methods to mitigate this bias, such as mixed methods, which will also help to gain a comprehensive understanding of a research topic (Taherdoost, 2022). Third, the study did not investigate the influence of customer technostress on other critical outcomes such as customer loyalty, repeat purchase intentions, and word-of-mouth recommendations.

Future research could investigate the impact of customer technostress on these outcomes to address this limitation. Fourth, because the study used a qualitative method, the results may not be generalizable to a larger group. Consequently, future research should employ a quantitative method to acquire information from a larger sample size (Paoletti et al., 2021). Finally, the study only looked at customer technostress from restaurant food-ordering apps, so the

findings may not apply to other types of technology. Consequently, future research should investigate the efficacy of the proposed model with various restaurant customer-based technologies, such as self-service kiosks.

Author Contributions: Conceptualization, M.S.H. and M.Y.H.; methodology, M.Y.H. and B.A.B.; software, T.H.H. and O.M.A.; validation, O.M.A. and B.A.B. and N.N.E.; formal analysis, N.N.E. and M.Y.H.; investigation, M.S.H. and M.Y.H.; data curation, N.N.E. and B.A.B.; writing - original draft preparation, T.H.H. and N.N.E.; writing - review and editing, B.A.B. and N.N.E.; visualization, M.S.H. and T.H.H. and O.M.A.; supervision, M.S.H. and O.M.A.; project administration, N.N.E. and T.H.H. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [Grant No. 5049].

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [Grant No. 5049].

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Adams, W.C. (2015). Conducting Semi-Structured Interviews. In *Handbook of Practical Program Evaluation*, Wiley, 492-505.

Alalwan, A.A. (2020). Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse. *International Journal of Information Management, 50*, 28-44. https://doi.org/10.1016/j.ijinfomgt.2019.04.008

Ali, S., Khalid, N., Javed, H.M.U., & Islam, D.M.Z. (2021). Consumer Adoption of Online Food Delivery Ordering (OFDO) Services in Pakistan: The Impact of the COVID-19 Pandemic Situation. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(1), 10. https://doi.org/10.3390/joitmc7010010

Alshreef, M.A., Hassan, T.H., Helal, M.Y., Saleh, M.I., Tatiana, P., Alrefae, W.M., & Elsayed, M.A.S. (2023). Analyzing the Influence of eWOM on Customer Perception of Value and Brand Love in Hospitality Enterprise. *Sustainability, 15*(9), 7286. https://doi.org/10.3390/su15097286

Batouei, A., Boninsegni, M.F., Leung, X.Y., & Teoh, A.P. (2023). Enhancing Full-Service Restaurant Online Food Ordering Experiences: Which Factors Should Restaurants Emphasize? *International Journal of Hospitality & Tourism Administration*, 1-22. https://doi.org/10.1080/15256480.2023.2175289

Blocker, C.P., Flint, D.J., Myers, M.B., & Slater, S.F. (2010). Proactive customer orientation and its role for creating customer value in global markets. *Journal of the Academy of Marketing Science, 39*(2), 216-233. https://doi.org/10.1007/s11747-010-0202-9

Blut, M., & Wang, C. (2019). Technology readiness: a meta-analysis of conceptualizations of the construct and its impact on technology usage. *Journal of the Academy of Marketing Science, 48*(4), 649-669. https://doi.org/10.1007/s11747-019-00680-8

Brewer, P., & Sebby, A.G. (2021). The effect of online restaurant menus on consumers' purchase intentions during the COVID-19 pandemic. *International Journal of Hospitality Management, 94*, 102777. https://doi.org/10.1016/j.ijhm.2020.102777

Chopdar, P.K., & Paul, J. (2023). The impact of brand transparency of food delivery apps in interactive brand communication. *Journal of Research in Interactive Marketing*. https://doi.org/10.1108/JRIM-12-2022-0368

Christ-Brendemühl, S., & Schaarschmidt, M. (2020). The impact of service employees' technostress on customer satisfaction and delight: A dyadic analysis. *Journal of Business Research, 117*, 378-388. https://doi.org/10.1016/j.jbusres.2020.06.021

Cohen, S., Evans, G.W., Stokols, D., & Krantz, D.S. (2013). *Behavior, health, and environmental stress*: Springer Science & Business Media.

Daniel, C.O. (2019). Effects of job stress on employee's performance. *International Journal of Business Management and Social Research, 6*(2), 375-382. https://doi.org/10.18801/ijbmsr.060219.40

Daradkeh, F.M., Hassan, T.H., Palei, T., Helal, M.Y., Mabrouk, S., Saleh, M.I., & Elshawarbi, N.N. (2023). Enhancing Digital Presence for Maximizing Customer Value in Fast-Food Restaurants. *Sustainability, 15*(7), 5690. https://doi.org/10.3390/su15075690

Doeim, A.R., Hassan, T.H., Helal, M.Y., Saleh, M.I., Salem, A.E., & Elsayed, M.A.S. (2022). Service Value and Repurchase Intention in the Egyptian Fast-Food Restaurants: Toward a New Measurement Model. *International Journal of Environmental Research and Public Health, 19*(23), 15779. https://doi.org/10.3390/ijerph192315779

Fan, A., Wu, L., Miao, L., & Mattila, A.S. (2019). When does technology anthropomorphism help alleviate customer dissatisfaction after a service failure? – The moderating role of consumer technology self-efficacy and interdependent self-construal. *Journal of Hospitality Marketing & Management, 29*(3), 269-290. https://doi.org/10.1080/19368623.2019.1639095

Furunes, T., & Mkono, M. (2019). Service-delivery success and failure under the sharing economy. *International Journal of Contemporary Hospitality Management, 31*(8), 3352-3370. https://doi.org/10.1108/IJCHM-06-2018-0532

Griesbach, K., Reich, A., Elliott-Negri, L., & Milkman, R. (2019). Algorithmic Control in Platform Food Delivery Work. *Socius: Sociological Research for a Dynamic World, 5*, 237802311987004. https://doi.org/10.1177/2378023119870041

Hassanin, M.A., Salem, A.E., Helal, M.Y., Elshawarbi, N.N., Ahmed, I.S., & Mansour, N. (2023). The power of Integration Towards Sustainable Performance: A Model to Minimize Technostress Among Frontline Restaurant Employees by Combining Job and Employee Resources. *GeoJournal of Tourism and Geosites, 49*(3), 934-945. https://doi.org/10.30892/gtg.49310-1094

Helal, M.Y.I. (2022). The role of customer orientation in creating customer value in fast-food restaurants. *Journal of Hospitality and Tourism Insights, 6*(5), 2359-2381. https://doi.org/10.1108/JHTI-08-2022-0394

Helal, M.Y.I. (2023). The impact of fast-food restaurant customers' digital transformation on perceived value and well-being. *Journal of Hospitality and Tourism Technology, 14*(5), 893-907. https://doi.org/10.1108/JHTT-05-2022-0141

Husband, G. (2020). Ethical Data Collection and Recognizing the Impact of Semi-Structured Interviews on Research Respondents. *Education Sciences, 10*(8), 206. https://doi.org/10.3390/educsci10080206

Islam, T., Pitafi, A.H., Arya, V., Wang, Y., Akhtar, N., Mubarik, S., & Xiaobei, L. (2021). Panic buying in the COVID-19 pandemic: A multi-country examination. *Journal of Retailing and Consumer Services, 59*, 102357. https://doi.org/10.1016/j.jretconser.2020.102357

Ji, X., Nicolau, J.L., & Liu, X. (2023). Insights into managerial responses to repeat customers: the moderating role of social influence and revisit intention. *International Journal of Contemporary Hospitality Management*. https://doi.org/10.1108/IJCHM-10-2022-1193

Joffe, H. (2011). Thematic analysis. *Qualitative research methods in mental health and psychotherapy: A guide for students and practitioners*. Wiley-Blackwell, 209-223. https://doi.org/10.1002/9781119973249.ch15

Kang, J.W., & Namkung, Y. (2019). The role of personalization on continuance intention in food service mobile apps. *International Journal of Contemporary Hospitality Management, 31*(2), 734-752. . https://doi.org/10.1108/IJCHM-12-2017-0783

Kumar, V., Rajan, B., Salunkhe, U., & Joag, S.G. (2022). Relating the dark side of new-age technologies and customer technostress. *Psychology & Marketing, 39*(12), 2240-2259. https://doi.org/10.1002/mar.21738

Kupiek, M. (2021). *Digital Leadership, Agile Change and the Emotional Organization: Emotion as a Success Factor for Digital Transformation Projects*: Springer.

Lazarus, R.S. (1990). Theory-Based Stress Measurement. *Psychological Inquiry, 1*(1), 3-13. https://doi.org/10.1207/s15327965pli0101_1

Lee, S., Erdem, M., Anlamlier, E., Chen, C.C., Bai, B., & Putney, L. (2023). Technostress and hotel guests: A mere hurdle or a major friction point? *Journal of Hospitality and Tourism Management, 55*, 307-317. https://doi.org/10.1016/j.jhtm.2023.04.008

Maier, C., Wirth, J., Laumer, S., & Weitzel, T. (2017). Personality and Technostress: Theorizing the influence of IT mindfulness. *ICIS Proceedings*, 1-11.

Paoletti, J., Bisbey, T.M., Zajac, S., Waller, M.J., & Salas, E. (2021). Looking to the Middle of the Qualitative-Quantitative Spectrum for Integrated Mixed Methods. *Small Group Research, 52*(6), 641-675. https://doi.org/10.1177/1046496421992433

Petcharat, T., Jattamart, A., & Leelasantitham, A. (2023). A conceptual model to imply a negative innovation assessment framework on consumer behaviors through the electronic business platforms. *Journal of Retailing and Consumer Services, 74*, 103450. https://doi.org/10.1016/j.jretconser.2023.103450

Peters, L., Feste, J., & Schumacher, K. (2022). *Coping with IT! Antecedents and Consequences of Technostress in E-Commerce*. Paper presented at the Proceedings of the Annual Hawaii International Conference on System Sciences, 641-675. http://dx.doi.org/10.24251/hicss.2022.609

Schulze, A., Townsend, J.D., & Talay, M.B. (2022). Completing the market orientation matrix: The impact of proactive competitor orientation on innovation and firm performance. *Industrial Marketing Management, 103*, 198-214. https://doi.org/10.1016/j.indmarman.2022.03.013

Schweitzer, F., Palmié, M., & Gassmann, O. (2016). Beyond listening: the distinct effects of proactive versus responsive customer orientation on the reduction of uncertainties at the fuzzy front end of innovation. *R&D Management, 48*(5), 534-551. https://doi.org/10.1111/radm.12252

Shah, A.M., Yan, X., & Qayyum, A. (2021). Adoption of mobile food ordering apps for O2O food delivery services during the COVID-19 outbreak. *British Food Journal, 124*(11), 3368-3395. https://doi.org/10.1108/BFJ-09-2020-0781

Sharma, R., Dhir, A., Talwar, S., & Kaur, P. (2021). Over-ordering and food waste: The use of food delivery apps during a pandemic. *International Journal of Hospitality Management, 96*, 102977. https://doi.org/10.1016/j.ijhm.2021.102977

Showkat, D., & Choudhury, N.N. (2019). *Pathao Ride-sharing App Design*. Paper presented at the Conference Companion Publication of the 2019 on Computer Supported Cooperative Work and Social Computing, 372-376. https://doi.org/10.1145/3311957.3359467

Taherdoost, H. (2022). What are Different Research Approaches? Comprehensive Review of Qualitative, Quantitative, and Mixed Method Research, Their Applications, Types, and Limitations. *Journal of Management Science & Engineering Research, 5*(1), 53-63. https://doi.org/10.30564/jmser.v5i1.4538

Timur, B., Oğuz, Y.E., & Yilmaz, V. (2023). Consumer behavior of mobile food ordering app users during COVID-19: dining attitudes, e-satisfaction, perceived risk, and continuance intention. *Journal of Hospitality and Tourism Technology, 14*(3), 460-475. https://doi.org/10.1108/JHTT-04-2021-0129

Wahyudin, M., Chen, C.C., Yuliando, H., Mujahidah, N., & Tsai, K.M. (2023). Importance–performance and potential gain of food delivery apps: in view of the restaurant partner perspective. *British Food Journal*. https://doi.org/10.1108/BFJ-11-2022-1003

Wu, L., Liu, S.Q., Ma, S., & Hanks, L. (2022). Platform-centric vs. multi-party service failure: an examination of consumers' negative word of mouth about sharing economy platforms. *International Journal of Contemporary Hospitality Management, 35*(4), 1332-1375. https://doi.org/10.1108/IJCHM-12-2021-1559

Yoon, J., & Yu, H. (2022). Impact of customer experience on attitude and utilization intention of a restaurant-menu curation chatbot service. *Journal of Hospitality and Tourism Technology, 13*(3), 527-541. https://doi.org/10.1108/JHTT-03-2021-0089

Article history: Received: 31.09.2023 Revised: 14.11.2023 Accepted: 11.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1749-1756
DOI 10.30892/gtg.514 spl15-1170

A REVIEW OF DOMESTIC TOURISM RESILIENCE RESEARCH AGENDA IN AFRICA POST-COVID-19

Catherine KIFWORO*
Tourism Management, Faculty of Human Sciences, Vaal University of Technology, Vanderbijlpark, South Africa, e-mail: ckifworo@gmail.com

Kaitano DUBE
Ecotourism Management, Faculty of Human Sciences, Vaal University of Technology, Vanderbijlpark, South Africa, e-mail: kaitanod@vut.ac.za

Citation: Kifworo, C. & Dube, K. (2023). A REVIEW OF DOMESTIC TOURISM RESILIENCE RESEARCH AGENDA IN AFRICA POST-COVID-19. *GeoJournal of Tourism and Geosites*, 51(4spl), 1749–1756. https://doi.org/10.30892/gtg.514spl15-1170

Abstract: Domestic tourism emerged as a recovery strategy post-COVID-19. This study sought to identify domestic tourism research agendas in Africa post-COVID-19. Following a document review methodology, data was collected via an electronic search of journal articles on the Web of Science and SCOPUS. A total of 42 articles were reviewed and analysed using thematic analysis. It was established that product development, marketing, resilience, sustainability and measurement of domestic tourism were the main research agendas. Domestic tourism emerged as a complement rather than a substitute for international tourism. The study sets the agenda for African domestic tourism resilience and sustainability research.

Key words: Africa, COVID-19, Domestic Tourism, Resilience, Sustainability

* * * * * *

INTRODUCTION

Tourism plays a significant role in the economies of many African countries (Bama and Nyikana, 2021). The COVID-19 pandemic significantly impacted the tourism industry on a global scale (Gössling et al., 2021; Tung, 2021). In Africa, the pandemic propelled domestic tourism to the limelight as many destinations adopted it as a recovery strategy (Giddy and Rogerson, 2021; Mensah and Boakye, 2023; Soliku et al., 2021). Before the pandemic, most African countries relied on international tourism, which was viewed as more lucrative than its domestic counterpart (Emmy et al., 2023; Stone and Nyaupane, 2020). Among its many advantages, domestic tourism presents a more stable demand that is resilient to external threats (Setiawati, 2023; Xi and Xang, 2023). It is also known to aid in the geographical spread of tourism flows and economic benefits as domestic tourists explore remote and unknown areas in their country (World Travel Tourism Council, 2019). However, despite apparent benefits, domestic tourism in Africa is not research-driven and is often relegated to second place after international tourism (Kihima, 2015). It is often considered when international tourism faces a crisis rather than a significant segment (Matiza et al., 2022; Manono and Rotich, 2013).

In support of this opinion, Aburumman et al. (2023) argued that African destinations mostly use domestic tourism to recover from declining international flows. As tourism destinations move beyond recovery from COVID-19, issues of resilience and sustainable growth emerge. While recovery is short-term and mainly focuses on regaining the market share, resilience is long-term (Hynes et al., 2022). It refers to the ability to withstand change or crisis by adapting or maintaining a position (Folke et al., 2010). Hall et al. (2017) proposed that tourism resilience can be viewed from an individual, organisational, or destination level. Prayag (2020) expanded this to describe the levels of tourism resilience as macro level (tourism system), meso level (tourism supply chain), and micro level (tourists, individual businesses and host communities). Some authors consider resilience an alternative development model to sustainability (Lew et al., 2016), while others consider it a complementary concept (Espiner et al., 2017). Sustainability in the context of tourism is the ability to balance social, economic and environmental concerns of tourism.

It is important to note that COVID-19 is not the only crisis in tourism. In the past, the industry has faced other infectious disease outbreaks such as MERS, Ebola (Zhaowen et al., 2023), terror attacks (Novelli et al., 2018), climate change (Dube et al., 2023; Scott et al., 2019), cyclones (Nhamo and Dube, 2021), economic crisis (Bhakat et al., 2023), and war such as the Russia-Ukraine crisis (Kupika and Dube, 2023; OECD, 2022). These crises affect domestic tourism too, hence the significance of developing resilient and sustainable destinations informed by research. This study is a review paper that aims to pinpoint current research trends and identify potential research agendas for domestic tourism post covid.

It also points out practical implications for the industry that can inform resilience-building and sustainability initiatives. The study is novel since previous reviews on African domestic tourism were conducted before 2020, leaving out the post-COVID-19 period. Past reviews were also country-specific country, hence missing out on a regional perspective. This research article is structured as follows: The first section is the introduction, followed by the research methodology. The next part describes the findings, followed by the section on discussion of the findings, while the last part provides a conclusion.

* Corresponding author

MATERIALS AND METHODS

The research adopted a qualitative document review methodology, as proposed by Bowen (2009). The process involved finding, selecting, appraising and synthesising relevant data (Bowen, 2009). This method has been used to conduct reviews in the past by tourism scholars such as Hambira et al., 2022; Stone et al., 2021.

An online search was conducted on Scopus and Web of Science (WOS) databases, as they are international databases containing a wide range of high-quality publications in tourism. The search, guided by the keyword "domestic touris*", covered the period between April 2020 to August 2023. The initial search generated 553 documents from Scopus and 393 from Web of Science. The search was further refined using inclusion criteria that limited the selection to journal articles published in English focusing on Africa. After applying the criteria, the Scopus database yielded 24 articles, while WOS yielded 29. The two lists were then merged and checked for duplicates and relevance.

After removing 11 duplicates and 7 articles that were not relevant, a final combined list of 33 articles was realised. A further 9 articles were purposively selected from references of the combined list and added to result in a final sample of 42 articles. These 42 articles were then subjected to thematic analysis.

RESULTS AND DISCUSSIONS

It was evident that various methodologies have been employed in domestic tourism post-COVID-19. Most studies were empirical (81%), while 19% were conceptual, indicating an emerging trend of conceptual studies in tourism scholarship. Out of the empirical studies, 50% were quantitative, 26% were qualitative, and 24% were mixed-method studies. Table 1 shows the complete list of these studies and their respective methodologies.

Table 1. Number and methodology of journal articles analysed

QUANTITATIVE	QUALITATIVE	MIXED METHOD	CONCEPTUAL
Aburumman et al., 2023	Chakrabarti and Ekblom, 2023	Chamboko-Mpotaringa and Tichaawa, 2023	Bama et al., 2022
Aina and Ezeuduji, 2021	Melubo, 2020	Chetty and Ndlovu, 2022	Hambira et al., 2022
Bayih and Singh, 2020	Mensah and Boakye, 2023	Chebli et al., 2021	Matiza, 2020
Dlomo and Ezeuduji, 2020	Nyikana and Bama, 2022	Emmy et al., 2023	Mensah and Boakye, 2023
Matiza et al., 2022	Rogerson et al., 2021	Mwawaza et al., 2022	Rogerson and Baum, 2020
Matiza and Kruger, 2022	Saleem et al., 2022	Kifworo et al., 2020a	Shereni et al., 2023
Matiza and Slabbert, 2022	Soliku et al., 2021	Kifworo et al., 2020b	Stone et al., 2021
Nunkoo et al., 2022	Stone and Nyaupane, 2020	Kifworo et al., 2020c	Timothy, 2020
Odunga et al., 2020	Tichaawa, 2021		
Osiako et al., 2022			
Raafat et al., 2023			
Ragab et al., 2020			
Rodgerson and Rodgerson, 2023			
Seyfi et al., 2022			
Vermeulen-Miltz et al., 2022			
Wilkinson et al., 2021			
Wireko -Gyebi,2022			

Themes observed in the studies reviewed

The study sought to identify a research agenda for domestic tourism that would propel the segment towards resilience and sustainability in Africa post-COVID-19. The findings revealed the following themes: COVID-19 and domestic tourism, predicting domestic tourism behaviour, marketing of domestic tourism, economic, environmental and social impacts of domestic tourism, and conceptualising domestic tourism. These are illustrated in Table 2.

Table 2. Summary of emerging codes and themes

Code	Emerging sub-theme	Final Research Themes
Impacts of COVID-19 and domestic tourism	Covid and domestic tourism	Resilience
Responses, adaptations and recovery strategies from COVID-19		
Demographic characteristics	Predicting domestic tourism behaviour and demand	Marketing domestic tourism Product development
Psychographic characteristics		
Motivation for domestic tourism		
Preferences for domestic tourism		
Constraints for domestic tourism		
Informal domestic business travellers	Segmentation, targeting and marketing	
Visiting Friends and Relatives		
Domestic Non-tourists		
Technology/ digital marketing		
Domestic tourism and host communities- Social issues	Balancing the economic benefits of increasing domestic tourism numbers versus environmental and social concerns	Sustainability
Conservation/environmental issues of domestic tourism		
Definition and measurement of domestic tourism demand data	Conceptualisation of domestic tourism	Monitoring and evaluation of domestic tourism

COVID-19 and domestic tourism

Most of the reviewed studies on domestic tourism post-COVID-19 were focused on the pandemic and its implications on domestic tourism (Aburumman et al., 2023; Hambira et al., 2022; Nunkoo et al., 2022; Nyikana and Bama, 2022; Salem et al., 2022; Soliku et al., 2021; Vermeulen-Miltz et al., 2022). Some of the studies, however, were not exclusively on domestic tourism but mentioned domestic tourism as a recovery strategy from COVID-19 (Chakrabarti and Ekblom, 2023; Giddy and Rogerson, 2021; Mensah and Boakye, 2023; Rogerson and Baum, 2020; Rogerson et al., 2021; Soliku et al., 2021). Some focused on other aspects of domestic tourism that were not directly related to COVID-19 (Kifworo et al., 2020a; Kifworo et al., 2020b; Kifworo et al., 2020c; Odunga et al., 2020; Timothy, 2020).

The COVID-19 pandemic caused significant disruptions to domestic tourism due to the implementation of total or partial lockdown measures (Soliku et al., 2021; Vermeulen-Miltz et al., 2022). Even when the lockdown was lifted, the perceived risk arising from the pandemic negatively affected the travel intention of domestic tourists (Aburumman et al., 2023). Domestic tourism also emerged as a catalyst in spreading COVID-19 morbidity and mortality, justifying some destinations' containment measures in the pandemic's initial stages (Nunkoo et al., 2021). Despite the disruptions, domestic tourism was the first to recover, as most destinations lifted restrictions locally before allowing international travel (Bama and Nyikana, 2021). Even when the restrictions on international travel were eventually lifted, the stringent travel conditions imposed served as a deterrent to international travel (Rodgerson and Rodgerson, 2021). The preference for domestic tourism was also perpetuated by the perception that "home was safer than abroad" (Wolff et al., 2019, p.6). While this is a positive trend, debates abound on whether domestic tourism is a substitute for international tourism or is a short-term reaction to the COVID-19 pandemic (Seyfi et al., 2022). Indeed, studies such as Matiza and Slabbert (2022) and Matiza et al. (2022) argue that the shift to domestic tourism in many destinations is crisis-induced. This brings to question the ability of African destinations to maintain the momentum towards domestic tourism, hence the concern about resilience.

Responses and recovery strategies

The review revealed immediate responses to the COVID-19 pandemic and long-term recovery strategies by various stakeholders. The initial responses were short-term measures meant to help tourism survive the crisis. They included government responses such as policy and marketing interventions (Mensah and Boakye, 2023). They also included responses by individual tourism businesses such as laying off staff, marketing through social media, price reductions, downsizing and product diversification (Rogerson et al., 2021). There was also stakeholder support for Small and Medium Enterprises (SMEs) in finances and skills development (Soliku et al., 2021). Hence, there was a collaboration between the governmental and private sectors in instituting these response operations (Nyikana and Bama, 2022).

Recovery strategies for the entire tourism industry and those specific to domestic tourism were also featured widely. Domestic tourism served as a recovery strategy for many destinations (Chakrabarti and Ekblom, 2023; Hambira et al., 2022; Mensah and Boakye, 2023; Nyikana and Bama, 2022; Rodgerson and Baum, 2020; Shereni et al., 2023; Soliku et al., 2021). Some scholars argue that domestic tourism is only a springboard to recovery that has short-lived gains (Nyikana and Bama, 2022). Before the pandemic, some African destinations did not focus on domestic tourism but relied heavily on international tourism (Emmy et al., 2023). This raises concerns about whether destinations will maintain attention to domestic tourism or revert their focus to the seemingly more lucrative international tourism and neglect the domestic market.

In addition to its role in revitalising the tourism sector, domestic tourism also experienced a significant decline during the pandemic that warranted attention. Therefore, strategies focused on domestic tourism recovery and long-term growth emerged from the review. One emerging strategy was product diversification beyond the current product offering (Stone et al., 2021). Kifworo et al. (2020c) observed that product variety was ranked higher than disposable income in determining participation in domestic tourism. Empirical evidence indicates that preferences in international markets differ from those in domestic markets; hence necessitating product customisation to cater to the domestic tourism market (Adinolfi et al., 2021; Melubo, 2020; Stone et al., 2021). Beyond availing the right product offering, it is also essential to adopt marketing strategies that appeal to the domestic market (Chamboko-Mpotaringa and Tichaawa., 2023). As stated earlier, the domestic market exhibits heterogeneity, rendering a generic marketing approach impractical (Matiza et al., 2022).

Technology use in marketing also took centre stage, with social media being instrumental in domestic tourism post-pandemic marketing (Aina and Ezeuduji, 2021). Adopting digital marketing by domestic tourists necessitates a comprehensive understanding of their favoured platforms (Chamboko-Mpotaringa and Tichaawa, 2023). For instance, social media influencers greatly influenced the Millennials and Generation Z market (Aina and Ezeuduji, 2021; Raafat et al., 2023). In addition to advertising, public education and awareness creation are essential in stimulating a travel culture among the local communities (Soliku et al., 2021). Marketers must also know and understand how to effectively package their marketing messaging for the domestic market. Where possible, the destination image should be co-created with the locals to avoid the stereotypical Western image that targets international tourists (Melubo, 2020; Stone and Nyaupane, 2020).

In addition to developing a suitable product and effectively promoting it to the intended target market, it is crucial to ascertain that it is affordable. One of the significant constraints to domestic tourism in Africa has been the lack of disposable income (Adinolfi et al., 2021; Aina and Ezeuduji, 2021; Kifworo et al., 2020c). Various initiatives were put forward post-COVID-19 to mitigate this constraint. Melubo (2020) suggested supporting economic opportunities for locals to create disposable income. (Giddy and Rogerson., 2021) suggested affordable or dual pricing for domestic tourists. Other initiatives encouraged a culture of saving for holidays. Adinolfi et al. (2021) proposed savings for tourism through stokvels and lay-by-lay arrangements that enable tourists to pay for their holidays at their own pace as they meet other obligations.

Domestic tourism behaviour and demand

With domestic tourism being viewed as a significant recovery strategy by most tourism destinations (Mensah and Boakye, 2023), there has been a need to grow domestic tourism to the pre-pandemic level and beyond. Previously, it has been erroneously assumed that the international tourism product equally appeals to domestic tourists (Kifworo et al., 2020b). Thus, studies focused on predicting domestic tourism behaviour and demand are critical. Many factors, including demographic characteristics, psychographic characteristics, preferences, constraints and motivation, determine tourist demand. These factors are used to profile and segment the market, as demonstrated by Matiza and Kruger (2022), who profiled domestic tourists based on socio-demographics, push factors, constraints and willingness to pay.

Age, education, marital status, occupation, and gender are significant demographic determinants of domestic tourism demand (Kifworo et al., 2020b; Dlomo and Ezeuduji, 2020; Matiza and Kruger, 2022). For instance, females with tertiary education are more likely to travel than their male counterparts (Aina and Ezeuduji, 2021). In addition to demographic factors, psychographic characteristics have also been used in domestic market segmentation. Matiza et al. (2022) identified four psychographic segments that could be targeted for domestic tourism: Psychocentric, Traditional idealist, Apprehensive and Despondent domestic tourists. Preferences inform tourism product development and shape marketing messages (Kifworo et al., 2020a). Mwawaza et al. (2022) noted domestic tourists' preference for diverse and affordable tourism products. Domestic tourists also prefer technology-based marketing, mainly social media (Aina and Ezeuduji, 2021; Dlomo and Ezeuduji, 2020). Additionally, domestic tourists prefer destinations with enhanced security (Dlomo and Ezeuduji, 2020), and with niche tourism products (Chebli et al., 2021; Kifworo et al., 2020a). Motivation and constraints are other significant drivers of tourism demand. Among the constraints revealed by the study were a lack of disposable income, lack of product variety, lack of travel culture, and high cost of tourism products (Aina and Ezeuduji, 2021; Adinolfi et al., 2021; Kifworo et al., 2020c; Melubo, 2020; Mensah and Boakye, 2023; Shereni et al., 2023). Other constraints are a lack of local interpretation services (Melubo, 2020) and health risks (Aburumman et al., 2023).

As for motivation, both pull and push factors significantly affected domestic tourist satisfaction and intention to visit and revisit (Bayih and Singh, 2020; Osiako et al., 2022). The push factors represent the reason for wanting to participate in tourism, while the pull factors are destination attributes that respond to the need. Wireko-Gyebi (2022) noted that students in tertiary institutions were motivated by escapist and social motives. The domestic market exhibits pull and push factors heterogeneity (Matiza and Slabbert, 2022; Matiza et al., 2022). This calls for a differentiated approach, as not all domestic tourists are alike. Though not fully exploited, Indigenous knowledge systems are pull factors for domestic tourism and could be used to develop niche tourism products (Shereni et al., 2023). Chebli et al. (2021) supported the sentiment and observed that domestic tourists seek niche authentic, and immersive cultural experiences instead of mass tourism.

Regarding identifying market segments for domestic tourism, Kifworo et al. (2020b) identified viable demographic segments of non-tourists with the highest potential for conversion into domestic tourists. These include the youth, retirees/empty nesters and high-income earners who favour outbound tourism. Studying non-tourist perspectives yields information on why people are not participating in tourism, informing marketing and product strategies required to harness new markets (Kifworo et al., 2020b; Matiza and Kruger, 2022). Tichaawa (2021) identified five segments of informal domestic business travellers that could be harnessed for domestic tourism.

These are informal salespeople, shop owners, herdsmen, local farmers and wholesalers. Visiting Friends and Relatives (VFR) is another significant segment that drives domestic tourism in Africa and has excellent potential for expansion (Rodgerson and Baum, 2020; Tichaawa, 2021). However, there are concerns about whether VFR will move beyond numbers and sustain domestic tourism in the long run (Rogerson and Rogerson, 2023).

Resilience and Sustainability Concerns for Domestic Tourism

Growing domestic tourism in Africa has socioeconomic and environmental implications that destinations must navigate as they strive towards resilience (Chetty and Ndlovu, 2022; Rodgerson and Baum, 2020). Economically, there have been concerns about whether destinations can bear the economic implications of expanding domestic tourism in Africa, as citizens may not have the spending capacity of international visitors who bring in foreign currency (Bama et al., 2022). These concerns underscore the issues pertaining to domestic tourism expenditure. Tourism businesses are concerned about reduced income from implementing dual pricing to attract cash-strapped domestic tourists who cannot afford tourism priced for the international market (Rodgerson and Baum, 2020).

The COVID-19 pandemic demonstrated the need to reposition through price cuts, marketing and product innovation to attract domestic tourists to nature-based destinations, which were previously highly dependent on international tourism (Chakrabarti and Ekblom, 2023; Giddy and Rogerson, 2021). While others view this shift as critical in sustaining income in the short run, some argue that price reduction will taint the destination's image, reduce profitability (Rodgerson and Baum, 2020) and result in mass tourism with adverse environmental effects (Stone et al., 2021). Consequently, there is a need to move beyond increasing domestic tourism numbers to environmental protection (Chetty and Ndlovu, 2022) and provide satisfying experiences for customer loyalty and long-term resilience (Chebli et al., 2021).

On the social front, it is suggested that making domestic tourism more accessible to host communities around protected areas helps to mitigate human-wildlife conflicts as communities appreciate and support conservation (Wilkinson et al., 2021). Increasing access goes beyond reducing the cost of tourism. It involves including host communities as tourism partners rather than just hosts. Inclusion can be achieved by involving them in marketing, creating products that appeal to locals and favourable pricing (Stone and Nyaupane, 2020). Promoting community-based tourism can also achieve social justice within tourism destinations. Environmental concerns about domestic tourism were also emergent. Promoting

domestic tourism may negatively affect the protected areas in nature-based destinations with high visitations (Stone et al., 2021). Environmental concerns also extend to domestic beach tourists. The beach is a popular destination with domestic tourists (Kifworo et al., 2020a). According to Chetty and Ndlovu (2022), beachgoers are known to be careless with waste disposal/and exhibit poor waste management. They further advocated for the inclusion of tourists in stakeholder collaboration for sustainable tourism in areas such as environmental education, code of conduct, enforcement and policing. The other environmental concern is the contribution of domestic tourism to carbon emissions. Though domestic travel in Africa is mainly short-haul, domestic tourism may still localise emissions unless low-carbon transport is used (Seyfi et al., 2022). Thus, domestic tourism providers and consumers need to adopt low-carbon initiatives.

Definition and measurement of domestic tourism demand data

The definition and measurement of domestic tourism have consistently been debated among tourism researchers. This discourse has been challenging due to the need for precise data collection indicators, sources and methods and ambiguity in definitions of domestic tourism (Ragab et al., 2022). Traditionally, domestic tourism has been defined as the activities of persons travelling to and staying outside their usual environment but within their country of residence for less than one year for leisure, business and other personal purposes unrelated to work or employment (UNWTO, 2010). These traditional definitions have been challenged, including travel within one's country of residence, same-day excursions, one's usual environment, and travel to contested territories within one's country (Timothy, 2020).

Additionally, certain activities, such as those associated with visiting friends and relatives (VFR) or engaging in business-related travel, resemble leisure activities or align with work-related travel. Consequently, the definition of domestic tourism becomes ambiguous (Rodgerson and Baum, 2020). Thus, there is a need to re-conceptualise the parameters of domestic tourism. It is commendable that tourism satellite accounts have been used to measure the economic contribution of domestic tourism (Odunga et al., 2020). However, other aspects, such as accounting for all the domestic tourist flows, still need to be improved. Quantifying domestic tourism contributes to the discourse on whether domestic tourism is merely a recovery strategy or a resilient and sustainable segment.

DISCUSSION

For most African destinations, COVID-19 propelled and gave prominence to domestic tourism. While domestic tourism kept many destinations afloat during the pandemic and has been instrumental in recovery, stakeholders are concerned about its ability to thrive beyond the crisis in Africa. It is, therefore, vital to interrogate domestic tourism as Africa transitions from being a host destination reliant on external tourism source markets to its own source market. Two prominent angles arise, one being how to grow the segment and the second one being ensuring resilience and sustainability. The review findings focus on increasing access and returns concerning growing domestic tourism. Domestic tourist expenditure is seen as less than international tourism, which translates to less income. As Rodgerson and Baum (2020) stated, domestic tourists are majorly cash-constrained nationals and, hence, have a reduced ability to pay more for tourism. This constraint leads to price reductions, hence, reduced business income. This limitation is also observed by the OECD (2022), which posits that domestic tourism cannot compensate for the loss of international tourism, which comes with the further advantage of strong foreign currencies.

The cost of tourism is a concern in most African tourism destinations (Mwawaza et al., 2022; Woyo, 2021). Beyond availing the right products to the right target audience, it is crucial to ensure they are affordable. The industry has been mitigating affordability by using a dual pricing model with lower rates to lure the domestic market. However, this can also be challenging as tourism establishments strive to ensure that the domestic market yields comparable income to the international market. At this point, it would be prudent to segment the domestic market into high-end and budget markets.

The high-end domestic market seeks premium and unique products. Evidence shows that some domestic tourists do not rank income or cost of products as a constraint but rather find the lack of product variety to be most challenging (Kifworo et al., 2020c). This segment is okay with paying a premium for unique and memorable experiences and would benefit from niche products. Thus, this is an opportunity to create high-end tourism products that attract premium domestic tourists who would otherwise opt for outbound tourism. This market share is, however, small.

The budget domestic tourists who form the majority are price sensitive and would benefit from the dual pricing. Other behavioural strategies, such as encouraging a culture of saving for holidays, are also helpful. Tour operators in some parts of Africa have tapped into groups that save together, such as Stokvels in South Africa (Adinolfi et al., 2021) and Chamas in Kenya (Mathuva, 2022). Other initiatives involve flexible pre-payment modes that allow payment by instalment.

Regarding marketing, it is necessary to contextualise domestic tourism within the African region by utilising preference research to customise products and marketing messages (Kifworo et al., 2020b; Matiza and Kruger, 2022). Since the domestic market is not homogenous, a heterogenous approach based on identified market segments should be adopted (Matiza et al., 2022). Research should also move beyond focusing only on current tourists to include examination of non-tourists. People not currently participating in tourism (non-tourists) present potential new market segments that can increase participation in destinations with low domestic tourism (Li et al., 2016). It is also evident that technology, especially social media influencers, is very influential in creating awareness of remote destinations and instilling a travel culture amongst peers. Growing domestic tourism may also include the inclusion of locals in tourism marketing, management and supply chains. Arrangements to allow locals to have controlled access to cultural and natural resources that were historically at their disposal can contribute to a change in perspective towards tourism. Additionally, as destinations grow domestic tourism, measures should be taken to ensure that destination carrying capacity is not exceeded. Over tourism in the form of congestion, competition for amenities, transportation, accommodation, and challenges in waste management in the

destination may occur. More studies are required to ascertain whether domestic tourism results in less carbon footprint given that it is often short-haul. Green tourism should be incorporated into awareness messages for domestic tourism, such as carbon literacy. The awareness will empower domestic tourists to make sustainable travel choices.

Destinations must move domestic tourism beyond recovery to build resilience towards future crises and sustainability. In order to achieve this, there is a need for a mechanism that can monitor progress and identify potential adverse effects requiring mitigation. Developing a monitoring and evaluation framework for domestic tourism is crucial in clarifying definitions, data sources, indicators to be measured, and methods to be used. The framework will facilitate continuous monitoring and periodic assessment of resilience and sustainability.

CONCLUSION

Several practical implications and research gaps have emerged from this review that require further attention as part of the domestic tourism research agenda. Firstly, the industry and other stakeholders should treat domestic tourism as a complement to international tourism rather than a substitute, competitor, or fallback option whenever there is a crisis. Whereas international tourism compensates in terms of relatively higher returns, domestic tourism compensates in stability and ironing out seasonality. The two segments should be marketed and developed simultaneously as informed by customised research.

Secondly, there is also a need to empower SMEs in African domestic tourism destinations regarding capacity building, access to finance, carbon literacy and digital technology, as they serve a large proportion of the budget domestic tourism segment. Thirdly, in terms of research gaps, there is a need for research on domestic tourism product preferences and marketing strategies targeting new segments such as the VFR, informal business travellers and niche or special interest tourism. Fourthly, research on domestic tourism's economic, social and environmental impacts should be conducted. This will be instrumental in informing domestic tourism's resilience and sustainability measures. Lastly, studies on redefinitions and measurement of domestic tourism are needed. These will help to develop a robust monitoring and evaluation strategy to measure and monitor resilience and sustainability. They will also contribute to theory development for domestic tourism.

Author Contributions: Conceptualization, C.K and K.D.; methodology, C.K and K.D.; software, C.K and K.D.; validation, C.K and K.D.; formal analysis, C.K and K.D.; investigation, C.K and K.D; data curation, C.K and K.D.; writing - original draft preparation, C.K and K.D.; writing - review and editing, C.K and K.D; visualization, C.K and K.D.; supervision, C.K and K.D.; project administration, C.K and K.D. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Aburumman, A., Abou-Shouk, M., Zouair, N., & Abdel-Jalil, M. (2023). The Effect of Health-Perceived Risks on Domestic Travel Intention: The Moderating Role of Destination Image. *Tourism and Hospitality Research*, 14673584231172376. https://doi.org/10.1177_14673584231172376

Adinolfi, M.C., Harilal, V., & Giddy, J.K. (2021). Travel Stokvels, Leisure on Lay-by, and Pay at Your Pace Options: The Post COVID-19 Domestic Tourism Landscape in South Africa. *African Journal of Hospitality, Tourism and Leisure*, 10(1), 302–317. https://doi.org/10.46222/ajhtl.19770720-102

Aina, A.O., & Ezeuduji, I.O. (2021). The Influence of Socio-Demographic Factors on Perceptions of Domestic Tourism: The Case of Generation Z. *African Journal of Hospitality, Tourism and Leisure*, 10(4), 1503-1515. https://doi.org/10.46222/ajhtl.19770720.175

Bama, H.K.N., Nyathela-Sunday, T., & Makuzva, W. (2022). What Innovations Would Enable the Tourism and Hospitality Industry in Africa to Re-Build? *Worldwide Hospitality and Tourism Themes*, 14(6), 557-564. https://doi.org/10.1108/WHATT-05-2022-0058

Bama, H.K.N., & Nyikana, S. (2021). The effects of COVID-19 on future domestic travel intentions in South Africa: a stakeholder perspective. *African Journal of Hospitality, Tourism and Leisure*, 10(1), 179-193. https://doi.org/10.46222/ajhtl.19770720-94

Bayih, B.E., & Singh, A. (2020). Modelling domestic tourism: Motivations, satisfaction and tourist behavioural intentions. *Heliyon*, 6(9), e04839. https://doi.org/10.1016/j.heliyon.2020.e04839

Bhakat, A., Nirmalya, D.A.S., & Guchhait, S. (2023). Temporal Change of Foreign Tourism in Sri Lanka: A Study on Economic Perspective. *Journal of Environmental Management and Tourism*, 14(6), 2786-2798. https://doi.org/10.14505/jemt.v14.6(70).25.

Bowen, G.A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*, 9(2), 27-40.

Chakrabarti, S., & Ekblom, A. (2023). Covid-19 pandemic effects and responses in the Maasai Mara Conservancy. *Tourism and Hospitality Research*. https://doi.org/10.1177_14673584231162275

Chamboko-Mpotaringa, M., & Tichaawa, T.M. (2023). Sustainability of digital marketing strategies for driving consumer behaviour in the domestic tourism industry. *Studia Periegetica*, 43 (3). https://doi.org/10.58683/sp.570

Chebli, A., Kadri, B., & Said, F.B. (2021). Promotion of Domestic Tourism by Enhancing the Practice of Alternative Tourism as a Quality Measure to Satisfy and Retain National Tourists. *Journal of Tourism and Services*, 12(23), 61-85. https://doi.org/10.29036/jots.v12i23.274

Chetty, P., & Ndlovu, J. (2022). Impact of Environmental Education on Waste Disposal Behaviour of Beachgoers on the Durban Central Beachfront. *African Journal of Hospitality, Tourism and Leisure*, 11(6), 1899-1912. https://doi.org/10.46222/ajhtl.19770720.331

Dlomo, N.C., & Ezeuduji, I.O. (2020). Local Residents' Assessment of South Africa as a Domestic Leisure Travel Destination. *African Journal of Hospitality, Tourism and Leisure*, 9(3), 335-348. https://doi.org/10.46222/ajhtl.19770720-22

Dube, K., Nhamo, G., Kilungu, H., Hambira, W.L., El-Masry, E.A., Chikodzi, D., & Molua, E.L. (2023). Tourism and Climate Change in Africa: Informing Sector Responses. *Journal of Sustainable Tourism*, 1-21. https://doi.org/10.1080/09669582.2023.2193355

Emmy, T., Callixte, K., & Mahina, J.N. (2023). Domestic Tourism Strategies and its Implications on Economic Growth: Case Study of Rwandan National Parks. *East African Journal of Business and Economics*, 6(1), 193–202. https://doi.org/10.37284/eajbe.6.1.1290

Espiner, S., Orchiston, C., & Higham, J. (2017). Resilience and sustainability: A complementary relationship? Towards a practical conceptual model for the sustainability–resilience nexus in tourism. *Journal of Sustainable Tourism*, 25(10), 1385–1400. https://doi.org/10.1080/09669582.2017.1281929

Folke, C., Carpenter, S.R., Walker, B., Scheffer, M., Chapin, T., & Rockstrom, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society*, 15(4), 20. https://www.jstor.org/stable/26268226

Giddy, J.K., & Rogerson, J.M. (2021). Nature-Based Tourism Enterprise Adaptive Responses to COVID-19 in South Africa. *GeoJournal of Tourism and Geosites*, 36(2), 698-707. https://doi.org/10.30892/gtg.362spl18-700

Gössling, S., Scott, D., & Hall, M. (2021). Pandemics, tourism, and global change: a rapid assessment of COVID-19. *Journal of Sustainable Tourism*, 29(1), 1-20. https://doi.org/10.1080/09669582.2020.1758708

Hall, C.M., Prayag, G., & Amore, A. (2017). *Tourism and Resilience: Individual, organisational and Destination Perspectives*. Channel View Publications. https://doi.org/10.21832/9781845416317

Hambira, W.L., Stone, L.S., & Pagiwa, V. (2022). Botswana nature-based tourism and COVID-19: transformational implications for the future, *Development Southern Africa*, 39 (1), 51-67. https://doi.org/10.1080/0376835X.2021.1955661

Hynes, W., Trump, B.D., Kirman, A., Haldane, A., & Linkov, I. (2022). Systemic resilience in economics. *Nature Physics*, 18(4), 381-384. https://doi.org/10.5751/ES-10385-230434

Kifworo, C., Okello, M., & Mapelu, C. (2020a). The influence of travel preferences on domestic tourism participation behaviour in Kenya: An analysis of tourists and non-tourists. International *Journal of Tourism and Hospitality Reviews*, 7 (1), 40-50. https://doi.org/18510/ijthr.2020.715

Kifworo, C., Okello, M.M., & Mapelu. (2020b). Demographic Profiling and Domestic Tourism Participation Behavior in Nairobi County, Kenya. *Journal of Tourism Management Research, Conscientia Beam*, 7(2), 155-169. https://doi.org/10.18488/journal.31.2020.72.155.169

Kifworo, C., Okello, M., & Mapelu, C. (2020c). The Role of Constraints in Determining Domestic Tourism Participation Behaviour: A Comparison of the Perspectives of Domestic Tourism Participants and Non-Participants. *Ottoman Journal of Tourism and Management Research*, 5(2), 643-661. https://doi.org/10.26465/ojtmr.2018339534

Kihima, B.O. (2015). Domestic tourism in Kenya: Trends, Initiatives and practices. *The East African Review*, 50(May), 22–39. https://doi.org/10.4000/eastafrica.289

Kupika, O.L., & Dube, K. (2023). A Resilient Tourism Future for Developing Countries: Conclusions and Recommendations. In *COVID-19, Tourist Destinations and Prospects for Recovery: Volume Three: A South African and Zimbabwean Perspective*, 293-310, Cham: Springer International Publishing.

Lew, A.A., Ng, P.T., Ni, C.C., & Wu, T.C. (2016). Community sustainability and resilience: Similarities, differences and indicators. *Tourism Geographies*, 18(1), 18–27. https://doi.org/10.1080/14616688.2015.1122664

Li, H., Meng, F., & Zhang, Z. (2016). Non-participation of Domestic Tourism: Analysing the Influence of Discouraging Factors. *International Journal of Tourism Research*, 18(6), 567–578. https://doi.org/10.1002/jtr.2074

Manono, G., & Rotich, D. (2013). Seasonality Effects on Trends of Domestic and International Tourism: A Case of Nairobi National Park, Kenya. 3(1), 131–140.

Mathuva, D. (2022). Savings Groups in Kenya: A Contextualised Literature Review on Savings Groups in Kenya. In Redford, D.T. & Verhoef, G. (Eds.) *Transforming Africa* 163-178, Emerald Publishing Limited, Bingley. https://doi.org/10.1108/978-1-80262-053-520221013

Matiza, T., & Kruger, M. (2022). Profiling the South African Recreational Domestic Tourist in the Era of COVID-19. *Leisure Sciences*, 1-22. https://doi.org/10.1080/01490400.2022.2046525

Matiza, T., Kruger, M., & Slabbert, E. (2022). Delineating the South African domestic tourist's behaviour amid a crisis: A psychographic segmentation approach. *The Retail and Marketing Review*, 18(2), 1-17. https://hdl.handle.net/10520/ejc-irmr1_v18_n2_a2

Matiza, T., & Slabbert, E. (2022). Tourism Reset: Reimagining South African Domestic Tourism in the Era of Covid-19. *Tourism Review International*, 26(1). https://doi.org/10.3727/154427221X16098837280037

Matiza, T. (2020). Post-COVID-19 crisis travel behaviour: towards mitigating the effects of perceived risk. *Journal of Tourism Futures*, 8(1), 99-108. https://doi.org/10.1108/JTF-04-2020-0063

Melubo, K. (2020). Is there room for domestic tourism in Africa? The case of Tanzania. *Journal of Ecotourism*, 19(3), 248-265. https://doi.org/10.1080/14724049.2019.1689987

Mensah, E.A., & Boakye, K.A. (2023). Conceptualizing Post-COVID 19 Tourism Recovery: A Three-Step Framework. *Tourism Planning and Development*, 20(1),37-61. https://doi.org/10.1080/21568316.2021.1945674

Mwawaza, S.M., Kariuki, A.C., & Ndubi, E.O. (2022). Tourism Product Influence on Domestic Tourist's Choice of Mombasa County, Kenya. *African Journal of Hospitality, Tourism and Leisure*, 11(3), 1188-1198. https://doi.org/10.46222/ajhtl.19770720.284

Nhamo, G., & Dube, K. (2021). Cyclones in Southern Africa. Springer International Publishing.

Novelli, M., Burgess, L.G., Jones, A., & Ritchie, B.W. (2018). 'No Ebola… still doomed'–The Ebola-induced tourism crisis. *Annals of Tourism Research*, 70, 76-87.

Nunkoo, R., Daronkola, H.K., & Gholipour, H.F. (2022). Does domestic tourism influence COVID-19 cases and death? *Current Issues in Tourism*, 25(3), 338-351. https://doi.org/10.1080/13683500.2021.1960283

Nyikana, S., & Bama, H. (2023). Domestic tourism as a recovery strategy in the face of COVID-19: Insights from South Africa. *Acta Commercii*, 23(1), a1066. http://dx.doi.org/10.4102/ac.v23i1.1066

Odunga, P.O., Manyara, G., & Yobesia, M. (2020). Estimating the direct contribution of tourism to Rwanda's economy: Tourism satellite account methodology. *Tourism and Hospitality Research*, 20(3), 259–271. https://doi.org/10.1177/1467358419857786

OECD (2022), *OECD Tourism Trends and Policies 2022*, OECD Publishing, Paris. Available at: https://doi.org/10.1787/a8dd3019-en

Osiako, P.O., Kummitha, H.R., & Szente, V. (2022). Motivational decisions, satisfaction, and revisit behaviour of domestic tourists: An empirical analysis. *GeoJournal of Tourism and Geosites*, 44(4), 1442-1449. https://doi.org/10.30892/gtg.44432-964

Prayag, G. (2020). Time for reset? COVID-19 and tourism resilience. *Tourism Review International*, 24(2), 179–184. https://doi.org/10.3727/154427220X15926147793595

Raafat, M., Montaser, N., & Soliman, D. (2023). The Impact of Social Media Influencer's credibility on the Travel Intentions of the Egyptian Millennials: Applied to Domestic tourism. *GeoJournal of Tourism and Geosites*, 47(2), 656–663. https://doi.org/10.30892/gtg.47234-1066

Ragab, A., Smith, S., Ragab, A.M., & Meis, S. (2020). Domestic Tourism Statistics: A Comparative Analysis of Demand Data Coverage and Method. *Tourism Review International*, 24(1), 5-21. https://doi.org/10.3727/154427220X15791346544752

Rogerson, C.M., & Rogerson, J.M. (2023). VFR Travel and COVID-19 Impacts: The South African Experience. *GeoJournal of Tourism and Geosites*. 48(2), 717-724. https://doi.org/10.30892/gtg.482spl05-1071

Rogerson, C.M., & Rogerson, J.M. (2021). COVID-19 and changing tourism demand: research review and policy implications for South Africa. *African Journal of Hospitality, Tourism and Leisure*, 10(1), 1–21. https://doi.org/10.46222/ajhtl.19770720-83

Rogerson, J.M., Lekgau, R.J., Mashapa, M.M., & Rogerson, C.M. (2021). COVID-19 and Local Business Responses: Evidence from South Africa's most Tourism-Dependent Locality. *African Journal of Hospitality, Tourism and Leisure*, 10(1), 388–405. https://doi.org/10.46222/ajhtl.19770720-107

Rogerson, C.M., & Baum, T. (2020). COVID-19 and African tourism research agendas. *Development Southern Africa*, 37(5), 727-741. https://doi.org/10.1080/0376835X.2020.1818551

Salem, I.E., Elkhwesky, Z., & Ramkissoon, H. (2021). A content analysis for Government's and hotels' response to COVID-19 pandemic in Egypt. *Tourism and Hospitality Research*, 22(1), 42–59. https://doi.org/10.1177/14673584211002614

Seyfi, S., Hall, C.M., & Saarinen, J. (2022). Rethinking sustainable substitution between domestic and international tourism: a policy thought experiment. *Journal of Policy Research in Tourism, Leisure and Events*, 1-15. https://doi.org/10.1080/19407963.2022.2100410

Shereni, N.C., Musavengane., R., & Woyo, E. (2023). COVID-19, Domestic Tourism and Indigenous Knowledge Systems in Zimbabwe. Studia Periegetica, 41(1), 135-152. https://doi.org/10.58683/sp.501

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

Setiawati, I.D. (2023). Role and Determinants of Domestic Tourism Demand in Indonesia. Economics *Development Analysis Journal*, 12(3), 293-304. https://doi.org/10.15294/edaj.v12i3.68495

Stone, L.S., & Nyaupane, G.P. (2020). Local residents' pride, tourists' playground: the misrepresentation and exclusion of local residents in tourism. *Current Issues in Tourism*, 23(11), 1426-1442. https://doi.org/10.1080/13683500.2019.1615870

Stone, L.S., Mogomotsi, P.K., & Mogomotsi, M. (2021). The Impacts of Covid-19 on Nature-based Tourism in Botswana: Implications for Community Development. *Tourism Review International*, 25(2). https://doi.org/10.3727/154427221X16098837279958

Tichaawa, T.M. (2021). Business Tourism in Africa: The Case of Cameroon. *Tourism Review International*, 21(2) 181-192. https://doi.org/10.30892/gtg.38437-771

Timothy, D.J. (2020). Domestic tourism: Challenging the notion through a geopolitical lens. *Tourism Review International*, 24(1), 67–73. https://doi.org/10.3727/154427220X15845838896251

Tung, L.T. (2021). Impact of the COVID-19 Pandemic on Global Tourism: A Synthetic Analysis. *African Journal of Hospitality Tourism and Leisure*, 10(2), 727–741. https://doi.org/10.46222/ajhtl.19770720-129

UNWTO. (2010). International Recommendations for Tourism Statistics 2008. United Nations Publication. New York.

Vermeulen-Miltz, E., Clifford-Holmes, J.K., Snow, B., & Lombard, A.T. (2022). Exploring the Impacts of COVID-19 on Coastal Tourism to Inform Recovery Strategies in Nelson Mandela Bay, South Africa. *Systems*, 10 (4) 120. https://doi.org/10.3390/systems10040120

Wilkinson, C.E., Brashares, J.S., Bett, A.C., & Kelly, M. (2021). Examining Drivers of Divergence in Recorded and Perceived Human-Carnivore Conflict Hotspots by Integrating Participatory and Ecological Data. *Frontiers in Conservation Science*, 2, 681769. https://doi.org/10.3389/fcosc.2021.681769

Wireko-Gyebi, S. (2022). Tertiary students' motivation for leisure travel: implications for domestic tourism. *Anatolia*, 33:4, 603-613. https://doi.org/10.1080/13032917.2021.1985541

Wolff, K., Larsena, S., & Øgaard, T. (2019). How to define and measure risk perceptions. *Annals of Tourism Research*, 79, 102759. https://doi.org/10.1016/j.annals.2019.102759

World Travel Tourism Council. (2019). *Domestic tourism importance and economic impact*. In World Travel and Tourism Council. Available at: https://www.wttc.org/publications/2018/domestic-tour

Woyo, E. (2021). *The sustainability of using domestic tourism as a post-COVID-19 recovery strategy in a distressed destination. In Information and Communication Technologies in Tourism 2021:* Proceedings of the ENTER 2021 eTourism Conference, January 19–22, 2021, 476-489, Springer International Publishing.

Xu, L., & Xing, M. (2023). *Study on the Impact of Major Public Health Emergencies on Chinese Tourism Industry*. In 2023 9th International Conference on Humanities and Social Science Research ICHSSR 2023, 1157–1164, Atlantis Press.

Zhaowen, L., Kexian, W., Mengran, W., Yike, X., Yafeng, Y., Chenxi, Z., & Yang, Z. (2023). Tourism Rebounds Analysis—Lessons from Baltics Countries. In *Tourism Analytics Before and After COVID-19: Case Studies from Asia and Europe*, 47–64. Singapore: Springer Nature Singapore.

Article history: Received: 15.09.2023 Revised: 15.11.2023 Accepted: 12.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1757-1764
DOI 10.30892/gtg.514 spl16-1171

PANEL ANALYSIS ON THE TOURISM SECTOR OF SELECTED MEDITERRANEAN COUNTRIES

Nigar HUSEYNLI *
Azerbaijan State University of Economics (UNEC), UNEC Business School, Baku, Azerbaijan, e-mail: nigar.f.huseynli@gmail.com

Bahman HUSEYNLI
Azerbaijan State University of Economics (UNEC), Azerbaijan Public Employment Agency, Baku, Azerbaijan, e-mail:bahmanhuseynli@gmail.com

Citation: Huseynli, N., & Huseynli, B. (2023). PANEL ANALYSIS ON THE TOURISM SECTOR OF SELECTED MEDITERRANEAN COUNTRIES. *GeoJournal of Tourism and Geosites*, 51(4spl), 1757–1764. https://doi.org/10.30892/gtg.514spl16-1171

Abstract: The tourism industry is a dynamic sector for the economies of Mediterranean countries. The aim of this study is to investigate the relationships between tourism revenues, employment rates and economic growth of two selected Mediterranean countries in the 1997-2020 period. In this study, panel data analysis method was used. In the analysis of panel data regression models, it was seen that the random effects model was appropriate. The model was estimated with Driscoll/Kraay resistant standard estimators developed against deviations from the assumptions. The results show that there is a positive relationship between tourism revenues, employment rates and economic growth in the two Mediterranean countries. Accordingly, an 1% increase in tourism revenues increases economic growth by 0.54%, while a 1% increase in employment rates increases economic growth approximately 1.5 times.

Key words: tourism sector, employment, tourism receipts, panel analysis, Mediterranean Countries

* * * * * *

INTRODUCTION

Tourism is one of the leading sectors of the world economy. Tourism plays a vital role in countries' economic growth (Abouseada et al., 2023; Horváth et al., 2023). The efficacy of increasing tourism in promoting economic growth is not yet established. Using the cointegration and Granger causality tests, researchers Balaguer and Cantavella-Jordá (2002) for Spain, Gunduz and Hatemi-J (2005) for Turkey, Belloumi (2010) for Tunisia, and Tang and Abosedra (2014) for Lebanon discovered that tourism and economic growth are likely to be cointegrated and that tourism Granger-causes economic growth.

The tourism sector has a considerable impact on the social and economic development of nations. From an economic standpoint, the tourism sector unites and attracts a large number of producers and consumers while also facilitating the knowledge and interaction of nations and people in terms of natural, social, and cultural factors. Consumption of commodities and services created to satisfy people's needs necessitated their replacement to satisfy new demands, which in this case resulted in higher revenues (Dilber, 2007). A large employer and labor-intensive industry, tourism. It is one of the top employers worldwide for a variety of skilled jobs, allowing young people, women, and migrant workers to enter the workforce quickly (ILO, 2014). The tourist and lodging industries provide millions of people with multiple employment opportunities in a range of businesses, including accommodation, food and beverage (restaurants, dining halls, cafés, fast food outlets, bars, nightclubs, hostels, etc.), and tourism (Aynalem et al., 2016). Employment opportunities are generated in all three of these ways thanks to tourism (Vanhove, 1981; Mathieson and Wall, 1982).

According to the findings of various research, the tourist industry in developing nations is viewed as a low-wage sector (Gartner and Cukier, 2011; Thomas, 2014). The tourist and hospitality industries are often recognized for their low hourly salary rates, lengthy working hours of 50 hours per week, no breaks during peak season, and overtime without additional pay (Aynalem et al., 2016). A bigger part of the income in a labor-intensive sector like tourism and hospitality is likely to come from wages and salaries paid to employees in occupations that either directly meet the demands of visitors or indirectly profit from their spending. It is unknown if employment in the tourist industry increased as a result of job losses in the forestry sector. Yet, there may also be connections between employment in the forest industry and employment in tourism. For instance, if tourism trends well in a region, this might perhaps support the development of hotels and cottages (Lundmark et al., 2010). The majority of the study that has been done on the topic of quality of life and tourism has focused on the unidirectional link between the two, arguing that tourism numbers of visitors and earnings have a substantial impact on quality of life (Sarpong et al., 2020). Many people believe that tourism should be treated as a regional development firm because of its capacity to drive economic growth both locally and distantly (Hall and Page, 2006; Yang, 2012).

Using panel data estimate, Gökoval and Bahar (2006) looked at how much tourism contributes to economic growth in Mediterranean nations. In a research published by Hilmi et al. (2015) examined the various effects of ecotourism on employment and income in Mediterranean nations. The Mediterranean coastline is the world's top travel destination due to its abundance of natural resources, including stunning beauty, a welcoming environment for tourists, major wildlife, etc.

* Corresponding author

Particularly for the economies on the northern side of the Mediterranean, the rise of the tourist sector has brought about economic improvements (Hilmi et al., 2015). The tourist-favored places in Mediterranean nations are safe, just as in other nations. The growth of tourism is particularly inhibited in nations where there is terrorism and political unrest. The regional impacts of terrorism on tourism in Mediterranean nations were examined by Drakos and Kutan (2003). They revealed that terrorist attacks that had place in Turkey, Greece, and Israel between 1991 and 2000 could have been instantly replaced by neighbors. Enders and Sandler (1991) discovered that terrorist attacks had a detrimental impact on the number of tourists visiting Spain. They suggested that a country's engagement in security and stability concerns had a detrimental impact on tourism.

Both the growth of tourism and the development of regions are inherently more complicated than they appear to be in statistical models. This indicates that some significant concerns are being overlooked in this discussion. Statistical models explain far more than any variance in employment change, which raises problems for the direction of future study (Lundmark et al., 2010). Yet, Mediterranean economies require a tourism development plan that integrates economic growth and environmental conservation (Hilmi et al., 2015). Since the tourism potential of Mediterranean countries is very high, there are many studies in this field (Dimitrić et al., 2019; Ren et al., 2019; Pérez-Rodríguez et al., 2020; Yıldırım et al., 2021; Bayar et al., 2023). In their study, Dimitrić et al. (2019) investigated the factors that influence the profitability of hotel enterprises across a range of Mediterranean nations. The examination of panel data models fitted with an extensive dataset spanning from 2007 to 2015 revealed that cash flow oriented toward operating income positively and statistically significantly impacted profitability. In an empirical study conducted by Ren et al. (2019), the researchers assessed the influence of tourism income on economic development and environmental degradation in a sample of eight Mediterranean countries. An examination of yearly data spanning from 1995 to 2014 has unveiled that the socioeconomic status of visitors to a nation significantly influences the progress of its economy across all sectors.

Pérez-Rodríguez et al. (2020) utilized a dynamic panel data model to investigate the extent to which tourism contributes to economic development. The analysis, which utilised quarterly GDP and tourist arrival series data from 1995 to 2019, for fourteen European countries concluded that the positive long-term correlation between tourism and economic growth is relatively tenuous. The study by Yıldırım et al (2021) tested the effects of the number of tourists and tourism revenues on carbon emissions for Mediterranean countries. Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, and Israel were among the 15 Mediterranean nations from which annual data were obtained between 2001 and 2017. Spain, Tunisia, and Turkey were also included in the collection. Carbon emissions are reduced by visitor arrivals and tourism revenues, according to the findings of the study. In their study, Bayar et al. (2023) examined the impact of terrorism, corruption, and rule of law on the tourism industry in fourteen Mediterranean-bordering nations. The findings of the causality analysis indicate that the mitigation of corruption has a transient yet noteworthy effect on the tourism industry. Cointegration analysis revealed that tourism in Albania, Algeria, Egypt, and Tunisia was adversely affected by terrorism, while tourism in Bosnia and Herzegovina, Greece, and Italy was positively impacted by reductions in corruption. Based on all this, the aim of the study is to investigate the relationships between tourism revenues, employment rates and economic growth of two selected Mediterranean countries in the period 1997-2020. In this example, analyzes were conducted using information from two Mediterranean countries.

LITERATURE REVIEW

1. Tourism growth

Using data from the 1960s to 2000s, Dritsakis and Athanasiadis (2000) conducted causality tests for Greece using the VAR model. Both the growth of tourism and the development of regions are inherently more complicated than they appear to be in statistical models. This indicates that some significant concerns are being overlooked in this discussion. Statistical models explain far more than any variance in employment change, which raises problems for the direction of future study (Lundmark et al., 2010). Özdemir and Öksüzler (2006) used the Johansen approach and VECM in Turkey's 1963–2003 sampling period to examine the causal link between tourism profits and economic development. Using the Toda-Yamamoto causality technique, Kızılgöl and Erbaykal (2008) investigated the link between tourist receipts and economic development for Turkey between 1992 and 2006. Aslan (2008) conducted in-depth research on Turkey using Johansen cointegration and Granger causality tests with error correction to analyze the causation link between tourism and economic development during the period of 1992 to 2007. Moreover, Kaplan and Çelik (2008) discovered that in the case of Turkey, an increase of one percent in tourism results in an increase in economic growth that is only three-tenths of one percent in the long term.

The findings of the study by Öztürk and Acaravci (2009) demonstrate that real GDP and foreign tourism do not have a particular long-term or equilibrium connection. Ztürk and Acaravci (2009) looked studied the long-term correlation between Turkey's real GDP and foreign travel from 1987 to 2007. The literature has also explored the relationship between rising relative pricing, economic growth, and tourism growth (Risso et al., 2010). In a research by Katircioglu (2010), yearly data from 1960 to 2007 were used to assess tourism-induced growth in Singapore. The literature has also explored the relationship between rising relative pricing, economic growth, and tourism growth (Risso et al., 2010).

Arslanturk et al. (2011) studied the causal association between tourist revenues and GDP in Turkey utilizing yearly data for the period 1963-2010 and employing Granger-based vector ECM. Their research focused on the relationship between tourism revenues and GDP in Turkey (VECM). A study conducted by Gautam looked at the relationship between tourism and economic development in Nepal, and the findings were interesting (2011). The authors Suresh et al. (2011) conducted research on the topic and studied the connection that exists between India's rising standard of living and its participation in global commerce. Samimi et al. (2011) used the P-VAR method to study the causality between economic growth and the development of tourism in developing nations over the time period of 1995-2009. They

focused on the period between 1995 and 2009. Using yearly time series data from Kenya, Kibara et al. (2012) investigated the dynamic link between the expansion of the tourist sector and economic growth. For Germany, Italy, Spain, Greece, Austria, England, Cyprus, the Netherlands, Portugal, and Sweden, Antonakakis et al. (2013) used a vector autoregressive model (VAR) to analyze the link between tourism and economic growth. Aslan (2014) used the panel Granger causality tests, which were recently created for the 1995–2010 period in Mediterranean nations, to examine the causative link between tourist development and economic growth. The long-term and short-term link between tourism and economic development in Sri Lanka was evaluated by Mustafa and Santhirasegaram (2014) in a research that used yearly data spanning the period of 1978-2011. The study focused on the island nation.

2. International tourism receipts

One of the most lucrative service sectors in the world, international tourism is also one of the most rapidly expanding (Suresh and Senthilnathan, 2014). The sales, earnings, and tax revenues that are brought in by tourists contribute to the general rise of income in the nations that host tourists (Fawaz and Rahnama, 2014). Part of this cash goes toward the repayment of inputs of production by local firms including salaries, rent, and interest payments, while some of it goes toward the distribution of dividends (Brida et al., 2016). In addition to its direct influence on income, the government's increased investment in tourism results in the creation of income multipliers (Suresh and Senthilnathan, 2014).

When there is adequate economic growth and a higher level of total income, economic inequality will diminish, and income distribution will become more balanced. Because of this, the revenue that is generated by tourism is very crucial for all nations, but particularly for those that rely heavily on the industry. According to the findings of a study conducted by Lorah and Southwick (2003), the preservation of the natural environment is linked to higher levels of income and employment in the western region of the United States, which has a beneficial effect on both domestic migration and international tourism. Using panel data from 42 African nations, a research by Fayissa et al. (2008) found that the profits from the tourist sector considerably contributed to the economic growth of African countries. A higher-than-average percentage of the population is employed in the tourist business in regions near to national parks (i.e. within 15 km), according to preliminary surveys conducted in Swedish mountain municipalities (Lundmark, 2009). Granger and Hsiao causality tests were used in an investigation of the causation association between revenue from tourism and GDP in Iran over the period of 1968-2007 that was carried out as part of a research that was carried out by Assadzadeh and Nasab (2012). According to the findings of a research conducted by Kreishan (2011) in Jordan between the years 1970 and 2009, there is a long-term positive and unidirectional relationship between tourism revenues and economic development. A research that was conducted by Aleemi (2015) examined the influence that tourist earnings had on the overall rate of economic development in Pakistan between the years 1981 and 2013. The links between tourism competitiveness, tourist arrivals, and tourism revenues to population diversity were looked at in a study undertaken by Bacsi (2017).

In a research published by Hesami et al., (2020) the effect of oil prices on tourist income in nations that significantly depended on crude oil exports from 2000 to 2017 was investigated. According to McAleer et al. (2005) and Pérez-Rodriguez and Santana-Gallego (2000), international tourist profits are acknowledged as a substantial source of income for both smaller island economies and bigger economies that are heavily dependent on tourism.

3. Employment in tourism

The capacity of a country to reduce the development gap it has with other nations and to find solutions to economic difficulties such as unemployment, balance of payments deficits, and financial and monetary macroeconomic instability is essential to the nation's development and economic progress. In this regard, the tourist industry is seen as an important contributor (Hakan et al., 2015). According to Burkart and Medlik (1981), it is challenging to properly predict how tourism would affect employment. Furthermore, according to Bahar and Kozak (2008), the high employment rate in the tourist industry is characterized by the prevalence of low-paying, transitory, part-time work, and seasonal intensity.

The significance of the tourist sector in generating female employment was examined in research by Obadic and Maric (2009). The tourist industry typically only offers temporary, low-paying jobs. Yet it should also be obvious that many people in the sector, particularly women, would be unemployed without tourism. Women can enter and leave the tourist business very readily since many occupations simply demand basic, highly transferrable skills (Obadi and Mari, 2009). In research done by Akkemik (2012), two social accounting matrices (SAM) modeling methodologies were used to analyze the impact of foreign travel on the Turkish economy. Snyman (2012) looked at how jobs in the tourist industry contribute to eradicating poverty in Namibia, Malawi, and Botswana. According to the findings of a research that was conducted by Adiyia et al. (2017), work in the tourist industry within the hotel sector generates a relatively low income when compared to other non-agricultural industries. The impact of specialization, urbanization, and diversification externalities on the growth rate of tourist employment in Brazilian towns between 2006 and 2015 was examined in research by Ribeiro et al. (2018).

RESEARCH METHODOLOGY

1. Purpose and Data Set

The urban geography of tourism destinations is always changing (Brito and Zarrilli, 2023). In this research, it was tried to determine the relationship between the economic growth in Italy and Greece, which are selected Mediterranean countries, and the tourism sector of this country. The aim of this study is to investigate the relationships between tourism revenues, employment rates and economic growth of two selected Mediterranean countries in the 1997-2020 period. In other words, it is examined whether there is an effect between the economic growth in the countries within the scope of

the research and the earnings that the tourism sector of this country brings to the country and the employment rates. In this direction, to use suitable variables and models, the literature has been examined and the variables and models used have been tried to be seen. The data set consists of annual data for the years 1997-2020. Logarithmic values of economic growth and tourism revenues used in the study are included in the analysis.

2. Analysis Method

The methodology of the study is shown in Figure 1. In studies conducted in the literature, panel data models are generally used in two dimensions, unit, and time. Since two-dimensional panel data models with single unit or single time effects do not meet the analysis needs in some cases, models with more than two time and unit dimensions were used and these models were named "Multidimensional Panel Data Models". Multidimensional panel data models provide economic results in different and broad perspectives by using a rich and high - quality data set. In multidimensional panel data models, as in this study, years are taken as time dimension, while countries are considered as unit dimensions. In the case of one time and two-unit dimensions, the three-dimensional panel data model can be represented as in Equation 1. Here, μ, γ denotes unit effects and λ stands for time effects, respectively. α is the constant term, X is the independent variables matrix, Y and u are the dependent variable and error term vectors, respectively. The two units under consideration are nested within each other (Yerdelen Tatoglu, 2016).

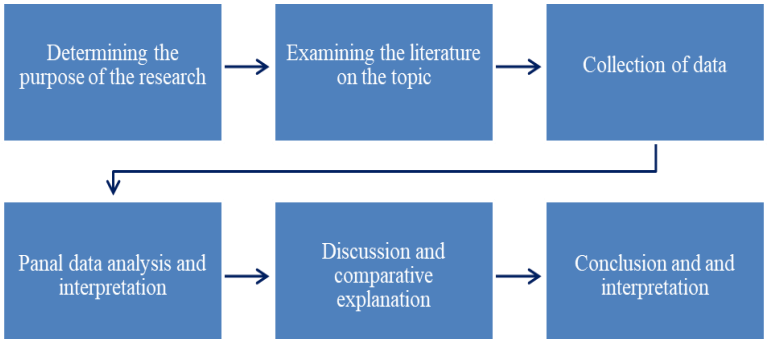


Figure 1. Research flow chart (Source: developed by authors)

$$Y_{ijt}=\alpha+\beta X_{ijt}+\mu_i+\gamma_i+\lambda_t+u_{ijt} \quad (1)$$

$$(i=1...N,\ t=1...T,\ j=1...M)$$

Multidimensional panel data models, like two-dimensional models, are studied under fixed and random effects. Multidimensional models, which are considered with the fixed effects assumption, can be used as shadow variable least squares estimator and in-group estimator, as in two-dimensional panel data models. In the multidimensional random effects model, generalized least squares and maximum likelihood methods are used. In panel data analysis, the relationship between the variables, the error terms in the regression equation and the assumptions about the properties of the constant terms; It can be tested using three models: random, fixed, and joint effects. In this study, the relationship between these variables, random and fixed effects were estimated using panel data techniques. The main hypothesis of the fixed effects model is that the differences between economic units can be captured by the differences in the fixed term and individual effects are related to the independent variables. From this point of view, it is accepted that each economic unit in the panel has a fixed term that does not change with time and shows the effects of the variables excluded from the model (Greene, 2000; Stock and Watson, 2007). In the random effects model, which can also be called the error components model, the constant term is accepted as a random variable, unlike the fixed effects model. In other words, in this approach, it is accepted that individual differences between economic units occur randomly (Gujarati, 2003).

After the fixed and random effects model analysis in panel data applications, the path followed in the application is to decide which of these two models will be more appropriate. Appropriate model selection can be made with the Breusch-Pagan (1980), Hausman and Rhausman tests. In this study, which of the panel data approaches is appropriate was decided by the Hausman test? In the Hausman test, it is tested whether the error components are related to the independent variables in the model (Gujarati, 2003; Maddala, 2001). If the H_0 hypothesis, which claims that there is no relationship between εi and the independent variables (X_i), is rejected, the fixed effects model is decided, and if not, the random effects model is the appropriate model. In the study, which analyzes the relationship between economic growth, tourism revenues and employment rates, annual data covering the period 1997-2020, from two selected Mediterranean countries, were used.

ANALYSES AND RESULTS

Before the analysis, the summary statistical table of the data set was analyzed. Logarithmic values of economic growth and tourism revenues are considered in the analysis. After there were no problems with the statistical table between the data set, the necessary model for analysis was established.

As stated in Equation 1, LGDP is the dependent variable in the study and β_0, β_1Ltourismrevenu, $\beta_2$employmentrate and μ are the independent variables. The model for the analysis is as described in Equation 2.

$$LGDP=\beta_0+\beta_1 Ltourismrevenue+\beta_2 employmentrate+\mu \quad (2)$$

LGDP– logarithmic value of the standard measure of the value added created through the production of goods and services in a country during a certain period; β_0 – is a constant term; β_1Ltourismrevenue – refers to tourism revenues; $\beta_2$employmentrate – shows unemployment rates; μ – represents the unit effects present in the model.

After determining that there are unit and/or time effects as a result of the LR test, it is necessary to decide whether the current effect is constant or random (Table 1). One of the most important differences between fixed and random effects models is whether unit effects are correlated with independent variables. If there is no correlation between them, the random effects model is more effective and valid. In the Hausman test: "H_0= There is no correlation between explanatory variables and

unit effect". Therefore, since the random effects estimator is more efficient, its use will be appropriate: "H_1=There is a correlation between the explanatory variables and the unit effect". As a result of the Hausman and Rhausman tests, it should be preferred whether the fixed effects model or the random effects model is consistent (Table 2). In other words, Hausman and Rhausman tests show that the unit effect is constant. Therefore, the analysis is a model with a one-way effect.

Table 1. Likelihood Ratio (LR) Test Results

	LR Statistics	Probability Value
Unit and Time Impact	96.77	0.0000
Unit Impact	73.18	0.0000
Time Effect	2.78	0.0529

Table 2. Hausman and Rhausman Test Results

Test Name	Test Statistic	Probability Value
Hausman	37.70	0.0000
Rhausman	1.92	0.4130

The selection between fixed-effect and random-effect models was also made by Hausman and Rhausman test. According to the Hausman test statistic result, the assumptions of the random effect model are not met, and in this context, the analysis should be continued with the fixed effect model. The Rhausman test, on the other hand, is more reliable than the Hausman test and shows the final decision about which model should be selected. According to the Rhausman test results, the one-way random effects model is valid.For the autocorrelation assumption, Durbin Watson and Baltagi-Wu test of Bhargava et al. (1982) was applied. In the random effects analysis, since the units come from random attraction, it is not expected to find a correlation between units (Yerdelen Tatoglu, 2016). Table 3 shows the Durbin Watson and Baltagi-Wu test results of Bhargava et al. (1982). The fact that the values in the table are close to two means that the null hypothesis suggesting that there is no first-order autocorrelation cannot be rejected. However, since both test results are less than two, the H_0 hypothesis is rejected. It is understood that there is a problem of varying variance in the model.

Table 3. Durbin Watson and Baltagi-Wu's LBI Test Results

Test Name	Test Statistic
Durbin Watson	0.65222378
Baltagi-Wu`nun LBI	0.89392572

Table 4. Test Results of Pesaran and Friedman

Test Name	Test Statistic	Probability Value
Pesaran CD	3.677	0.0002
Friedman	39.400	0.0000

Table 5. VIF Criteria Results

Variable	VIF	1/VIF
Linternational tourism receipts	1.02	0.980529
Employment rate	1.02	0.980529
Mean VIF		

In the study, cross-section dependence was tested with Pesaran CD and Friedman tests. Cross-section dependency: It was tested with Pesaran CD and Friedman tests, which can be applied to both fixed and random effect models. The H_0 hypothesis states that there is no cross-sectional dependence, and the H_1 hypothesis states that there is a cross-sectional dependence. According to the results of the analysis, there is a cross-section dependency in the study. The test results regarding the cross-section dependency are presented below with the help of Table 4. According to the cross-section dependency test findings, H_0 hypothesis is rejected in both Pesaran CD test and Friedman test results and there is cross-section dependency. Another factor that prevents the results from being reliable in regression analysis is the high correlation of explanatory variables with each other. The existence of this situation, which is expressed as a multi-correlation problem, is investigated with the VIF multi-correlation test. In the test in Table 5, the VIF value is at the accepted level.

Driscoll/Kraay results for panel causality test are presented with the help of Table 6. The test results show that the direction of causality is from tourism revenues and employment rates to economic growth. The test results show that the model is significant at the 95% level. In terms of Italy and Greece, the effect of both variables on economic growth is positive and significant. According to the results of the analysis, a 1% increase in tourism revenues will have a 54% effect on economic growth. Likewise, a 1% increase in employment rates will have a 1.5-fold effect on the economic growth of these countries.

Table 6. Driscoll/Kraay Estimation Test Result

R^2	Number of Observations		Prob	
0.5312	48		prob> 0.0055	
LGDP	**Coefficient Values**	**Drisc/Kraay Resistive Standard Errors**	**T statistics**	**P>|t|**
Linternational tourism receipts	.5445245	.1762758	3.09	0.005
Employment rate	1.477739	.5919823	2.50	0.020
Fixed Coefficient	3.724994	2.239045	1.66	

3. DISCUSSION AND CONCLUSION

The tourism industry is a dynamic sector that is responsible for bringing about changes in the economic structure, social structure, and cultural structure of countries. The money spent by visitors brings a return in the form of cash to the businesses and individuals who supply the goods and services that are consumed by tourists. This helps to expand job opportunities in areas that see a rise in tourism-related activity. Tourism is beneficial to society in terms of the development of social and cultural values since it affords individuals from a variety of nations and cultures the opportunity to interact with one another. The nations that have a coastline on the Mediterranean may attribute a significant amount of their recent economic growth to the contributions made by the tourism industry. The countries of the Mediterranean region stand before us as the nations that take home the lion's share of the economic benefits that come from tourism across the world.

Determining the influence that tourism has on the rate of economic expansion in these nations might, in this context, be an indication of the political and social position that should be implemented. In the body of academic research, there are a great number of empirical studies that investigate the links between tourism and economic expansion.

According to the findings of the research that was carried out by Dritsakis and Athanasiadis (2000), tourism-oriented growth is encouraged, and there is a long-term cointegration relationship between tourism and economic growth. These findings were discovered as a result of the study that was carried out. It was discovered via the research conducted by Balaguer and Cantavella-Jorda (2002) that the earnings generated by foreign tourism have a beneficial impact on the expansion of the Spanish economy. As a consequence of the research that Gunduz and Hatemi (2005) carried out, they came to the conclusion that international tourism is a unidirectional causal factor in the progression of economic growth.

Because of the findings of the research that Özdemir and Öksüzler (2006) carried out, it has been demonstrated that there is a short-term as well as a long-term unidirectional causation between tourism and GDP. According to the findings of the research that was conducted by Gokovali and Bahar (2006), the contribution of tourism to the expansion of the economies of Mediterranean nations is only approximately 0.1 percent for every 1 percent rise in the number of tourists. Because of the findings of the research that Kizilgol and Erbaykal (2008) carried out, it has been established that there is a unidirectional causation extending from economic growth to the income generated by tourism. As a consequence of the research that was carried out by Aslan (2008), it was determined that the TLG hypothesis may be applied to Turkey with success. According to the findings of the research that was carried out by Assadzadeh and Nasab (2012), there is a long-term positive association between these factors and revenue from tourism. This was discovered as a consequence of the study that they carried out.

According to the findings of Arslanturk et al. (2011), the income generated by tourism had a beneficial impact on GDP in the early 1980s. The findings indicate that there is no Granger causality between the series of variables when they use VECM to analyze the data. As a result, it has been shown that the NC hypothesis may be applied to Turkey with success. As a result of the research that was carried out by Gautam (2011), it was found that the cointegration test for the determination of the long-run relationship and the error correction method for the short-run dynamics were both performed, and it was found that it was determined that tourism (represented by foreign exchange income) causes economic growth in both the short run and the long run. This was discovered as a result of the study that was carried out. According to the findings of the research that was carried out by Samimi et al. (2011), there is a positive long-term association, as well as a bidirectional causation, between economic growth and the development of tourism. This relationship is beneficial.

According to the findings of a research conducted by Snyman (2012), work in tourism in rural areas serves to include inhabitants in the market economy, and the revenue that families receive from employment in tourism allows them to invest in assets, education, and investment. According to the findings of the research conducted by Akkemik (2012), the elasticity of international tourism's impact on GDP is relatively low, and the impacts of foreign tourist consumption on domestic production, value added, and employment are small. These findings were found to be the case. As a consequence of the findings of the research conducted by Aslan (2014), the EDTG hypothesis was validated with regard to the countries of Spain, Italy, Tunisia, Cyprus, Croatia, Bulgaria, and Greece. Yet, the TLG theory is supported by the data for Turkey and Israel, the BC hypothesis is accepted for Portugal, and the NC hypothesis is supported by Malta and Egypt.

According to the findings of the research that was carried out by Aleemi (2015), the income generated by tourism does, in fact, contribute significantly and favorably to the expansion of the national economy. According to the findings of a study conducted by Adiya et al. (2017), non-management tourism fees in South Africa are sufficient to keep a family above the line of extreme poverty, but these fees are still considered to be low in comparison to the standards of tourism resource markets. According to the findings of the research that was carried out by Ribeiro et al. (2018), specialization, urbanization, and diversification externalities all have a favorable influence on the employment growth rate in the tourist industry. According to the findings of the research that was carried out by Hesami et al. (2020), oil prices and tourism revenues are cointegrated, there is a long-term equilibrium relationship between the two, and there is a unidirectional Granger causality from oil prices to tourism revenues. These findings were discovered as a result of the study that was carried out.

According to the findings of this research, there is a correlation between tourism and economic expansion that is favorable. The approach of panel data analysis was utilized in this research project to explore the impact that tourism and employment rates had on economic growth in two Mediterranean nations over the period of 1997-2020.

According to the findings of the research, a rise in tourism income and an increase in employment rates both have a significant and favorable impact on the expansion of the economy. The fact that it can demonstrate its economic value in a shorter amount of time when compared to other industries is the most significant quality that sets it apart from those industries. The beneficial impacts of an effective advertising and marketing campaign may be felt after only a short period of time has passed. Yet, this aspect of tourism may be related to the economy, politics, diplomacy, natural disasters, and other related topics. As a result of this, there is a school of thought that maintains that it would be unethical for a nation to devote all its economic resources to the tourist industry. Under the parameters of this discussion, it would be more beneficial for the tourist sector to continue its growth by taking on a supporting role for the industry and farm sectors. For the purpose of this research, data from nations located in the Mediterranean region, which is the most advanced geographical area in the world in terms of its tourist infrastructure, were utilized. As the scope of the study is broadened to include more nation groupings as well as data pertaining to tourism, it is anticipated that results that are more complete with regard to the economic benefits of tourism would be acquired.

Author Contributions: Conceptualization, N.H. and B.H.; methodology, N.H.; software, N.H.; validation, N.H. and B.H.; formal analysis, N.H.; investigation, B.H.; data curation, N.H.; writing - original draft preparation, B.H.; writing - review and editing, N.H. and B.H.; visualization, B.H.; supervision, N.H.; project administration, B.H. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abouseada, A.A.A.H., Hassan, T.H., Saleh, M.I., & Radwan, S.H. (2023). The power of airport branding in shaping tourist destination image: passenger commitment perspective. *GeoJournal of Tourism and Geosites*, *47*(2), 440-449. https://doi.org/10.30892/gtg.47210-1042

Adiyia, B., Vanneste, D., & Van Rompaey, A. (2017). The poverty alleviation potential of tourism employment as an off-farm activity on the local livelihoods surrounding Kibale National Park, western Uganda. *Tourism and Hospitality Research*, *17*(1), 34-51. https://doi.org/10.1177/1467358416634156

Akkemik, K.A. (2012). Assessing the importance of international tourism for the Turkish economy: A social accounting matrix analysis. *Tourism Management*, *33*(4), 790-801. https://doi.org/10.1016/j.tourman.2011.09.002

Aleemi, A.R. (2015). Tourism receipts and economic growth: Empirical evidence from Pakistan. *International Journal of Research*, *2*(2), 1401-1412.

Antonakakis, N., Dragouni, M., & Filis, G. (2013). *Time-varying interdependencies of tourism and economic growth: evidence from European countries.* MPRA Munich Personal Repec Archive, 4875. 1-34.

Arslanturk, Y., Balcilar, M., & Ozdemir, Z.A. (2011). Time-varying linkages between tourism receipts and economic growth in a small open economy. *Economic Modelling*, *28*(1-2), 664-671. https://doi.org/10.1016/j.econmod.2010.06.003

Aslan, A. (2008). *An econometric analysis on economic growth and tourism in Turkey.* MPRA Munich Personal Repec Archive, 1-11.

Aslan, A. (2014). Tourism development and economic growth in the Mediterranean countries: Evidence from panel Granger causality tests. *Current issues in Tourism*, *17*(4), 363-372. https://doi.org/10.1080/13683500.2013.768607

Assadzadeh, A., & Nasab, M.H.N. (2012). Investigating the relationship between tourism industry and GDP in the Islamic Republic of Iran. *International Review of Business Research Papers*, *8*(2), 85-95.

Aynalem, S., Birhanu, K., & Tesefay, S. (2016). Employment opportunities and challenges in tourism and hospitality sectors. *Journal of tourism & Hospitality*, *5*(6), 1-5. https://doi.org/10.4172/2167-0269.1000257

Bacsi, Z. (2017). Tourism and diversity. *Deturope*, *9*(2), 25-57.

Bahar, O., & Kozak, M. (2008). *Tourism Economics: Concepts and Practices.* Nova Science Pub Incorporated.

Balaguer, J., & Cantavella-Jorda, M. (2002). Tourism as a long-run economic growth factor: the Spanish case. *Applied economics*, *34*(7), 877-884. https://doi.org/10.1080/00036840110058923

Bayar, Y., Gavriletea, M.D., & Remeikienė, R. (2023). Impact of the rule of law, corruption and terrorism on tourism: Empirical evidence from Mediterranean countries. *Oeconomia Copernicana*, *14*(3), 1009-1035. https://doi.org/10.24136/oc.2023.02930

Belloumi, M. (2010). The relationship between tourism receipts, real effective exchange rate and economic growth in Tunisia. *International Journal of Tourism Research*, *12*(5), 550-560. https://doi.org/10.1002/jtr.774

Bhargava, A., Franzini, L., & Narendranathan, W. (1982). Serial correlation and the fixed effects model. *The Review of Economic Studies*, *49*(4), 533-549. https://doi.org/10.2307/2297285

Breusch, T.S., & Pagan, A.R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic studies*, *47*(1), 239-253. https://doi.org/10.2307/2297111

Brida, J.G., Cortes-Jimenez, I., & Pulina, M. (2016). Has the tourism-led growth hypothesis been validated? A literature review. *Current Issues in Tourism*, *19*(5), 394-430. https://doi.org/10.1080/13683500.2013.868414

Brito, M.L., & Zarrilli, L. (2023). The Role of Tourism in the Regeneration of Peripheral Neighbourhoods: A Comparison Between Alcântara (Lisbon) and Bagnoli (Naples). *GeoJournal of Tourism and Geosites*, *49*(3), 1134-1143. https://doi.org/10.30892/gtg.49328-1112

Burkart, A.J., & Medlik, S. (1981). *Tourism: Past, Present and Future*, London: Heinemann.

Dilber, İ. (2007). Turizm sektörünün Türkiye ekonomisi üzerindeki etkisinin girdi-çıktı tablosu yardımıyla değerlendirilmesi [Evaluating the impact of the tourism sector on the Turkish economy with the help of the input-output table]. *Yönetim ve Ekonomi*, *14*(2), 205-220.

Dimitrić, M., Tomas Žiković, I., & Arbula Blecich, A. (2019). Profitability determinants of hotel companies in selected Mediterranean countries. *Economic Research-Ekonomska Istraživanja*, *32*(1), 1977-1993. https://doi.org/10.1080/1331677X.2019.1642785

Drakos, K., & Kutan, A.M. (2003). Regional effects of terrorism on tourism in three Mediterranean countries. *Journal of Conflict Resolution*, *47*(5), 621–641. https://doi.org/10.1177/0022002703258198

Dritsakis, N., & Athanasiadis, S. (2000). An econometric model of tourist demand: The case of Greece. *Journal of Hospitality & Leisure Marketing*, *7*(2), 39-49. https://doi.org/10.1300/J150v07n02_03

Enders, W., & Sandler, T. (1991). Causality between transnational terrorism and tourism: The case of Spain. *Studies in Conflict & Terrorism*, *14*(1), 49–58. https://doi.org/10.1080/10576109108435856

Fawaz, F., Rahnama, M., & Stout, B. (2014). An empirical refinement of the relationship between tourism and economic growth. *Anatolia*, *25*(3), 352-363.

Fayissa, B., Nsiah, C., & Tadasse, B. (2008). Impact of tourism on economic growth and development in Africa. *Tourism Economics*, *14*(4), 807–818.

Gartner, C., & Cukier, J. (2012). Is tourism employment a sufficient mechanism for poverty reduction? A case study from Nkhata Bay, Malawi. *Current Issues in Tourism*, *15*(6), 545-562. https://doi.org/10.1080/13683500.2011.629719

Gautam, B.P. (2011). Tourism and economic growth in Nepal. *NRB Economic Review*, *23*(2), 18-30.

Gokovali, U., & Bahar, O. (2006). Contribution of tourism to economic growth: A panel data approach. *Anatolia*, *17*(2), 155-167. https://doi.org/10.1080/13032917.2006.9687184

Greene, H.W. (2000). *Econometric Analysis.* (4th Ed). New Jersey: Prentice Hall.

Gujarati, D.N. (2003). *Basic Econometrics.* (4th Ed.). New York: McGraw Hill Educations.

Gunduz, L., & Hatemi, J.A. (2005). Is the tourism-led growth hypothesis valid for Turkey?. *Applied Economics Letters*, *12*(8), 499-504. https://doi.org/10.1080/13504850500109865

Hakan, K.U.M., Aslan, A., & Gungor, M. (2015). Tourism and economic growth: the case of next 11 countries. *International Journal of Economics and Financial Issues*, *5*(4), 1075-1081.

Hall, C.M., & Page, S. (2006). *The Geography of Tourism and Recreation. Environment, Place and Space* (3rd ed.). London: Routledge. https://doi.org/10.4324/9780203796092

Hesami, S., Rustamov, B., Rjoub, H., & Wong, W.K. (2020). Implications of oil price fluctuations for tourism receipts: The case of oil exporting countries. *Energies*, *13*(17), 4349. https://doi.org/10.3390/en13174349

Hilmi, N., Safa, A., Teisserenc, B., & Peridy, N. (2015). Sustainable tourism in some MENA countries. *Topics in Middle Eastern and North African Economies*, *17*(1), 92-112.

Horváth, Z.I., Kupi, M., & Happ, E. (2023). The Role of Tourism Management for Sustainable Tourism Development in Nature Reserves in Hungary. *GeoJournal of Tourism and Geosites*, *49*(3), 893-900. https://doi.org/10.30892/gtg.49306-1090

International Labour Organization (ILO). (2010). *Development and Challenges in Tourism and Hospitality Sector.* Geneva, Switzerland.

Kaplan, M., & Çelik, T. (2010). The impact of tourism on economic performance: the case of Turkey. *International Journal of Applied Economics and Finance*, *4*(4), 254-259.

Katircioglu, S. (2010). Research note: Testing the tourism-led growth hypothesis for Singapore–an empirical investigation from bounds test to cointegration and Granger causality tests. *Tourism Economics*, *16*(4), 1095-1101. https://doi.org/10.5367/te.2010.0012

Kibara, O.N., Odhiambo, N.M., & Njuguna, J.M. (2012). Tourism and economic growth in Kenya: An empirical investigation. *International Business & Economics Research Journal (IBER)*, *11*(5), 517-528. https://doi.org/10.19030/iber.v11i5.6970

Kizilgöl, Ö., & Erbaykal, E. (2008). The relationship between tourism revenues and economic growth in Turkey: A causality analysis. *Suleyman Demirel University The Journal of Economics and Administrative Sciences*, *13*(2), 351-360.

Kreishan, F.M. (2011). Time-series evidence for tourism-led growth hypothesis: A case study of Jordan. *International Management Review*, *7*(1), 89-93.

Lorah, P., & Southwick, R. (2003). Environmental protection, population change, and economic development in the rural western United States. *Population and Environment*, *24*(3), 255-272.

Lundmark, L. (2009). Mountain Resort Labour Market. In Müller, D., Saarinen, J. & Hall, M. (Editors). *Nordic Tourism: Issues and Cases.* (pp. 231-235). Clevedon: Channel View Press.

Lundmark, L.J., Fredman, P., & Sandell, K. (2010). National parks and protected areas and the role for employment in tourism and forest sectors: A Swedish case. *Ecology and Society*, *15*(1), 19-42.

Maddala, G.S. (2001). *Introduction to Econometrics.* (3rd Ed.). England: John Wiley & Sons.

Mathieson, A., & Wall, G. (1982). *Tourism, economic, physical and social impacts*. Longman.

McAleer, M., Shareef, R., & da Veiga, B. (2005). Risk management of daily tourist tax revenues for the Maldives. FEEM Working Paper No. 137.05. http://dx.doi.org/10.2139/ssrn.855924

Mustafa, A.M.M., & Santhirasegaram, S. (2014). Empirical investigation of the relationship between tourism receipts and sustainable economic growth in Sri Lanka. *Journal of Emerging Trends in Economics and Management Sciences*, *5*(7), 131-137. https://hdl.handle.net/10520/EJC156898

Obadic, A., & Maric, I. (2009). The significance of tourism as an employment generator of female labour force. *Ekonomska misao i praksa*, 18(1), 93-114.

Özdemir, A.R., & Öksüzler, O. (2006). Can Tourism be an Economic Growth Policy Tool in Turkey? A Granger Causality Analysis. *Balıkesir Üniversitesi Sosyal Bilimler Dergisi*, *9*(16), 107-126.

Öztürk, I., & Acaravci, A. (2009). On the causality between tourism growth and economic growth: Empirical evidence from Turkey. *Transylvanian Review of Administrative Sciences*, *5*(25), 73-81.

Pérez-Rodríguez, J.V., & Santana-Gallego, M. (2020). Modelling tourism receipts and associated risks, using long-range dependence models. *Tourism Economics*, *26*(1), 70-96. https://doi.org/10.1177/1354816619828170

Pérez-Rodríguez, J.V., Rachinger, H., & Santana-Gallego, M. (2022). Does tourism promote economic growth? A fractionally integrated heterogeneous panel data analysis. *Tourism Economics*, *28*(5), 1355-1376. https://doi.org/10.1177/1354816620980665

Ren, T., Can, M., Paramati, S.R., Fang, J., & Wu, W. (2019). The impact of tourism quality on economic development and environment: Evidence from Mediterranean countries. *Sustainability*, *11*(8), 2296. https://doi.org/10.3390/su11082296

Ribeiro, L.C.D.S., Lopes, T.H.C.R., Montenegro, R.L.G., & Andrade, J.R.D.L. (2018). Employment dynamics in the Brazilian tourism sector (2006–2015). *Tourism Economics*, *24*(4), 418-433. https://doi.org/10.1177/1354816617736409

Risso, W.A., Barquet, A., & Brida, J.G. (2010). Causality between economic growth and tourism expansion: empirical evidence from Trentino-Alto Adige. *Tourismos: an international multidisciplinary journal of tourism*, *5*(2), 87-98. https://ssrn.com/abstract=1375407

Samimi, A.J., Sadeghi, S., & Sadeghi, S. (2011). Tourism and economic growth in developing countries: P-VAR approach. *Middle-East journal of scientific research*, *10*(1), 28-32.

Sarpong, S.Y., Bein, M.A., Gyamfi, B.A., & Sarkodie, S.A. (2020). The impact of tourism arrivals, tourism receipts and renewable energy consumption on quality of life: A panel study of Southern African region. *Heliyon*, *6*(11), e05351.

Snyman, S.L. (2012). The role of tourism employment in poverty reduction and community perceptions of conservation and tourism in southern Africa. *Journal of Sustainable Tourism*, *20*(3), 395-416. https://doi.org/10.1080/09669582.2012.657202

Stock, J.H., & Watson, M.W. (2007). *Introduction to Econometrics* (2nd Ed.). Boston: Pearson Education Inc.

Suresh, J., & Senthilnathan, S. (2014). Relationship between tourism and economic growth in Sri Lanka. *Published as the 7th chapter of a book entitled "Economic Issues in Sri Lanka" compiled by Dr. S. Vijayakumar*, 115-132. http://dx.doi.org/10.2139/ssrn.2373931

Suresh, K.G., Gautam, V., & Kumar, M. (2011). Analysing the relationships among tourism, trade, and economic growth in Indian perspective. *Journal of International Business and Economy*, *12*(1), 1-11.

Tang, C.F., & Abosedra, S. (2014). The impacts of tourism, energy consumption and political instability on economic growth in the MENA countries. *Energy Policy*, *68*, 458-464. https://doi.org/10.1016/j.enpol.2014.01.004

Thomas, F. (2014). Addressing the measurement of tourism in terms of poverty reduction: Tourism value chain analysis in Lao PDR and Mali. *International Journal of Tourism Research*, *16*(4), 368-376. https://doi.org/10.1002/jtr.1930

Vanhove, N. (1981). Tourism and employment. *International Journal of Tourism Management*, *2*(3), 162-175. https://doi.org/10.1016/0143-2516(81)90003-7

Yerdelen Tatoglu, F. (2018). *Panel Zaman Serileri Analizi: Stata Uygulamalı.* İstanbul: Beta Basım Yayım.

Yıldırım, S., Yıldırım, D.Ç., Aydın, K., & Erdoğan, F. (2021). Regime-dependent effect of tourism on carbon emissions in the Mediterranean countries. *Environmental Science and Pollution Research*, *28*(39), 54766-54780. https://doi.org/10.1007/s11356-021-14391-7

Article history: Received: 31.09.2023 Revised: 14.11.2023 Accepted: 16.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1765-1774
DOI 10.30892/gtg.514 spl17-1172

BIBLIOMETRIC ANALYSIS OF COMMUNITY-BASED TOURISM AND ITS THEORETICAL IMPLICATIONS

Victor Dante AYAVIRI-NINA*
Universidad Nacional de Chimborazo (UNACH), Facultad de Cs. Ps. y Adm. Riobamba, Ecuador, e-mail: dayaviri@unach.edu.ec.

David FLORES RUIZ
Universidad de Huelva, Departamento de Economía Aplicada, Huelva, España, e-mail: david.flores@dege.uhu.es.

Gabith Miriam QUISPE FERNANDEZ
Universidad Nacional de Chimborazo (UNACH), Facultad de Cs. Ps. y Adm. Riobamba Ecuador, e-mail: gquispe@unach.edu.ec.

Citation: Ayaviri-Nina, V.D., Flores Ruiz, D., & Quispe Fernandez, G.M. (2023). BIBLIOMETRIC ANALYSIS OF COMMUNITY-BASED TOURISM AND ITS THEORETICAL IMPLICATIONS. *GeoJournal of Tourism and Geosites*, 51(4spl), 1765–1774. https://doi.org/10.30892/gtg.514spl17-1172

Abstract: Bibliometric studies allow us to observe and interpret the behavior and progress of scientific production on a topic. Thus, present research performs a bibliometric analysis of the research developed on community tourism. For this purpose, articles published in journals indexed in Scopus in the period 1983 to 2022 are considered; the search is restricted to (TITLE ("community tourism") OR TITLE ("turismo comunitario")), which makes 124 items visible. The analysis is carried out using the Bibliometrix and VOSviewer software, which formally and thematically characterizes scientific production through bibliometrics. The indicators used are: annual scientific production and by country, productivity by type of institution, most cited articles, magazines with the most publications on community tourism, analysis of keywords and relationship with the topics, and finally, the main currents or trends of research. The results reflect that there is a trend in research in the field of community tourism: tourism sustainability, economic development, tourism linked to local development, indigenous communities, topics that will gain strength such as the use of platforms and social capital.

Key words: community-based tourism, bibliometric, sustainability, participation, tourism development

* * * * * *

INTRODUCTION

In the rural context, tourism is seen as an effective activity in the fight against poverty (Pan et al., 2021; Wang, 2022), because it generates employment in conditions of labor market uncertainty (Nordbo, 2022), on the other hand, it creates opportunities to produce and market communities' traditional products (Cheer et al., 2019; Li et al., 2020). Community-based tourism has been extensively studied from both private and public perspectives. (Eslami et al., 2019), for its ability to improve local economies, and its practice has become widespread in all countries (Khalid et al., 2019). As a result, rural communities dedicated to agricultural production, artisan, livestock, mining and indigenous communities develop community tourism activities in an effort to improve the economic and social conditions of their territories (Lew, 2014; Lew and Wu, 2017; Filimonau and De Coteau, 2020; Yachin and Loannides, 2020).

Rural community-based tourism activity development increases from the creation of value in local resources, from old facilities, parks, recreational attractions, traditions and cultures, which benefits the quality of life of the population (Lalangui et al., 2017). In rural communities, tourism offers opportunities for local development, taking advantage of endogenous knowledge potential of their practices, history, legends and organization, thus increasing the social and economic sustainability of the territories (Filimonau and De Coteau, 2020; Nuanmeesri, 2022). Also, in indigenous communities, populations have revived formation on traditions, religion and local culture that were exhibited to the tourists (Nicolaides, 2020; Lin et al., 2021; Moayerian et al., 2022); together with natural resources richness such as flora and fauna, environmental conservation, and regional customs, in an attempt to provide quality in tourism services management oriented to sustainable development (Apostolopoulos et al., 2020; Dolezal and Novelli, 2022). Therefore, community-based tourism plays an important role in fighting against poverty and community undevelopment.

Several studies agree that rural tourism initiatives are an economic activity component, and the development of their communities could depend to a large extent on this activity, although with different development levels (Lai and Hitchcock, 2017; Stone and Nyaupane, 2018; Yodkhayan and Muneenam, 2023), the communities have a clear orientation in the search for sustainable development and improvement of the population's quality of life (Ridho et al., 2021; Ramkissoon, 2023). Thus, community-based tourism is emerging as an alternative to bridge the social and economic disparities suffered by rural communities (Lew, 2017; Sumarmi et al., 2023; Prasongthan and Silpsrikul, 2023; Makandwa et al., 2023), community-based tourism understood as those community practices related to tourism, community private initiatives whose

* Corresponding author

main offer are local tourism services (Stone and Nyaupane, 2018; Dolezal and Novelli, 2022; Prayitno et al., 2023); offer an alternative that they can use to generate other income within their daily economic activities, using cultural, natural and local resources (Pasanchay and Schott, 2021; Mathew, 2022). On the other hand, community-based tourism offers the population opportunity to exchange goods and services, generating an active tourist participation. (Teshome et al., 2021). Also, some rural communities identify opportunities within the tourism sphere for participation in the tourism industry, which contributes to and promotes communities' transformation (Dolezal and Novelli, 2022; Chatkaewnapanon and Lee, 2022); also, under the participatory approach, they create a link between community, public and private sectors in the search of scenarios for new practices and community tourism promotion (Lee, 2019; Martini, 2020).

Studies on community tourism are undoubtedly diverse (Nuanmeesri, 2022; Dolezal and Novelli, 2022; Makandwa et al., 2023; Van Tran et al., 2023; Lapuz, 2023), a method that allows reflecting the evolution of studies on one topic is the bibliometric method (Qiao et al., 2022), which relates theoretical aspects, current situation and trends on community tourism activity. In this regard, there are several studies on tourism bibliometric analysis (Comerio and Strozzi, 2019; Garrigos-Simon et al., 2019; Niñerola et al., 2019; Agapito, 2020; Naruetharadhol and Gebsombut, 2020; Yagmur et al., 2020 ; Sigala, 2021; Ridho et al., 2021; Qiao et al., 2022; Zeng et al., 2022; Iqbal et al., 2022; Shin et al., 2023; Yildirim et al., 2023) among others, that address the scientific production developed on the tourism sector and its relationships with the theory and the elements they relate; Likewise, other studies on the bibliometry of rural tourism are observed, they collect important aspects of the actions and their performance of the activity of rural tourism and the contribution they generate in the local economic structure from the community and literature perspective (Pérez-Ramírez and Flores-Montes, 2019; Randelli and Martellozzo, 2019; Ma et al., 2020; Yachin and Loannides, 2020; Wijijayanti et al., 2020; Ma et al., 2021; Weyland et al., 2021; Ruiz-Real et al., 2022; Zeng et al., 2022; Utami et al., 2023; Wang et al., 2023; Dossou et al., 2023). In relation to the studies on the bibliometric analysis of community tourism, these are limited and provide information related to the first studies on the scientific production of the construct and the variables linked to community tourism (Graciano and Holland, 2020; Iqbal et al., 2022; Nindito et al., 2022; Tham and Chin, 2023), and do not carry out an exhaustive analysis as this research intends to be. However, there are no bibliometric studies on rural community tourism. Therefore, the research carries out a bibliometric analysis of the research developed on community tourism, rigorously describing scientific production and advances in scientific production.

METHODOLOGY

The method used consists of a bibliometric analysis of scientific production on rural community tourism, based on a construct search equation in the Scopus database. The use of this type of analysis is motivated by the need to evaluate scientific production. Its use makes it possible to present the most relevant results of a set of documents in summary form (Martínez-López et al., 2018), to detect new research trends and increase cooperation possibilities among researchers (Rosas Jaco et al., 2021). The analysis is based on bibliometric indicators, which are statistical data derived from scientific publications in a specific field and which measure the role of publications in the dissemination of knowledge (Duque and Duque, 2022), the results are used to classify and analyze scientific publications in an action field and provide information that makes it possible to observe behavior results of the analyzed variables, considering parameters for evaluating scientific activity (Donthu et al., 2021; López-Rodríguez, 2022). The database used to extract the information was Scopus, which allows access to publications in all knowledge fields with a high quality index (Shah et al., 2019).

The inclusion criteria focused search on articles published in English and Spanish within 1983 to 2022 period, considering the words "community tourism" or "turismo comunitario". For this purpose, Bibliometrix and VOSviewer software were used to perform the bibliometric analysis of the best positioned records. (López-Rodríguez et al., 2022), as shown in Table, it should be noted that indicators include those with the highest number of publications, citations and concurrence, because they are the most important in the bibliometric exercise (Comerio y Strozzi, 2019; Yagmur et al., 2020; Naruetharadhol and Gebsombut, 2020; Mukherjee et al., 2022; Alsmadi et al., 2022; Minga López et al., 2022; Yildirim and Esen, 2023) and a ranking of the 20 best positioned elements is presented (Minga López et al., 2022). Table 1 shows the search criteria and the analysis parameter, and the diagram that summarizes the steps developed is seen in Figure 1.

Table 1. Search criteria and analysis parameter

Search criteria	
Database	Scopus
Language	English and Spanish
Period of analysis	1983 -2022
Date of consultation	March 30, 2023
Types of documents	Scientific articles
Type of journal	All types
Field and search terms	TITLE ("community tourism") OR TITLE ("turismo comunitario")
Resultado Total	124
Analysis parameter	
Annual scientific production, scientific production by country, productivity by institution type, most cited articles, journals with the most publications on community tourism, key words and relationship with other topics, main research trends (thematic map).	

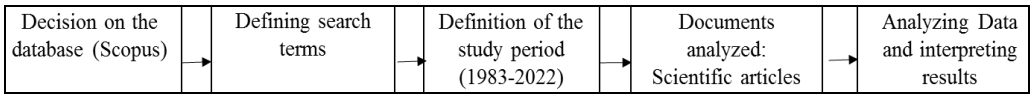


Figure 1. Flow Chart of Methodology Steps

RESULTS

The results of the scientific production on community-based tourism are shown in Figure 2, which shows that the first articles published on the subject correspond to the authors Loukissas (1983) published by Journal of Travel Research whose article title is: Public participation in community tourism planning: a gaming simulation approach and D'Amore (1983), published by the Western Geographical Series, and his work Guidelines to planning in harmony with the host community (tourism). From 2004 the production increases slightly until 2011; it is from 2012 that begins an important growth reaching a number of 17 articles published in 2022, which means an 850% growth since its inception, so the construct of community tourism is increasingly researched (Teshome et al., 2021; Pasanchay and Schott, 2021; Li et al., 2023; Zavaleta Chavez et al., 2023) and its contribution to society is reflected in an economic contribution, social and cultural spheres (Teshome et al., 2021; Ridho et al., 2021; Dolezal and Novelli, 2022; Sann et al., 2023).

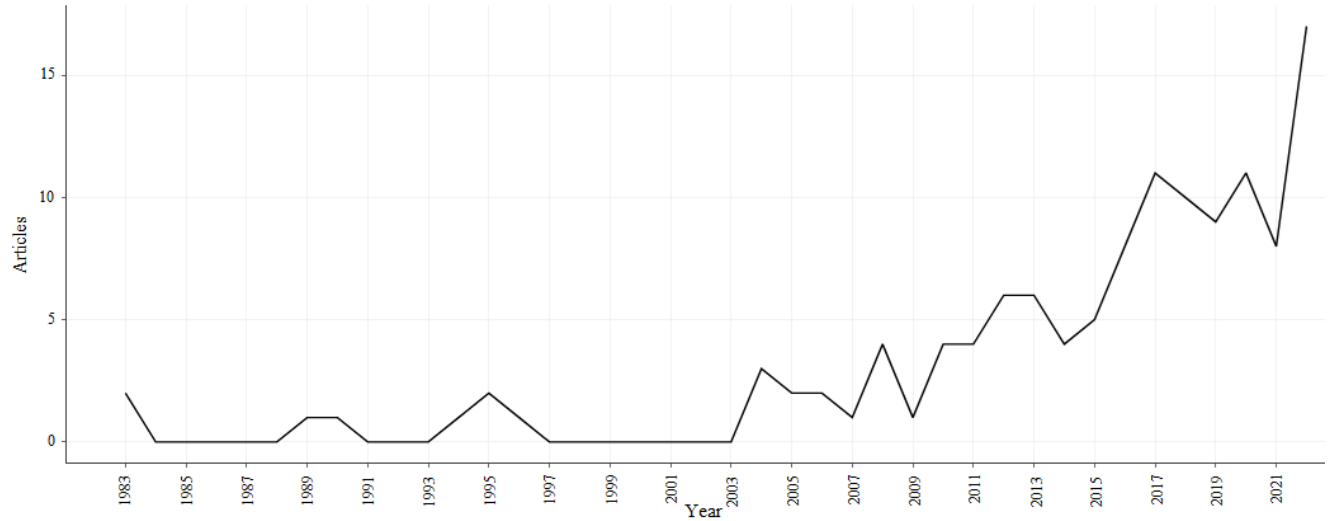


Figure 2. Annual scientific production (Source: Own elaboration based on Scopus data, 2023)

In biblometric analysis, it is important to highlight the institutions that made most contributions and, consequently, the countries and journals that made most contributions as well (Yagmur et al., 2020; Mukherjee et al., 2022; Alsmadi et al., 2022; Chen et al., 2022; Bahuguna et al., 2023). Thus, Figure 3 shows the 20 countries that have made the best performance and contributions to the community-based tourism (CBT) construct and collaborations with other researchers from other countries (CCM). At the ranking top, the United States leads with 16 publications, followed by Spain with 11 publications, China with 6 publications, Canada and Hong Kong with 5 and 3 publications respectively. These positions could be attributed to the concentration of tourism activity and public policies aimed at promoting community-based tourism associated with economic, social and cultural aspects (Agyeman et al., 2022).

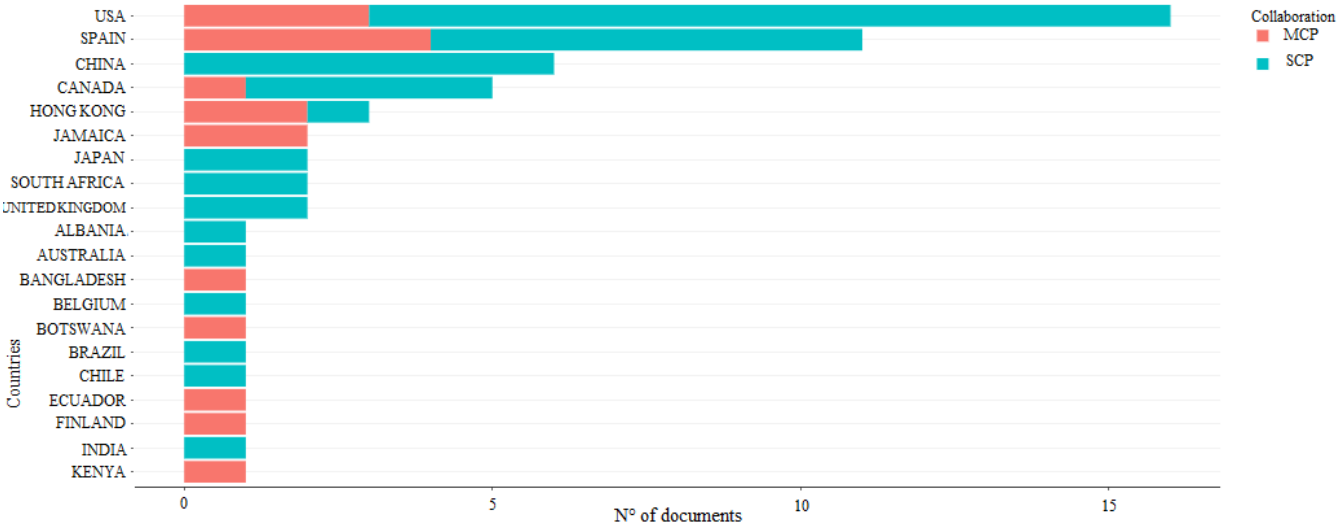


Figure 3. Scientific production by country (Countries of the corresponding author)

In relation to the contribution of universities in the scientific production on community-based tourism (Figure 4), 126 institutions participated; the ones that stand out for their contribution are the University of the West Indies (Jamaica) with 9 articles, closely followed by the Arizona State University (USA) and the University of Guelph (Canadá) with 6 articles each, with 4 articles each respectively, and five universities and one institute with 4 articles each.: Central Connecticut State

University (USA), Universidad Autónoma de Guerrero (México), Universidad de Córdoba (España), University of Northern Iowa (USA), University of South Africa (South Africa), Instituto Politécnico de Tomar (Portugal), among the most important.

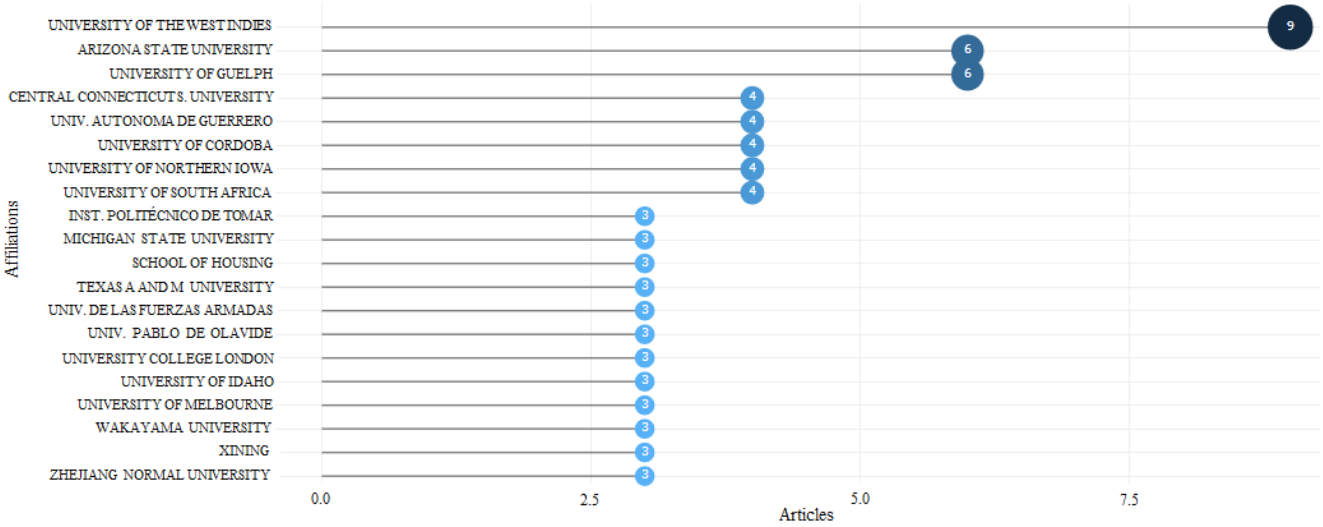


Figure 4. Productivity by type of institution

Table 2 shows the 20 most cited authors and articles in relation to the study variable. The most cited topics undoubtedly offer relevant themes on community tourism and its relationship with other variables that open up a range of possibilities for creating or expanding other lines of research. The most cited article corresponds to Andereck et al., (2005) which reaches 1012; those studying residents' perceptions of the impacts of community-based tourism, which undoubtedly contributed significantly to the construction and theoretical discussion of perceptions of community-based tourism. (Andereck et al., 2005), followed by Jamal and Getz (1995) with 1004 citations, studying on the theory of community tourism collaboration and planning, which fed into the study of community tourism planning processes (Bello, 2021).

It is also important to mention the work of Choi and Sirakaya (2006) with 619 citations, whose theme is focused on the study and construction of sustainability indicators for community tourism management, which made it possible to strengthen and open opportunities to develop research on the complexity of indicators on sustainability and community tourism (Merkel and Kieffer, 2022); It is also useful to refer to the contributions and quotations of Choi and Murray (2010), whose article analyzes the attitudes of residents towards sustainable community tourism, which years later would lead to the development of research on the attitudes, perceptions and behaviors of the tourist receiving community (Lee and Jan, 2019); as well as the article analyzing change and resilience in community tourism planning, which reaffirms the importance of community tourism planning (Bello, 2021; Dolezal and Novelli, 2022; Chatkaewnapanon and Lee, 2022).

Table 2. Most cited articles (Source: Own elaboration based on Scopus data, 2023)

Posi-tion	Authors	Article title	N° of appo-intments
1	Andereck et al., 2005)	Residents' perceptions of community tourism impacts	1012
2	Jamal and Getz (1995)	Collaboration theory and community tourism planning	1004
3	Choi and Sirakaya (2006)	Sustainability indicators for managing community tourism	619
4	Choi y Murray (2010)	Resident attitudes toward sustainable community tourism	325
5	Lew (2014)	Scale, change and resilience in community tourism planning	218
6	Keogh (1990)	Public participation in community tourism planning	195
7	Joppe (1996)	Sustainable community tourism development revisited	175
8	Reid et al., (2004)	Community tourism planning: A self-assessment instrument	115
9	Robinson and Jarvie (2008)	Post-disaster community tourism recovery: The tsunami and Arugam Bay, Sri Lanka	69
10	Stone and Nyaupane (2018)	Protected areas, wildlife-based community tourism and community livelihoods dynamics: spiraling up and down of community capitals	64
11	Harvey et al., (1995)	Gender and community tourism dependence level	64
12	Lai and Hitchcock (2017)	Local reactions to mass tourism and community tourism development in Macau	61
13	Li (2004)	Exploring community tourism in China: The case of nanshan cultural tourism zone	60
14	Ruiz-Ballesteros and Hernández-Ramírez (2010)	Tourism that empowers?: Commodification and appropriation in Ecuador's	56
15	Hamilton and Alexander (2013)	Organic community tourism: A cocreated approach	47
16	Chen and Raab, (2012)	Predicting Resident Intentions to Support Community Tourism: Toward an Integration of Two Theories	39
17	Loukissas (1983)	Public participation in community tourism planning: a gaming simulation approach.	36
18	Jordan et al., (2013)	The interplay of governance, power and citizen participation in community tourism planning	31
19	Lenao and Saarinen (2015)	Integrated rural tourism as a tool for community tourism development: Exploring culture and heritage projects in the North-East District of Botswana	30
20	D'Amore (1983)	Guidelines to planning in harmony with the host community (tourism).	30

In the period under analysis, 76 journals published on community-based tourism, of which the top twenty are shown in the ranking, see Table 3. The United Kingdom leads with 9 journals with high impact factor Q1 and Q2; also, the United States registers 3 journals with varied quartiles, Spain and Venezuela register 2. Among the most important journals and topics published, the following journals are noted Annal of Tourism Research, Sustainability, Espacios, Gazeta de Antropología, Journal of Sustainable Tourism, Pasos Revista de Turismo y Patrimonio Cultural. 70% of journals described in the table publish topics related to community tourism linked to sustainability, management aspects and actions of rural tourism activity, which helps to understand that community tourism has a direct link and relationship with the development of communities, the search for better living conditions, and a perspective of sustainable development of peoples and territories based on the responsible use of natural resources (Iqbal et al., 2022; Nuanmeesri, 2022; López-Rodríguez et al., 2022); 30% concentrate their publications in the field of perceptions, attitudes, management, and social science.

Table 3. Journals with the most publications on community-based tourism
(Source: Own elaboration based on Scopus information, 2023)

Position	Journals	N° of articles	Countries	Quartile (2022)	ISNN
1	Annal of Tourism Research	8	United Kingdom	Q1	01607383
2	Sustainability	7	Switzerland	Q1	20711050
3	Espacios	5	Venezuela	Q0	07981015
4	Gazeta de antropología	4	España	Q4	02147564
5	Journal of Sustainable Tourism	4	United Kingdom	Q1	09669582
6	Pasos Revista de Turismo y Patrimonio Cultural	4	España	Q2	16957121
7	Revista de Ciencias Sociales	3	Venezuela	Q2	13159518
8	Tourism Management	3	United Kingdom	Q1	02615177
9	Community Destination Management in Developing Economies	2	United Kingdom		ISBN 9780789023872
10	Community Development	2	United Kingdom	Q2	15575330
11	Cuadernos de Desarrollo Rural	2	Colombia	Q4	01221450
12	Iberian Conference on Information Systems and Technologies, CISTI	2	United States	Q0	21660727
13	International Journal of Civil Engineering and Technology	2	India	Q4	09766308
14	International Journal of Professional Business Review	2	Brasil	Q4	25253654
15	IOP Conference Serie: Earth and Environmental Science	2	United Kingdom	Q4	17551315
16	Journal of Travel Research	2	United Kingdom	Q1	15526763
17	The Local Turn in Tourism: Empowering Communities	2	United Kingdom		ISBN 1845418786
18	Tourism Economics	2	United States	Q1	20440375
19	Tourism Geographies	2	United Kingdom	Q1	14701340
20	Tourism, Culture and Communication	2	United States	Q1	1098304X

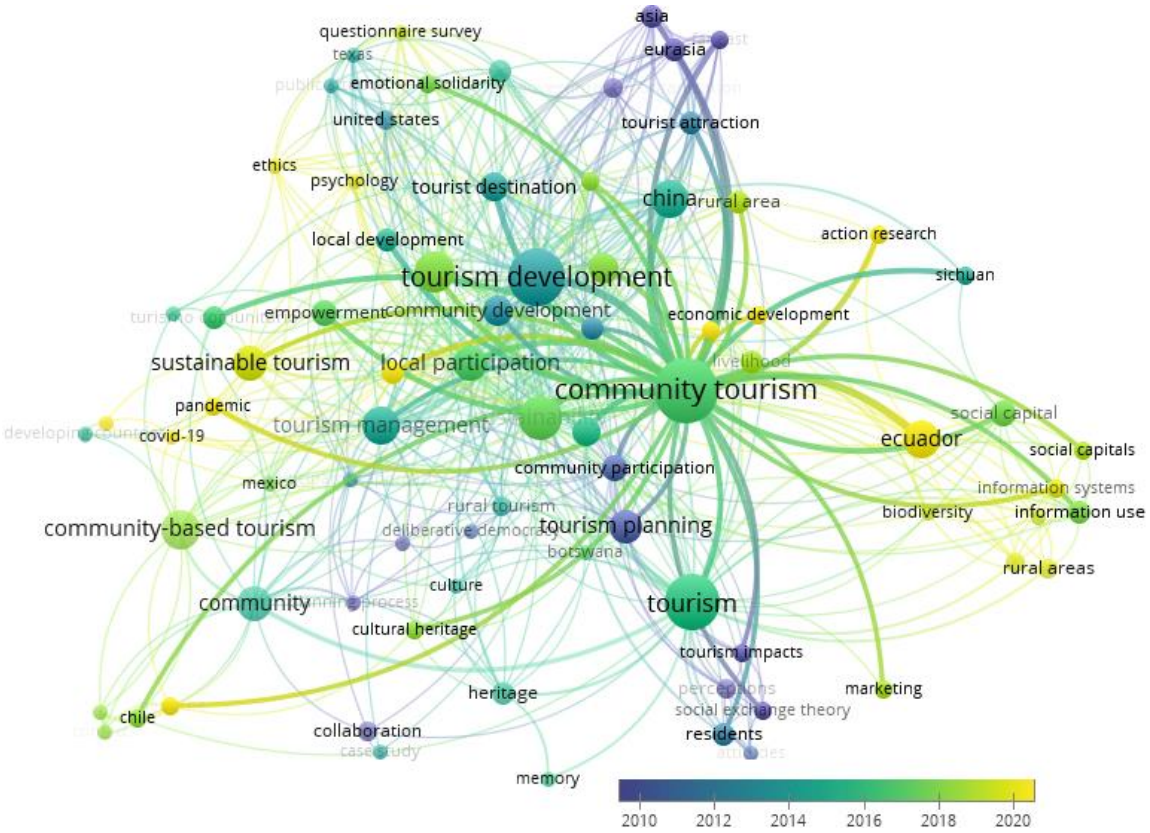


Figure 5. Key words and relationship with themes (Source: Own elaboration based on VOSviewer)

The relationship of the keywords of research associated with other topics is an important element in the bibliometric analysis, since it allows to identify the areas of knowledge and topics related to the construct and its analysis (Naruetharadhol and Gebsombut, 2020; Sigala, 2021; Yildirim and Esen, 2023). Figure 5 shows that research on community tourism until 2014 was related to community participation, tourism planning, impact of tourism in the rural context, tourist destinations, rural tourist attractions, residents' perception of rural tourism activity, tourism development, among the most important. Between 2014 and 2018 were related to tourism management, community development, local development, social capital, cultural heritage. From 2019 onwards, research is closely related to biodiversity, social capital, economic development, tourism sustainability, pandemic in the context of Covid-19, ethical issues of community tourism and information systems linked to platforms or networks. This makes it possible to affirm that these variables configure the spectrum of lines of research generated by the phenomenon under study, within a changing scenario. These last variables incorporated in the studies reflect the orientation of the research towards current issues in changing scenarios in the social, economic and cultural spheres (Wijijayanti et al., 2020; Ruiz-Real et al., 2022; Moayerian et al., 2022; Ramkissoon, 2023).

In order to visualize the trends in community tourism research, an analysis is made based on the themes developed. Figure 5 shows the thematic map of the areas or themes related to the construct; its importance lies in the identification of the relationship and trends that exist between community tourism and other areas of knowledge (Ruiz-Ballesteros and Hernández-Ramírez, 2010; Stone and Nyaupane, 2018; Agapito, 2020; Niñerola et al., 2019; Donthu et al., 2021; Qiao et al., 2022). Quadrant A shows research developed in the area of community projects, community tourism, social responsibility and other topics such as exploratory analysis, which are peripheral or isolated to the study phenomenon, are addressed separately; quadrant B shows the central themes or driving forces in their approach to community tourism, the most important of which are: social capital, tourism services, tourism planning, community development, sustainable development, community tourism, these themes have an important association with the research developed based on the study variable; On the other hand, in quadrant C, there are emerging or trending topics such as sustainable tourism, economic development, sustainable community, ethnic cultural, local tourism and indigenous community. Finally, quadrant D shows the basic themes that define the construct, as can be seen, they are linked to community empowerment, community participation, community development and mobile applications. In this order, Figure 6 shows the theoretical implications of community tourism linked to other areas of knowledge, the progress, and contributions of the subject of study. As shown in quadrant B, the central themes that stand out are social capital, as an element linked to community cooperation and associations of entrepreneurs or productive economic activities related to community tourism (Stone and Nyaupane, 2018; Ramkissoon, 2023), public-oriented tourism services as one of the strengths of the business units, the search for quality in services is one of the permanent and differentiated tasks and responsibilities in relation to traditional tourism (Lew and Wu, 2017; Wang et al., 2023).

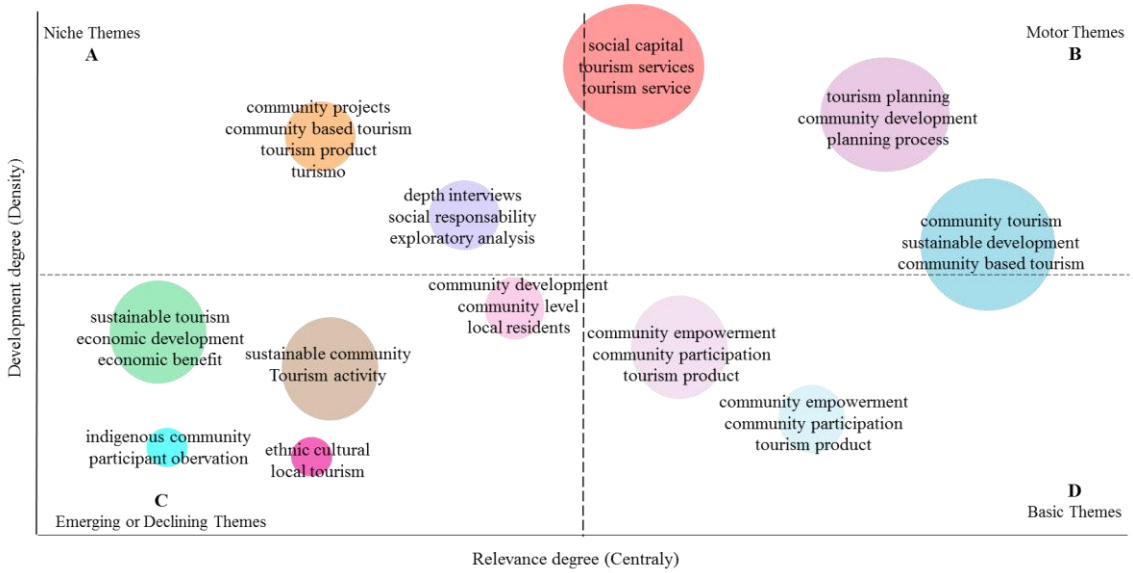


Figure 6. Main Research Streams (Source: Own elaboration based on Bibliometrix, 2023)

The planning of community-based tourism is also highlighted (Comerio and Strozzi, 2019), as a determining aspect in the definition and prioritization of objectives for the growth and development of tourism activities at the community level (Bello, 2021), sustainable community development, which is approached from the perspective of the community, which considers natural resources as its development potential, studies agree that the greater the efforts in investments, financing and promotion of local tourism, the better the social and economic benefits and its development (Wijijayanti et al., 2020; Zeng et al., 2022; Ramkissoon, 2023), their organizations and the participation of local stakeholders and the population in planning processes, generating more sustainable community projects (Wijijayanti et al., 2020; Ridho et al., 2021; Ayaviri Nina et al., 2023), together with the culture of the population in the generation of tourism activities and their development (Ma et al., 2021) and good community practices (Teshome et al., 2021; Weyland et al., 2021).

The economic need to explore new ways of generating income, together with the opportunity to generate new productive initiatives, allow us to assume an entrepreneurial philosophy with a high level of empowerment (Khalid et al., 2019; Dolezal

and Novelli, 2022; Quispe, 2023); on the other hand, community participation is highlighted as a space for the consolidation of interpersonal relationships and decision making for the fulfillment of community objectives (Martini, 2020; Bello, 2021; Iqbal et al., 2022); research on community development is also observed as the ultimate goal of the practice of community-based tourism, which creates employment opportunities and consolidates local development processes (Hitchcock, 2017; Lee and Jan, 2019; Pasanchay and Schott, 2021; Chatkaewnapanon and Lee, 2022; Ruiz-Real et al., 2022), to a large extent these activities are based on the use of natural resources considered as local or cultural heritage of the community linked to community development (Rasoolimanesh et al., 2017), and the transformation of the territories, the change of the economic structure and the progress of the communities (Lew, 2017; Wijijayanti et al., 2020; Agyeman et al., 2022).

In this line, the role of communities in the sustainable management of their heritage and a responsible environmental perspective for their development is relevant (Lew and Wu, 2017; Pérez-Ramírez and Flores-Montes, 2019; Bahuguna et al., 2023); studies on mobile applications in community tourism have also been carried out. Their importance lies in the geo-referential incorporation of location, information on tourist services and better communication with tourists, which undoubtedly contribute positively to the improvement of tourist services (Oskam, 2022; Yildirim and Esen, 2023; Nuanmeesri, 2022; Jordan et al., 2023; Shrestha et al., 2023), the adaptation to new technologies represents an effort for the rural population involved in these productive units, but the contribution is greater in terms of sustainability (Shin et al., 2023).

In quadrant C, there are the emerging or trending topics, which will configure a new scenario for community tourism, including sustainable tourism, as an approach to strategic management of productive units, care and responsible administration of natural resources, linked to sustainable and environmental development (Randelli and Martellozzo, 2019; Merkel Arias and Kieffer, 2022; Maggi and Vroegop, 2023; Dossou et al., 2023); studies pay special attention to community tourism activity linked to economic development, beyond income generation and social aspects, the trends are oriented to endogenous aspects such as knowledge, innovation, technology, education and good governance, which provide an important scenario in the approach and contribution to the construct (Wijijayanti et al., 2020; Agyeman et al., 2022; Zeng et al., 2022; Moayerian et al., 2022; Zavaleta et al., 2023;) and that open up a range of possibilities for generating research on this front (Zeng et al., 2022). An issue that becomes relevant has to do with the ethno-cultural aspect, understood as the sharing and opening of their traditions, ancestral knowledge and customs, which have a social value that rural communities possess (Moayerian et al., 2022), for the establishment of local tourism based on the potentialities; in this line, another topic studied is sustainable communities, in the search to achieve tourism projects that remain in time (Rembulan and Kusumowidagdo, 2022; Li et al., 2023;). Finally, issues related to indigenous communities are observed, these populations have a special interest in visitors, and recent research reveals that these territories are joining the tourist activity as another alternative for survival and the search for new economic alternatives (Rembulan and Kusumowidagdo, 2022; Shrestha et al., 2023), linked to the local development of their communities.

CONCLUSION

The bibliometric analysis on community tourism shows that during the study period, scientific production shows a sustained behavior; the exponential growth from 2012 to 2022 is relevant, which means that the field of study is important because it is an area with potential in the generation of future research and its relationship with other areas of knowledge.

In the ranking of the first twenty countries, the United Kingdom and the United States stand out, followed by Spain and Venezuela as Ibero-American countries; in the same context, the scientific contribution according to institutions, the University of the West Indies (Jamaica), the Arizona State University (United States) and the University of Guelph (Canada) are among the most important. The most outstanding articles with the highest number of citations within the analysis group correspond to authors who publish topics related to planning, community development and sustainability.

As of 2019, research on community-based tourism is related to topics such as biodiversity, social capital, sustainability of tourism as key elements of analysis, in addition to ethics in community-based tourism and information systems linked to platforms or networks. This allows us to affirm that these variables configure the spectrum of the lines of research that are generated from the phenomenon of study; with greater strength in the last two years, the theme linked to sustainable tourism, sustainable development, economic development is observed, a theme that becomes relevant has to do with the ethnic cultural aspect that rural communities have that contributes to local tourism; in this line, they also study sustainable communities. Finally, the topics related to indigenous communities are observed as a very strong trend in the analysis of the elements or aspects of the indigenous communities and population. Finally, the theoretical implications related to community tourism constitute a significant contribution to the construction of knowledge and the scientific structure around the analyzed variable and the elements related to it; consequently, the link between community tourism and other areas of knowledge is diverse and rests on the theoretical approach according to the context and focus assumed by the researchers. The new trends or emerging topics open a range of new lines and topics of research that will continue to contribute to the strengthening of research on the community tourism variable.

Author Contributions: Conceptualization, V.D.A.N and D.F.R.; methodology, V.D.A.N. and G.Q.F.; software, V.D.A.N.; validation, D.F.R. and G.Q.F.; formal analysis, V.D.A.N. and D.F.R.; investigation, G.Q.F.; data curation, V.D.A.N; writing - original draft preparation, V.D.A.N.; writing - review and editing, D.F.R. and G.Q.F.; visualization, D.F.R. and G.Q.F.; supervision, V.D.A.N.; All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research was made possible by the equal involvement of all the authors.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Agapito, D. (2020). The senses in tourism design: A bibliometric review. *Annals of Tourism Research,* 83, 102934. https://doi.org/10.1016/j.annals.2020.102934

Agyeman, F., Zhiqiang, M., Li, M., Sampene, A., Dapaah, M., Kedjanyi, E., Buabeng, P., Li, Y., Hakro, S., & Heydari, M. (2022). Probing the Effect of Governance of Tourism Development, Economic Growth, and Foreign Direct Investment on Carbon Dioxide Emissions in Africa: The African Experience. *Energies,* 15, 4530. https://doi.org/10.3390/en15134530

Alsmadi, A., Al-Gasaymeh, A., Alrawashdeh, N., & Alhwamdeh, L. (2022). Financial supply chain management: A bibliometric analysis for 2006-2022. *Uncertain Supply Chain Management,* 10(3), 645-656. https://doi.org/10.5267/j.uscm.2022.5.010:

Andereck, K., Valentine, K., Knopf, R., & Vogt, C. (2005). Residents' perceptions of community tourism impacts. *Annals of tourism research,* 32(4), 1056-1076. https://doi.org/10.1016/j.annals.2005.03.001

Apostolopoulos, N., Liargovas, P., Stavroyiannis, S., Makris, I., Apostolopoulos, S., Petropoulos, D., & Anastasopoulou, E. (2020). Sustaining rural areas, rural tourism enterprises and EU development policies: A multi-layer conceptualisation of the obstacles in Greece. *Sustainability,* 12(18), 7687. https://doi.org/10.3390/su12187687

Ayaviri Nina, D., Giner Pérez, J.M., & Quispe Fernandez, G.M. (2023). Development Planning in Rural Context. A theoretical Approach, *Interciencia,* 48(9), 449 – 459.

Bahuguna, P., Srivastava, R., & Tiwari, S. (2023). Two-decade journey of green human resource management research: a bibliometric analysis *Benchmarking: An International Journal,* Vol. 30 No. 2, pp. 585-602. https://doi.org/10.1108/BIJ-10-2021-0619

Bello, F. (2021). Community participation in tourism planning at majete wildlife reserve, Malawi. *Quaestiones Geographicae,* 40(4), 85-100. https://doi.org/10.2478/quageo-2021-0035

Chatkaewnapanon, Y., & Lee, T. (2022). Planning Sustainable Community-Based Tourism in the Context of Thailand: Community, Development, and the Foresight Tools. *Sustainability,* 14(12), 7413. https://doi.org/10.3390/su14127413

Cheer, J., Milano, C., & Novelli, M. (2019). Tourism and community resilience in the Anthropocene: Accentuating temporal overtourism. *Journal of Sustainable Tourism,* 27(4), 554-572.

Chen, S., & Raab, C. (2012). Predicting resident intentions to support community tourism: Toward an integration of two theories. *Journal of Hospitality Marketing & Management,* 21(3), 270-294. https://doi.org/10.1080/19368623.2011.584268

Chen, S., Xu, Z., Wang, X., & Škare, M. (2022). A bibliometric analysis of natural disasters and business management in tourism. *Journal of Business Economics and Management,* 23(2), 305-326. https://doi.org/10.3846/jbem.2022.16388

Choi, H., & Murray, I. (2010). Resident attitudes toward sustainable community tourism. *Journal of Sustainable Tourism,* 18(4), 575-594. https://doi.org/10.1080/09669580903524852

Choi, H., & Sirakaya, E. (2006). Sustainability indicators for managing community tourism. *Tourism management,* 27(6), 1274-1289. https://doi.org/10.1016/j.tourman.2005.05.018

Comerio, N., & Strozzi, F. (2019). Tourism and its economic impact: A literature review using bibliometric tools. *Tourism economics,* 25(1), 109-131. https://doi.org/10.1177/1354816618793764

D'Amore, L. (1983). Guidelines to planning in harmony with the host community. Guidelines to planning in harmony with the host community. *Western Geographical Series, 21,* 135-160.

Dolezal, C., & Novelli, M. (2022). Power in community-based tourism: empowerment and partnership in Bali. *Journal of Sustainable Tourism,* 30(10), 2352-2370. https://doi.org/10.1080/09669582.2020.1838527

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research,* 133, 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Dossou, T., Ndomandji Kambaye, E., Bekun, F., & Eoulam, A. (2023). Exploring the linkage between tourism, governance quality, and poverty reduction in Latin America. *Tourism Economics,* 29(1), 210-234.

Duque, P., & Duque Oliva, E. (2022). Tendencias emergentes en la literatura sobre el compromiso del cliente: un análisis bibliométrico. *Estudios Gerenciales,* 38(162), 120-132. https://doi.org/10.18046/j.estger.2022.162.4528

Eslami, S., Khalifah, Z., Mardani, A., Streimikiene, D., & Han, H. (2019). Community attachment, tourism impacts, quality of life and residents' support for sustainable tourism development. *Journal of Travel & Tourism Marketing,* 36(9), 1061-1079. https://doi.org/10.1080/10548408.2019.1689224

Filimonau, V., & De Coteau, D. (2020). Tourism resilience in the context of integrated destination and disaster management (DM2). *International Journal of Tourism Research,* 22, 202–222. https://doi.org/10.1002/jtr.2329.

Garrigos-Simon, F., Narangajavana-Kaosiri, Y., & Narangajavana, Y. (2019). Quality in tourism literature: A bibliometric review. *Sustainability,* 11(14), 3859. https://doi.org/10.3390/su11143859

Graciano, P.F., & Holanda, L.A.D. (2020). Bibliometric analysis of scientific literature on community-based tourism from 2013 to 2018. *Revista Brasileira de Pesquisa em Turismo,* 14, 161-179. https://doi.org/10.7784/rbtur.v14i1.1736

Hamilton, K., & Alexander, M. (2013). Organic community tourism: A cocreated approach. *Annals of Tourism Research,* 42, 169-190. https://doi.org/10.1016/j.annals.2013.01.015

Harvey, M., Hunt, J., & Harris, C. (1995). Gender and community tourism dependence level. *Annals of Tourism Research,* 22(2), 349-366.

Iqbal, A., Ramachandran, S., Siow, M., Subramaniam, T., & Afandi, S. (2022). Meaningful community participation for effective development of sustainable tourism: Bibliometric analysis towards a quintuple helix model. *Journal of Outdoor Recreation and Tourism,* 39, 100523.

Jamal, T., & Getz, D. (1995). Collaboration theory and community tourism planning. *Annals of tourism research,* 22(1), 186-204. https://doi.org/10.1016/0160-7383(94)00067-3

Joppe, M. (1996). Sustainable community tourism development revisited. *Tourism management,* 17(7), 475-479. https://doi.org/10.1016/S0261-5177(96)00065-9

Jordan, E., Vieira, J., Santos, C., & Huang, T. (2023). Do residents differentiate between the impacts of tourism, cruise tourism, and Airbnb tourism?. *Journal of Sustainable Tourism,* 31(2), 265-283. https://doi.org/10.1080/09669582.2020.1833894

Keogh, B. (1990). Public participation in community tourism planning. *Annals of tourism research,* 17(3), 449-465. https://doi.org/10.1016/0160-7383(90)90009-G

Khalid, S., Ahmad, M., Ramayah, T., Hwang, J., & Kim, I. (2019). Community empowerment and sustainable tourism development: The mediating role of community support for tourism. *Sustainability*, 11(22), 6248. https://doi.org/10.3390/su11226248

Lai, I., & Hitchcock, M. (2017). Local reactions to mass tourism and community tourism development in Macau. *Journal of Sustainable Tourism*, 25(4), 451-470. https://doi.org/10.1080/09669582.2016.1221413

Lalangui, J., Espinoza, C., & Pérez, M. (2017). Turismo sostenible. Un aporte a la responsabilidad social empresarial: Sus inicios, características y desarrollo. *Universidad y Sociedad Revista Científica dela Universidad de Cienfuegos.* 9(1), 148 -153.

Lapuz, M.C. (2023). The role of local community empowerment in the digital transformation of rural tourism development in the Philippines. *Technology in Society*, 74, 102308. https://doi.org/10.1016/j.techsoc.2023.102308

Lee, T., & Jan, F. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. *Tourism Management*, 70, 368-380. https://doi.org/10.1016/j.tourman.2018.09.003

Lew, A., & Wu, T. (2017). *Cultural ecosystem services, tourism and community resilience in coastal wetland conservation in Taiwan*. In Alan A. Lew and Joseph M. Cheer (Eds.), Tourism resilience and adaptation to environmental change: London: Routledge.

Lew, A. (2014). Scale, change and resilience in community tourism planning. *Tourism Geographies*, 16(1), 14-22. https://doi.org/10.1080/14616688.2013.864325

Li, Y. (2004). Exploring community tourism in China: The case of Nanshan cultural tourism zone. *Journal of sustainable tourism*, 12(3), 175-193. https://doi.org/10.1080/09669580408667232

Li, T., Wu, B., Guo, L., Shi, H., Chen, N., & Hall, C. (2023). Semi-Acquaintance Society in Rural Community-Based Tourism: Case Study of Moon Village, *China. Sustainability.* 15(6):5000. https://doi.org/10.3390/su15065000

Li, B., Mi, Z., & Zhang, Z. (2020). Willingness of the new generation of farmers to participate in rural tourism: The role of perceived impacts and sense of place. *Sustainability*, 12(3), 766. https://doi.org/10.3390/su12030766

Lin, H., Ying, L., Jao-Chuan, L., & Zhou-Fu, L. (2021). Research on the Development of Religious Tourism and the Sustainable Development of Rural Environment and Health" International Journal of Environmental. *Research and Public Health* 18(5), 2731. https://doi.org/10.3390/ijerph18052731

López-Rodríguez, C.E., Mora-Forero, J.A., & León-Gómez, A. (2022). Strategic Development Associated with Branding in the Tourism Sector: Bibliometric Analysis and Systematic Review of the Literature between the Years 2000 to 2022. *Sustainability*, 14(16), 9869. https://doi.org/10.3390/su14169869

Loukissas, P.J. (1983). Public participation in community tourism planning: A gaming simulation approach. *Journal of Travel Research*, 22(1), 18-23. https://doi.org/10.1177/004728758302200l

Ma, X., Dai, M., & Fan, D. (2020). Cooperation or confrontation? Exploring stakeholder relationships in rural tourism land expropriation. *Journal of Sustainable Tourism*, 28(11), 1841-1859. https://doi.org/10.1080/09669582.2020.1762622

Ma, X., Wang, R., Dai, M., & Ou, Y. (2021). The influence of culture on the sustainable livelihoods of households in rural tourism destinations. *Journal of Sustainable Tourism*, 29(8), 1235-1252. https://doi.org/10.1080/09669582.2020.1826497

Maggi, R., & Vroegop, E. (2023). Decent work in traditional tourism destinations: Tourism Agenda 2030 perspective article, *Tourism Review*, (78)2, 332-338. https://doi.org/10.1108/TR-08-2022-0414

Makandwa, G., de Klerk, S., & Saayman, A. (2023). Culturally-based community tourism ventures in Southern Africa and rural women entrepreneurs' skills. *Current Issues in Tourism*, 26(8), 1268-1281. https://doi.org/10.1080/13683500.2022.2052267

Martini, N. (2020). Community participation in Blangsinga tourism village development. International Research Journal of Management, *IT and Social Sciences*, 7(3), 91-97. https://doi.org/10.21744/irjmis.v7n3.922

Mathew, P. (2022). Sustainable tourism development: discerning the impact of responsible tourism on community well-being. *Journal of Hospitality and Tourism Insights*, 5(5), 987-1001.

Merkel Arias, N., & Kieffer, M. (2022). Participatory Action Research for the assessment of Community-Based Rural Tourism: A case study of co-construction of tourism sustainability indicators in Mexico. *Current Issues in Tourism*, 1-18.

Minga López, D., Carrillo Cueva, C., & Flores Ruiz, D. (2022). Emprendimiento social: un análisis bibliométrico y revisión de literatura. REVESCO. *Revista de Estudios Cooperativos*, 142, e84390. https://dx.doi.org/10.5209/reve.84390.

Moayerian, N., McGehee, N.G., & Stephenson Jr, M. (2022). Community cultural development: Exploring the connections between collective art making, capacity building and sustainable community-based tourism. *Annals of Tourism Research*, 93, 103355.

Mukherjee, D., Kumar, S., Mukherjee, D., & Goyal, K. (2022). Mapping five decades of international business and management research on India: A bibliometric analysis and future directions. *Journal of Business Research*, 145, 864-891. https://doi.org/10.1016/j.jbusres.2022.03.011

Naruetharadhol, P., & Gebsombut, N. (2020). A bibliometric analysis of food tourism studies in Southeast Asia. *Cogent Business & Management*, 7(1), 1733829. https://doi.org/10.1080/23311975.2020.1733829

Nicolaides, A. (2020). Sustainable ethical tourism (SET) and rural community involvement. *African Journal of Hospitality, Tourism and Leisure*, 9(1), 1-16.

Nindito, H., Warnars, H.S., Sfenrianto, S., & Prabowo, H. (2022). Community-based tourism and technology relationship: A bibliometric analysis. *Journal of Theoretical and Applied Information Technology*, 100(6), 1-10.

Niñerola, A., Sánchez-Rebull, M.V., & Hernández-Lara, A.B. (2019). Tourism research on sustainability: A bibliometric analysis. *Sustainability*, 11(5), 1377. https://doi.org/10.3390/su11051377

Nordbo, I. (2022). Female entrepreneurs and path-dependency in rural tourism. *Journal of Rural Studies*, 96, 198-206. https://doi.org/10.1016/j.jrurstud.2022.09.032

Nuanmeesri, S. (2022). Development of community tourism enhancement in emerging cities using gamification and adaptive tourism recommendation. *Journal of King Saud University-Computer and Information Sciences*, 34(10), 8549-8563. https://doi.org/10.1016/j.jksuci.2021.04.007

Qiao, G., Ding, L., Zhang, L., & Yan, H. (2022). Accessible tourism: A bibliometric review (2008–2020). *Tourism Review*, 77(3), 713-730.

Oskam, J. (2022). *Understanding the Airbnb Community and its Community Impact: the Use of Scenarios to Build Resilience. In Peer-to-peer Accommodation and Community Resilience: Implications for Sustainable Development*, GB: CABI.

Pan, Y., Wang, X., & Ryan, C. (2021). Chinese seniors holidaying, elderly care, rural tourism and rural poverty alleviation programmes. *Journal of Hospitality and Tourism Management*, 46, 134-143. https://doi.org/10.1016/j.jhtm.2020.09.010

Pasanchay, K., & Schott, C. (2021). Community-based tourism homestays' capacity to advance the Sustainable Development Goals: A holistic sustainable livelihood perspective. *Tourism Management Perspectives*, 37, 100784. https://doi.org/10.1016/j.tmp.2020.100784

Pérez-Ramírez, C.A., & Flores-Montes, A. (2019). Rural tourism, environmental impact and resilience in Piedra Herrada, Mexico. *Agricultura, Sociedad y Desarrollo*, 16(4), 429-450. Doi: https://doi.org/10.22231/asyd.v16i4.1278

Prasongthan, S., & Silpsrikul, R. (2023). The connection of slow food principle with community – based tourism in Thailand: Investigating generation y perception. *GeoJournal of Tourism and Geosites*, 48(2spl), 709–716. https://doi.org/10.30892/gtg.482spl04-1070

Prayitno, G., Dinanti, D., Wisnu Adrianto, D., Rahmawati, R., Auliah, A., & Eka Wardhani, L. (2023). The influence of social capital in improving the quality of life of the community in Sidomulyo Tourism Village, Indonesia. *GeoJournal of Tourism and Geosites*, 46(1), 208–217. https://doi.org/10.30892/gtg.46123-1017

Quispe, G., Giner-Pérez, J.M., Ayaviri, D., & Villa, M. (2023). Bibliometric Studies on Rural Female Entrepreneurship: A Metabibliometric Review. *Academic Journal of Interdisciplinary Studies*, 12(4), 101-120. https://doi.org/10.36941/ajis-2023-0098

Ramkissoon, H. (2023). Perceived social impacts of tourism and quality-of-life: A new conceptual model. *Journal of Sustainable Tourism*, 31(2), 442-459. https://doi.org/10.1080/09669582.2020.1858091

Randelli, F., & Martellozzo, F. (2019). Is rural tourism-induced built-up growth a threat for the sustainability of rural areas? The case study of Tuscany. *Land Use Policy*, 86, 387-398. https://doi.org/10.1016/j.landusepol.2019.05.018

Rasoolimanesh, S., Jaafar, M., Ahmad, A., & Barghi, R. (2017). Community participation in World Heritage Site conservation and tourism development. *Tourism Management*, 58, 142-153. https://doi.org/10.1016/j.tourman.2016.10.016

Rembulan, C., & Kusumowidagdo, A. (2022). When the sense of place value is challenged by pandemic: value exchange in indigenous community-based tourism in Sade-Lombok, Indonesia. *Journal of Enterprising Communities: People and Places in the Global Economy*, 16(6), 849-875. https://doi.org/10.1108/JEC-02-2021-0020

Reid, D., Mair, H., & George, W. (2004). Community tourism planning: A self-assessment instrument. *Annals of Tourism research*, 31(3), 623-639. https://doi.org/10.1016/j.annals.2004.01.007

Ridho, S., Paisal, P., Mellita, D., & Roseno, M. (2021). The community participation in tourism sustainability and tourist satisfaction. *International Journal of Applied Sciences in Tourism and Events*, 5(1), 53-63. http://dx.doi.org/10.31940/ijaste.v5i1.2115

Robinson, L., & Jarvie, J. (2008). Post-disaster community tourism recovery: the tsunami and Arugam Bay, Sri Lanka. *Disasters*, 32(4), 631-645. https://doi.org/10.1111/j.1467-7717.2008.01058.x

Rosas Jaco, M., Almeraya Quintero, S., Guajardo Hernández, L., & Sangerman-Jarquín, D. (2021). Análisis bibliométrico de la producción científica sobre cadena de valor turística. *Revista mexicana de ciencias agrícolas*, 12(6), 1101-1113. https://doi.org/10.29312/remexca.v12i6.3014

Ruiz-Real, J., Uribe-Toril, J., de Pablo Valenciano, J., & Gázquez-Abad, J. (2022). Rural tourism and development: Evolution in scientific literature and trends. *Journal of Hospitality & Tourism Research*, 46(7), 1322-1346. https://doi.org/10.1177/1096348020926538

Ruiz-Ballesteros, E., & Hernández-Ramírez, M. (2010). Tourism that empowers? Commodification and appropriation in Ecuador's turismo comunitario. *Critique of Anthropology*, 30(2), 201-229. https://doi.org/10.1177/0308275X09345426

Sann, R., Lai, P.C., & Chen, C. (2023). Crisis Adaptation in a Thai Community-Based Tourism Setting during the COVID-19 Pandemic: A Qualitative Phenomenological Approach. *Sustainability*. 15(1):340. https://doi.org/10.3390/su15010340

Shah, S., Lei, S., Ali, M., Doronin, D., & Hussain, S. (2019). Prosumption: bibliometric analysis using HistCite and VOSviewer. *Kybernetes*, 49(3),1020–1045

Shrestha, R., L'Espoir Decosta, J., & Shrestha, R. (2023). Creating value networks through a learning society for Indigenous women tourism entrepreneurs, *International Journal of Contemporary Hospitality Management*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/IJCHM-03-2022-0317

Shin, H., Shin, S., & Gim, J. (2023). Looking back three decades of hospitality and tourism technology research: a bibliometric approach. *International Journal of Contemporary Hospitality Management*, 35(2), 563-588. https://doi.org/10.1108/IJCHM-03-2022-0376

Sigala, M. (2021). A bibliometric review of research on COVID-19 and tourism: Reflections for moving forward. *Tourism Management Perspectives*, 40, 100912. https://doi.org/10.1016/j.tmp.2021.100912

Stone, M., & Nyaupane, G. (2018). Protected areas, wildlife-based community tourism and community livelihoods dynamics: Spiraling up and down of community capitals. *Journal of Sustainable Tourism*, 26(2), 307-324. https://doi.org/10.1080/09669582.2017.1349774

Sumarmi, Bachri, S., Sholeha, A.W., Kurniawati, E., Hakiki, A.R., & Hidiyah, T.M. (2023). Development strategy for special interest tourism (sit) through community – based ecotourism (CBET) in Perawan beach promote a sustainable economy. *GeoJournal of Tourism and Geosites*, 48(2spl), 696708. https://doi.org/10.30892/gtg.482spl03-1069.

Tham, A., & Chin, S.W. (2023). Community-based tourism in East Asia: A bibliometric research note. *Tourism and Hospitality Research*, 23(3), 459-467. https://doi.org/10.1177/14673584221100719

Teshome, E., Shita, F., & Abebe, F. (2021). Current community based ecotourism practices in Menz Guassa community conservation area, Ethiopia. *GeoJournal* 86, 2135–2147. https://doi.org/10.1007/s10708-020-10179-3.

Utami, D., Dhewanto, W., & Lestari, Y. (2023). Rural tourism entrepreneurship success factors for sustainable tourism village: Evidence from Indonesia. *Cogent Business & Management*, 10(1), 2180845.

Van Tran, N., Van Quyet, T., & Kingsbury, A.J. (2023). Banking for tourism in the digital age: Access to credit and cashless payments for community-based tourism household-owned businesses in Vietnam. *Tourism Management Perspectives*, 48, 101144. https://doi.org/10.1016/j.tmp.2023.101144

Wang, H., Bai, K., Wang, H., & Rafiqul, I. (2022). Research on the Motivation Mechanism of Precise Poverty Alleviation in Rural Tourism in China. *Sustainability*, 14(21), 14328. https://doi.org/10.3390/su142114328

Wang, J., Han, G., You, J., Zhu, L., Li, Y., & Zhou, X. (2023). Analysis of the Spatial Relationship between Ecosystem Regulation Services and Rural Tourism. *International Journal of Environmental Research and Public Health*, 20(5), 3888. https://doi.org/10.3390/ijerph20053888

Weyland, F., Colacci, P., Cardoni, A., & Estavillo, C. (2021). Can rural tourism stimulate biodiversity conservation and influence farmer's management decisions?. *Journal for Nature Conservation*, 64, 126071. https://doi.org/10.1016/j.jnc.2021.126071

Wijijayanti, T., Agustina, Y., Winarno, A., Istanti, L., & Dharma, B. (2020). Rural tourism: A local economic development. Australasian Accounting, *Business and Finance Journal*, 14(1), 5-13. http://dx.doi.org/10.14453/aabfj.v14i1.2

Yachin, J., & Ioannides, D. (2020). Making do in rural tourism: the resourcing behaviour of tourism micro-firms. *Journal of Sustainable Tourism*, 28(7), 1003-1021. https://doi.org/10.1080/09669582.2020.1715993

Yagmur, Y., Ehtiyar, R., & Aksu, A. (2020). Evaluation of halal tourism in terms of bibliometric characteristics. *Journal of Islamic Marketing*, 11(6), 1601-1617. https://doi.org/10.1108/JIMA-05-2019-0101

Yildirim, Ş., & Esen, Ü. (2023). *Social Entrepreneurship Activities in the Tourism Sector: Bibliometric Analysis and Social Network Analysis. In Research Anthology on Approaches to Social and Sustainable Entrepreneurship*. IGI Global USA.

Yodkhayan, M., & Muneenam, U. (2023). Evaluation of community-based gastronomic tourism in Satun Province, Thailand, Regarding Management for zero food Waste. *GeoJournal of Tourism and Geosites*, 50(4), 1260–1267. https://doi.org/10.30892/gtg.50406-1124.

Zavaleta, F., Sánchez, A., Navarro-Mendoza, Y., & Esparza-Huamanchumo, R. (2023). Community Tourism Conditions and Sustainable Management of a Community Tourism Association: The Case of Cruz Pata, Peru. *Sustainability*, 15(5), 4401. https://doi.org/10.3390/su15054401

Zeng, L., Li, R., Nuttapong, J., Sun, J., & Mao, Y. (2022). Economic development and mountain tourism research from 2010 to 2020: Bibliometric analysis and science mapping approach. *Sustainability*, 14(1), 562. https://doi.org/10.3390/su14010562.

Article history: Received: 03.10.2023 Revised: 17.11.2023 Accepted: 15.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1775-1785
DOI 10.30892/gtg.514 spl18-1173

STUDY ABROAD PROGRAMMES AS AN EDUTOURISM SEGMENT FOR SOUTH AFRICAN UNIVERSITIES

Elhaam ABRAHAMS
Cape Peninsula University of Technology, Department of Tourism and Event Management, Faculty of Business and Management Sciences, Cape Town, South Africa, e-mail: abrahamselh@cput.ac.za

Hilary K.N. BAMA*
University of the Free State, Department of Business Management, Faculty of Economics and Business Management Sciences, Bloemfontein, South Africa, e-mail: bamahkn@ufs.ac.za

Citation: Abrahams, E., & Bama, H.K.N. (2023). STUDY ABROAD PROGRAMMES AS AN EDUTOURISM SEGMENT FOR SOUTH AFRICAN UNIVERSITIES. *GeoJournal of Tourism and Geosites*, 51(4spl), 1775–1785. https://doi.org/10.30892/gtg.514spl18-1173

Abstract: This study focuses on factors influencing international students' selection of South Africa as a study-abroad destination. Using selected universities as a case study, a mixed methods approach was used for data collection by targeting 130 study-abroad students at the selected universities and 5 representatives at the international offices at these universities. Key indications from the data noted (1) a European dominance in the demographic distribution of participants and (2) a steady interest in the study-abroad programme niche. Furthermore, (3) a combination of pull and push factors was considered essential to marketing efforts in attracting prospective students. The significance of the study lies in underscoring the importance of combining known motives and marketing efforts to attract prospective students. The nuanced absence of regional participation and the study's enhancement of theory development in this context was noted, and pathways for future research were proposed.

Key words: Edutourism, study abroad, student profile, motivations, South Africa

* * * * * *

INTRODUCTION

International higher education, as a distinct element of tourism attraction, can be a cornerstone of knowledge exchange, focusing on both the formal and informal sectors (Budayasa et al., 2018). The phenomenon of cross-border mobility in higher education, although relatively small, has attracted unprecedented growth in contemporary times and is progressively venturing into novel structures, including the mobility of students and faculty members, the movement of educational programmes and institutions as well as the introduction of online courses facilitated via advancements in technology (Bhandari et al., 2018). Studying abroad presents students with a unique opportunity as it represents more than travelling to another destination; it represents a pedagogical activity with several results and learning goals (Abrahams et al., 2023). The benefits of "education with travel" represent a key factor for expanding the edutourism sector (Eduan, 2019). Globally, there has been increased competitiveness for study abroad programmes, with many nations, including Canada, Germany, Australia, the United States, the United Kingdom, and South Africa revealing bold plans to attract and enrol students/faculty members (Abrahams et al., 2023; Cheung et al., 2019). However, the growth in study abroad enrolment numbers saw a 15% drop due to the impacts of the COVID-19 pandemic (Valls-Figuera et al., 2023).

Current data indicates that the number of students from abroad has returned to pre-pandemic levels (Open Doors, 2023). The Organization for Economic Cooperation and Development (OECD) notes that the number of internationally mobile students is projected to reach eight million by 2025 (OECD, 2023). This statistic is a testament to the growing popularity of studying abroad, highlighting that more and more students are recognising the value of international education and taking advantage of its opportunities, a trend which is likely to continue in the coming years as more students seek to gain a global perspective and expand their horizons (Abrahams et al., 2023; Doerr, 2012).

According to IEASA (2020:25), South Africa's international incoming student profile is dominated by African students, a statistic which is in contrast with recent findings that most study abroad students are made up of students from countries from the Global North, specifically North America and Europe (Abrahams and Bama, 2023). Although students from over 170 countries were registered between 2015 and 2018, the OECD Education at a Glance (2021) report 2018 noted that South Africa only attracted 3.6% of the total market share of international study-abroad students and was the only African country featured in the report. Many factors influence international student mobility trends at the individual, institutional, national, and global levels. Personal ambitions and aspirations for improved job opportunities, a shortage of high-quality higher educational institutions at home, the ability of higher education institutions abroad to attract talent, and government programmes to encourage cross-border mobility for education are also some of the considered factors (Bhandari et al., 2020).

* Corresponding author

Table 1. Differences between the various study-abroad programmes
Source: Adapted from Study Abroad and Beyond (2022:1); University of Minnesota (2022:1); GEO, (n.d.:1); NJIT (n.d)

	Study-abroad programme	Exchange Programme	Faculty-Led Programme	Research Programme	Language Learning Programme	Independent Study Abroad/Freemovers	Non-credit Programme
Programme description	Organisations like CIEE, IES Global, SIT, Semester at Sea and DIS run these programmes, which contribute to the extensive range of programming options available to students. Many provider programmes come with pre-packaged accommodation options, on-site programme staff, optional weekend and day trips, an in-depth site orientation, specific group flight options, and more. Cultural exchanges, internships, volunteer opportunities, and other services are shared among programme providers.	An exchange allows students to enrol directly at a foreign university for a semester or an entire academic year. Students receive access to nearly all the university's courses in a variety of academic subjects. Exchanges frequently have lower overall costs than similar-length programmes. This is because exchange students have fewer organised excursions, on-site services, and individualised support.	Most faculty-led programmes are created to meet specific major and minor requirements in the faculty leader's department. These are usually short-term programmes with a pre-planned itinerary and a group that travels together.	In addition to classwork, some programmes have a research component. This applies to both field and laboratory research. If students want to create their research portfolio for future graduate school applications or a senior thesis, this could be a fantastic method to obtain hands-on research experience.	These programmes concentrate on language acquisition and are typically demanding and immersive! Students frequently participate in cultural activities and excursions in order to gain a deeper understanding of the target culture and language.	This programme allows students to work directly with the preferred host university's international student office in order to enrol as a visiting student for a semester. The international student office will then provide information about housing, visas, classes, orientation, and other relevant requirements.	Work, internship, volunteer, and teaching English programmes are examples of non-academic programmes that are not eligible for financial aid.
Duration	Ranges from 3 weeks - an academic year	Ranges from a semester - to an academic year	2-6 week or semester courses	Ranges from a semester - to an academic year	Ranges from a semester - to an academic year	A semester	Ranges from a semester - to an academic year
Credits	Credits are awarded for each course taken that can be applied towards a degree.	Credits earned from overseas universities are transfer credits	For most institutions, the programmes are short-term, led by a current faculty member that offers resident credits at home university	Credits are awarded for each course taken that can be applied towards a degree	Some programmes allow students to bring back a large number of language credits, even up to the equivalent of one year of language coursework	A contract is drawn up between the student and the institution that specifies how many credits will be provided upon successful completion of the project and/or research.	No academic credits granted
Fees	The student would pay the programme provider who would then be responsible for all payments towards fees	Depending on the agreements between the two universities either the scholarship or host university would cover all tuition costs	Depending on the programme, it is usually covered by a scholarship or an agreement between the two universities	Depending on the programme, the provider or student should cover all tuition and fees	Depending on the programme, the provider or student should cover all tuition and fees	The student is responsible for payments towards tuition and fees	Most non-credit programmes abroad are often unpaid and require students to pay an administrative fee in order to participate.
Travel arrangements	The programme provider would arrange and cover all travel costs	Depending on the agreements between the two universities either the scholarship or host university would arrange and cover travelling costs	Covered by scholarship if applicable or the host university	Covered by scholarship if applicable or the host university or student would need to arrange and cover all travel costs	Depending on the programme, the provider or student should make all travel arrangements	The international office would advise on all travel arrangements which the student would have to cover	Depending on the programme, the provider or student should make all travel arrangements
Housing arrangements	The programme provider would arrange and cover housing costs	Depending on the agreements between the two universities either the scholarship or host university would arrange and cover housing costs	Covered by scholarship if applicable or the host university	Covered by scholarship if applicable or the host university or student would need to arrange and cover housing costs	Homestays are the most common form of housing, which is arranged by the international office or student	The international office would advise on housing which the student would have to cover	Depending on the programme, the provider or student should make housing arrangements

Concurrently, IEASA (2015:8) claims that "geographic region, the quality of home-based higher education, the ability to transfer credits between countries, historical connections between countries, language, the perceived quality of a country's education and its accessibility, affordability, the ranking of universities and the 'employability' of qualifications obtained", are factors that influence mobility trends and motivates students to travel abroad.

There are several reasons why students study abroad, and many variables need to be considered, including which country and university are chosen (Eder et al., 2010). While there is a wealth of research on the motivations of international students to travel abroad (Casas Trujillo et al., 2020; Harazneh et al., 2018; Ozoglu et al., 2015; Anderson and Bhati, 2012; Ivy, 2010; Lu et al., 2009), there are comparatively few studies that examine the phenomenon in the Global South, particularly from a South African perspective. To attract prospective study-abroad students, it is essential to investigate the socio-demographic and motivational aspects that may impact their preferences for studying abroad (Åmo and Doornich, 2023; Nissen et al., 2022). Furthermore, as was evident during the COVID-19 pandemic, an over-reliance on the Global North international student market is ill-advised, and marketing initiatives targeting prospective students from the Global South should be prioritised and developed.

Consequently, the current study seeks to (a) understand the profiles and motives of study-abroad students in South Africa, (b) identify the promotional and marketing strategies for attracting students, and (c) provide insight into strategies which could be leveraged to promote study-abroad travel within the South African context.

LITERATURE REVIEW

Tomasi et al. (2020) contend that internationally mobile students cross international boundaries to participate in educational activities at receiving destinations. Although the basic idea behind study-abroad programmes is the same: studying in another country, there are distinct differences that vary by cost, location, length, and programme type (Bama and Abrahams, 2023). Accordingly, seven study-abroad programmes were identified while delving through the extant literature—study-abroad programmes, exchange programmes, faculty-led programmes, research programmes, language learning programmes, independent study abroad programmes and non-credit programmes (Study Abroad and Beyond, 2022; University of Minnesota, 2022; Global Education Oregon [GEO], n.d.; New Jersey Institute of Technology [NJIT], n.d.). Study abroad students are not homogenous and have distinct impetuses for pursuing international experiences, such as an international cultural experience, the prestige of attending a world-class university, or more unswervingly linked to employment opportunities (Kanwar and Carr, 2020). Tabulated in Table 1 are the differences sourced from various university databases highlighting several factors that benchmark each programme; an understanding of these factors allows for a better grasp of the characteristics of each of the seven programmes.

Considering the nature of studies into the nature of edutourism in South Africa (Abrahams and Bama, 2022; Boekstein, 2017; Donaldson and Gatsinzi, 2005; Henama, 2013; McGladdery and Lubbe, 2017a; 2017b), most have focused mainly on defining edutourism from a South African perspective, as well as highlighting the benefits in terms of fostering global learning and addressing issues of poverty and inequality. For instance, Donaldson and Gatsinzi (2005) discussed foreign students as tourists and Boekstein (2017) analysed whether English language learners were students or tourists. Additionally, Henama (2013) explored the strategies of tourism, edutourism and global mobility in addressing issues of poverty and inequality, while McGladdery and Lubbe (2017b) proposed a new process model for educational tourism at the school level. More recently, Bama and Abrahams (2023) examined the effects of COVID-19 on edutourism, focusing on the study abroad segment and the prospects of the sector within the South African context.

The paucity of broader studies in the South African context highlights the need for further empirical inquiries into edutourism in South Africa, in this case, focussing on understanding the profiles of study-abroad edutourism stakeholders. Although Africa possesses a diverse culture, abundant natural resources, and a substantially good educational system, many African youths who reside there often dream about participating in tertiary education abroad, whether for shorter periods [credit-mobile students] or for the entirety of a degree program [degree-mobile students] (David and Masaki, 2023). As noted, consequently, destinations in the Global North are frequently featured in decisions to participate in a study abroad programme (UNESCO Institute of Statistics, 2023). Thus, these student migration flows often advantage Western countries such as the United Kingdom, the United States, and Australia (Brooks and Waters, 2011; David and Masaki, 2023). As such, this study aims to propose strategies which could be implemented to attract the regional (African) study-abroad population, which extant research suggests is prone to gravitating towards the Global North in most instances (Brooks and Waters, 2011; David and Masaki, 2023; UNESCO Institute of Statistics, 2023).

Despite evidence that a growing share of international students emanate from and move towards the Global South, the international student migration literature has focused mainly on students in or from the Global North and their experiences in programmes such as Erasmus (Hallberg Adu, 2019).

As highlighted in Figure 1, it is observed that while Asia is a significant source of international students (52%), Europe constitutes a primary source (16%) and a significant destination (39%). This suggests that more students from the Global North (Europe and North America) are studying abroad, and these regions are often selected as study-abroad destinations. In this regard, it is warranted to consider these power dynamics in relation to students from the Global North and within the Global South, particularly in Africa (South Africa). Nevertheless, regional (African) students, like students from other parts of the world, may choose to study in the Global North for a variety of reasons, such as quality of education, diversity of programs, research opportunities, employment opportunities, English as a medium of instruction, cultural exposure, internationalisation of education, political stability and safety, access to resources, visa and immigration opportunities, global networking, and perceived quality of life (Bhandari et al., 2018; David and Masaki, 2023).

However, international students' motivations and recruitment cannot be independent of the intersectional influences of historical, geographical, economic, political, and cultural contexts, as is highlighted in the global literature by the small number of international students who choose to study in developing or emerging nations (Gyamera and Asare, 2023). The current enquiry, therefore, should shed light on the South African context.

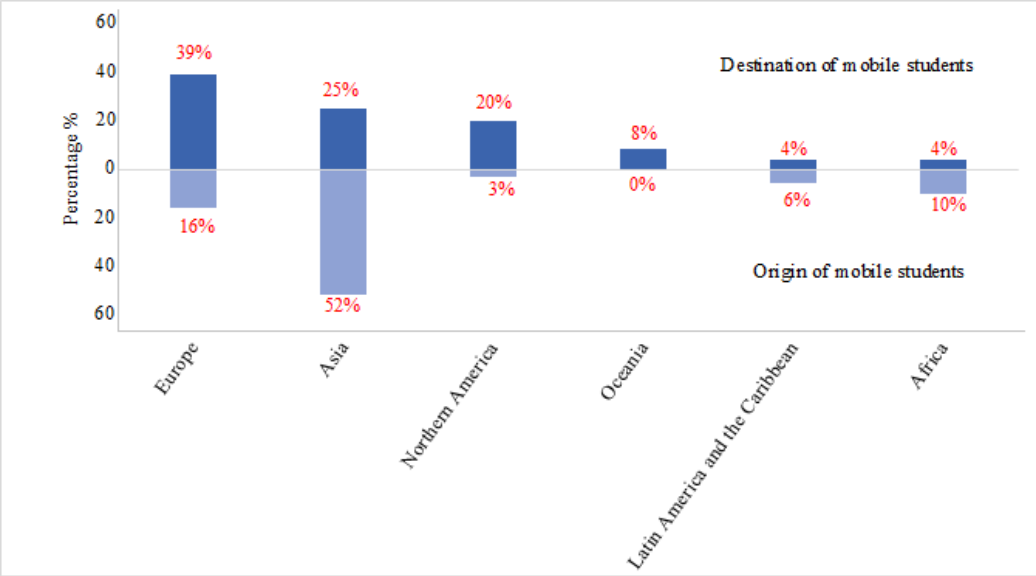


Figure 1. Destination and origin of international students across the continents (Source: Guillerme, 2022)

Many institutions in emerging destinations such as South Africa have worked hard to reposition themselves to compete with other universities worldwide for the attention of international students, following global trends. These include creating mission statements, growing current programmes, working with "prestigious" institutions abroad, and using the counsel and direction of international experts (Gyamera, 2015). Despite certain improvements, these higher education institutions draw comparatively fewer students (Statista, 2023). Therefore, a concerted focus is needed for these institutions to reposition themselves as worthy competitors. This study aims to shed light on a better understanding of the decision-making process of study-abroad students in the South African context and the Global South more generally.

THEORETICAL FRAMEWORK

Several theoretical frameworks seek to explain students' profiles and motivations for studying abroad. A familiar theory for understanding travel motivation is the "push and pull" model, which has been used to describe international ecotourists decision-making processes while choosing edutourism destinations (Statista, 1977). The core concept of this model supposes that an individual's choice of a travel destination is broken down into two factors.

Push factors encourage the student to study abroad, whereas pull factors entice the student to a particular region, nation, or university (Åmo and Doornich, 2023). If the student chooses to study abroad, the model shows a sequence for choosing a destination and then a university (Mazzarol and Soutar, 2002). Additionally, social and psychological factors often trigger the desire to study abroad. Dann's theory of push and pull motivations (1981), when extrapolated by Crompton's socio-psychological motivations (1979) and Pearce and Lee's travel career patterns (TCP) (2005), illustrates how different theories are related in that students who study abroad develop a desire to advance, whether it be academically, mentally, or physically, (Abrahams et al., 2023).

According to Eder et al. (2010:233), deciding to participate in a study-abroad programme includes a complex set of factors, including the decision to explore studying abroad, which country to choose, and which institution. Several researchers have attempted to identify international students' motives; it is evident that various factors motivate the respondents to study abroad, such as cost, family, better job prospects, quality, environmental, regulatory, cultural, political, safety and social factors (Casas Trujillo et al., 2020; Harazneh et al., 2018; Ozoglu et al., 2015; Anderson and Bhati, 2012; Ivy, 2010; Lu et al., 2009). Intriguingly, Prazeres (2017) investigated students from the Global North and their motives for participating in short-term international exchanges in the Global South and discovered that students see these experiences as chances to "leave their comfort zone" and develop a stronger sense of self. From there, it explored the idea of a "comfort zone" and examined why young people study or intern in the Global South. This revealed that being removed from familiar and comfortable environments—physical, emotional, and cultural—is conducive to self-awareness and self-change.

The characteristics of the study-abroad student profile are critical factors in understanding the nature of students who opt for study-abroad mobilities in South Africa. As noted by Steber (2017), profiling is the process of cultivating insight, facts, and knowledge about the target audience's personalities. To identify the characteristics of tourists, socio-demographic and travel motivational/intention variables are typically utilised in tourism research. Age, gender, income, marital status, occupation, education, and nationality are the main socio-demographic factors.

According to Cordua and Netz (2022), students' socio-demographic characteristics significantly impact their decision to study abroad. As a result, the decision to pursue studies abroad is influenced by micro-level variables related to the

student's personal circumstances, traits, and goals, such as age, language proficiency, prior exposure to international environments, financial resources, socioeconomic background, social connections, familial obligations, and the expected impact on their academic achievements (Souto-Otero et al., 2013; Van Mol and Timmerman, 2014; Netz, 2015). The Integrated Student Choice model is predicated on the notion that students' intentions to study abroad are influenced by sociodemographic traits, financial situation, cultural and social capital, and habitus, which is shaped by social class, educational and home environments (Salisbury et al., 2009). The campus environment can expand a student's habitus, which offers possibilities to increase social, cultural, and human capital (Kim and Lawrence, 2021). Social capital describes how different social networks and organisations allow students to access materials, assistance, and knowledge. Cultural capital is the sum of a person's knowledge, values, and beliefs from their ancestors' social classes and formal education. Unlike financial capital, which primarily represents money resources obtained from social class membership, human capital comprises academic preparation and accomplishments (Salisbury et al., 2009; Kim and Lawrence, 2021).

Kim and Lawrence (2019), Salisbury (2011), and Salisbury et al. (2010) assert that the Integrated Student Choice Model (ISCM) posits a three-stage decision-making process for studying abroad. Accordingly, prospective students first create an educational goal (in this regard, a propensity to study abroad), then recognise and weigh the benefits and drawbacks of chances (through discovering programmes and determining opportunity costs), and then pick which course of action to take (Kim and Lawrence, 2019). Students' habitus and capital frame the formulation of ambitions (intentions) and decisions to study abroad and entail balancing the costs and benefits of possibilities and selecting one that maximises benefits (rational choice). The model presupposes that the student habitus (campus) provides an important context that can broaden a student's habitus by offering opportunities to deepen their social, cultural, and human capital (Petzold and Peter, 2015).

MATERIALS AND METHODS

The research context

The Western Cape Province of South Africa labelled the “Rainbow” nation due to the diversification of people and climate seasons, is one of nine provinces that draw the most tourists during peak seasons (SA-Venues, 2023). The province is known for its agriculture, wine and tourism industries (Encyclopaedia Britannica, 2023). The area is also acknowledged for its higher educational institutes (IEASA, 2020). As illustrated by Figure 2, there are four universities in the Western Cape, namely the University of Cape Town (UCT), University of Western Cape (UWC), Cape Peninsula University of Technology (CPUT) and Stellenbosch University (SU). Three are listed among the top 2000 universities globally (South Africa - The Good News, 2021; Centre for World University Rankings, 2022). According to IEASA (2020), UCT and SU are amongst the oldest universities in South Africa. Moreover, CPUT, with campuses in Cape Town, Bellville, Mowbray and Wellington, is the only university of technology and the largest university in the province.

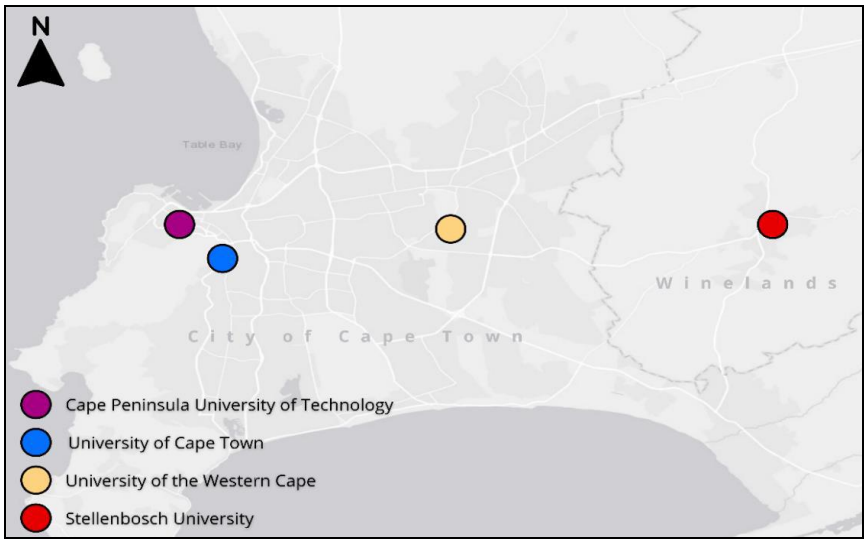


Figure 2. Universities in the Western Cape (Source: Author’s construct)

Data collection and analysis

For this study, both quantitative and qualitative methods were employed. The quantitative data were collected in two phases. Phase one between September 2020 and October 2021 and phase two between February – July 2023, via a questionnaire distributed among foreign students through the international offices of each of the universities. The data collection tool included questions about respondents’ socio-demographic characteristics, tourist activities during their study-abroad sojourn and reasons for choosing South Africa. With the average population of 726 foreign students at the universities between 2019–2021, an estimated sample size of 131 was decided upon.

In total, 130 responses were received at the end of the data collection period, and analyses were conducted using the Statistical Package for Social Sciences (SPSS) version 28. For the qualitative study, semi-structured interviews were conducted between November 2020 and December 2021 using purposive sampling with 5 key informant personnel [KIP01 – KIP05] (3 at international offices of the targeted HEIs in the WC and 2 coordinators from German

universities). The inclusion of coordinators from two German universities was given the fact that the biggest group of foreign students at the four universities were from Germany. Transcripts were pulled from the recorded interviews, and a content analysis was conducted to highlight common themes associated with the study's aim.

The findings, as collated, present (a) the demographic details of the sample, (b) factors influencing students' choice of South Africa as a study-abroad destination in terms of descriptive presentations and thematic annotations; discussions will accompany these presentations and focus on the potential implications of the responses collated.

RESULTS AND DISCUSSIONS

Demographic profiles of respondents

Table 2 presents the demographic profiles of the respondents according to which a homogenous pattern in terms of age and gender is identified, which is consistent with extant literature (Anderson and Bhati, 2012; Lam et al., 2016; Harazneh et al., 2018). 59.2% of the respondents were female, 40% were male, and 0.8% were gender variant/non-conforming. The data collected further reflects that most participants (84.0%) were between the ages of eighteen (18) and twenty-four (24) years of age, while the remaining 16.0% were between the ages of twenty-five (25) and over thirty-four (34) years of age. In terms of the origin of the international students, the feedback highlights a European dominance of the respondents as reflected in Table 2, with Austria (0.8%), Belgium (3.8%), Brazil (0.8%), Finland (1.5%), France (20%), Germany (35.4%), Hungary (0.8%), Italy (4.6%), Japan (0.8%), Netherlands (4.6%), Norway (2.3%), Slovakia (0.8%), Slovenia (0.8%), Sweden (1.5%), Switzerland (5.4%), Ukraine (0.8 %) and United Kingdom (0.8%). The remainder of the respondents (1.5%) were Multinational and from the United States of America (13.1%).

Regarding their majors at the various universities, the majority (43.1%) were undertaking business studies, 23.8% enrolled in social sciences, 9.2% in natural sciences, 4.6% in humanities, 3.1% in education and engineering respectively, 2.3% in media studies and communication, and another 2.3% selected the 'other' category (automotive, business/economics, foreign trade). The remaining students were spread over other disciplines, such as architecture, hospitality and tourism, health sciences, mathematics and art and design, with 0.8% each. In addition, computer sciences, social and community welfare and education all had 1.5% representation, respectively. Regarding their source of funding, most of the respondents (44.6%) noted that they were self-funded, 23.0% were partially self-funded and partially on a scholarship, 14.6% on a full scholarship, 6.2% were on a financial aid scheme from their country's government, and 11.5% noted their parents funded them. Asked to indicate what category of international student they were, most (87.5%) noted that they were exchange students, 6% indicated they were freemovers, 5.5% were visiting graduate students, and 0.8% indicated they were research students.

Table 2. Summary of sample profile of the respondents (n=130)

Characteristics	Category	Total (in %)
Nationality	Austria	0.8
	Belgium	3.8
	Brazil	0.8
	Finland	1.5
	France	20.0
	Germany	35.4
	Hungary	0.8
	Italy	4.6
	Japan	0.8
	Multinational	1.5
	Netherlands	4.6
	Norway	2.3
	Slovakia	0.8
	Slovenia	0.8
	Sweden	1.5
	Switzerland	5.4
	Ukraine	0.8
	United Kingdom	0.8
	United States of America	13.1
Gender	Male	40.0
	Female	59.2
	Non-conforming	0.8
Age (in years)	18-24	83.8
	25-34	16.2
Current place of residence (accommo-dation)	Homestay (living with a host family)	1.5
	Purchased condominium or house.	3.1
	Renting by myself	22.3
	Renting with family members	2.3
	Renting with strangers	31.5
	University residence	39.2
Study type	Freemover	6.3
	Exchange Student	87.5
	Visiting graduate Student	5.5
	Research Student	0.8
Study major	Agriculture	3.1
	Architecture	0.8
	Art and Design	0.8
	Business (Marketing, Commerce, Accounting)	43.1
	Computer Science & Information Technology	1.5
	Education	1.5
	Engineering	3.1
	Health Science	0.8
	Hospitality & Tourism	0.8
	Humanities	4.6
	Mathematics / Actuarial Science / Statistics	0.8
	Media Studies / Communication / Journalism	2.3
	Natural Sciences	9.2
	Other (Automotive Business/Economics, Foreign Trade)	2.3
	Social and Community Services / Law enforcement	1.5
	Social Sciences	23.8
Main source of funding	Parents	11.5
	Self-funding	44.6
	Scholarship	14.6
	Self-funding and partial scholarship	23.1
	Student loans	6.2

Finally, when the respondents were asked to indicate their current form of accommodation, 31.5% stated they were renting with strangers, and 39.2% were using the university's residences. 22.3% of the respondents were renting by themselves, 2.3% were renting with family members, 3.1% in a condominium, and the remainder (1.5%) resided in a

homestay (that is, living with a host family). These results are important when considered in light of South Africa's place within the context of Africa and the Global South more generally. With some universities, such as the University of Cape Town and Stellenbosch University, ranked among the best globally (Abrahams and Bama, 2022; Abrahams et al., 2023), the results point to an allure for students from the Global North.

With extant research highlighting an increased involvement of students from the Global South and Africa, in particular, in the higher education academy, the results of this study present a somewhat surprising outlook with an absence of participants from countries in the region. Such a result may suggest these South African universities' lack of focused promotional strategies in targeting students from the continent. Current literature on international higher education notes that African students have been drawn towards the Global North by the allure of financial support through grants and scholarships (David and Masaki, 2023; Ke et al., 2022). This scenario may not be accessible in the South African context or perhaps is blurred by the absence of focused marketing initiatives. Financial constraints could also explain the absence of students from other parts of Africa, who may be studying in South African universities but not enrolled on the international student category due to other considerations and, therefore, not part of this enquiry.

South African universities as study-abroad destinations

Through the statistical analysis of factors influencing study-abroad students' selection of South African universities, the current study noted a cross-section of both push and pull factors accounting for this attraction. Statements about motivational elements were posed to respondents on a 5-point Likert scale ranging from not at all important, unimportant, neither important nor unimportant, important, and very important. In some analytical cases, replies were categorised as Important (important + extremely important) or Unimportant (not at all important + unimportant) for convenience of reporting. The attractiveness of a different cultural experience (97.3%), living in another country (97.3%), international experience (96.0%), and making new friends (81.4%) were cited as crucial considerations for enrolling in a study-abroad programme by the majority of respondents. Unimportant considerations, on the other hand, were being with my partner (89.3%), a lack of available programmes in my native country (82.7%), funding (78.7%), and where my friends are going (78.3%). Such feedback could be beneficial to study-abroad marketers.

Furthermore, an Oblivion rotation with Kaiser normalisation was used to perform a factor analysis on a pattern matrix of the principal component, which identified five motivating factors that push students to participate in a study abroad experience, which were labelled based on similarities in characteristics, as shown in Table 3. The factors explained 64% of the total variance, with a high-reliability coefficient of 0.77 (the highest) to an acceptable coefficient of 0.55 (the lowest) (Taber, 2018:1278), suggesting that each component had internal consistency. Finally, all the factors loaded with a loading larger than 0.3 suggested a relatively high correlation between the factors and their component items. The factor scores were derived as an average for all relevant items to allow interpretation with respect to the original five-point Likert scale of measurement. Furthermore, the standard deviations ranged from 0.799 (the lowest) to 4.339 (the highest). The following push factors influenced students to enrol in study abroad courses, as shown in Table 3: quality and network aspects (Factor 1), marketing and financial concerns (Factor 2), foreign exposure (Factor 3), socio-cultural (Factor 4) and regulatory (Factor 5). International exposure was the most important push element for students, with a mean score of 4.82, followed by quality and network aspects (3.34), socio-cultural (2.47), marketing and financial concerns (2.39), and regulatory (1.57).

Table 3. Push factors for selecting South African universities (n=130, in %) KEY: FL= Factor loading; Mean= M; Reliability coefficient= RC; Average interitem correlation= AIC; Standard deviation= SD

Motivational Factors and Items	**FL**	**M**	**RC**	**AIC**	**SD**
Factor 1: Quality and Network Aspects		3.34	0.73	.471	4.133
Further career prospects	0.79				
International exposure in the field of study	0.69				
Quality education	0.69				
Parental encouragement	0.49				
To make new friends	0.47				
Factor 2: Marketing & Financial Considerations		2.39	0.77	.460	4.339
Cost of study	0.79				
Sponsorships	0.70				
University marketing activities	0.66				
University counsellor influence	0.61				
To become independent	0.47				
Factor 3: International exposure		4.82	0.64	.472	0.799
Living in another country	0.82				
International experience	0.70				
Factor 4: Socio-Cultural		2.47	0.56	.406	2.324
Where my friends are going	0.76				
To be with my partner	0.54				
Factor 5: Regulatory		1.57	0.55	.383	1.768
Expected as part of the university programme	0.84				
Lack of available programmes in the home country	0.53				
Total variance explained:	64%				

Respondents' motivations for selecting South African universities were considered. Natural and environmental factors (93.3%), favourable climate and weather conditions (86.6%), use of English as a teaching medium (82.6%), common language (65.3%), and lower cost of living in South Africa (56.0%) were cited as primary motivators for choosing South Africa as the destination by respondents. Moreover, the factor analysis yielded the following results as shown in Table 4; the factors accounted for 66% of the total variance, explained in terms of a high-reliability 0.88 (the highest) to an adequate coefficient of 0.65 (the lowest) (Taber, 2018:1278), indicating that each of the factors has internal consistency. The standard deviations ranged from 2.515 (the lowest) to 6.570 (the highest). The following pull factors for students to participate in study abroad programmes in South Africa were identified: quality (Factor 1), socio-political (Factor 2), marketing (Factor 3), environmental (Factor 4) and social (Factor 5). With a mean value of 4.13, environmental was the most important push factor for students, followed by social (3.58), quality (2.77), marketing (2.45) and socio-political (2.12). Table 4 highlights the feedback from the factor analysis (pull factors) from the respondents.

Table 4. Pull factors for selecting South African universities (n=130, in %) KEY: FL= Factor loading; Mean= M; Reliability coefficient= RC Average interitem correlation= AIC; Standard deviation= SD

Motivational Factors and Items	**FL**	**M**	**RC**	**AIC**	**SD**
Factor 1: Quality		2.77	0.88	.653	5.393
Qualified and friendly academic staff	0.80				
Expertise and specialisation in area of study interest	0.75				
Availability of labs and research instruments	0.67				
Accreditation and reputation of the country and its institutions	0.62				
University services	0.62				
Factor 2: Socio-Political		2.12	0.86	.688	6.570
Low rate of discrimination	0.84				
Safety and security	0.75				
Favourable government policies	0.67				
Familiarity with own culture	0.62				
Closeness to the home country (proximity)	0.49				
Political or historical ties with South Africa	0.48				
Easy to get visa/visa-free	0.46				
Factor 3: Marketing		2.45	0.83	.516	5.604
Referrals from friends, family members and social media	0.76				
Domestic websites	0.69				
Media advertising	0.67				
Overseas websites	0.65				
Lower cost of living in South Africa	0.54				
Easy admission	0.51				
Factor 4: Environmental		4.13	0.74	.798	2.515
Natural and environmental factors, e.g., landscape and beach	0.89				
Favourable climate and weather conditions	0.88				
Factor 5: Social		3.58	0.65	.449	2.946
English as the teaching medium	0.84				
Common language and travel	0.69				
University ranking	0.50				
Total variance explained:	66%				

Mounting evidence, especially in the developing context, suggests that the edutourism sector represents an essential segment of the tourism industry that could be leveraged. For instance, with 2.2% of the worldwide share and 40,712 foreign students, South Africa was the world's eighth most popular foreign student-receiving location in 2019. In this light, one of the participants, a coordinator of the international office of one of the universities, noted the following about the future of study-abroad programmes. South Africa, in general, is very popular with our students, they feel it is cheap, beautiful and everyone speaks good English, so it is very popular. However, not many students are going there because, as I said, a partner company employs them during their entire studies, so they alternate with three months of studies here at [home university]. Three months of practice, so if they want to study abroad, they have to check the semester dates of the partner university. So, the problem with Cape Town [South Africa] is that all universities have very long semester dates, which is a problem. They have to negotiate with their company that they will be set out for longer, which does not always work. Therefore, not many students end up going there, but if they did not have this length issue, I am sure there would be many more students because many would be interested in going there (KIP04). Supporting this nuanced optimism, a representative from another university stated: From what I have seen, many students want to come to the Western Cape, Cape Town [South Africa]. I have seen an increase in the number of students who want to travel here they want to come, and I think it is because of the destination…

Also, students have seen the advertising and the university and what it has to offer. South Africa is a good destination; foreign students want to come here, and I hope they will keep wanting to come (KIP02). In line with the existing optimism, the participants were asked what could be done to make these programmes more attractive.

Suggestions were made to focus on marketing efforts, increasing internationalisation within the respective institutions, engaging in partnerships with more institutions with aligned programmes for exchange purposes, and increasing co-funding models. Furthermore, partnerships with government and other sector partners that could market the destinations were highlighted as a potential leverage. In this light, and related to marketing efforts, one of the key informants noted that with the current generation of study abroad students, social media platforms can effectively promote study abroad programs. It also gives students to stay a part of the community they joined when coming to a study program.

This can be expanded through advertisements on sites like TikTok and YouTube (KIP03). Further emphasis on partnerships and funding arrangements saw one of the representatives indicate that most international offices in higher education universities have partnerships with other universities, and staff travel happens at that level.

Nevertheless, this still needs to be developed more because it would be nice for staff, especially those doing this work, to see how it is done in other countries because study abroad is such a big field. There is study abroad at every university that is exchanging students. The only difference is that the European Union makes funding available for students to study abroad and staff exchanges such as ERUMAS+ funding for programmes (KIP01).

The findings of this study highlight that South Africa is considered a popular study-abroad destination, with several push and pull factors accounting for the destination's allure. Cultural diversity, international exposure and experience, and the opportunity to visit friends and family are posited as some of the push factors. In addition, ease of communication, cost of living, and environmental factors were the key pull factors highlighted. Given the current levels of international student mobility in Sub-Saharan Africa (430 000), which should hit close to 900000 by 2050, South Africa's position as a prime destination for study-abroad programmes on the continent looks promising (Kigotho, 2023; Oyeleye, 2023). Nevertheless, the glaring absence of students from other African countries as part of this study raises nuanced concerns about the quality and quantity of marketing efforts currently dedicated to the segment. Ke et al (2022) assert that marketing efforts are essential if a destination is to leverage to potential of their international student niche in developing both the educational and tourism potential it can engender. In addition, the interviewed key informant personnel from the international offices also lend their voices to this element by highlighting the various avenues through which marketing efforts can be dedicated. To maintain the current positive outlook, focused marketing campaigns with effective, efficient and transparent communications are suggested. The streamlining of visa regimes is contended to be a limiting element for the student within the content who may be interested in such programmes.

CONCLUSION

The current study presented an initiation point for analysing study-abroad participation initiatives within the South African and Global South context more generally. The study involved 130 students and 5 key informants. It concluded that combining pull and push factors were essential for successfully leveraging the study-abroad segment as a sub-niche within the edutourism sector. To ascertain and obtain further insights into the value and potential of the study-abroad programmes in promoting edutourism in South Africa and Africa more generally, longitudinal studies should be undertaken, given the limitations that were experienced during this study, prime among which was the limited sample due in part to the impacts of the COVID-19 regulations which restricted access to a broader sample.

Furthermore, a key issue that was not considered as part of the scope of the research entailed examining the factors and reasons for the complete absence of students from countries in Africa from the study sample. Given the lessons learned from the COVID-19 pandemic, much evidence points to the need to leverage the African student market, most of whom paradoxically gravitate towards the Global North for study-abroad opportunities (UNESCO Institute of Statistics, 2023). Evidently, in the context of probable future disasters, leveraging regional student markets provides a prudent approach to safeguarding the study-abroad segment in the face of stringent regulations. It is recommended that HEIs, in making suggestions, engage with the government authorities and consider the broader ramifications and realities that the investments into the study-abroad segment are bound to attract.

Additionally, the study found a concerted paucity of consultation between key stakeholder groups. It is, therefore, imperative to set up a framework to guide how the communication between the different stakeholder groups involved in developing and marketing the study-abroad segment of the edutourism industry should be managed more broadly.

Author Contributions: Conceptualization, E.A and H.B.; methodology, E.A and H.B.; software, E.A and H.B.; validation, E.A and H.B.; formal analysis, E.A and H.B.; investigation, E.A.; data curation, E.A and H.B.; writing - original draft preparation, E.A and H.B.; writing - review and editing, H.B.; visualization, E.A. and H.B.; supervision, H.B.; project administration, H.B. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: This paper is an extract from a master's thesis submitted to the Department of Tourism and Events Management, Faculty of Business and Management Sciences, Cape Peninsula University of Technology.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abrahams, E., Bama, H.K.N., & Mokoena, P.P. (2023). Motives for participating in study-abroad programmes and the impact of the pandemic on selected universities in South Africa. *Studia Periegetica*, 41(1), 2.1-2.17. https://doi.org/10.58683/sp.554

Åmo, B.W., & Doornich, J.B. (2023). Profiling Norwegian business students considering studying abroad through credit mobility. *Southern African Journal of Entrepreneurship and Small Business Management*, 15(1), a667. https://doi.org/10.4102/sajesbm.v15i1.667

Anderson, R., & Bhati, A. (2012). Factors influencing Indian students' choice of overseas study destination. *Social and Behavioral Sciences*, 46: 1706–1713. https://doi.org/10.1016/j.sbspro.2012.05.365

Bama, H.K.N., & Abrahams, E. (2023). Emerging from the COVID-19 pandemic: challenges and prospects for edutourism demand in South Africa. *African Journal of Hospitality, Tourism and Leisure*, 12(3), 883-898. https://doi.org/10.46222/ajhtl.19770720.405

Bhandari, R., Robles, C., & Farrugia, C. (2020). *International higher education: Shifting mobilities, policy challenges, and new initiatives.* United Nations Educational, Scientific and Cultural Organization, Global Education Monitoring Report. https://www.gcedclearinghouse.org/sites/default/files/resources/190415eng_0.pdf. accessed October 20, 2023.

Boekstein, M.S. (2017). Language learners as cultural tourists: Development potential of the English language learning tourism market in South Africa. *African Journal for Physical Activity and Health Sciences*, 23(1): 46-53. https://hdl.handle.net/10520/EJC-869eaf017

Brooks, R., & Waters, J.L. (2011). *Student mobilities, migration and the internationalization of higher education.* New York: Palgrave Macmillan.

Budayasa, P.K., Martiningsih, N.G.A.G.E., & Surata, S.P.K. (2018). Potency of tourism education (edu tourism) in Lombok International Airport, Indonesia. *International Journal of Science and Research (IJSR)*, 7(2), 1213-1218.

Casas Trujillo, J.P., Mohammed, P.J., & Saleh, S.T. (2020). Students' motivations to study abroad: The case of international students at the university of Debrecen. *Central European Journal of Educational Researc*h, 2: 76-81. https://doi.org/10.37441/CEJER/2020/2/1/5760

Center for World University Rankings. (2022). Global 2000 list by the center for World University Rankings 2022–2023 edition. https://cwur.org/2022-23.php. accessed October 20, 2023.

Cheung, A., Guo, X., Wang, X., & Miao, Z. (2019). Push and pull factors influencing Mainland Chinese MEd students in Hong Kong. *International Journal of Educational Managemen*t, 33: 1539–1560. https://doi.org/10.1108/IJEM-06-2018-0179

Cordua, F., & Netz, N. (2022). Why do women more often intend to study abroad than men? *Higher Education*, 83: 1079–1101. https://doi.org/10.1007/s10734-021-00731-6

Dann, G.M.S. (1977). Anomie, ego-enhancement and tourism. *Annals of Tourism Research*, 4(4), 184-194. https://doi.org/10.1016/0160-7383(77)90037-8

David, A., & Masaki, E.M. (2023). *Perceptions of young African scholars' migration from Africa to the Global North: A case of selected Kenyan universities.* Proceedings in Biennial Conference: The Social Practice of Human Rights. 3. https://ecommons.udayton.edu/human_rights/2023/concurrent4c/3

Doerr, N.M. (2012). Study abroad as 'adventure': globalist construction of host–home hierarchy and governed adventurer subjects, *Critical Discourse Studies*, 9:3, 257–268, https://doi.org/10.1080/17405904.2012.688211

Eder, J., Smith, W., & Pitts, R. (2010). Exploring factors influencing students' study abroad destination choice. *Journal of Teaching in Travel & Tourism*, 10(3), 232–250. https://doi.org/10.1080/15313220.2010.503534

Eduan, W. (2019). Influence of study abroad factors on international research collaboration: evidence from higher education academics in sub-Saharan Africa, *Studies in Higher Education*, 44:4, 774-785, https://doi.org/10.1080/03075079.2017.1401060

Encyclopaedia Britannica. (2023). *Western Cape Province, South Africa*. https://www.britannica.com/place/Western-Cape

Future Market Insight. (n.d). *Educational tourism: Sector outlook overview.* https://www.futuremarketinsights.com/reports/educational-tourism-sector-outlook

Global Education Oregon (GEO). (n.d.). Types of study abroad programs. https://geo.uoregon.edu/types-of-study-abroad-programs

Guillerme, G. (2022). International student mobility at a glance 2022. Top International Managers in Engineering (TIME) Association.

Gyamera, G.O. (2015). The internationalisation agenda: A critical examination of internationalisation strategies in public universities in Ghana. *International Studies in Sociology of Education*, 25(2), 112–131.

Gyamera, G.O., & Asare, W. (2023). A critical examination of factors influencing international students' choice to study in Ghanaian higher educational institutions. *Cogent Education*, 10. https://doi.org/10.1080/2331186X.2023.2186014

Hallberg Adu, K. (2019). Student migration aspirations and mobility in the global knowledge society: The case of Ghana. *Journal of International Mobility*, 7: 23-43. https://doi.org/10.3917/jim.007.0023

Henama, U.S. (2013). Tourism, educational tourists, and global mobility: Strategies from the tourism industry to address poverty and inequality in South Africa. *Southeast Asia Journal of Contemporary Business, Economics and Law*, 2(2), 65–72. https://doi.org/10.13140/RG.2.1.4074.4404

Harazneh, I., Al-Tall, R.M., Al-Zyoud, M.F., & Abubakar, A.M. (2018). Motivational factors for educational tourism: An empirical test. *Management & Marketing: Challenges for the Knowledge Society*, 13: 796-811. https://doi.org/10.2478/mmcks-2018-0006

IEASA (International Education Association of South Africa). (2015). The knowledge race: South Africa's response to global knowledge creation (15th ed.).

IEASA. (2020). The guide to South African higher education: Innovation and resilience in higher education internationalisation (19th ed.).

Ivy, J. (2010). Choosing futures: Influence of ethnic origin in university choice. *International Journal of Educational Management*, 24(5), 391–403. https://doi.org/10.1108/09513541011055965

Kanwar, A., & Carr, A. (2020). The impact of COVID-19 on international higher education: new models for the new normal. *Journal of Learning for Development*, 7(3), 326–333. https://doi.org/10.56059/jl4d.v7i3.467

Ke, H., Junfeng, D., & Xiaojing, L. (2022). International students' university choice to study abroad in higher education and influencing factors analysis. *Frontiers in Psychology*. 13: 1036569. https://doi.org/10.3389/fpsyg.2022.1036569

Kigotho, W. (2023). Student mobility from Sub-Saharan Africa could double by 2050. https://www.universityworldnews.com/post.php?story=20230301202553233#:~:text=Students%20from%20Sub%2DSaharan%20Africa,promotes%20French%20higher%20education%20abroad. accessed September 21, 2023.

Kim, H.S., & Lawrence, J.H. (2021). Who studies abroad? understanding the impact of intent on participation. *Research in Higher Education*, 62: 1039–1085 https://doi.org/10.1007/s11162-021-09629-9

Lu, Y., Mavondo, F.T., & Qiu, L.L. (2009). Factors influencing the choice of overseas study by undergraduate and postgraduate Chinese students. In Tojib, D. (Ed.), Australian and New Zealand Marketing Academy (ANZMAC) 2009 Sustainable Management and Marketing Conference, 1–7.

Mazzarol, T., & Soutar, G.N. (2002). Push-pull factors influencing international student destinationchoice. *International Journal of Educational Management*, 16(2), 82–90. https://doi.org/10.1108/09513540210418403

Netz, N. (2015). What deters students from studying abroad? Evidence from four European countries and its implications for higher education policy. *Higher Education Policy*, 28(2), 151–174. https://doi.org/10.1057/hep.2013.37

New Jersey Institute of Technology (NJIT). (n.d.). Study abroad programs. https://www.njit.edu/studyabroad/studyabroadprograms. accessed 20 September 2023.

Nissen, A.T., Bleidorn, W., Ericson, S., & Hopwood, C.J. (2022). Selection and socialization effects of studying abroad. *Journal of personality*, 90(6), 1021–1038. https://doi.org/10.1111/jopy.12712

Organization for Economic Cooperation and Development (OECD). (2021). E*ducation at a glance: OECD indicators*. Paris: OECD Publishing. https://dx.doi.org/10.1787/69096873-en

OECD. (2023). *Education at a glance: OECD indicators*. Paris: OECD Publishing.

Open Doors. (2023). International students. https://opendoorsdata.org/data/international-students/ accessed October 20, 2023.

Oyeleye, O. (2023). Africa's bumpy road to regional economic cooperation. https://www.businessamlive.com/africas-bumpy-road-to-regional-economic-cooperation-6/. accessed September 21, 2023.

Ozoglu, M., Gur, B.S., & Coskun, I. (2015). Factors influencing international students' choice to study in Turkey and challenges they experience in Turkey. *Research in Comparative and International Education,* 10(2), 223–237. https://doi.org/10.1177/1745499915571718

Petzold, K., & Peter, T. (2015). The social norm to study abroad: determinants and effects. *Higher Education*,
69(6), 885–900. https://doi.org/10.1007/s10734-014-9811-4

Prazeres, L. (2017). Challenging the comfort zone: self-discovery, everyday practices and international student mobility to the Global South. *Mobilities*, 12(6), 908-923. https://doi.org/10.1080/17450101.2016.1225863

Salisbury, M.H., Paulsen, M.B., & Pascarella, E.T. (2010). To see the world or stay at home: Applying an integrated student choice model to explore the gender gap in the intent to study abroad. *Research in Higher Education, 51*(7), 615–640. https://doi.org/10.1007/s11162-010-9171-6

Salisbury, M.H., Umbach, P.D., Paulsen, M.B., & Pascarella, E.T. (2009). Going global: Understanding the choice process of the intent to study abroad. *Research in Higher Education*, 50(2), 119–143. https://doi.org/10.1007/s11162-008-9111-x

South Africa – The Good News. (2021). Centre for world university rankings – the SA (South Africa)
story. https://www.sagoodnews.co.za/centre-for-world-university-rankings-the-sa-story/ accessed October 20, 2023.

Souto-Otero, M., Huisman, J., Beerkens, M., de Wit, H., Vujić, S., & Vuji, C.S. (2013). Barriers to international student mobility: Evidence from the ERASMUS program. *Educational Researcher*, 42(2), 70–77. https://doi.org/10.3102/0013189X12466696

Statista. (2023). Top host destination of international students worldwide in 2022, by number of students. https://www.statista.com/statistics/297132/top-host-destination-of-international-students-worldwide/#statisticContainer

Steber, C. (2017). In-depth interviews: Data collection advantages and disadvantages. https://www.cfrinc.net/cfrblog/in-depth-interviewing

Study Abroad and Beyond. (2022). Types of study abroad programs. https://www.studyabroadandbeyond.com/types-of-study-abroad-programs/. accessed September 20, 2023.

Tomasi, S., Paviotti, G., & Cavicchi, A. (2020). Educational tourism and local development: The role of universities. *Sustainability*, *12*(17), 1–15. https://doi.org/10.3390/su12176766

UNESCO Institute of Statistics. (2023). Global flow of tertiary-level students. https://uis.unesco.org/en/uis-student-flow. accessed October 25, 2023.

University of Minnesota. (2022). Program types & definitions. https://umabroad.umn.edu/students/choosingprogram/programdefinitions. accessed 20 September 2023.

Valls-Figuera, R.G., Torrado-Fonseca, M., Romero-Rodríguez, S., & Jurado-de-los-Santos, P. (2023). The decision-making process in access paths to master's degree studies: the case of international students in Spain. *Sustainability*, 15, 5621. https://doi.org/10.3390/su15075621

Van Mol, C., & Timmerman, C. (2014). Should I stay or should I go? An analysis of the determinants of intra-European student mobility. *Population, Space and Place*, 20(5), 465–479. https://doi.org/10.1002/psp.1833

Wilkins, S., & He, L. (2022). Student mobility in transnational higher education: study abroad at International Branch campuses. *Journal of Studies in International Education*, 26(1), 97-115. https://doi.org/10.1177/1028315320964289

Wilson, O. (n.d.) *List of universities in the Western Cape Province*. accessed 20 September 2023, available: https://randnews.co.za/list-of-universities-in-the-western-cape-province/

Article history: Received: 27.09.2023 Revised: 20.11.2023 Accepted: 18.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1786-1795
DOI 10.30892/gtg.514 spl19-1174

ENERGY TRAILS OF TOURISM: ANALYZING THE RELATIONSHIP BETWEEN TOURIST ARRIVALS AND ENERGY CONSUMPTION IN MALAYSIA

Asif RAIHAN
Institute of Climate Change, National University of Malaysia, Bangi, Malaysia, e-mail: asifraihan666@gmail.com

Liton Chandra VOUMIK
Department of Economics, Noakhali Science and Technology University, Noakhali, Bangladesh, e-mail: litonvoumik@gmail.com

Miguel Angel ESQUIVIAS*
Faculty of Economics and Business, Airlangga University, Indonesia, e-mail: miguel@feb.unair.ac.id

Abdul Rahim RIDZUAN
Institute for Big Data Analytics and Artificial Intelligence (IBDAAI), Universiti Teknologi MARA, Malaysia; University of Religions and Denominations, Qom, Iran; Faculty of Business Management, Universiti Teknologi MARA, Melaka Campus, Malaysia, Centre for Economic Development and Policy (CEDP), Universiti Malaysia Sabah, Malaysia; Accounting Research Institute (ARI), University Teknologi MARA, Malaysia, e-mail: Rahim670@uitm.edu.my

Nora Yusma Mohamed YUSOFF
Institute of Energy Policy and Research, University Tenaga Nasional, Putrajaya, Malaysia, e-mail: nora@uniten.edu.my

Asmaul Husna HARIS FADZILAH
Faculty of Economics and Business, University Malaysia Sawarak, Malaysia, e-mail: hfahusna@unimas.my

Sahoo MALAYARANJAN
Institute of Energy Policy and Research, University Tenaga Nasional, Putrajaya, Malaysia, e-mail: sahoomalayaranjan4@gmail.com

Citation: Raihan, A., Voumik, L.C., Esquivias, M.A., Ridzuan, A.R., Yusoff, N.Y.M., Haris Fadzilah, A.H., & Malayaranjan, S. (2023). ENERGY TRAILS OF TOURISM: ANALYZING THE RELATIONSHIP BETWEEN TOURIST ARRIVALS AND ENERGY CONSUMPTION IN MALAYSIA. *GeoJournal of Tourism and Geosites*, 51(4spl), 1786–1795. https://doi.org/10.30892/gtg.514spl19-1174

Abstract: This study aims to investigate the long-term relationship between Malaysian tourism, energy consumption, and their association with economic growth, and financial development, using the Autoregressive Distributed Lag (ARDL) method. Utilizing annual data spanning from 1990 to 2020, this research examines how increased international tourist arrivals, economic growth, and financial development contribute to energy consumption in Malaysia. The study's findings reveal that growing tourism escalates energy demands for transportation, accommodation, and leisure activities. Furthermore, economic expansion drives energy usage through business expansion and increased industrial activities. Financial progress facilitates capital accessibility, leading to investments in energy-intensive sectors. In conclusion, to ensure sustainable future energy demand, this study underscores the importance of eco-friendly tourism practices that stimulate economic growth while minimizing emissions. Sustainable economic and financial strategies are also essential.

Key words: Energy use; Tourist arrivals; Economic growth; Financial development; Sustainable tourism; Climate change

* * * * * *

INTRODUCTION

Energy is the main wheel of the rising Malaysian economy, and it is essential to find out which factors are related to energy demand (Begum et al., 2023). In Malaysia, rising tourism sectors, increasing income, and spreading financial development might be correlated with energy demand (Raihan and Tuspekova, 2022a). The general thinking is that tourism is one of the most noticeable service industries, making it an extremely important international industry (Nocca et al., 2023). According to the World Travel and Tourism Council's latest findings, the tourism industry contributed 10.3% of the world's total gross domestic product (GDP) in 2019 and brought in 8.9 trillion dollars worldwide in income (WTTC, 2022). Even amid an economic downturn, tourism can help a nation's economy recover and thrive because it can help create jobs and generate money (such as earnings in a foreign currency), both of which are important contributors to economic growth (Jahanger et al., 2023).

Nevertheless, tourism remains Malaysia's most important source of overseas revenue and a major factor in the country's overall development. In 2019, Malaysia welcomed 26 million international tourists (World Bank, 2022), nearly the country's total population. In the year 2020, the tourism industry in Malaysia contributed 14.1% to the country's GDP. In addition, Malaysia's growing tourism industry was responsible for providing 11.4% of all jobs in the country. This tourism business

* Corresponding author

employed around 1.5 million people directly or indirectly. Since 2012, China surpassed Thailand as Malaysia's third-largest tourist source, with over 2 million annual Chinese visitors by 2016, peaking at 2.94 million in 2018 (Tourism Malaysia, 2020). Tourism Malaysia, under the Ministry of Tourism, promotes the country internationally (Musa et al., 2023). COVID-19 caused a drastic 83.4% drop in 2020's international tourist arrivals to 4.3 million (Tourism Malaysia, 2020). However, Malaysia reopened its borders in 2021, leading to a positive resurgence in the tourism industry's growth (Shaari et al., 2022b).

Tourism's growth boosts income but escalates energy use (Kumail et al., 2023; Liu et al., 2023; Ventura et al., 2023), driven by increased hotel stays and transit use (Dogan and Aslan, 2017). Particularly, aviation exacerbates energy consumption and emissions. Malaysia's National Tourism Policy (2020-2030) emphasizes balancing income with sustainable transformation, competitiveness, and environmental protection. Stagnation in Malaysia's tourism industry stems from lacking innovation, government reliance, and unsustainable practices. To remain competitive and eco-friendly, the industry must pivot towards responsible consumption, supporting Net Zero Emission (NZE) goals and decarbonization. Energy consumption is vital for economic progress but must be balanced to mitigate negative impacts (Selvanathan et al., 2021). While driving technological advancement and growth, excessive energy use harms the environment, increasing carbon dioxide (CO_2) concentrations and driving climate change (Nocca et al., 2023). This harms ecosystems and human well-being (Pan et al., 2021). Tourism contributes almost 5% of global emissions, mainly from transport (75%) and lodgings (20%). Malaysia's energy sector faces emission challenges (Shaari et al., 2022a; Ridzuan et al., 2022), alongside natural disasters. Over three decades, Malaysia's tourism and energy consumption surged, necessitating sustainable practices for environmental resilience.

The intricate interplay of energy, emissions, and tourism captivates scholars, as does the nexus of globalization, energy sources, economic growth, and usage (Işik et al., 2020a). Recent research highlights factors like technological evolution, economic status, urbanization, regional environmental policies, and industry composition influencing travel (Pan et al., 2021; Thang, 2022). Rural tourism success hinges on rural business engagement, while "entertainment tourism" success entails quality services, logistics, marketing, and safety (Luo et al., 2021). Evolving travel trends alter these dynamics. Countries promote agricultural, rural, and medical tourism interchangeably (Cham et al., 2021). Many nations explore tourism's CO_2 impact tied to energy (Shi et al., 2022). Tourism wields both positive and negative pollution effects, explored through empirical studies (Dogru et al., 2019a; Işik et al., 2020b). Scarce research examines this link in a single, expanding upper-middle-income nation like Malaysia. Thus, this study delves into how Malaysia's tourism affects its energy consumption.

This study explores how tourism affects energy use in Malaysia, revealing a lasting connection. By predicting energy changes tied to tourism, economic growth, and development, the study fills an important gap. Since tourism is crucial for Malaysia's economy (Solarin, 2014), it's vital to understand its energy impact for effective carbon emission rules. The research focuses on sustainability, looking at environmental, economic, and socio-cultural aspects. Recommendations aim at creating jobs, preserving local culture, and balancing socio-cultural, economic, and environmental aspects. This approach ensures Malaysia's tourism lasts long and follows global trends. For policymakers in Malaysia and similar developing nations relying on tourism, the study suggests considering energy efficiency and clean technologies. This aligns with Sustainable Development Goal 7. It also emphasizes reducing pollution, managing waste, and supporting cultural sites, contributing to Goals 8, 12, and 14 for sustainable growth and resource use. In the post-COVID-19 world, where tourism helps economic recovery, this study guides national policies in line with Malaysia's Paris Agreement goals. The article comprises five sections: an introduction, a literature review, a methodology, findings and discussion, and a conclusion with policy implications.

LITERATURE REVIEW

Rising energy demand is a concern and there is a link between growing economies, trade, FDI, industrialization, GDP growth, urbanization, and rising energy use. Tourism has a significant impact on the economy, but its effect on CO_2 emissions has been neglected. Some research has found a connection between tourism and energy consumption, but more investigation is needed to understand the impact of tourism on the environment. For example, tourism activity can lead to increased emissions in Mediterranean countries (Gao et al., 2021; Alola and Alola, 2018), high-income countries within the OECD (Balsalobre-Lorente et al., 2023), Golf member countries (Farooq et al., 2023), Middle Eastern nations (Onifade et al., 2023), emerging countries (Nathaniel et al., 2023). Katircioglu (2014) found that tourism is a major factor in the rise of energy consumption, similar to Zhang and Gao (2016) who found that tourism has a substantial impact on GDP growth and CO_2 emissions in China. However, a few studies have suggested the opposite, such as certain Middle Eastern regions (Voumik et al., 2023a), G7 nations (Ahmad et al., 2022), top tourist destinations (Ansari and Villanthenkodath, 2022), and countries involved in the Belt and Road initiative (Umurzakov et al., 2023).

Jebli and Hadhri (2018) used the feedback hypothesis to confirm short-run Granger causality between touristic zone development and energy consumption. They found only one path of long-term causation between energy use and international travel using a vector error correction model (VECM). Tang et al. (2016) investigated dynamic causal and inter-relationships between India's tourist sector, GDP growth, and energy use, finding only roughly 9 per cent of the GDP-tourism gap could be attributed to energy use. The growth in tourism and the economy significantly impacted the total amount of energy consumed. Ali et al. (2018) found a strong correlation between renewable energy use and tourism in nations with higher GDP, suggesting a feedback loop between the two industries.

Nepal et al. (2019) found a one-way causal relationship between energy use and the number of visitors, demonstrating how the consumption of firewood and reduced reliance on fossil fuels affected tourism in Nepal and other developing countries. Dogan and Aslan (2017) discovered no correlation between the quantity of tourists visiting European Union member states and candidate nations and overall energy consumption. Gamage et al. (2017) found that an increase in tourism

in Sri Lanka would not substantially influence the country's ecological system. Raihan (2023) used the DOLS approach to report that recent investigations found that tourism increases CO_2 emissions in the Philippines, Thailand, and Chile.

Recently, research has focused on the relationship between tourism and energy consumption. Gokmenoglu and Eren (2020) analyzed 55 years of data (1960-2015) to determine the impact of tourists from other countries on Turkey's energy use. They found a one-way causal relationship between the number of tourists and energy consumption, using the bootstrap method to adjust for multiple correlations. The study concluded that Turkey's high energy consumption is largely due to its large number of visitors from other countries. Amin et al. (2020) found a long-term, unidirectional causal link between the rise in the number of visitors and energy use. Selvanathan et al. (2021) evaluated the correlations between tourism, energy consumption, carbon emissions, and GDP for South Asian countries and found that tourism positively affects energy consumption in Bangladesh, India, Nepal, and Pakistan. However, the expansion of the tourist industry in South Asia poses a significant risk to the environment due to growing CO_2 emissions, which could harm the quality of the environment.

Tourism's impact on the natural world is a concern due to the increasing energy demand for activities like transportation, housing, and retail services (Ali et al., 2020). High-middle-income nations' primary energy consumption has a one-way causal relationship with visitors' expenditures and the net inflow of international tourists over the long run (Shi et al., 2020). The primary energy use of high-income nations is causally associated with the per-capita expenditure of foreign tourists in a short-run, one-way relationship. Tourism's impact on energy use varies based on the countries' GNP. The article examines the link between carbon emissions and tourism's impact on energy consumption. Raihan et al. (2022c) found that a 1% increase in tourism results in a 0.04% rise in CO_2 emissions. A paired Granger causality test revealed that tourism is a primary sector responsible for CO_2 emissions.

Tourism expansion and economic growth are shown to go hand in hand in Germany by Isik et al. (2018), while in China and Turkey, it is the reverse. Dogru et al. (2019b), employing the ARDL method, reported that a depreciation of the local currency improves the balance of US tourism trade with Canada, Mexico, and the UK, but the results were inconclusive overall. Isik et al. (2020a) confirmed the validity of the tourism-driven EKC theory in the French context and confirm that countries like France, Italy, the UK, and the US can benefit from a decrease in their CO_2 emissions if they increase their use of renewable energy sources. However, a rise in the country's foreign tourist arrivals has a net positive effect on Italy's carbon footprint. For the top 10 most visited countries, Isik et al. (2017a) found evidence of causality between tourist arrivals, tourism receipts, energy consumption, and economic growth. Isik et al. (2017b) demonstrated that rising GDP, improved financial markets, increased exports and imports, and higher tourism spending all contributed to rising CO_2 emissions in Greece. From 1996Q3 to 2015Q1, Ongan et al. (2017) looked into how changes in real exchange rates and revenue affected demand for international travel to the US from selected EU countries finding that visitors to the US are more responsive to shifts in the actual exchange rate than they are to shifts in GDP. More recent studies by Voumik et al. (2023b) explored the impact of tourism, GDP, renewable energy, and fossil fuel towards environmental degradation at top ten most attraction tourist destinations at Africa. The main outcome showed that higher renewable energy reduced the carbon emissions, while higher number tourist arrivals and fossil fuels lead towards higher releases of carbon emissions.

Research conducted by Irfan et al. (2023) on China's tourism industry from 2001 to 2019 reveals that tourism related activities (i.e., food and beverage, shopping and entertainment) significantly contribute to greenhouse gas emissions. In the long run, the tourism-traveling sector is one of the primary contributor to CO_2 emissions. Xiong et al. (2022) used the ARDL method to investigate the influence of tourism on environmental quality in the USA. Their findings highlight a significant connection between tourism and both greenhouse gas emissions and air pollution, indicating an adverse impact on people's lives. Yıldırım et al. (2023) found that by analyzing tourism revenues alongside variables such as trade openness, financial development, urbanization, and energy consumption in Mediterranean countries, it was observed that an increase in tourism revenue was correlated with a rise in CO_2 emissions. Other studies in the Middle East have found similar findings (Al Fahmawee and Jawabreh, 2023). Recently, groundbreaking econometric techniques have been employed to investigate the GDP- CO_2 nexus, yielding novel insights. The study conducted by Jiang and Yu (2023) investigated the relationship between greenhouse gas emissions and economic activity in China, revealing significant trade-offs between rapid economic growth and environmental quality. This research highlights the increasing difficulties that economies face in pursuing the SDGs through rapidly expanding sectors such as tourism. In accordance with Ghosh et al. (2023), who utilize innovative quantile regression techniques, economic advancement is of paramount importance. This is evidenced by the strong positive relationship between GDP growth and carbon dioxide emissions, particularly in developing nations such as the BRICS group. The findings of Usman et al. (2023) suggest that the use of ARDL bound testing reveals that economic growth, non-renewable energy utilization, and trade openness have a detrimental effect on environmental quality and an increase in carbon emissions in Pakistan.

The adverse impacts of tourism on CO_2 emissions have been thoroughly documented and widely recognized across the globe. Guo et al. (2023) find that initial growth in manufacturing and services increases fossil fuel consumption and CO_2 emissions, but long-term expansion in the tourism service sector in Asian developing countries is expected to mitigate environmental degradation. This supports the tourism growth hypothesis, predicting increased inbound arrivals in Asia. Raihan (2023) explores interdependent effects in the Philippines, indicating that a 1% increase in economic growth, urbanization, industrialization, and tourism corresponds to CO_2 emission increases of 0.16%, 1.25%, 0.06%, and 0.02%, respectively. Farooq et al. (2023) reveal positive correlations between economic growth, foreign investment, tourism investment, electricity production, and population density with CO_2 emissions in the Gulf region. Azam and Raza (2022) analyze global data (1990-2018), showing positive correlations between economic growth, foreign investment, tourism investment, electricity production, and population density with CO2 emissions.

Research on the ecological consequences of financial growth and trade openness, aimed at acquiring advanced technologies for reducing CO_2 emissions, has been explored. Habiba et al. (2023) find that financial development contributes to increased CO_2 emissions and environmental degradation, but when combined with renewable energy, the impact can be mitigated. Ren et al. (2023) show that the link between financial development and CO2 emissions is more pronounced in areas with lower poverty levels, with structural factors playing a role in mitigating this association. However, financial development has both positive and negative effects on CO_2 emissions at the regional level, leading to spatial spillover effects. Foreign investment's environmental impact varies across countries with differing income levels. Huang and Guo (2023) discover that in the Europe & Central Asia region, financial development tends to separate carbon emissions from economic growth, while in the Eastern Partnership, Sub-Saharan Africa, and Middle East and North Africa regions, financial development correlates with increased carbon emissions.

Several studies suggest that energy consumption affects economic growth and environmental quality (Amin et al., 2020; Isik et al., 2021), but there is limited research on tourism's impact on energy use, particularly in Malaysia. This study aimed to address this knowledge gap by investigating the relationship between tourism, energy consumption, GDP growth, and the financial sector using country-specific time series data.

METHODOLOGY

1. Data

This study analyzed annual time-series data from 1990 to 2020, which included data from the Visit Malaysia campaign's launch in the 1990s. The study aimed to evaluate the campaign's impact on energy use since its inception. The Malaysia Tourism Promotion Board (MTPB) website provided tourism statistics, while the World Development Indicator (WDI) provided data on energy consumption, economic growth, and financial development. To reduce variance, logarithmic forms were used for the variable of interest. Definitions, units of measurement, and data sources for each variable are listed in Table 1.

Table 1. Description of the variables and data sources (Source: WDI and MTPB)

Variables	Description	Logarithmic structures	Measurement units	Sources
EU	Energy use	LEU	Kg of oil equivalent per capita	WDI
TR	International tourism	LTR	Number of tourist arrivals	MTPB
GDP	Economic growth	LGDP	GDP per capita (constant Malaysian Ringgit)	WDI
FD	Financial development	LFD	Domestic credit to the private sector (% of GDP)	WDI

2. Empirical framework

The Cobb-Douglas production function is a reasonable fit if we assume a market-clearing scenario in which energy demand is proportional to tourist arrivals, GDP, and financial growth.

$$EU_t = f\ (TR_t; GDP_t; FD_t) \quad (1)$$

Where EU_t represents energy use, TR_t is employed as a proxy for tourism, GDP_t is the proxy for income growth, and FD_t represents financial development. The subscript t represents 'time'

In this empirical analysis, the exogenous variables are TR, GDP, and FD; and the endogenous variable is EU. Theoretically, increasing tourist arrivals is anticipated to contribute to the surge in energy use. Therefore, TR is expected to increase EU. Prior studies established that economic growth enhances energy use. Therefore, GDP is expected to increase EU. As per previous studies, financial institutions offer funding for economic activities (low-cost loans to consumers and enterprises), which encourages energy demand. Therefore, FD is expected to contribute to boosting the EU.

Although the number of tourist arrivals was the primary variable of interest for this study, the researchers also consider other important control variables, such as economic growth and financial development, which are known to influence the amount of energy consumed, according to the previous research (Begum et al., 2020; Akan, 2023). The number of visitors from other countries and Malaysia's overall demand for energy is formulated as:

$$LEU_t = \tau_0 + \tau_1 LTR_t + \tau_2 LGDP_t + \tau_3 LFD_t + \varepsilon_t \quad (2)$$

where τ_1, τ_2, and τ_3 are the coefficients of the regressors. Besides, ε_t represents an error term.

The empirical model was subjected to several innovative econometric procedures. Firstly, the stationarity property of the data was analyzed using three-unit root tests, including the Augmented Dickey-Fuller (ADF), Dickey-Fuller generalized least squares (DF-GLS), and Phillips-Perron (P-P) tests. The study verified the long-term relationship between the specified model and certainty once the integration order of the series was determined. Next, the ARDL bounds test, developed by Pesaran et al. (2001), was employed to test for the presence of cointegration between Malaysia's energy consumption and other variables used to explain it. Compared to alternative one-time integer procedures, the ARDL bounds test for cointegration valuation provides several advantages, such as providing higher reliability for even small sample sizes (Ridzuan et al., 2022). It can also be used to test for mixed order of integration, as long as all variables are included in the same order. The Akaike information criterion (AIC) was used to select the most effective model order. The following Equation represents the ARDL model for the estimation:

$$\Delta LEU_t = \tau_0 + \tau_1 LEU_{t-1} + \tau_2 LTR_{t-1} + \tau_3 LGDP_{t-1} + \tau_4 LFD_{t-1} + \sum {}^{q}{}_{i=1}\gamma_1 LEU_{t-1} + \sum {}^{q}{}_{i=1}\gamma_2 LTR_{t-1} + \sum {}^{q}{}_{i=1}\gamma_3 LGDP_{t-1} + \sum {}^{q}{}_{i=1}\gamma_4 LFD_{t-1} + \varepsilon_t \quad (3)$$

The study investigated the long-term and short-term associations between the variables using the ARDL bounds testing equation to obtain the F-statistic result. The ARDL model was used to determine the long-run relationship and short-run dynamics of a single model's variables in case cointegration was discovered. The ARDL method is suitable for studies where variables are kept the same, either at level, first differences, or a combination of the two (Ansari and Villanthenkodath, 2022). It is also straightforward to understand and requires only one equation to be set up. The long-term relationship between the series was determined, and the short-run coefficients were calculated. The error-correction model was evaluated, and the short-run coefficients were obtained as shown in Equation (4).

$$\Delta LEU_t = \tau_0 + \tau_1 LEU_{t-1} + \tau_2 LTR_{t-1} + \tau_3 LGDP_{t-1} + \tau_4 LFD_{t-1} + \sum {}^{q}{}_{i=1}\gamma_1 LEU_{t-1} + \sum {}^{q}{}_{i=1}\gamma_2 LTR_{t-1} + \sum {}^{q}{}_{i=1}\gamma_3 LGDP_{t-1} + \sum {}^{q}{}_{i=1}\gamma_4 LFD_{t-1} + \theta ECT_{t-1} + \varepsilon t \quad (4)$$

In Equation (4), the dynamics of error correction and the long-term links between the series are displayed, where q represents the lag length of the series and Δ is the first difference operator. The ECT notation refers to the error correction term, and the coefficient of the ECT is denoted by θ. This analysis used FMOLS, DOLS, and CCR to examine how energy consumption was affected by various factors over time as part of a robustness evaluation. The cointegration requirement among the I (1) parameters must be satisfied before using FMOLS, DOLS, or CCR. These techniques account for endogeneity and serial correlation biases resulting from the cointegration connection, producing asymptotically efficient results. Figure 1 presents the analysis flowchart in its entirety.

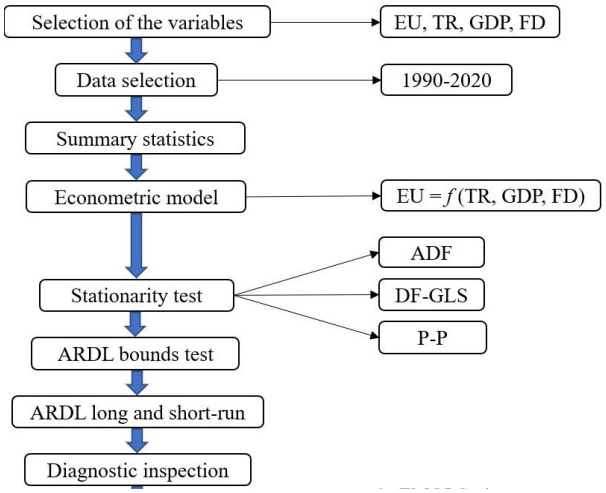


Figure 1. Flow Chart of the Analysis

RESULT AND DISCUSSION

The results of the evaluation of the unit root test provide crucial information on the integration characteristics of the parameters. This information is necessary to develop long-term relationships. The ADF, DF-GLS, and PP tests were used to evaluate the series' integration features.

Table 2 outlines the results of the stationarity test, revealing that LEU, LTR, and LGDP exhibited a unit root problem at the level before becoming stationary after taking the first difference. The DF-GLS test showed that LFD was not stationary at the level, but became stationary after taking the first difference. The ADF and P-P tests revealed that LFD was stationary at the level I(0), and became I(1) after taking the first difference.

Table 2. Unit Root test results; *** and ** indicate the significance level at 1% and 5%, respectively

Variables	ADF		DF-GLS		P-P	
	levels	first difference	levels	first difference	levels	first difference
LEU	-1.730	-5.502***	-0.174	-3.469**	-1.289	-7.813***
LTR	-1.246	-3.728***	-1.255	-3.507**	-1.271	-3.753***
LGDP	-1.990	-4.318***	0.180	-4.341***	-1.990	-4.305***
LFD	-3.228**	-4.181***	-1.380	-4.130***	-3.141**	-4.154***

In light of the unit root test findings, the ARDL bounds test was carried out to determine whether the variables connected over time. The results of the cointegration study are detailed in Table 3, which can be found here. According to the results, the F-statistic value (7.032) was much greater than the critical values at the top limits of 1%, 5%, and 10%. Therefore, it may be concluded that these factors have a long-term correlation.

Table 3. ARDL bounds test results
(Source: Authors estimations)

F-bounds test		Null hypothesis: No degrees of relationship		
Test statistic	Estimate	Significance	I(0)	I(1)
F-statistic	7.032	At 10%	2.37	3.20
K	3	At 5%	2.79	3.67
		At 2.5%	3.15	4.08
		At 1%	3.65	4.66

Table 4. ARDL long and short-run results: dependent variable LEU. (Source: Authors estimations) *** and ** indicate the significance level at 1% and 5%, respectively

Variables	Long-run			Short-run		
	Coefficient	t-Statistic	p-value	Coefficient	t-Statistic	p-value
LTR	0.021***	2.186	0.006	0.026**	1.954	0.013
LGDP	0.948***	13.747	0.000	0.638***	4.589	0.000
LFD	0.036***	2.922	0.005	0.014**	1.936	0.013
C	10.716	2.900	0.137	-	-	-
ECT (-1)	-	-	-	-0.596***	-4.481	0.000
R^2	0.987					
Adjusted R^2	0.974					

The research used the ARDL method to investigate the long-term and short-term interplay between the variables, following a long-term relationship established in the bound test. The results of the long-run and short-run estimations are presented in Table 4. The study revealed a positive and statistically significant coefficient for LTR, indicating that a 1% rise in tourist arrivals leads to a 0.021% increase in energy consumption in the long term and a 0.026% increase in the short term. This suggests that the rapid growth of the tourism industry in Malaysia has had a positive impact on energy

consumption both in the short and long term. Additionally, the ARDL results showed that GDP and financial development positively influence energy consumption, with a significance of 1%. A 1% rise in GDP is associated with a long-term increase in energy consumption of 0.95% and a short-term increase of 0.64%. The rapid economic expansion of Malaysia has favorable implications for energy usage both in the short and long term. Similarly, the coefficient of LFD shows that a 1% rise in financial development has a positive effect on energy consumption patterns in the long run (0.036%) and the short run (0.014%). This suggests that greater economic progress is associated with higher energy use, regardless of other variables.

Other studies have found similar results in economies comparable to ours (Saud et al., 2019; Begum et al., 2020; Jahanger et al., 2023; Voumik et al., 2022a; Liu et al., 2023). The growth of GDP leads to increased energy consumption and environmental pollution (Majumder et al., 2023; Voumik et al., 2022b). Additionally, Foreign Direct Investment (FDI) can both promote new sectors and product lines while also impacting emissions and pollution (Ridzuan et al., 2022).

Our findings are consistent with previous research, which has demonstrated that tourism activity can lead to an increase in carbon dioxide emissions, as noted in the case for Mediterranean countries (Gao et al., 2021), high-income countries in OECD (Balsalobre-Lorente et al., 2023), golf member countries (Farooq et al., 2023), cases among middle East nations (Onifade et al., 2023), the case of emerging countries (Nathaniel et al., 2023), and a case in Malaysia reported by Rahman et al. (2022). Few studies have suggested that tourism can lead to a reduced level of CO_2 emissions, with exceptions in the Middle East (Voumik et al., 2023a), countries members of the G7 group of nations (Ahmad et al., 2022), selected top tourist destinations (Ansari and Villanthenkodath, 2022), and selected countries participating in the Belt and Road initiative (Umurzakov et al., 2023). It is highly plausible that variations in the relationship between CO_2 emissions and tourism activities can be attributed to differences in energy policies, tourist attractions, available infrastructure, technological stage of countries, environmental regulations, and infrastructure among others (Jahanger et al., 2023; Banga et al., 2023).

The regression model fits the data well with R2 and adjusted R2 values of 0.987 and 0.974, respectively. This implies that changes in the independent variable can be explained nearly completely by the independent causes. Short-run results indicate that tourism, economic expansion, and financial development have positive impacts on energy consumption. If short-term deviations are balanced over the long run, as the ECT suggests, the error correction coefficient should be calculated. The ECT was negative and statistically significant at 1%, indicating that the shock from the previous year would be mitigated by 0.60 percentage points this year. The critical level was set at 1%. As time passes, the amplitude of the fluctuation decreases, making it possible for a return to equilibrium in the future.

To validate the model's accuracy, several diagnostic tests were conducted. The log transformation of time-series data was evaluated. The results of these tests are presented in Table 5. The Lagrange Multiplier test showed no serial correlation, indicating that the data was unrelated. The series was found to have a normal distribution using the Jarque-Bera normality test, and the Breusch-Pagan-Godfrey heteroscedasticity test demonstrated that the observation did not contain any errors in regression. The Ramsey RESET test confirmed that the regression was correctly specified. The log form of time-series data did not have any issues with heteroscedasticity or serial correlation, and the model passed the stability test since its residual was normally distributed. The p-value of the F-statistic was 0.0000, indicating that the linear relationship between the variables had statistical significance. The CUSUM and CUSUMSQ tests were used to determine if there was a stable link over a long period, and the plots of the model's coefficients were within the critical bounds and significance level (Figure 2). No lines passed the critical bound, indicating the stability of the model was confirmed.

Table 5. The results of ARDL model diagnostic tests

Diagnostic tests	Coefficient	p-value	Decision
Lagrange Multiplier test	1.831	0.173	No serial correlation exits
Jarque-Bera test	1.491	0.474	Residuals are normally distributed
Breusch-Pagan-Godfrey test	1.732	0.183	No heteroscedasticity exists
Ramsey RESET test	2.426	0.102	The regression is properly specified
F-statistic	220.491	0.000	The linear relationship of this model is significant

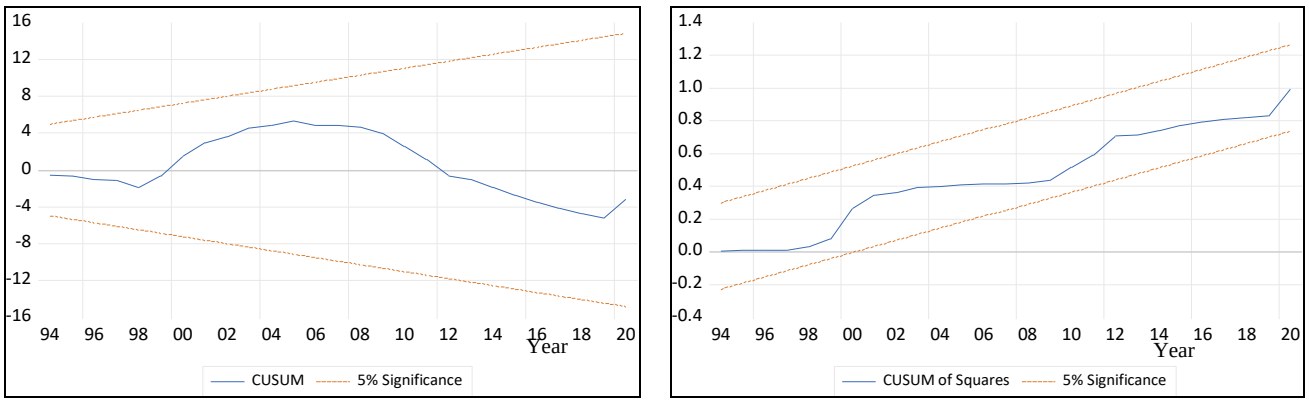


Figure 2. The results of CUSUM and CUSUMSQ tests

Over the past three decades, Malaysia has seen a significant increase in the number of tourists visiting the country, as well as in income growth and energy use. In 2019, the number of tourists visiting the country was over five times higher

than in 1991, and GDP per capita increased by approximately three times during the same period (World Bank, 2022). Energy consumption by individuals also rose by 27%. This is because an increase in tourist arrivals leads to increased economic activity and production, requiring more energy for infrastructure, facilities, and services associated with tourism. Additionally, transportation associated with tourism is a significant contributor to total energy consumption. Therefore, an increase in the number of tourists results in a higher demand for energy. The study's findings suggest that a rise in energy consumption due to an increase in the number of international visitors to Malaysia could negatively impact the environment through increased emissions. Tourism also affects not only the biophysical environment but also the sociocultural components, such as contributing to air pollution and noise pollution. The introduction of trash can transform a beautiful location into a landfill, and deforestation is a significant negative impact of increasing tourist numbers on the ecosystem. To mitigate these negative effects, sustainable tourism must be developed to reduce its impact on biodiversity and the economy.

CONCLUSION AND POLICY IMPLICATIONS

1. Conclusion

This study analyzes tourism's impact on energy consumption, accounting for improved living standards and economic conditions. Time series data from 1990 to 2020 were examined using ADF, DF-GLS, and P-P unit root tests, confirming stationarity, while ARDL bounds tests indicated long-term cointegration. Results revealed significant positive influence of GDP, financial development, and tourism on Malaysia's energy consumption in both short and long terms. ARDL estimates indicated 1% increases in GDP, financial development, and tourist arrivals correspond to energy consumption growth by 0.02%, 0.95%, and 0.04% in the long run, and 0.03%, 0.64%, and 0.01% in the short run, respectively. Findings underscore the need for environmentally responsible tourism policies, aligning with Malaysia's 2030 target for sustainable tourism fostering job creation, cultural preservation, and economic support.

2. Policy implications

To address the issues of energy consumption, climate change, and CO_2 emissions, Malaysia should implement robust policies that encourage tourism stakeholders to adopt renewable energy, carbon-neutral transport, and emission-free technologies. Incentives can be provided to encourage the adoption of eco-friendly public transport, offer tax benefits, and incentivize energy-efficient tourism services. The government can also integrate energy-efficient features in popular tourist destinations, fostering reduced energy costs and emphasizing energy efficiency in hotels and eateries. Energy efficiency not only mitigates pollution and emissions but also saves money, creates long-term jobs, and aligns with sustainable practices.

The Malaysian government plans to implement a system to hold tourists, residents, and visitors accountable for their impact on natural environments at popular tourist attractions. The tourism sector will be encouraged to adopt sustainability and environmental responsibility, providing a better experience for tourists while promoting environmental education. To support a campaign promoting energy conservation, the public will be informed through flyers, brochures, infographics, and updates on authorities' green initiatives. Encouraging eco-friendly infrastructure, alternative energy sources, and low-carbon logistics for tourism businesses, coupled with eco-focused events, could curtail CO_2 emissions and resource depletion. Measures like monitoring energy use, efficient lighting, eco-friendly air conditioning, reduced water consumption, and efficient heating could be adopted. Environmental levies could be implemented at popular tourist spots to ensure sustainable practices. Investing in energy efficiency, waste management, and modernizing public transportation can reduce tourism-induced CO_2 emissions. Malaysia's enhanced energy and environmental regulations could serve as a model for other developing nations grappling with tourism-related environmental deterioration from fossil fuel-based energy.

Collaborative efforts among Southeast Asian governments could yield effective strategies for regional sustainable tourism development. This research addresses tourism and energy consumption, a significant knowledge gap in the Malaysian context. Results carry the potential to inform policymaking by highlighting the impact of visitor numbers on energy use. Energy security is vital for both tourism and economic growth. Diversifying into sustainable energies is vital for long-term energy security and environmental preservation. Policymakers must align energy and tourism policies with Malaysia's National Tourism Policy (NTP) 2020-2030, which aligns with the Sustainable Development Goals (SDGs). The tourism sector should boost competitiveness through sustainable practices, revenue generation, and community engagement. Aligning with NTP's strategies and SDGs can create jobs, conserve biodiversity, and protect cultural heritage, fostering responsible consumption and green practices across the tourism sector.

3. Limitations and future research directions

The study's findings could have significant implications for sustainable tourism policies, but the research had limitations in using econometric approaches due to the absence of data beyond the study's time frame. Further studies could examine the effectiveness of regulations to convert Malaysia's tourism sector to renewable energy and the cost-effectiveness of building green-energy tourism. Policymakers, government officials, and the tourism industry need to conduct further research to evaluate the impact of the tourism-energy connection in the context of the COVID-19 crisis, particularly in regards to air transport, travel, and tourism. This analysis could aid in coping with the economic disruption caused by COVID and could be broadened to aid in the economic recovery.

Authors Contribution: Conceptualization A.R. and L.C.V.; methodology A.R., L.C.V. and S.M.; software L.C.V.; validation M.A.E. and S.M.; formal analysis N.Y.M.Y., and A.H.H.F.; investigation A.R., A.R.R., and A.H.H.F.; data curation A.R.R. and A.H.H.F.; writing original draft preparation A.R.R. and N.Y.M.Y.; writing – review and editing

M.A.E. and S.M.; visualization N.Y.M.Y.; supervision project administration M.A.E, . All authors have read and agreed to the published version of the manuscript.

Funding: The APC was Supported by Airlangga University.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The original contributions presented in the study are included in the article; further inquiries can be directed to the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest..

REFERENCES

Ahmad, N., Youjin, L., & Hdia, M. (2022). The role of innovation and tourism in sustainability: why is environment-friendly tourism necessary for entrepreneurship?. *Journal of Cleaner Production*, *379*, 134799. https://doi.org/10.1016/j.jclepro.2022.134799

Akan, T. (2023). Explaining and modeling the mediating role of energy consumption between financial development and carbon emissions. *Energy*, *274*, 127312. https://doi.org/10.1016/j.energy.2023.127312

Ali, Q., Khan, M.T.I., & Khan, M.N.I. (2018). Dynamics between financial development, tourism, sanitation, renewable energy, trade and total reserves in 19 Asia cooperation dialogue members. *Journal of Cleaner Production*, 179, 114-131. https://doi.org/10.1016/j.jclepro.2018.01.066

Ali, W., Sadiq, F., Kumail, T., Li, H., Zahid, M., & Sohag, K. (2020). A cointegration analysis of structural change, international tourism and energy consumption on CO_2 emission in Pakistan. *Current Issues in Tourism*, 23(23), 3001-3015. https://doi.org/10.1080/13683500.2020.1804338

Alola, A.A., & Alola, U.V. (2018). Agricultural land usage and tourism impact on renewable energy consumption among Coastline Mediterranean Countries. *Energy & Environment*, 29(8), 1438-1454. https://doi.org/10.1177/0958305X18779577

Amin, S.B., Kabir, F.A., & Khan, F. (2020). Tourism and energy nexus in selected South Asian countries: a panel study. *Current Issues in Tourism*, 23(16), 1963-1967. https://doi.org/10.1080/13683500.2019.1638354

Ansari, M.A., & Villanthenkodath, M.A. (2022). Does tourism development promote ecological footprint? A nonlinear ARDL approach. *Anatolia*, *33*(4), 614-626. https://doi.org/10.1080/13032917.2021.1985542

Azam, M., & Raza, A. (2022). Does foreign direct investment limit trade-adjusted carbon emissions: fresh evidence from global data. *Environmental Science and Pollution Research*, *29*(25), 37827–37841. https://doi.org/10.1007/s11356-021-18088-9

Balsalobre-Lorente, D., Abbas, J., He, C., Pilař, L., & Shah, S.A.R. (2023). Tourism, urbanization and natural resources rents matter for environmental sustainability: The leading role of AI and ICT on sustainable development goals in the digital era. *Resources Policy*, *82*, 103445. https://doi.org/10.1016/j.resourpol.2023.103445

Banga, C., Deka, A., Kilic, H., Ozturen, A., & Ozdeser, H. (2022). The role of clean energy in the development of sustainable tourism: does renewable energy use help mitigate environmental pollution? A panel data analysis. *Environmental Science and Pollution Research*, *29*(39), 59363-59373. https://doi.org/10.1007/s11356-022-19991-5

Begum, R.A., Raihan, A., & Said, M.N.M. (2020). Dynamic impacts of economic growth and forested area on carbon dioxide emissions in Malaysia. *Sustainability*, 12(22), 9375. https://doi.org/10.3390/su12229375

Cham, T.H., Lim, Y.M., Sia, B.C., Cheah, J.H., & Ting, H. (2021). Medical tourism destination image and its relationship with the intention to revisit: A study of Chinese medical tourists in Malaysia. *Journal of China tourism research*, 17(2), 163-191. https://doi.org/10.1080/19388160.2020.1734514

Dogan, E., & Aslan, A. (2017). Exploring the relationship among CO_2 emissions, real GDP, energy consumption and tourism in the EU and candidate countries: Evidence from panel models robust to heterogeneity and cross-sectional dependence. *Renewable and Sustainable Energy Reviews*, 77, 239-245. https://doi.org/10.1016/j.rser.2017.03.111

Dogru, T., Isik, C., & Sirakaya-Turk, E. (2019a). The balance of trade and exchange rates: Theory and contemporary evidence from tourism. *Tourism Management*, 74, 12-23. https://doi.org/10.1016/j.tourman.2019.01.014

Al Fahmawee, E.A.D., & Jawabreh, O. (2023). Sustainability of Green Tourism by International Tourists and its Impact on Green Environmental Achievement: Petra Heritage, Jordan. *Geo Journal of Tourism and Geosites*, *46*(1), 27-36.

Farooq, U., Tabash, M., Anagreh, S., Al-Rdaydeh, M., & Habib, S. (2023). Economic growth, foreign investment, tourism, and electricity production as determinants of environmental quality: empirical evidence from GCC region. *Environmental Science and Pollution Research*, *30*, 1–13. https://doi.org/10.1007/s11356-023-25545-0

Gamage, S.K.N., Kuruppuge, R.H., & Haq, I.U. (2017). Energy consumption, tourism development, and environmental degradation in Sri Lanka. *Energy Sources, Part B: Economics, Planning, and Policy*, 12(10), 910-916. https://doi.org/10.1080/15567249.2017.1324533

Gao, J., Xu, W., & Zhang, L. (2021). Tourism, economic growth, and tourism-induced EKC hypothesis: Evidence from the Mediterranean region. *Empirical Economics*, *60*, 1507-1529. https://doi.org/10.1007/s00181-019-01787-1

Ghosh, S., Hossain, M.S., Voumik, L.C., Raihan, A., Ridzuan, A.R., & Esquivias, M.A. (2023). Unveiling the spillover effects of democracy and renewable energy consumption on the environmental quality of BRICS countries: A new insight from different quantile regression approaches. *Renewable Energy Focus*, *46*, 222–235. https://doi.org/10.1016/j.ref.2023.06.004

Gokmenoglu, K.K., & Eren, B.M. (2020). The role of international tourism on energy consumption: empirical evidence from Turkey. *Current Issues in Tourism*, 23(9), 1059-1065. https://doi.org/10.1080/13683500.2019.1574723

Guo, Y., Zhao, L., & Zhang, C. (2023). Energy resources, tourism development and growth-emission nexus in developing countries. *Resources Policy*, *81*(February). https://doi.org/10.1016/j.resourpol.2023.103407

Habiba, U., Xinbang, C., & Ali, S. (2023). Investigating the impact of financial development on carbon emissions: Does the use of renewable energy and green technology really contribute to achieving low-carbon economies? *Gondwana Research*, *121*, 472–485. https://doi.org/10.1016/j.gr.2023.05.013

Huang, J., & Guo, L. (2023). Research on the impact of financial development in different regions on the decoupling of carbon emissions from economic growth. *Energy & Environment*, *34*(6), 2007–2030. https://doi.org/https://doi.org/10.1177/0958305X22110734

Irfan, M., Ullah, S., Razzaq, A., Cai, J., & Adebayo, T.S. (2023). Unleashing the dynamic impact of tourism industry on energy consumption, economic output, and environmental quality in China: A way forward towards environmental sustainability. *Journal of Cleaner Production*, *387*(December 2022). https://doi.org/10.1016/j.jclepro.2022.135778

Işik, C., Sirakaya-Turk, E., & Ongan, S. (2020b). Testing the efficacy of the economic policy uncertainty index on tourism demand in USMCA: Theory and evidence. *Tourism Economics*, 26(8), 1344-1357. https://doi.org/10.1177/1354816619888346

Isik, C., Dogru, T., & Turk, E.S. (2018). A nexus of linear and non-linear relationships between tourism demand, renewable energy consumption, and economic growth: Theory and evidence. *International Journal of Tourism Research*, 20(1), 38-49. https://doi.org/10.1002/jtr.2151

Dogru, T., Isik, C., & Sirakaya-Turk, E. (2019b). The balance of trade and exchange rates: Theory and contemporary evidence from tourism. *Tourism Management*, 74, 12-23. https://doi.org/10.1016/j.tourman.2019.01.014

Işik, C., Ahmad, M., Pata, U.K., Ongan, S., Radulescu, M., Adedoyin, F.F., Bayraktaroğlu, E., Aydın, S., & Ongan, A. (2020a). An evaluation of the tourism-induced environmental Kuznets curve (T-EKC) hypothesis: evidence from G7 Countries. *Sustainability*, 12(21), 9150. https://doi.org/10.3390/su12219150

Işik, C., Doğan, E., & Ongan, S. (2017a). Analyzing the tourism–energy–growth nexus for the top 10 most-visited countries. *Economies*, 5(4), 40. https://doi.org/10.3390/economies5040040

Işik, C., Kasımatı, E., & Ongan, S. (2017b). Analyzing the causalities between economic growth, financial development, international trade, tourism expenditure and/on the CO_2 emissions in Greece. *Energy Sources, Part B: Economics, Planning, and Policy*, 12(7), 665-673. https://doi.org/10.1080/15567249.2016.1263251

Ongan, S., Işik, C., & Özdemir, D. (2017). The effects of real exchange rates and income on international tourism demand for the USA from some European Union countries. *Economies*, 5(4), 51. https://doi.org/10.3390/economies5040051

Işık, C., Ahmad, M., Ongan, S., Ozdemir, D., Irfan, M., & Alvarado, R. (2021). Convergence analysis of the ecological footprint: theory and empirical evidence from the USMCA countries. *Environmental Science and Pollution Research*, 28, 32648-32659. https://doi.org/10.1007/s11356-021-12993-9

Isik, C., Ongan, S., & Özdemir, D. (2019). The economic growth/development and environmental degradation: evidence from the US state-level EKC hypothesis. *Environmental Science and Pollution Research*, 26, 30772-30781. https://doi.org/10.1007/s11356-019-06276-7

Jahanger, A., Hossain, M.R., Awan, A., Adebayo, T.S., & Chishti, M.Z. (2023). Linking tourist's footprint and environmental tragedy through transportation, globalization and energy choice in BIMSTEC region: Directions for a sustainable solution using novel GMM-PVAR approach. *Journal of Environmental Management*, *345*, 118551. https://doi.org/10.1016/j.jenvman.2023.118551

Jebli, M.B., & Hadhri, W. (2018). The dynamic causal links between CO_2 emissions from transport, real GDP, energy use and international tourism. *International Journal of Sustainable Development & World Ecology*, 25(6), 568-577. https://doi.org/10.1080/13504509.2018.1434572

Jiang, W., & Yu, Q. (2023). Carbon emissions and economic growth in China: Based on mixed frequency VAR analysis. *Renewable and Sustainable Energy Reviews*, *183*(July), 113500. https://doi.org/10.1016/j.rser.2023.113500

Katircioglu, S.T. (2014). International tourism, energy consumption, and environmental pollution: The case of Turkey. *Renewable and Sustainable Energy Reviews*, 36, 180-187. https://doi.org/10.1016/j.rser.2014.04.058

Katircioglu, S.T., Feridun, M., & Kilinc, C. (2014). Estimating tourism-induced energy consumption and CO_2 emissions: The case of Cyprus. *Renewable and Sustainable Energy Reviews*, 29, 634-640. https://doi.org/10.1016/j.rser.2013.09.004

Kumail, T., Sadiq, M., Ali, W., & Sadiq, F. (2023). The impacts of tourism development on income inequality: how does tourism capital investment contribute to income distribution? Tourism Agenda 2030. *Tourism Review*. https://doi.org/10.1108/TR-08-2022-0378

Liu, X., Xiao, J., & Ullah, S. (2023). Examining the role of tourism industry in green economic and environmental performance: does structural change matter in Asia?. *Environmental Science and Pollution Research*, 1-11. https://doi.org/10.1007/s11356-023-27345-y

Luo, J.M., Fan, Y., & Shang, Z. (2021). Analysis of critical success factors for entertainment tourism destinations: The supply perspective. *Journal of Quality Assurance in Hospitality & Tourism*, 23(5), 1159-1182. https://doi.org/10.1080/1528008X.2021.1958126

Majumder, S.C., Voumik, L.C., Rahman, M.H., Rahman, M.M., & Hossain, M.N. (2023). A quantile regression analysis of the impact of electricity production sources on co_2 emission in South Asian countries. *Strategic Planning for Energy and the Environment*, 42:307-30. https://doi.org/10.13052/spee1048-5236.4223

Musa, F., & Nadarajah, R. (2023). Valuing visitor's willingness to pay for green tourism conservation: A case study of Bukit Larut forest recreation area, Perak, Malaysia. *Sustainable Environment*, 9(1), 2188767. https://doi.org/10.1080/27658511.2023.2188767

Nathaniel, S.P., Solomon, C.J., Ajide, K.B., Ahmed, Z., & Fakher, H.A. (2023). Striving towards carbon neutrality in emerging markets: the combined influence of international tourism and eco-friendly technology. *International Journal of Sustainable Development & World Ecology*, 1-16. https://doi.org/10.1080/13504509.2023.2195831

Nepal, R., Al Irsyad, M.I., & Nepal, S.K. (2019). Tourist arrivals, energy consumption and pollutant emissions in a developing economy–implications for sustainable tourism. *Tourism Management*, 72, 145-154. https://doi.org/10.1016/j.tourman.2018.08.025

Nocca, F., Bosone, M., De Toro, P., & Fusco Girard, L. (2023). Towards the human circular tourism: recommendations, actions, and multidimensional indicators for the tourist category. *Sustainability*, 15(3), 1845. https://doi.org/10.3390/su15031845

Onifade, S.T., & Haouas, I. (2023). Assessing environmental sustainability in top Middle East travel destinations: insights on the multifaceted roles of air transport amidst other energy indicators. *Environmental Science and Pollution Research*, 1-16. https://doi.org/10.1007/s11356-023-29183-4

Pan, Y., Weng, G., Li, C., & Li, J. (2021). Coupling coordination and influencing factors among tourism carbon emission, tourism economic and tourism innovation. *International Journal of Environmental Research and Public Health*, 18(4), 1601. https://doi.org/10.3390/ijerph18041601

Pesaran, M.H., Shin, Y., & Smith, R.J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326. https://doi.org/10.1002/jae.616

Rahman, A.R.A., Shaari, M.S., Masnan, F., & Esquivias, M.A. (2022). The impacts of energy use, tourism and foreign workers on CO_2 emissions in Malaysia. *Sustainability*, *14*(4), 2461. https://doi.org/10.3390/su14042461

Raihan, A. (2023). The dynamic nexus between economic growth, renewable energy use, urbanization, industrialization, tourism, agricultural productivity, forest area, and carbon dioxide emissions in the Philippines. *Energy Nexus*, 9, 100180. https://doi.org/10.1016/j.nexus.2023.100180

Raihan, A., Muhtasim, D.A., Pavel, M.I., Faruk, O., & Rahman, M. (2022c). Dynamic impacts of economic growth, renewable energy use, urbanization, and tourism on carbon dioxide emissions in Argentina. *Environmental Processes*, 9, 38. https://doi.org/10.1007/s40710-022-00590-y

Raihan, A., & Tuspekova, A. (2022a). Dynamic impacts of economic growth, energy use, urbanization, tourism, agricultural value-added, and forested area on carbon dioxide emissions in Brazil. *Journal of Environmental Studies and Sciences*, 12, 794-814. https://doi.org/10.1007/s13412-022-00782-w

Ren, X., Zhao, M., Yuan, R., & Li, N. (2023). Influence mechanism of financial development on carbon emissions from multiple perspectives. *Sustainable Production and Consumption*, *39*, 357–372. https://doi.org/10.1016/J.SPC.2023.05.009

Ridzuan, A.R., Kumaran, V.V., Fianto, B.A., Shaari, M.S., Padilla, M.A.E., & Albani, A. (2022). Reinvestigating the presence of environmental kuznets curve in Malaysia: The role of foreign direct investment. *International Journal of Energy Economics and Policy*, 12(5), 217-225. https://doi.org/10.32479/ijeep.13461

Saud, S., Chen, S., Haseeb, A., Khan, K., & Imran, M. (2019). The nexus between financial development, income level, and environment in Central and Eastern European Countries: a perspective on Belt and Road Initiative. *Environmental Science and Pollution Research*, 26(16), 16053-16075. https://doi.org/10.1007/s11356-019-05004-5

Shaari, M.S., Esquivias, M.A., Ridzuan, A.R., Zainal, N.F., & Sugiharti, L. (2022a). The impact of corruption and environmental degradation on foreign direct investment: New evidence from the ASEAN+3 countries. *Cogent Economics & Finance*, 10(1), 2124734. http://dx.doi.org/10.1080/23322039.2022.2124734

Shaari, M.S., Mahyudin Rafei, A.A., Nangle, B.M., Esquivias, M.A., & Hussain, N.E. (2022b). The impact on violent crime on tourist arrivals in Malaysia. *GeoJournal of Tourism and Geosites. 43,(3), 1148-1154 https://doi.org/10.30892/gtg.43336-930.*

Selvanathan, E.A., Jayasinghe, M., & Selvanathan, S. (2021). Dynamic modelling of inter-relationship between tourism, energy consumption, CO_2 emissions and economic growth in South Asia. *International Journal of Tourism Research*, 23(4), 597-610. https://doi.org/10.1002/jtr.2429

Shi, H., Li, X., Zhang, H., Liu, X., Li, T., & Zhong, Z. (2020). Global difference in the relationships between tourism, economic growth, CO_2 emissions, and primary energy consumption. *Current Issues in Tourism*, 23(9), 1122-1137. https://doi.org/10.1080/13683500.2019.1588864

Solarin, S.A. (2014). Tourist arrivals and macroeconomic determinants of CO_2 emissions in Malaysia. *Anatolia*, 25(2), 228-241. https://doi.org/10.1080/13032917.2013.868364

Tang, C.F., Tiwari, A.K., & Shahbaz, M. (2016). Dynamic inter-relationships among tourism, economic growth and energy consumption in India. *Geosystem engineering*, 19(4), 158-169. https://doi.org/10.1080/12269328.2016.1162113

Thang, P.N. (2022). Impact of exchange rate on foreign tourist demand: Evidence from developing countries. *GeoJournal of Tourism and Geosites*, *45*, 1579-1585. https://doi.org/10.30892/gtg.454spl06-977

Tourism Malaysia. (2020). *Malaysia Tourism Performance Indicators, Ministry of Tourism, Arts and Culture Malaysia*. Retrieved from https://www.tourism.gov.my/files/uploads/Key_Performance_Indicators_2020.pdf

Umurzakov, U., Tosheva, S., & Salahodjaev, R. (2023). Tourism and sustainable economic development: Evidence from Belt and Road countries. *Journal of the Knowledge Economy*, 14(1), 503-516. https://doi.org/10.1007/s13132-021-00872-0

Usman, M., Kousar, R., Makhdum, M.S.A., Yaseen, M.R., & Nadeem, A.M. (2023). Do financial development, economic growth, energy consumption, and trade openness contribute to increase carbon emission in Pakistan? An insight based on ARDL bound testing approach. *Environment, Development and Sustainability*, *25*(1), 444–473. https://doi.org/10.1007/s10668-021-02062-z

Ventura, R.V., Fernandes, E., Tshikovhi, N., & Sucheran, R. (2023). BRICS inbound and outbound tourism versus socio-economic indicators. *GeoJournal of Tourism and Geosites*, 48(2spl), 733–740. https://doi.org/10.30892/gtg.482spl07-1073

Voumik, L.C., Rahman, M.H., & Hossain, M.S. (2022a). Investigating the subsistence of Environmental Kuznets Curve in the midst of economic development, population, and energy consumption in Bangladesh: imminent of ARDL model. *Heliyon*, 8(8), e10357. https://doi.org/10.1016/j.heliyon.2022.e10357

Voumik, L.C., Rahman, M., & Akter, S. (2022b). Investigating the EKC hypothesis with renewable energy, nuclear energy, and R&D for EU: Fresh panel evidence. *Heliyon*, e12447. https://doi.org/10.1016/j.heliyon.2022.e12447

Voumik, L.C., Rahman, M.H., Nafi, S.M., Hossain, M.A., Ridzuan, A.R., & Mohamed Yusoff, N.Y. (2023b). Modelling a sustainable, non-renewable, and renewable energy based on the EKC hypothesis for Africa's most popular tourist destination. Sustainability, 15,4029. http://dx.doi.org/10.3390/su15054029

Voumik, L.C., Nafi, S.M., Bekun, F.V., & Haseki, M.I. (2023a). Modeling energy, education, trade, and tourism-induced environmental Kuznets curve (EKC) hypothesis: Evidence from the Middle East. *Sustainability*, 15, 4919. https://doi.org/10.3390/su15064919.

World Bank. (2022). World Development Indicators (WDI); Data series by The World Bank Group; The World Bank:

Washington, DC, USA. Retrieved from https://databank.worldbank.org/source/world-development-indicators

WTTC. (2022). *Economic Impact Reports*. World Travel & Tourism Council (WTTC). (accessed on 23 December 2022). https://wttc.org/Research/Economic-Impact

Xiong, C., Khan, A., Bibi, S., Hayat, H., & Jiang, S. (2022). Tourism subindustry level environmental impacts in the US. *Current Issues in Tourism*, *26*, 1–19. https://doi.org/10.1080/13683500.2022.2043835

Yıldırım, D.Ç., Ektiren, B., & Erdoğan, F. (2023). The threshold effect of tourism, growth, and population interactions on environmental pollution in Mediterranean countries. *Tourism Management Perspectives*, *47*(February). https://doi.org/10.1016/j.tmp.2023.101118

Zhang, L., & Gao, J. (2016). Exploring the effects of international tourism on China's economic growth, energy consumption and environmental pollution: Evidence from a regional panel analysis. *Renewable and Sustainable Energy Reviews*, 53, 225-234. https://doi.org/10.1016/j.rser.2015.08.040

Article history: Received: 27.09.2023 Revised: 21.11.2023 Accepted: 18.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1796-1802
DOI 10.30892/gtg.514 spl20-1175

EXPLORING THE PORTUGUESE TOURIST PROFILE DURING WAR

Maria CUNHA*
ISEC Lisbon – Higher Institute of Education and Sciences of Lisbon, Portugal;
CIAC – Arts and Communication Research Center, Lisbon, Portugal, e-mail: maria.cunha@iseclisboa.pt

Jorge FIGUEIREDO
Lusiada University, Economics and Business Sciences, Vila Nova de Famalicão, Portugal, e-mail: jorgefig85@gmail.com

Isabel OLIVEIRA
Lusiada University, Economics and Business Sciences, Vila Nova de Famalicão, Portugal, e-mail: isabel.m.m.oliveira@gmail.com

António CARDOSO
University Fernando Pessoa, Business Sciences, Porto, Portugal, e-mail: ajcaro@ufp.edu.pt

Manuel PEREIRA
Polytechnic Institute of Viana do Castelo, Viana do Castelo, Portugal, e-mail: msousa.manuel@gmail.com

Citation: Cunha, M., Figueiredo, J., Oliveira, I., Cardoso, A., & Pereira, M. (2023). EXPLORING THE PORTUGUESE TOURIST PROFILE DURING WAR. *GeoJournal of Tourism and Geosites*, 51(4spl), 1796–1802 https://doi.org/10.30892/gtg.514spl20-1175

Abstract: In this research, we intend to study the profile of the consumer in the face of the reality we live in: the War in Ukraine. The goal is to understand how individuals, as individual tourists, in groups or with family, consider that tourism is or will undergo changes, in terms of conditions of choice, opinions, categorization, and societal involvement. The Investigation was quantitative and adopted the survey method. Data was collected at Continental Portugal and Islands, where 1200 responses were obtained for analysis. Key findings revealed that people like to travel the world. People travel more for holiday reasons than for work. It is also concluded that people travel at least once a year on vacation. Due to the last event and according to the sample answers the will to travel has changed. Through the study, we could easily see that the impact of recent events interfered with the lives of tourists significantly changing intentions and habits and countries near the war are not a choice.

Key words: Consumer Profile, Tourist, Post-Pandemic, War, Ukraine

* * * * * *

INTRODUCTION

This research aims to understand the problem of the War in Ukraine, the changes in the profile of the tourists, and their behavior in current times of uncertainty. The problem of research has become central at the moment. Thus, it is worth mentioning that the general objective was to determine and analyze the profile of the consumer/ tourist in times of war.

In the tourist landscape, many concepts must be taken into account, but the most important is undoubtedly the definition of tourist. In this sense, it can be said that a tourist is a person who moves to other regions or countries to spend moments of leisure, know other cultures, and visit specific places that are absent in the region of the usual residence. From this perspective, it is understood that the role of the tourist is the consumer of services related to transportation and staying in other regions (Mielniczuk, 2016; Cunha, 2019; Hasan et al., 2020, Dharen and Rahul, 2023. In the past, participation in tourism was restricted to the elite who had the time and money to travel. The tourist routes started through the Grand Tour, and a long trip could last 3 or 4 years. As time went by, lives transformed and the world transformed lives and began to travel globally. Currently, due to the events that have been lived, human beings are forced to respect social distancing, reanalyze their travels, and take new measures of coexistence. This new world order leads humans to rethink tourism to empower the economy. This is precisely why the motivations that lead human beings to travel are a critical point when deciding the type of tourism to be presented by destinations and enjoyed by tourists, almost always in a leisure format (Cunha, 2019; Phuthong et al., 2023).

The truth is that it is unknown what the profile of tourists will be in the post-pandemic and during the war in Ukraine (Hudoshnyk and Krupskyi (2023). In this sense, the researchers decided to look for answers. The final aim is to understand what changes in tourist behavior caused by the last great moments lived globally.

The general objective was to determine and analyze the profile of the consumer/ tourist in times of war.

Investigation question nr. º 1 - What factors contributed to individuals' inclination and motivation to explore the world during the Ukrainian War?

Investigation question nr. º 2 – Where do tourists like to travel and where during This War?

Investigation question nr. º 3 – When and Where do the tourists wish to go?

Investigation question nr. º 4 – Where do they get information about possible Destiny?

* Corresponding author

LITERATURE REVIEW

Portugal as a tourist spot

The Portuguese tourism industry has been a vital component of the country's economy. Portugal is known for its rich history, stunning landscapes, and vibrant culture, making it a popular destination for both leisure and business travelers (Cunha, 2019; Cunha et al., 2021). The tourism industry holds significant importance in both local economies and the global tourism sector (Watjatrakul, 2018). In Portugal, tourism is a key economic activity for the generation of wealth and employment, and the tourism data for 2022 are encouraging.

In 2022, the tourism sector approached the record values of 2019 in the main indicators of overnight stays (-0.9%) and guests (-2.3%), having surpassed the values in tourism revenues (+15.4%) (Barry et al., 2022; Brito and Zarrilli, 2023). In Table 1 it is possible to see some key reasons why this industry is considered important. Overall, the Tourism industry plays a multifaceted role in supporting economic growth, fostering cultural exchange, and providing essential services for travelers. It has a significant impact on local economies, job creation, and the broader tourism sector, making it a vital component of many regions' development strategies (Watjatrakul, 2018; Barry et al., 2022; Brito and Zarrilli, 2023).

Table 1. Why is tourism so important? (Source: Watjatrakul, 2018; Barry et al., 2022; Brito and Zarrilli, 2023)

Economic Impact **Job Creation:** Tourism generates employment opportunities, both directly (in hotels, restaurants, transportation, etc.) and indirectly (in related industries such as agriculture and manufacturing). **Revenue Generation:** Tourism brings in foreign exchange through expenditures on accommodation, food, transportation, and other services, contributing to the economic growth of a region or country.
Cultural Exchange **Cultural Understanding:** Tourism promotes cross-cultural understanding as visitors engage with local traditions, customs, and ways of life, fostering mutual respect and appreciation for diversity. **Preservation of Culture:** Tourism can contribute to the preservation of cultural heritage by creating economic incentives for communities to maintain and showcase their unique traditions.
Infrastructure Development Investment: The need to accommodate tourists often leads to infrastructure development, including the construction of hotels, transportation facilities, and recreational areas, benefiting both residents and visitors.
Environmental Conservation **Conservation Funding:** Revenue generated from tourism can be used for environmental conservation efforts, including the protection of natural habitats and wildlife. **Awareness:** Tourism can raise awareness about the importance of preserving natural resources, fostering a sense of responsibility among visitors and local communities.
Global Peace and Understanding **Diplomacy:** Tourism can act as a form of soft diplomacy, promoting understanding and positive relations between different countries and cultures. **People-to-People Connections:** Interactions between tourists and locals can lead to the exchange of ideas and perspectives, contributing to global peace and harmony.
Quality of Life Improvement **Infrastructure and Services:** Improved infrastructure and services designed to cater to tourists can also enhance the quality of life for local residents. **Cultural and Recreational Opportunities:** Residents may benefit from increased cultural and recreational opportunities that arise due to tourism development.
Diversification of Economy Reducing Dependency: Tourism can help diversify the economy of a region or country, reducing dependence on a single industry and providing a buffer against economic downturns in other sectors.
Education and Learning Educational Opportunities: Tourism can provide educational opportunities for both tourists and locals, fostering a greater understanding of history, geography, and cultural diversity.

The tourist behavior

Talking about tourism until a few years ago was talking about concepts such as over tourism, creative and sustainable tourism, with concerns for nature and the environment, in the face of climate change. Today, after the pandemic and the entry of Ukraine into War, destinations have become risky, traveling is a risk and the tourist has become even more aware of the surrounding reality (Hudoshnyk and Krupskyi, 2023). Several factors contribute to the understanding of consumer behavior, such as the sources of information used, the influences on the destination and travel decision, and currently, the consequences and implications that the Post Covid-19 Pandemic and War entail (Bama and Abrahams, 2020; Hashemi et. al., 2023).

The choice of a destination to travel can be conditioned by several factors. There is talk, for example, of socio-economic, political, legal, cultural, or even personal factors in the sense that a third-age consumer does not seek the same as a young consumer 30. Psychological factors are extremely important and embrace concepts such as motivation, perception, attitude, and experience (Govender et al., 2020; Purwoko et al., 2023). In the light of these ideas, it is possible to verify that marketing plays a key role here. After all, marketing often presents the ability to change and influence consumer choices. And consumer behavior becomes central to a good understanding of the market. Thus, with the correct application of traditional and digital marketing under platforms offering tourist activities, it is possible to reorganize the product and or services and better meet the expectations and requirements of the tourist/ consumer (Rahim et al., 2022; Brito and Zarrilli, 2023).

The technological advances implemented and developed in recent times have, in a way, filled some tourist implications that the Pandemic and the War launched on Tourism, in the sense that they exert great influence on travel. There is talk not

only of common use but also of allowing tourist companies to develop new relationships with customers, to provide new experiences, and to organize products that offer otherwise and with added value. The availability of smart devices such as smartphones, their capabilities and functions, and the number of people they have access to grows rapidly worldwide (Lingadkar and Sankaranarayanan, 2020; Hossain et al., 2021). Digital has made the world more accessible by keeping information in the palm of the hands of ordinary mortals. The Pandemic has transformed digital platforms in general and the tourism market has not been left aside. Travel agencies began to be deprecated at the expense of the Internet and the consumer began to buy their trips (Barry et al., 2022; Hashemi et al., 2023).

The still latent risk of the Pandemic, the many mutations of the virus, and the War have become extremely important themes. According to Cunha (2019) by car, motorcycle, motorhome, or other means, the propensity to start discovering a new country with maximum autonomy and flexibility will tend to increase in the post-pandemic period. The trend is to travel at local, inter-municipal, and regional levels since international travel and the feeling of potential insecurity associated with flights and airports continue to generate a redirection to domestic tourism. Nature Tourism gains competitiveness among others (Brusadin, 2015; Govender et al., 2020; Ferraro, 2022; Daren and Rahul, 2023).

In recent news, there is also the implementation of Iberian partnerships and spiritual routes aimed at the recovery and restructuring of the territory, as an independent spatial factor and border areas, of greater value for the different tourist activities that may be experienced and enjoyed (Watjatrakul, 2018; Barry et al., 2022; Brito and Zarrilli, 2023).

MATERIALS AND METHODS

In this investigation, defining the research question and reviewing existing literature was considered a generic process that involves data analysis as it´s possible to see on the flowchart below Figure 1.

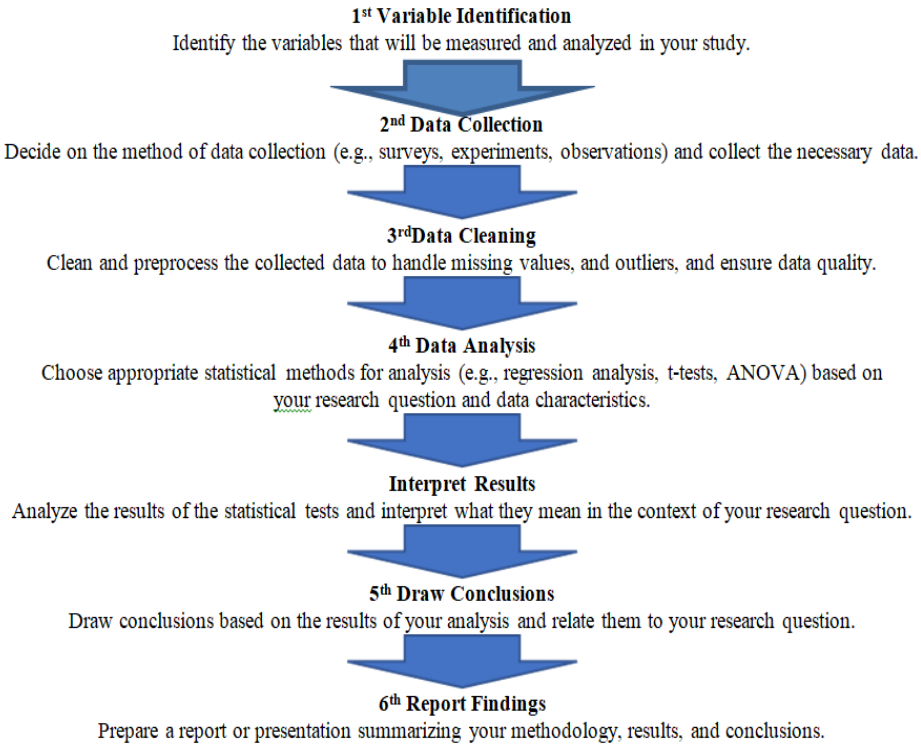


Figure 1. Investigation Process (Source: Own author)

This investigation submits to the positivist paradigm since it intends to test several a priori hypotheses to determine relationships between the independent and dependent variables. The researchers selected a quantitative research approach since it increases accuracy through statistical analysis. The investigation was conducted in Portugal. Questionnaires were collected by email in all the countries and Islands. The researchers were able to collect 1431 questionnaires but only 1200 were complete. The investigation took a quantitative research approach that made use of the survey method. The sampling technique used was the convenience sampling approach due to the lack of a sampling frame. The gathered data were recorded on a Microsoft Excel spreadsheet after screening returned questionnaires. The data were analyzed using descriptive statistics, Cronbach's alpha values and correlations, and the Statistical Package for Social Sciences (SPSS version 27.0). The Analysis of Moment Structures (AMOS version 27.0) statistical software was utilized to test the psychometric properties of the measurement scales and hypotheses.

This research investigation acted following the ethical standards of academic research, for instance, all participation was voluntary and it was conducted anonymously. No personally identifying data was not collected. Participants were briefed on the research and provided consent before completion of the questionnaire. No incentives were provided to participants and they we allowed to withdraw from the investigation at any point. This research aims to understand the problem of the War in Ukraine, the changes in the profile of the tourists, and their behavior in current times of

uncertainty. The problem of research has become central at the moment. Thus, it is worth mentioning that the general objective was to determine and analyze the profile of the consumer/ tourist in times of war.

Investigation question nr. º 1 - What factors contributed to individuals' inclination and motivation to explore the world during the Ukrainian War?

Investigation question nr. º 2 – Where do tourists like to travel and where during This War?

Investigation question nr. º 3 – When and Where do the tourists wish to go?

Investigation question nr. º 4 – Where do they get information about possible Destiny?

Data analysis

After examining the returned questionnaires, the collected data was recorded in a Microsoft Excel spreadsheet. The data were analyzed using descriptive statistics, alpha values, and correlations of Cronbach and the Statistical Package for Social Sciences (SPSS version 27.0). To test the psychometric properties of measurement scales and hypotheses, the statistical software Analysis of Moment Structures (AMOS version 27.0) was used.

Ethical contemplations

This research study acted by the ethical standards of academic research, for example, all participation was voluntary and conducted anonymously. No personal identification data were collected. Participants were informed about the research and gave their consent before completing the questionnaire. No incentives were provided to participants and they were allowed to withdraw from the study at any time.

RESULTS AND DISCUSSION

The Investigation was quantitative and adopted the survey method. Data was collected at Continental Portugal and Islands, where 1200 responses were obtained for analysis. The sample is Portugal representative. The demography of the sample has been analyzed concerning its different characteristics. Their findings showed that 56% (678) were male participants and 44% (522) were female participants as we can see in Figure 1. These results are in accordance with the INE (2023). As for age, the sample has 6 age groups: up to 19 years with 11% of the sample, from 20 to 29 years with 14%, from 30 to 39 years with 26% of the sample, from 40 to 49 years with 50 to 59 with 21%, from 60 years with 28% of the sample (Figure 2). According to Figure 3, the monthly income of participants, participants who receive between 500-1500 euros are 34.0%, while 52.0% and 14.0% earn between 1501-4000 euros and 4001 euros and more, respectively. Figure 4, presents the distribution of workers, 53.50% are part-time workers and 47.0% are full-time employees.

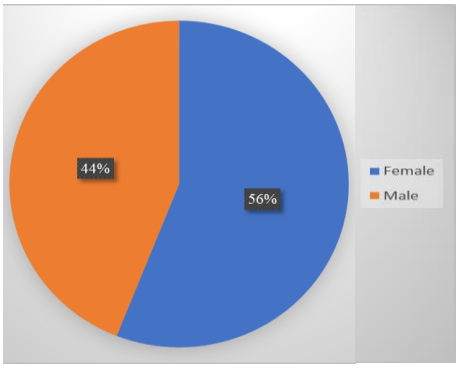


Figure 1. Gender (Source: Own author)

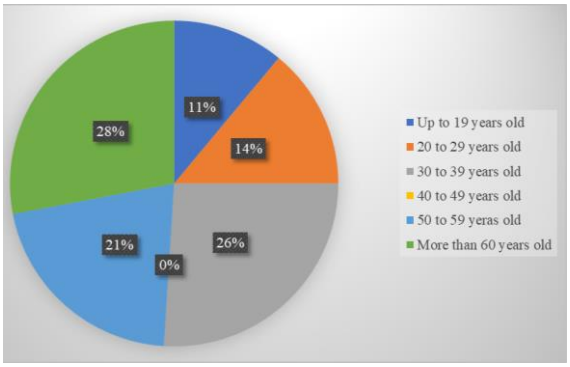


Figure 2. Age Groups (Source: Own author)

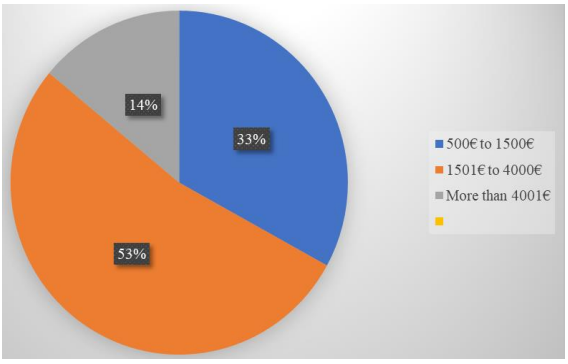


Figure 3. Monthly Income (Source: Own author)

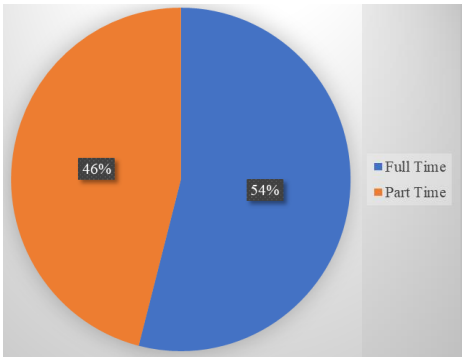


Figure 4. Part-Time vs full-time Time

In the context of schooling, it is possible to notice that 77%, are graduates, masters or doctorates, with secondary education the sample has 22%, and high school or basic education only 1%.

Regarding professional life, 81% of the sample is active, and only 19% is a student, unemployed, or retired. Regarding the region of residence, the North leads with 76%, followed by the Center with 11%, then the Metropolitan Area of Lisbon with 11%, the Autonomous Region of Madeira and Alentejo with 2%, and finally the Algarve with only one.

Trying to figure out if the sample likes to travel and where to

According to the answers obtained, it can be concluded that 93% of the sample are individuals who like to travel the world. However, they do so more often for holiday reasons than for work. It is also concluded that 69% of respondents travel at least once a year on vacation 13% traveled between 3 to 5 times a year, also on vacation, and 18% say they still travel also for work. This situation is in line with studies carried out by Cunha (2019). It's very important that the individual leaves the usual place to replenish their energy. It was also possible to conclude that around 6% of the sample admits to being afraid to travel outside Portugal since the Pandemic. And this is the turning point. It's important to mention that with the pandemic came a time of not traveling, travel with restrictions, and then the Ukraine War (Cunha, 2023). Due to the last event and according to the sample's answer the will to travel has changed.

Also, according to the answers given by the sample in question, it is possible to verify that the impact of recent events interfered with the lives of tourists significantly changing intentions and habits (74%).

As far as destination is concerned, 65% of respondents assumed that they would travel in the future. When detailing these trips 25% of individuals prefer the comfort of traveling within Portugal, and 30% mention that Europe would be a great option, but would avoid countries bordering Ukraine or Russia. Other travelers would opt for countries outside Europe. About specific destinations, most countries such as Spain, France, England, Dubai, or Morocco are mentioned. Maybe in time, things change again but we're really living in difficult times at the moment.

Where do they get information about possible Destiny As for the use of information sources, 79% of respondents assume that Digital Platforms are the most important source, and 21% say that their trips are based on the Opinions of Family and Friends. Only The Newspapers/Magazines play an irrelevant role in the choice of 1200 respondents. Fact that is in line with the investigation conclusion of Magano and Cunha (2020).

And how do they think to travel...

Respondents mentioned that they intend to enjoy trips in the form of visits to family/friends (76%), cultural visits 24%, weekend getaways (54%), and natural tourism as a holiday option (25%). Rural and cultural tourism were not rejected, but were not the first option of respondents, as happened before the Pandemic. The same does not happen with nautical tourism, spiritual routes, and enogastronomy which are not part of the options of the respondents of this sample.

When?

It was also possible to verify the respondents continue to have a pre-pandemic view. Some respondents even reject the trend towards a new reality in terms of types of tourism. They consider that they still need some time to travel back to Europe or outside of it. To verify that 79% of individuals answered "I do not know if I will travel shortly". Those who show more willingness to travel are young adults between 20 and 29 years old, who choose the option between 6 to 12 months or 12 months from now and mentioned "outside Europe" as a destination. This group assumes that it will travel in the medium-long future while 6% of respondents answered "Do not leave when I will travel".

Therefore, one can present a conclusive analysis that meets the fear of traveling. The reality is that the "unknown" destabilizes the way people invest in travel. Which makes it possible to realize that fear or fear remains a constant.

Scale reliability

Considering the proposed questionnaire, we found that the reliability test (Cronbach's test) showed excellent internal consistency, with $\alpha = 0.911$.

Analysis of differences in means

When assessing the intentions and habits of the tourists under study, the researchers found statistically significant differences. In particular, it seems important to mention the groups with 19 and less years of age and those from 40 years to 49 years, since Significance (Sig.) assumes the value 0.05 in the Bonferroni test after ANOVA.

The Bonferroni test is a statistical test for testing the difference between two population means (only done after an ANOVA test shows not all means are equal). The formula for the Bonferroni (1936) test statistic is:

$$t = \bar{x}i - \bar{x}j \sqrt{(MSW(1\ ni + 1\ nj)}$$

Let's break down the components of the equation:

t: This represents the test statistic, typically used in various statistical tests to assess the difference between groups or conditions.

$\bar{x}i$ and $\bar{x}j$: These are sample means from two different groups or conditions. $\bar{x}i$ represents the mean of the first group, and $\bar{x}j$ represents the mean of the second group.

√(MSW): This part seems to involve the square root of a term denoted as MSW. MSW could stand for "mean square within," and it typically represents the mean of the squared differences within each group or condition in an analysis of variance (ANOVA) context. It's related to the variability within each group.

(1/ni + 1/nj): This part of the equation involves the inverses of the sample sizes (ni and nj) for the two groups or conditions being compared. It's common to have different sample sizes when comparing groups in statistical tests.

In summary, the equation calculates a test statistic t to assess the difference between two sample means, taking into account the within-group variability (MSW) and the sample sizes of the two groups (ni and nj). However, the specific test or analysis this equation is related to would require more context to interpret accurately. It might be part of an ANOVA or a t-test, but further information is needed to determine its exact purpose. Regarding gender and net monthly income, there is no difference of choice, given the impact of the act of traveling. To better understand this sample, it was also realized some other analyses.

Cross-tabulation analysis

A cross-tabulation (or crosstab) report is used to analyze the relationship between two or more variables. The report has the x-axis as one variable (or question) and the y-axis as another variable.

Regarding the relationship between the demographic profile and the essential criteria for travel, the age group from 19 to 29 years has greater statistical relevance, followed by the group from 40 to 49 years who assume that Safety is a very important criterion. Other criteria also considered essential were Access to Health and Hygiene.

Ease of payment or access to online or contactless payment are also considered very important criteria when choosing the destination. As for the sources of information sought before and after travel, the ones that stand out are digital platforms, followed by websites, blogs, and the opinions of family and friends.

Regarding disease control, or increased care for when traveling, the sample was very careful. 90% admitted to seeking information about the place where they want to travel, but also about typical diseases. As for the type of experiences, to have, the age group of 30 to 39 years of age appears to be extremely relevant. For these elements of the sample, Rural Tourism and travel with family and friends within Europe are the most common. About 40% say they want to travel by motorcycle and/ or motorhome. The experiences that meet the trends of the moment, such as Dubai, are the ones that have less projection about this sample. Regarding the type of tourism that tourists see themselves practicing in the coming holidays, Natural Tourism presents a statistical representation of 48% of the respondents. About the Spiritual Routes, almost 63% of respondents assume that it will be little or nothing likely for enjoyment in the next vacation. As for the level of income, those who give the most opinions regarding the destination of the holidays, are the respondents without income, thus assuming that most students assume the destinations of the holidays, whether with family or with friends.

CONCLUSION

The problem of research has become central at the moment. Thus, it is worth reminding that the general objective was to determine and analyze the profile of the consumer/ tourist in times of war in Ukraine.

Outlining a profile of the tourist/consumer in this new world order becomes a delicate and even complicated topic to discern. However, our research had as its object of study the analysis and understanding of how tourists, as consumers of leisure and business, see today the Tourism of today. Through relevant methods, such as access to recent secondary data, and conducting a questionnaire, it was possible to delineate a type profile, however, we gathered the feeling that the trends that are released by the media, the responses we obtained, little or nothing goes together.

As for the conclusions, as mentioned above, it is delicate to develop a theme still under construction, with data as recent as those we have been working on, to understand how the war in Ukraine will change and condition travel, the act of traveling, and the arrival at destinations. However, it seems important to share some conclusions.

According to the answers obtained, it can be in general people like to travel the world. People travel more for holiday reasons than for work. It is also concluded that people travel at least once a year on vacation. It was also possible to conclude that people have admitted to being afraid to travel outside Portugal since the Pandemic. And this is the turning point. It's important to mention that with the pandemic came a time of not traveling, travel with restrictions, and then the Ukraine War (Cunha, 2021). Due to the last event and according to the sample answers the will to travel has changed.

Through the study, we could easily see that the impact of recent events interfered with the lives of tourists significantly changing intentions and habits. The truth is that they still have plans to travel but most of them prefer the comfort of traveling within Portugal, and some mention that Europe would be a great option, but would avoid countries bordering Ukraine or Russia. Other travelers would opt for countries outside Europe. About specific destinations, most countries such as Spain, France, England, Dubai, or Morocco are mentioned. When talking about getting information the most part still go to online platforms to read comments done by the last travelers of the Destiny they want. But most of them would prefer places where they have family or friends, cultural visits, and weekend getaways, mostly in nature.

Rural and cultural tourism were not rejected but were not the first option. The same does not happen with nautical tourism, spiritual routes, and enogastronomy which are not part of the options of the respondents of this sample.

Talking about “when” most of the sample answered within 6 to 12 months or 12 months from now. But we also could see a part of the sample saying they will not travel again showing that the reality is that the "unknown" destabilizes the way people invest in travel. Which makes it possible to realize that fear or fear remains a constant.

When investigating war, there are several limitations that researchers may encounter. It's important to acknowledge these limitations to provide a clear understanding of the scope and applicability of the study. For example, human biases, cognitive limitations, and emotional responses can impact the objectivity of researchers when studying war. Maintaining impartiality and avoiding preconceived notions can be challenging. The ethical challenges of studying war involve issues such as the potential harm to participants, invasion of privacy, and the sensitive nature of the topic. Access to certain information or populations may be restricted due to ethical considerations. But also, War studies often involve subjective elements, including interpretations of events, motivations, and consequences. Different researchers may analyze the same set of data and reach different conclusions based on their perspectives.

Author Contributions: Conceptualization, M.N.C.; J.F. methodology, M.N.C.; I.O. software, M.N.C; A.C. validation, M.N.C; M.P. formal analysis, M.N.C.; M.P. investigation, M.N.C.; J.F. data curation, M.N.C.; I.O. writing - original draft preparation, M.N.C.; A.C. writing - review and editing, M.N.C.; J.F. visualization, M.N.C.; supervision, M.N.C.; project administration, M.N.C. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Bama, H.K.N., & Abrahams, E. (2020). Emerging from the COVID-19 Pandemic: Challenges and Prospects for Edutourism Demand in South Africa. *African Journal of Hospitality, Tourism and Leisure*. ISSN: 2223-814X. https://doi.org/10.46222/ajhtl.19770720.405

Barry, S., Levy, M.D., & Leaning, M.D. (2022). Russia's War in Ukraine — The Devastation of Health and Human Rights. July 14. N *Engl J Med* 2022; 387:102-105. https://doi.org/10.1056/NEJMp2207415

Brito, L.M., &, Zarrilli, L. (2023). The role of tourism in the regeneration of peripheral neighborhoods: a comparison between Alcantara (Lisbon) and Bagnoli (Naples). *GeoJournal of Tourism and Geosites*. Year XVI, 2023 / 3(49). https://doi.org/10.30892/gtg.49328-1112

Brusadin, L.B. (2015). A teoria do turismo e os conceitos fundamentais. Cenário: *Revista Interdisciplinar Em Turismo E Território*, 3(4). https://doi.org/10.26512/revistacenario.v3i4.16536

Cunha, M.N. (2019). Organizational level antecedents of value co-destruction in the hospitality industry: an investigation of the moderating role of employee attribution. *African Journal of Hospitality, Tourism and Leisure*, 8 (4) - (2019) ISSN: 2223-814X https://www.researchgate.net/publication/373435174_Organizational_level_antecedents_of_value_codestruction_in_the_hospitality_industry_an_investigation_of_the_moderating_role_of_employee_attributionvol

Cunha, M.N., & Santos, E. (2019). A Perceção do Consumidor face à Comunicação das Marcasde Moda de Luxo nas Redes Sociais. *International Journal of Marketing, Communication and New Media*, ISSN:2182-9306, 7(12).

Cunha, M.N., Chuchu, T., & Maziriri, E. (2021). An empirical investigation into organizational level antecedents of value co-destruction in Lisbon, Portugal: A hospitality sector case. *Research in Business & Social Science IJRBS* Vol 10 Nº 6 ISSN: 2147-4478 Daren, K.P., & Rahul, K. (2023). Russia-Ukraine War and the global tourism sector: A 13-day tale, Current Issues in Tourism, 26:5, 692-700. https://doi.org/10.1080/13683500.2022.2081789

Ferraro, V. (2022). *The War in Ukraine: An analysis of the conflict and its impacts on Russian and Ukrainian societies*. In SciELO Preprints. https://doi.org/10.1590/SciELOPreprints.4948

Govender, K., Chuchu, T., Maziriri, E.T., & Nascimento Cunha, M. (2020). An Analysis of Local Tourists' Perceptions towards Attraction Sites in Cape Town, South Africa. *e-Review of Tourism Research*, 18(1), 1–21. Available at: https://ertr-ojstamu.tdl.org/ertr/article/view/598

Hasan, A.A., Biswas, C., Roy, M., Akter, S., & Kuri, B.C. (2020). The applicability of the theory of planned behavior to predict domestic tourist behavioral intention: the case of Bangladesh. *GeoJournal of Tourism and Geosites*, 31(3), 1019–1026. https://doi.org/10.30892/gtg.31313-536

Hashemi, S., Singh, K., Singh D., Mughal, M.A., & Kiumarsi, S. (2023). Reimagining Travel Intentions to China in the Post-COVID-19 Era: Exploring the Role of Perceived Safety, Electronic Word of Mouth, and Destination Image. *GeoJournal of Tourism and Geosites*. Year XVI, 2023/3. https://doi.org/10.30892/gtg.49333-1117.

Hossain, M.S., Mostafa, M.G., & Hossain, M.A. (2021). Modeling tourists' satisfaction in the nature-based tourist destination using structural equation modeling technique. *GeoJournal of Tourism and Geosites*, 37(3), 814–822. https://doi.org/10.30892/gtg.37311-71

Hudoshnyk, O., & Krupskyi, O. (2023). Practices of using Rapid Response Collecting by Ukrainian museums in wartime. *Muzeológia a kultúrne dedičstvo.* 11:2:5-16. https://doi.org/10.46284/mkd.2023.11.2.1

INED (2023). Digital Boletim Mensal de Estatística – National Estatistic Institut of Portugal – Outubro. Consulted in https://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE&xlang=pt

Lingadkar, P.R., & Sankaranarayanan, K.G. (2020). Hospitality and Tourism Internship Programme: Expectation Versus Reality. *African Journal of Hospitality, Tourism and Leisure*. https://doi.org/10.46222/ajhtl.19770720.407

Magano, J., & Cunha, M.N. (2020). Digital marketing impact on tourism in Portugal: a quantitative study. *African journal of hospitality, tourism and leisure*, 9(1), 2223-814X (Online). https://doaj.org/article/3f27a4801eed4c29951e24230ca6bd87

Mielniczuk, F. (2016). Identity as a source of conflict: Ukraine and Russia in the post-USSR. Contexto int. 28 (1) Centro Universitario La Salle, Brazil. Jun 2006. https://doi.org/10.1590/S0102-85292006000100004

Phuthong, T., Anuntavoranich, P., Chandrachai, A., & Piromsopa, K. (2023). A framework for assessing wellness tourism destination competitiveness: a perspective from the wellness tourism clusters in Thailand. *GeoJournal of Tourism and Geosites*, 49(3), 973–987. https://doi.org/10.30892/gtg.49313-1097

Purwoko, A., Zaitunah, A., Samsura, D.A.A., Sibarani, R., Muda, I., & Faustina, C. (2023). Assessing the development potential, feasibility, and visitor assessment in the spinster site natural tourism area, Toba Caldera Global Geopark, Indonesia. *GeoJournal of Tourism and Geosites*, 49(3), 1075–1086. https://doi.org/10.30892/gtg.49323-110

Rahim, M.A., Bakar, N.A., Hashim, N.A.A.N., Nawi, N.M.M., & Wee, H. (2022). EMPIRICAL Evidence from the tourism industry on the factors that affect tourist destination satisfaction. *GeoJournal of Tourism and Geosites*, 44(4), 1209–1215. https://doi.org/10.30892/gtg.44404-936

Watjatrakul, B. (2018). Determinants and Effects of Mobile Service Customization: An Empirical Study of A2P SMS Adoption. *International Journal of Information Systems in the Service Sector (JIS)*, 10(4), 73-87.

Article history: Received: 28.09.2023 Revised: 22.11.2023 Accepted: 19.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1803-1811
DOI 10.30892/gtg.514 spl21-1176

ASSESSMENT OF FOREST FIRES FACTORS IN EASTERN KAZAKHSTAN OVER THE LAST 20 YEARS (2003 - 2023) USING GIS TECHNOLOGIES

Nazgul Zh. ZHENSIKBAYEVA*
Sarsen Amanzholov East Kazakhstan State University, Department of Ecology and Geography, Ust-Kamenogorsk, Kazakhstan,
e-mail: naz_zanibek@mal.ru

Nazym K. KABDRAKHMANOVA
Sarsen Amanzholov East Kazakhstan State University, Department of Ecology and Geography, Ust-Kamenogorsk, Kazakhstan,
e-mail: knazym90@mail.ru

Aigul Y. YEGINBAYEVA
L.N. Gumilyev Eurasian National University, Department of Physical and Economical Geography, Nur-Sultan, Kazakhstan,
e-mail: aeginbaeva@mail.ru

Roza S. BEISEMBAYEVA
Sarsen Amanzholov East Kazakhstan State University, Department of Ecology and Geography, Ust-Kamenogorsk, Kazakhstan,
e-mail: knazym90@mail.ru

Nazerke AMANGELDY
Sarsen Amanzholov East Kazakhstan State University, Department of Ecology and Geography, Ust-Kamenogorsk, Kazakhstan,
e-mail: nazerke.amangeldy@inbox.ru

Citation: Zhensikbayeva, N.Z., Kabdrakhmanova, N.K., Yeginbayeva, A.Y., Beisembayeva, R.S., & Amangeldy, N. (2023). ASSESSMENT OF FOREST FIRES FACTORS IN EASTERN KAZAKHSTAN OVER THE LAST 20 YEARS (2003 - 2023) USING GIS TECHNOLOGIES. *GeoJournal of Tourism and Geosites*, 51(4spl), 1803–1811. https://doi.org/10.30892/gtg.514spl21-1176

Abstract: In this article, a study was conducted to analyze the factors leading to the occurrence of one of the natural disasters - fires on the territory of Eastern Kazakhstan. This work examined the consequences of forest fires that occurred before 2022 and analyzed changes in the state of forest cover in recent years using satellite images. The article also describes the methodology and application of geographic information technologies for assessing the potential damage caused by fires based on data from space. This technology provides a quick assessment of possible damage from forest and steppe fires, which can be supplemented with data from the area. Based on space monitoring data, areas affected by fires are identified, and a rapid assessment of such areas is carried out using information from the MODIS system, after which it is recommended to supplement it with more detailed medium-resolution data, such as Landsat images. In addition, the article determined the structure of forest cover, and also identified factors influencing the occurrence of fire conditions in the territory of Eastern Kazakhstan. As a result of the study, a set of proposals was developed to assess the level of damage caused by forest fires and measures to prevent such fires.

Key words: fire, forest fires, natural disasters, imbalance of ecosystems, anthropogenic factors, remote sensing methods, space photography, space monitoring, GIS technologies

* * * * * *

INTRODUCTION

The East Kazakhstan region extends north from 48˚ to 51˚ north latitude and east from 77˚ to 87˚ east longitude, bounded on the west by 76˚ 50" east longitude and on the east by 87˚ 20" east longitude. This area is located southwest of the Altai Mountain range, known as the Kazakh Altai, and is bounded by the Kalba and Sauyr-Tarbagatai ranges, as well as the Zaysan basin (Figure 1). The total area of the region is 97.8 thousand square kilometers (Yegorina, 2000). The territory of Eastern Kazakhstan contains 40% of the total reserves of wood resources of the main tree species, which play an important role in the formation of forest cover in the country. Forest areas in the East Kazakhstan region, in particular in the eastern part of the region, include dark coniferous taiga forests and pine forests of the Kazakh Altai and Saur (Zhensikbayeva, 2018).

Forest fires are accidental fires that occur within forest cover. They cause the destruction of trees and shrubs present in the forest and can lead to a decrease in the protective and other beneficial properties of the forest, destruction of wildlife, as well as infrastructure, and in some cases, populated areas. In addition, forest fires pose a serious threat to the lives of people and farm animals. Classification of fires. Classification of forest fires is based on various characteristics. Depending on the type of fire and the structure of the forest area, forest fires are divided into lower, upper and soil. According to the degree of burning intensity, forest fires are divided into weak, medium and strong. The intensity of combustion depends on the presence of combustible materials, the slope of the terrain, time of day and wind strength (Blinov, 2016).

* Corresponding author

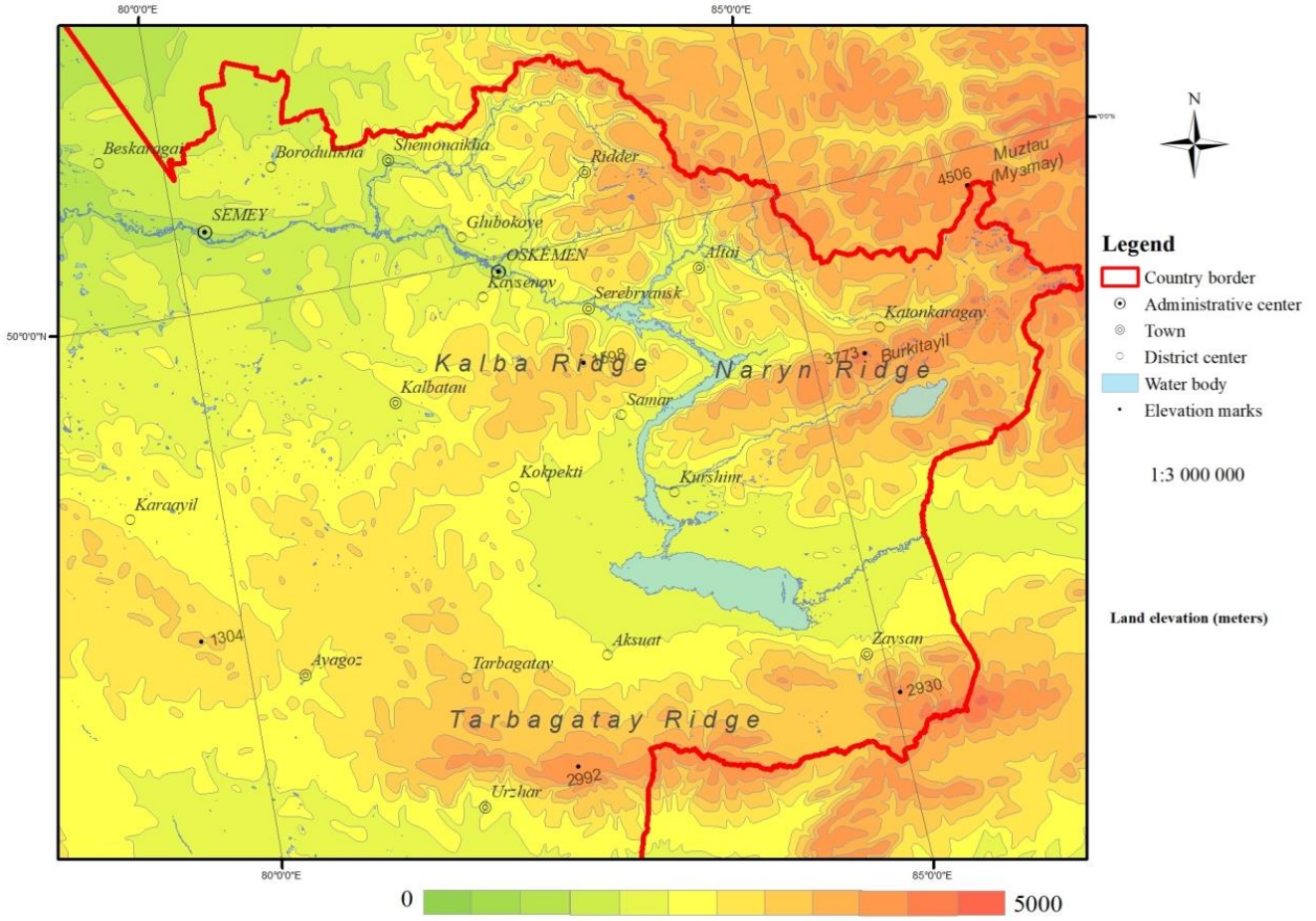


Figure 1. Hypsometric map of East Kazakhstan Region (National Atlas of the Republic of Kazakhstan, 2010)

Taking into account the speed of fire propagation, low and upper fires are divided into permanent and rapidly spreading. The speed of propagation of a weak lower fire does not exceed 1 meter per minute, and a strong one is more than 3 meters per minute. High fires have a spreading rate of up to 3 meters per minute at low intensity, up to 100 meters per minute at medium intensity and above 100 meters per minute at high intensity. The height of the fire also varies: a weak lower fire reaches a height of up to 0.5 meters, an average - 1.5 meters, a strong - more than 1.5 meters (Table 1). Soil (underground) fires are characterized by burning depth, which is no more than 25 cm for weak, 25-50 cm for medium and more than 50 cm for strong (Blinov, 2016). The main factors influencing the occurrence of forest fires. The main factors influencing the occurrence of forest fires include the frequency of rainfall, the amount of precipitation and wind patterns. Fire danger depends on the amount, nature and condition of combustible materials, forest cover and weather conditions such as precipitation and wind. Weather is the most variable factor, and fire danger increases as air temperatures rise and humidity decreases. Temperature and relative humidity vary both within a day and at different times of the year, depending on geographic location and altitude (Krepsha, 2014).

MATERIALS AND RESEARCH METHOD

Table 1. Classification of forest fires according to combustion indicators (Vlasova, 2014)

Indicator of forest burnability (ha)	Fire hazard level
less than 300	I – safety
301 – 1000	II – lower degree of danger
1001 – 4000	III – medium degree of danger
4001 – 100000	IV – high danger
more than 100000	V – very high danger

Forest fires, as one of the natural disasters, often cause imbalance in ecosystems and damage local structures. Recent studies indicate an increase in the number of forest fires around the world due to climate change. At the present stage, the work on the early identification of fire conditions is very relevant. In this field, scientists using the latest technologies are trying to identify various natural disasters, natural conditions of the forest. An example of this is the presentation in the works of E.V. Arkhipov, S.M. Zikriarova, I.A. Snytin, D.M. Syzdykov, P.K. Yants, S.J. Gadal, S.A. Ivanova of geoinformation systems and ways to effectively determine the state of the forest using remote sensing devices. Models for the prevention of emergencies using geoinformation systems have been created by E. Chuvieko and A. Jain. The need to create a geographic information system (GIS) for space-based fire monitoring of forests in the vast territories of our country and the constant lack of funds for the protection of sparsely populated remote forest areas is obvious. The use of space monitoring makes it possible to reduce the cost of detecting forest fires and automate the process of detecting forest fires. The data processing scheme consists of three main stages (Figure 2). At the first stage (input data), the polygon shape file is loaded into the GIS and added to the fire observation shape file. The forest fire observations shape contains all observations of forest fires since

the beginning of the current season and is the basis for constructing a database and analyzing the forest fire situation. The forest fire observation table stores the date and time of forest fire observation, satellite, area, administrative affiliation, the nearest populated area and its coordinates, the distance and azimuth of the direction to it from the geometric center of forest fire observation, the sign of belonging to a forest zone and the contour area (Pavlichenko et al., 2009).

At the second stage, newly discovered fires are analyzed. The main purpose of the analysis is to find fires that have been ongoing since the last observation and index all fires found. Fire indexing consists of spatially combining all observations of one fire as a separate polygon. The spatial combination of all observations of one fire has the meaning of the burning left by the fire, and will be further referred to as the fire trail.

The third stage consists of a number of auxiliary calculations (Pavlichenko et al., 2009):

1. determination of the territorial affiliation of fire traces to regions, subjects, states;
2. search for the nearest populated areas and calculate the distance and azimuth of the direction from the populated area to forest fires;
3. calculation of areas of fire traces in projective units;
4. setting a sign of a forest fire. This geographic information system for forest fire monitoring allows for rapid spatial analysis of forest fires. An increase in cases of forest fires was noticed in Kazakhstan in 2019-2020. This raises the question of how dangerous forest fires are and how they may be related to various climatic, abiotic and anthropogenic factors, as well as the possibility of predicting their occurrence in order to take preventive measures (Bogdanov et al., 2018). To date, as of January 1, 2022, the total area of the state forest fund is 30,552.5 thousand hectares and occupies 11.2% of the territory of the republic (Figure 3). Forests cover 13,635.3 thousand hectares, which is 44.6% of the total area of the forest fund. The area of the private forest fund is 1,017 hectares, and there is no forest cover on this territory. The level of forest cover in the republic is 5.0%. Most of the state forest fund, namely 74.9%, is managed by the government of the regions, and 24.4% is managed by the Committee (Vaganov, 2018). The total area of Republic Kazakhstan forest owners under the jurisdiction of the Committee is 7450.9 thousand hectares, and of this area 7335.9 thousand hectares are specially protected natural areas that have the status of a legal entity (Figure 4). These include 10 state natural reserves, 14 state national natural parks and 7 state natural reserves (Svarichevskaya, 1965). The forest area of the East Kazakhstan region is 3,843 thousand hectares, of which more than 2 million hectares are covered with forest.

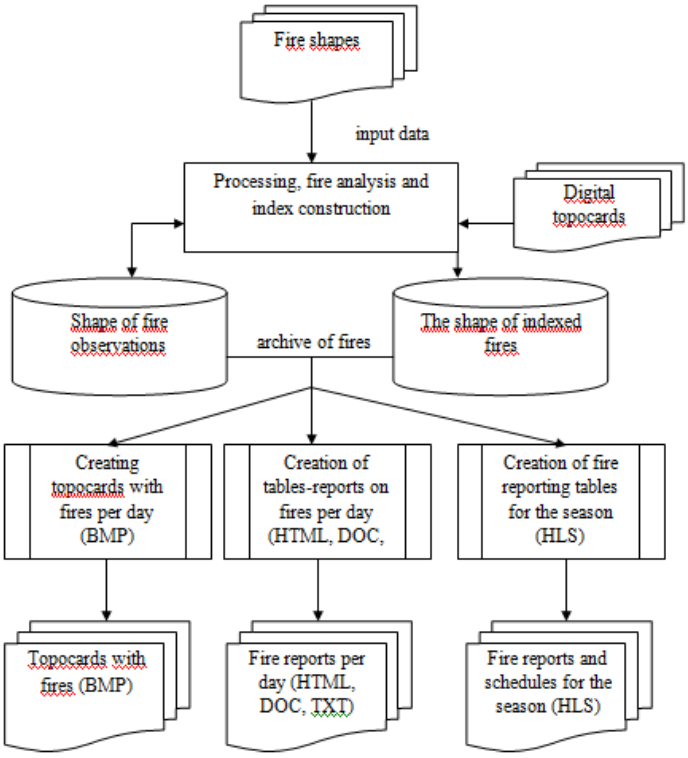
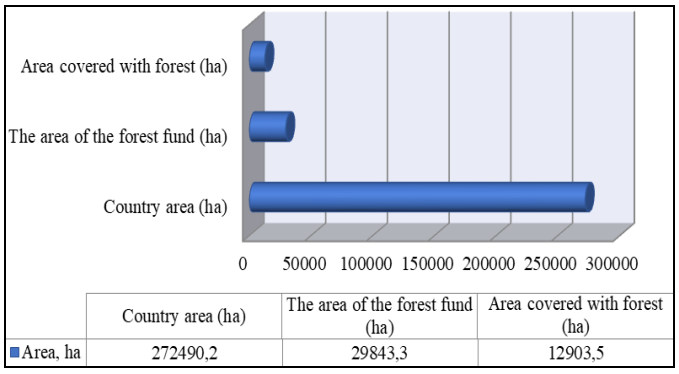


Figure 2. Scheme for processing data on forest fires in the ArcGis (Pavlichenko et al., 2009)



	Country area (ha)	The area of the forest fund (ha)	Area covered with forest (ha)
Area, ha	272490,2	29843,3	12903,5

Figure 3. Forest Fund of the Republic of Kazakhstan in the period 2023 (Information on the availability of land and its distribution by category, land owners, land users and lands in the East Kazakhstan region as of 2022, 2023)

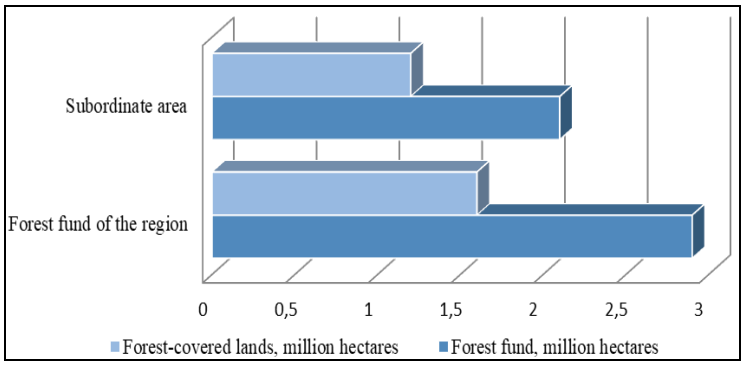


Figure 4. Forest Fund of the East Kazakhstan Region in the period 2023 (Information on the availability of land and its distribution by category, land owners, land users and lands in the East Kazakhstan region as of 2022, 2023)

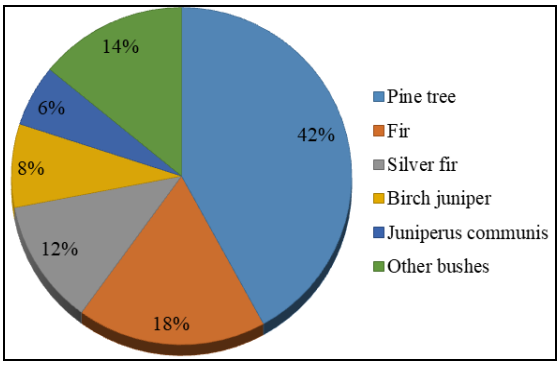


Figure 5. Types of forest species in the East Kazakhstan region (Baimaganbetov et al., 2020)

It is remarkable that more than half of the forest resources of the entire country are concentrated in this region of Eastern Kazakhstan. The forest cover level of this area is 16.5%. The main tree species that predominate in this area are pine, spruce, fir, cedar and larch, as well as aspen, birch and poplar (Zhensikbayeva, 2018). Forest areas in Eastern Kazakhstan are located mainly on the ridges of the Altai Mountains. Mainly coniferous forests are common here. In the lower parts of the forest zone there are deciduous and mixed forests. In the north, the altitudinal forest belt extends from 800 to 1700 meters, and in the south it reaches 2300 meters. These forests include trees such as pine, birch, aspen, poplar, cedar, spruce, fir, larch, as well as various types of shrubs. The species composition of forests is presented in the Figure 5 (Baimaganbetov et al., 2020).

The main timber reserves are concentrated in seven forestry enterprises, namely Altaisky, Riddersky, Verkhneubinsky, Malubinsky, Pikhtovsky, Cheremshansky and Ust-Kamenogorsky forestries, and amount to 96.6 million cubic meters, which is 84% of the total reserves (Shishikin et al., 2013). On the territory of the state forest fund, logging is carried out, beekeeping and deer breeding are being developed, areas are provided for health and recreational purposes, as well as haymaking and grazing, and medicinal raw materials are collected (Information on the availability of land and its distribution by category, land owners, land users and lands in the East Kazakhstan region as of 2022, 2023).

In 2020, a comprehensive plan for forest reproduction and increasing the volume of afforestation in the East Kazakhstan region for the period from 2021 to 2025 was developed and approved by the mayor of the city as part of the implementation of the Address of the President of the Republic of Kazakhstan dated September 1, 2020. The plan calls for 15,000 hectares of forest to be planted using individual seedlings over five years, for a total of 76 million seedlings (Information on the availability of land and its distribution by category, land owners, land users and lands in the East Kazakhstan region as of 2022, 2023).

1) 2021 - 513 hectares (177.5 million tenge); 2) 2022 - 600 hectares (789.8 million tenge);

3) 2023 - 1537 hectares (1133.6 million tenge); 4) 2024 - 5650 hectares (1032.9 million tenge);

5) 2025 - 6700 hectares (583.2 million tenge). Total - 15 thousand hectares (3.7 billion tenge).

The planned activities for 2021-2022 have been completed in full. In 2023, 7.8 million are planned to be planted on 1,537 hectares with the planting of individual seedlings. The material and technical base of state forestry institutions has been significantly strengthened and positive results have been achieved in preserving forests from fires.

RESEARCH RESULTS

On the total area of the forest fund of Eastern Kazakhstan, there are 13 municipal state forestry institutions and 4 specially protected natural areas - “Markakol” and “Western Altai”, the State National Natural Park “Katon-Karagay” and “Alakol”.

Table 2. Forest fires in the East Kazakhstan region for 2019-2023 (Information on the availability of land and its distribution by category, land owners, land users and lands in the East Kazakhstan region as of 2022, 2023) Note: On June 8, 2022, the East Kazakhstan region was divided into two - Abay with the regional center in Semey, and, in fact, East Kazakhstan region, where Oskemen remained the main city

Region	Year	Number of fires	Amount of damage (thousand tenge)	Death of people	Injured people
East Kazakhstan region (including Abay region)	2019	1755	165082	37	54
	2020	2037	2066421	46	46
	2021	1480	537069	47	51
East Kazakhstan region	2022	401	77965	18	13
	2023	339	60518	23	15

Table 2 contains statistics on forest fires in the East Kazakhstan region for the period from 2019 to 2023. Let's analyze the main indicators: **1.** Number of fires: - In 2019, 1,755 forest fires were registered; - In 2020, the number of fires increased to 2,037; - In 2021, the number of fires decreased to 1,480; - In 2022 there were only 401 fires; - In 2023, the number of fires also decreased to 339. **2.** Amount of damage (thousand tenge): - In 2019, damage from forest fires amounted to 165,082 thousand tenge; - In 2020, the damage increased significantly and reached 2,066,421 thousand tenge.

Forest fires can occur for various reasons, both natural and man-made. Natural factors include lightning, volcanic eruptions, sparks from falling rocks and spontaneous combustion. These phenomena are caused by high temperatures, low humidity and the presence of flammable materials. On the other hand, man-made causes include man-made ignition sources such as cigarettes, electrical sparks and any other sources that can start a fire due to human carelessness in coming into contact with flammable materials in the forest (Table 3). “In 2022, out of 801 cases of forest fires, 444 cases or 55% occurred from lightning strikes, 127 cases or 15% arose as a result of steppe fires moving onto state forest lands (due to the fault of the population 12, forest users - 1, other organizations and enterprises - 9), from unknown causes, 208 cases or 26% were recorded, and these figures are repeated annually with minor adjustments” (Velichko, 2023).

1-Moss-lichen, grass-moss-lichen, 2- short-grass crooked forests and deciduous woodlands; 3- Kobresia smirnovii, K.myosuroides, medium grass meadows; 4 -pine and birch-pine forests, lichen, moss, grass cover; 5 -fir and small-leaved-fir forests with large-grass moss cover; 6 -deciduous and small-leaved-larch forests, moss and birch-moss communities; 7-small-leaved aspen and birch forests with large grass communities; 8 -Shrub thickets combined with meadow and richly mixed-grass steppes; 9 -Larch and herbaceous communities on the northern slopes combined with meadow steppes and shrubs on the southern slopes; 10-Wormwood-feathergrass in combination with brittlegrass; 11- Stipa sereptana, Artemisia gracilescens, Allium polyrhizum; 12-sand-feather grass and shrub communities; 13-Stipa capiilata, Artemisa frigid, Caragana pumila, Clestogenes squarrosa, Potentilla acaulis; 14- Festuca valesiaca, Stipa kirghisorum, Stipa lessingiana, Stipa capillata, Spiraea hypericifolia, Caragana frutex, Caragana pumila; 14b- shrub-wormwood-turfgrass; 15 - arable land on the site of dry fescue steppes; 16- Wormwood-fescue; 17- Shrub - forbs - red feather grass; 18- Shrub-forb-red-feather, petrophytic-forb and shrub-fescue communities; 19 - Fescue-feather grass; 20 - Festuca valesiaca, Stipa

capillata, Stipa pennata, Artemisia marchalliana, Spirea hypericifolia, Lonicera microphylla; 21 -Artemisia sublessingiana, Stipa sereptana, Allium polyrzhum, Anabasis salsa; 22-Artemisa sublessingiana, Stipa sareptana, Nanophyton erinaceum, Parmelia vagans; 23-Artemisia xanthochroa, Artemisia santolina, Agropyron fragile, Calligonum rubicundum, Calligonum crispum; 24 - Shrublands, halophytic meadows and reed beds; 25-Calamagrostis epigeios, Xanthium strumarium, Trifolium, Plantago major, Potentilla anserina, Elaeagnus oxycarpa; 26 - aspen - birch - willow thickets, meadows and grass swamps; 27- кeed, halophyte meadows and communities. The occurrence and spread of fires in the East Kazakhstan region are highly dependent on the topography and altitudinal zone in which the vegetation cover is located.

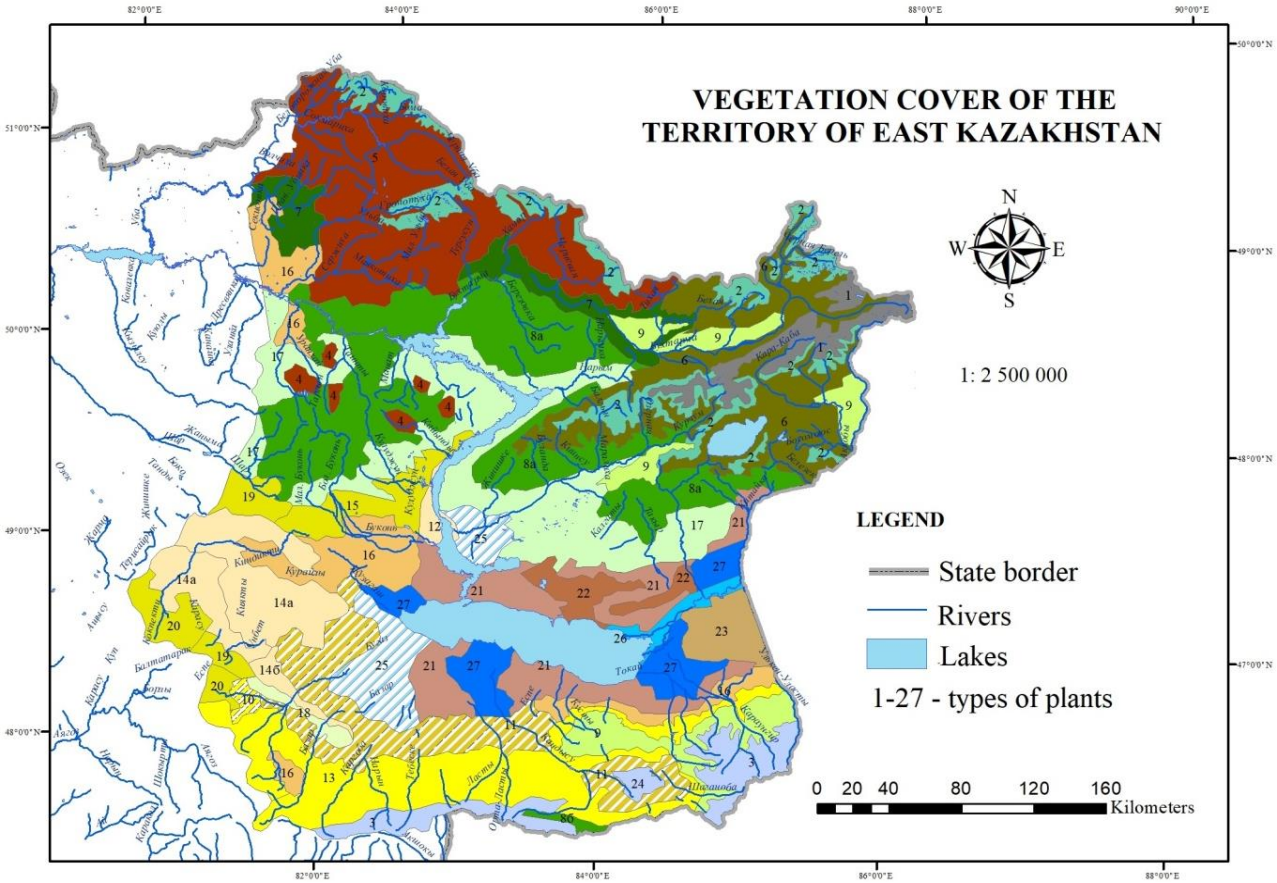


Figure 6. Vegetation map of the East Kazakhstan region (National Atlas of the Republic of Kazakhstan, 2010)

Table 3. Number of fires in Kazakhstan for 2020-2023 (Velichko, 2023)

Forest fires		Steppe fires	
2020	701	2020	130
2021	749	2021	115
2022	706	2022	74

Table 4. Number of fires in Kazakhstan for 2020-2023 (during August) (Velichko, 2023)

August			
Forest fires		Steppe fires	
2020	125	2020	33
2021	137	2021	39
2022	122	2022	13

Table 5. Number of fires in Kazakhstan for 2020-2023 (during August) (Official statistical accounting of fires and their consequences in Kazakhstan, 2019-2023)

September			
Forest fires		Steppe fires	
2020	39	2020	16
2021	87	2021	31
2022	47	2022	23

In mountain forests, natural fires begin after snow melts on the southern slopes, which occurs at different times: in the mountain ranges - in April, in the middle mountains - at the end of May, and in the upper zone - only in June and sometimes even in early July. Due to the climatic conditions of the region, fast-growing grass begins to limit the spread of fires (Figure 6). After the snow melts in late June and mid-July, the fire threat decreases significantly. According to Kazhydromet forecasts, in the upcoming fire danger period the average temperature will be +30ºC. Dryness and lack of precipitation are expected in the southern, eastern and western parts of the republic, while temperatures can reach +40ºC. All this will significantly increase the risk of forest fires. Due to the climatic conditions of the region, fast-growing grass begins to limit the spread of fires (Table 4). After the snow melts in late June and mid-July, the fire threat decreases significantly. (Shishikin et al., 2013). The growing season of the grass begins on the southern slopes and in light coniferous forests on the eastern and western exposures, and ends in dark coniferous forests on the northern slopes. In autumn, herbaceous plants gradually lose moisture and complete their life cycle, but by the end of autumn, when frost sets in, they dry out completely (Table 5). During periods of drought, fires can occur and spread throughout the entire mountain system, regardless of slopes and vegetation conditions (Arkhipov, 2017). In spring and autumn, when fires occur mainly in pine-birch and deciduous forests, and in summer during a period of prolonged drought - in all other types of forests. Under normal weather conditions, the fire spreads along bodies of water in the south and west. However, if the ridges and hills are higher than 500 meters, then the fire can engulf valleys, basins and lower slopes. During a period of prolonged drought in the spring, fires can spread to the eastern and some northern slopes (Arkhipov, 2017).

The intensity of lightning activity, that is, the duration of thunderstorms and the number of days with lightning, is closely related to the physical and geographical location of the region. In addition, the terrain greatly influences lightning activity. On mountain slopes, where humid winds act, the greatest number of lightning events is observed. This is because dynamic turbulence increases and updrafts create conditions for the formation of strong convective currents, which leads to the formation of clouds and, consequently, lightning. However, an increase in the number of thunderstorms in the mountains is observed only up to a certain altitude (800/1000 meters). Regarding the consequences of fires, persistent and intense lowland fires negatively affect the growth and health of pine forests. The impact depends on the age of the forest stand and the intensity of fires. A study conducted in the Katon-Karagai State National Natural Park showed that in all burnt areas the tree stand is generally preserved, but the condition of the wood can be assessed as unsatisfactory.

The number of healthy trees leaves much to be desired, and most forest areas have been damaged and destroyed. Already in the first year after the fire, it became obvious that the fire had caused serious damage to the trees. In 2018, in the new burned area, the proportion of destroyed and drying trees exceeded 93% (Baimaganbetov et al., 2020).

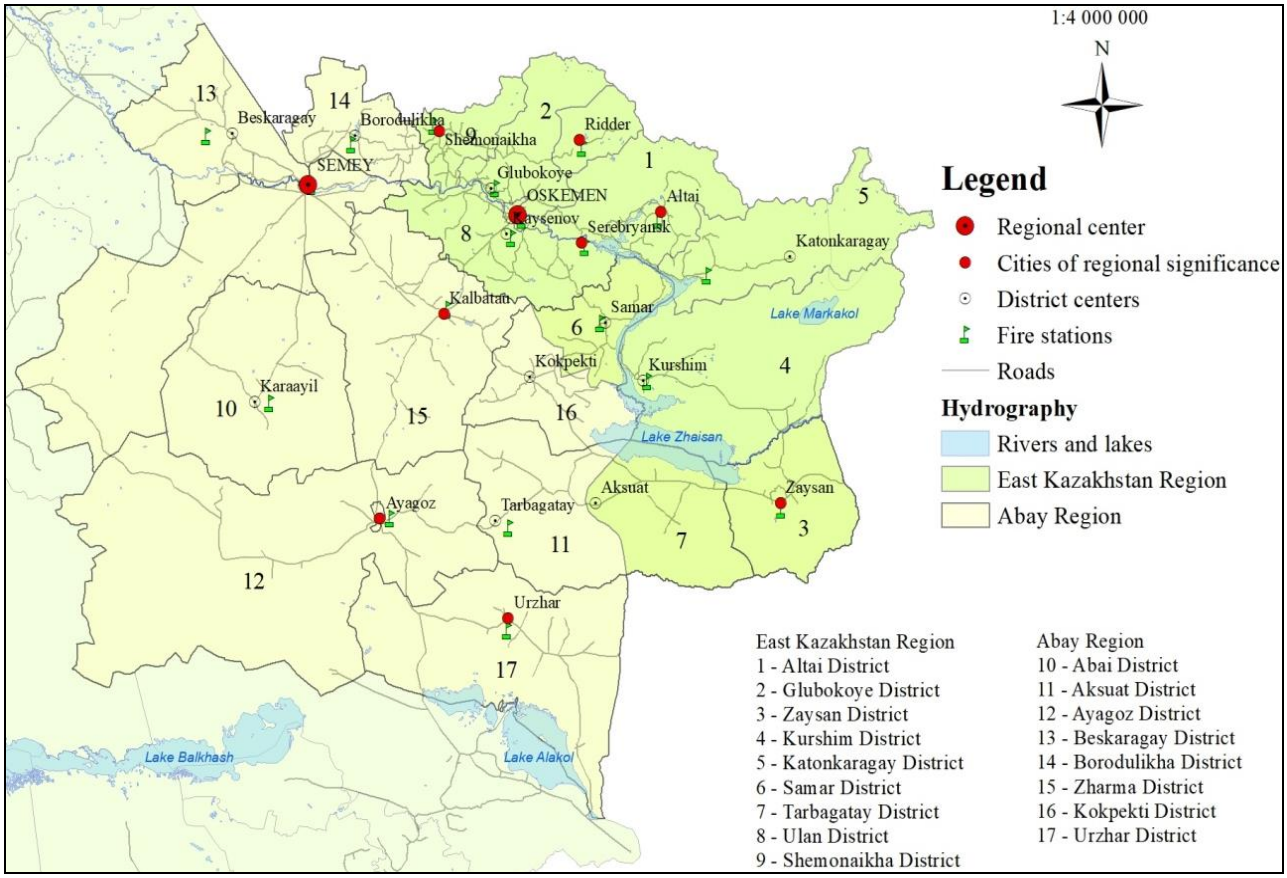


Figure 7. Fire stations on the territory of East Kazakhstan (National Atlas of the Republic of Kazakhstan, 2010)

According to the indicators of fire incidents and depending on the flammability index, all forest management in the East Kazakhstan region were conditionally divided into three groups. The highest level of fire danger (group I) was recorded in "Asubulak forestry" with a combustion index of 229.6 units, which indicates a high fire danger (Figure 7). The region is primarily planted with pine trees and is prone to wildfires. Over the past 15 years, 6,781.2 hectares of fires have occurred on the territory of this forestry, of which 2,848.7 hectares are in forested areas. The causes of fires are mainly related to anthropogenic activities (46.5%) and lightning strikes (53.5%) (Loupian et al., 2017). Most of the fire situation was included in group II of communal government agency "Zaysan forestry" (93.17) and communal government agency "Narym forestry" (69.09). These regions are characterized by flatter terrain, but there are still cases when forest fires spread to the territory of the forest fund. Particular attention should be paid to preventing transboundary fires in the Zaisan forestry communal government agency and conducting educational activities, since the main causes of fires here are closely related to human activity.

Group III includes communal government agency "Kurchum forestry" (25.68), communal government agency "Ridder forestry" (15.21), communal government agency "Samar forestry" (7.6) and communal government agency "Oskemen forestry" (2.08). Despite the low burning index values, fires occur in these areas, affecting large areas. For example, in 2011, at the Ridder forestry communal government agency, an overhead fire destroyed about 300 hectares of valuable pine forest in two hours. The main cause of forest fires in these areas is human activity, which accounts for 99.16% of all cases. It should be noted that in communal government agency "Ridder forestry" with such a number of fires, forest protection acts very quickly, and the average area of one fire during the study period is 6.2 hectares (Chlachula, 2019).

On the territory of the Samar forestry communal government agency, the main type of forest tree is pine, which contributes to the transformation of this zone into an area with a high risk of forest fires. This circumstance significantly

increases the risk of fires in this area. According to data for the last 15 years, the conditions conducive to the occurrence of fires in this territory are caused by 57.8% anthropogenic factors and 42.2% by natural causes (Meshkov et al., 2009).

This year marks the highest number of forest fires registered in the East Kazakhstan region, reaching 314 cases. The second largest number of fires is Pavlodar region with 141 incidents. Zhambyl, West Kazakhstan and Turkestan regions found themselves faced with a significant increase in the number of forest fires, with only 2 cases in each of them. It should be noted that in 2022, the only region where no forest fires were registered was the Mangistau region (Table 6).

As for steppe fires, this year the largest number of incidents was recorded in the Karaganda region - 34 cases. It is followed by the West Kazakhstan region with 23 cases and the Kostanay region with 19 cases. A smaller number of steppe fires were registered in the Zhambyl and Akmola regions, where two cases were recorded, as well as in the Atyrau region, where only one steppe fire was registered. It should be recalled that this year there was one of the major forest fires in the Kostanay region, which began on September 2 and required eight days to completely extinguish it. As a result of this fire, 43 thousand hectares of forest were destroyed and damaged, as well as more than 90 residential buildings in two settlements. A total of 12 people were injured, burned or poisoned in the fire, and another person was found dead in his home, buried under rubble. When analyzing the causes of forest fires in the Republic of Kazakhstan, it should be noted that the main factor causing fires is the careless handling of fire by local residents and vacationers when igniting forest fires. Throughout the Republic, 82% of all forest fires are caused by direct or indirect human impact, while natural factors (thunderstorms) are responsible for only 18% of forest fires. Only in the ribbon forests of the Irtysh region the share of forest fires caused by thunderstorms is 50-65% (Arkhipov and Arkhipov, 2014). To locate forest fires for rapid response, data obtained from remote sensing satellites are used, which create images in the infrared spectrum with a spatial resolution of 250 to 1000 meters. These data make it possible to quickly determine the coordinates of fires (thermal anomalies) and predict the spread of forest fires, including the use of meteorological information. To perform tasks that require regular and operational space surveys, it is recommended to use aerial photography to create detailed large-scale maps in small areas in areas of intensive forest management. This has advantages, especially when monitoring forests located in remote and inaccessible areas, as well as when monitoring fire conditions, fire sites and illegal logging in protected areas.

Table 6. Number of forest and steppe fires in Kazakhstan for 2022 (Velichko, 2023)

Regions	Forest fires	Steppe fires
East Kazakhstan	314	8
Pavlodar	141	
Akmola	55	2
Karagandy	55	34
Almaty	42	
Kostanay	36	19
North Kazakhstan	30	
Kyzylorda	13	
Aktobe	10	8
Atyrau	5	1
Zhambyl	2	2
West Kazakhstan	2	23
Turkestan	1	

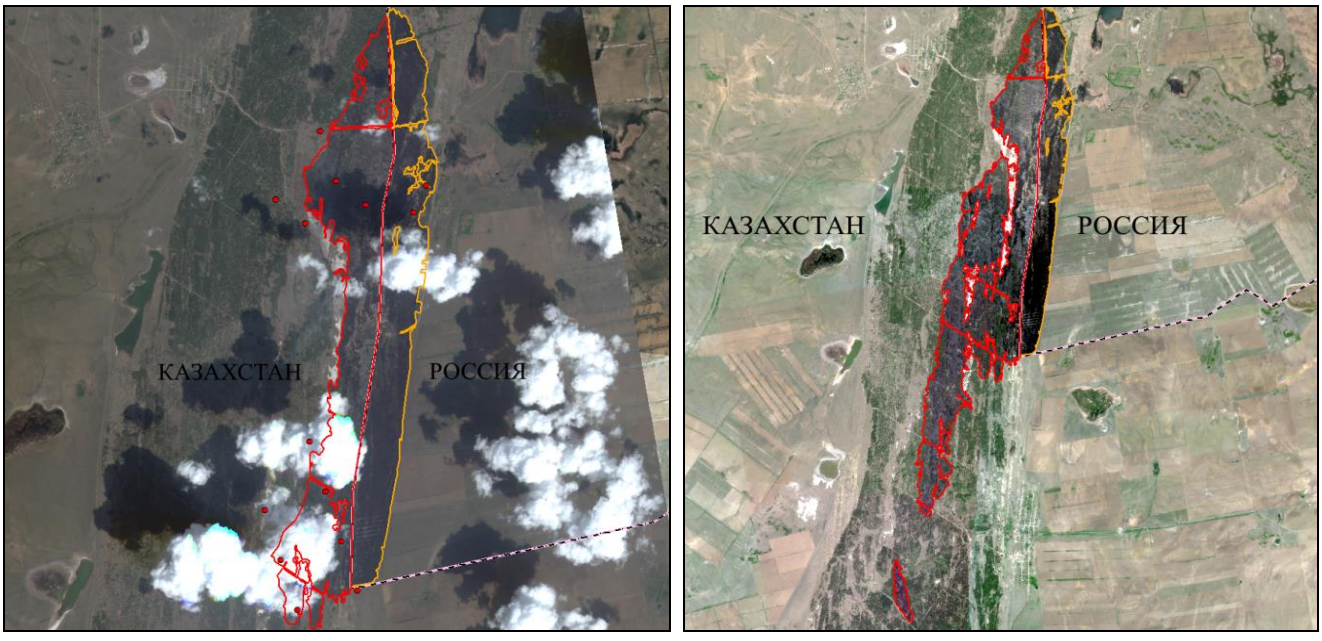


Figure 8. World View 2 image (fragment) with overlay of taxation map and burnt areas, obtained from Landsat and World View 2 data of the territory of the Semipalatinsk reserve for the period from 05.22.22 to 05.25.22 (https://forestopen.gharysh.kz/)

The Figure 8 shows the initial sources of fire in the Semipalatinsk reserve. It is important to ensure that rescuers are promptly informed about the occurrence and spread of forest fires. To do this, in most cases, a web interface is used, containing a graphical representation of the locations of forest fires over the last 24 hours, as well as an indication of geographic coordinates, date and time of fire detection, probability of detection, fire classification and other related information. Thermal channels of satellite images are used to detect forest fires (Figure 9).

There are two main types of fire detection algorithms: marginal and contextual. Marginal algorithms are based on identifying an abnormally high temperature above a certain point that exceeds the norm for the Earth's surface. In

contrast, contextual algorithms analyze the temperature of neighboring pixels, allowing temperature fluctuations to be detected in the context of surrounding pixels at lower temperatures (Arkhipkin et al., 2014).

Figure 9. Photos from fire scenes in the East Kazakhstan region: a - Fire in the forests of the city of Ridder, https://www.nur.kz/, 05.11.2021, Ridder, East Kazakhstan region; b - Fire in the Semey Ormany reserve, https://baigenews.kz/, 08.04.2023, Abay Region; c - Fire on the territory of the Kulunjunsky State Nature Reserve, https://orda.kz, 05.02.2022, East Kazakhstan region; d - Fires in the East Kazakhstan region, inbusiness.kz, 05.16.2023, East Kazakhstan region

High-resolution analysis of the following parameters is performed using remote sensing data:

- Detailed study of fire spread;
- Assessment of the total area covered by fire extinguishing in certain segments of the territory;
- Assessment of economic losses;
- Planning activities to prevent forest fires;
- Identification of hotbeds of burning peat bogs and other objects.

Satellite data is essential for assessing the spread and detection of wildfires, as well as for analyzing smoke clouds and fire risk. The ability to quickly detect fires in small areas, especially in conditions of increased fire danger, depends on the speed of detection. Therefore, the most suitable requirements for operational monitoring of forest and soil fires are those of satellites with high radiometric resolution and high image frequency, such as the NOAA and EOS series. Satellites with high spatial resolution must be used to monitor the consequences of fires.

CONCLUSION

Despite the low level of forest cover, forest fires cause serious damage to the forest fund of the Republic of Kazakhstan. In addition to natural factors, the level of fires in forests is influenced by the economic situation in the country and the effectiveness of measures to protect forests from fires.

From 2000 to 2022, the year 2022 was characterized by a high degree of danger from fires. While the high number of fires and area burned in 2010 can be explained by drought, the excessively high level of fires in 2021 and 2022 may be due to insufficient government attention to protecting forests from fires.

To minimize damage from forest fires, it is necessary to develop a comprehensive system for protecting forests from fires, taking into account the natural conditions and characteristics of the forest fund in each region of the republic.

In order to reduce the risk of fires, the following measures are proposed:

- Creation of a lightning rod service in the territories of communal government agency "Asubulak forestry" and communal government agency "Samar forestry", since cases of fires in pine forests due to lightning discharges are more common here;
- Taking urgent measures to normalize the sanitary situation in the spruce plantations of the dark taiga, including sanitary pruning and debris removal;

- Application of satellite images and monitoring through special platforms for rapid detection and control of fires.

To make a decision in the management of forest protection activities, a comprehensive assessment of the emergency situation is necessary, which is achieved by including all stages of the information and software complex to increase the percentage of reliability when checking it on the ground. Practice has shown that the most important block is considered to be the use of auxiliary information, including custom information, higher-resolution images (Landsat), taxational maps of vegetation and soils, conducting field research, climatic characteristics.

Author Contributions: Conceptualization, N.Zh and N.A.; methodology, N.K. and R.B.; software, N.Zh and N.A.; validation, A.Ye. and N.K.; formal analysis, N.Zh and R.B.; investigation, A.Ye and N.A.; data curation, R.B. and N.K.; writing - original draft preparation, N.K. and A.Ye.; writing - review and editing, N.Zh. and R.B; visualization, N.A. and N.Zh; supervision, N.Zh; project administration, N.Zh.. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Arkhipkin, O.P., Sagatdinova, G.N., & Bralinova, Z.A. (2014). Remote estimation of damage from forest fires in the space monitoring system of emergency situations of Kazakhstan. *Modern problems of remote sensing of the Earth from space* 11(3). 203–214, (in russian).

Arkhipov, E.V., & Zalesov, S.V. (2017). Forest fires in the republic of Kazakhstan and their ecological consequences. *Agrarian Bulletin of the Urals*, 04(158), 10-14, (in russian).

Arkhipov, V.A., & Arkhipov, E.V. (2009). Ecological danger of wildfires. *Messenger of agricultural science of Kazakhstan*, 7, 74–76, (in russian).

Arkhipov, Ye.V. (2014). The analysis of forest fire dynamics in the belt pine forests of the Priirtyshye (The Irtysh river area), *Bulletin of the Altai State Agrarian University*, 11(121), 61-64.

Arkhipov, Ye.V. (2017). Dynamics of the fires in mountain forests of East Kazakhstan. *Agrarian Bulletin of the Urals. Shschuchinsk*, 10-14, (in russian).

Baimaganbetov, R.S., Amankeshuly, D., & Kopytkov, V.V. (2020). Ecological consequences of forest – ground fair. *Bulletin of the Belarusian State University of Transport: Science and transport*, 1(40), (in russian).

Blinov, S.Yu. (2016). *Life safety in natural emergencies: textbook.* Saint Petersburg, 83, (in russian).

Bogdanov, A.P., Karpov, A.A., & Demina, N.A. (2018). *Improving forest monitoring through the use of cloud technologies as an element of sustainable forest management.* Modern problems of remote sensing of the Earth from space, 15(1), 89–100, (in russian).

Chlachula, J. (2019). Geotourism perspectives in East Kazakhstan. *Geography, Environment and Sustainability, 12(2),* 29–43. https://doi.org/10.24057/2071-9388-2018-78

Loupian, E.A., Bartalev, S.A., Balashov, I.V., Egorov, V.A., Ershov, D.V., Kobets, D.A., Senko, K.S., Stytsenko, F.V., & Sychugov, I.G. (2017). *Satellite monitoring of forest fires in the 21st century in the territory of the Russian Federation*. Facts and figures based on active fires detection, 158-172, (in russian).

Krepsha, N.V. (2014). *Hazardous natural processes: textbook*, Tomsk, 105-123, (in russian).

Meshkov, V.V., Baizakov, S.B., Yeger A.V., & Orozumbekov, A. (2009). Forest Rehabilitation in Kazakhstan. *Keep Asia Green Volume IV "West and Central Asia",* Vienna, Austria, 83-131, (in russian).

National Atlas of the Republic of Kazakhstan (2010). [Ch. ed. A. R. Medeu]. 2nd ed., processed and additional, [Maps], Almaty: VIT BRAND, T.1, Natural conditions and resources.

Pavlichenko, E.A., Ivanov V.V., & Miskiw S.I. (2009). *The use of geoinformation systems in the analysis and forecast of natural emergencies on the example of forest fire monitoring*. Federal Center for Science and High Technologies "Russian Research Institute for Civil Defense and Emergency Situations", 614(8), 46-51, (in russian).

Svarichevskaya, E. (1965). *Geomorphology of Kazakhstan and Central Asia*. Nauka, Leningrad, 15-20, (in russian).

Shishikin, A.S., Ivanov, V.A., Ivanova, G.A., & Valendik, E.N. (2013). *Strategy for reducing fire danger in protected areas of the Altai-Sayan ecoregion: textbook*. Novosibirsk, 50-56, (in russian).

Vaganov, A.V. (2018). Prospects for studying and preserving the biodiversity of the Altai-Sayan ecoregion in the context of the development of open databases. Ukrainian *Journal of Ecology, 8(3),* 380–392, (in russian).

Velichko, A. (2023). *Voice of the People.* "Forests in Kazakhstan burn every day, but foresters can no longer "make money" from it (in russian). https://golos-naroda.kz/kazakhstan/

Vlasova, O.S. (2014). *Opasnyye prirodnyye protsessy. [Hazardous natural processes].* Volgograd, 23-33.

Yegorina, A.V. (2000). Physical geography of Eastern Kazakhstan: textbook, A. V. Egorina, Yu. K. Zinchenko, E. S. Zinchenko; Ust-Kamenogorsk, 100-112, (in russian).

Zhensikbayeva, N.Z. (2018). Assessment of the tourism and recreational potential of Southern Altai: textbook, Ust-Kamenogorsk, 47-62, (in russian).

*** Information on the availability of land and its distribution by category, land owners, land users and lands in the East Kazakhstan region as of 2022, (in kazakh). https://www.gov.kz/memleket/entities/akimvko/documents/details/464073?lang=ru

Article history: Received: 03.10.2023 Revised: 23.11.2023 Accepted: 19.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 51, no. 4spl, 2023, p.1812-1822
DOI 10.30892/gtg.514 spl22-1177

SOIL EROSION AND IMPACT ON RECREATIONAL RESOURCES IN THE SHYNGYRLAU BASIN, WESTERN KAZAKHSTAN: A MULTI-ANALYTICAL ASSESSMENT

Nurgul RAMAZANOVA
L.N. Gumilyev Eurasian National University, Faculty of Natural Sciences Department of Physical and Economical Geography, Astana, Republic of Kazakhstan, e-mail: nurgulram@gmail.com

Elvira TURYSPEKOVA*
L.N. Gumilyev Eurasian National University, Faculty of Natural Sciences Department of Physical and Economical Geography, Astana, Republic of Kazakhstan, e-mail: elvira.turyspekova@mail.ru

Kalibek ASSYLBEKOV
L.N. Gumilyev Eurasian National University, Faculty of Natural Sciences Department of Physical and Economical Geography, Astana, Republic of Kazakhstan, e-mail: aslkalibek@mail.ru

Zhanar OZGELDINOVA
L.N. Gumilyev Eurasian National University, Faculty of Natural Sciences Department of Physical and Economical Geography, Astana, Republic of Kazakhstan, e-mail: ozgeldinova@mail.ru

Anzhela AKHMEDOVA
L.N. Gumilyev Eurasian National University, Faculty of Natural Sciences Department of Physical and Economical Geography, Astana, Republic of Kazakhstan, e-mail: aangela89@mail.ru

Aliya AYAPBEKOVA
L.N. Gumilyev Eurasian National University, Faculty of Natural Sciences Department of Physical and Economical Geography, Astana, Republic of Kazakhstan, e-mail: alya1960@list.ru

Talant SAMARKHANOV
Astana International University, Pedagogical Institute, Astana, Republic of Kazakhstan, e-mail: talant.68@mail.ru

Janat KHAMZAEVA
Department of Hydrometeorology and Environmental Monitoring of the National University of Uzbekistan named after Mirzo Ulugbek, Tashkent, Uzbekistan, e-mail: xamzayeva.j@mail.ru

Citation: Ramazanova, N., Turyspekova, E., Assylbekov, K., Ozgeldinova, Z., Ahmedova, A., Ayapbekova, A., Samarkhanov, T., & Khamzaeva, J. (2023). SOIL EROSION IN THE SHYNGYRLAU BASIN, WESTERN KAZAKHSTAN: A MULTI-ANALYTICAL ASSESSMENT. *GeoJournal of Tourism and Geosites*, 51(4spl), 1812–1822. https://doi.org/10.30892/gtg.514spl22-1177

Abstract: Over the past decades, water erosion has increased significantly in the Shyngyrlau River basin. Recreational development, haphazard construction and operation of roads have led to increased water erosion and the formation of numerous linear erosion forms. Erosion reduces the natural resource status of the region. Water erosion develops in most cases along roads laid along the thalwegs of the ravine-hollow network. The light substrate along with sparse vegetation cover (the sparseness is aggravated by intensive grazing) predetermine its rapid development. Water erosion is an acute problem arising from the present climate change, agricultural intensification and diverse forms of anthropogenic land degradation. Assessment of present and potential soil erosion is useful for landscape preservation as well as development planning. Multi-analytical modeling can provide a quantitative and consistent estimation of soil erosion and sediment yield under locally specific environmental conditions. The soil loss model, Revised Universal Soil Loss Equation (RUSLE), integrated with GIS, has been used to estimate soil loss in the Shyngyrlau Basin (a left-bank tributary of the Ural River, NW Kazakhstan). The RUSLE model is based on remote sensing and field data; erosion probabilities were determined using GIS. The percentage ratio of the soil loss in the Shyngyrlau River basin shows erosion variation of 0.001–2.47 t/ha/yr. The degree of erosion increases with the length of the slope. A new factor Chip curvature (Cu factor), defining the accuracy of the soil loss results, was defined. According to this factor, soil erosion in the study area is 0.007–2.48 t/ha/yr within the low erosion class. The lowest indicator of the K factor is 0.2 in sandy clay soils used as pasturelands. The highest K factor (0.3) relates to clayey arable soils. The research results add to implementation of new strategies in soil management and conservation practices reducing soil erosion in the Shyngyrlau Basin. Both climate and anthropogenic factors are seen behind the activated ground erosion. The development of forms of water erosion leads to a violation of the integrity of modern natural complexes of the West Kazakhstan region, which significantly reduces their stability and recreational potential.

Key words: Shyngyrlau Basin; RUSLE; GIS; Soil; Erosion; Climate; Environment

* * * * * *

* Corresponding author

INTRODUCTION

Present soil erosion is a global phenomenon that degrades agricultural lands worldwide by removing the top, nutrient-rich surface layer. This process generates an increasing surficial runoff ona more impermeable subsoil, and reduces the amount of water available to plants. The effectiveness of a soil conservation program depends on the calculation of soil loss and the identification of crucial areas for implementation of soil preservation management practices. The soil erosion results in a depletion of soil elements due to natural mechanical factors such as wind, water, and gravity, frequently with co-acting human factors (Gunawan et al., 2013).

The biophysical environment, which includes soil, climate, terrain, bedrock, top ground cover, and interactions between these, affects the locally specific soil erosional processes. Erosion is a natural geological occurrence that occurs when soil particles are removed by water or wind and carried to new locations. Slope, length, local geology and geomorphology are the principal topographical features that affect the mechanism of soil erosion and the top surface runoff. The runoff intensity and reduction in water infiltration into ground increase with slope (Nearing et al., 2005) As the runoff's velocity rises, the runoff generated by the gravity slope processes will cause soil erosion. Some anthropogenic actions, such as agricultural practices and deforestrationpromoting expansion of farmland, would exacerbate erosion rates. Steep slopes, climate, torrential rains, improper land use, and vegetation patterns of the local land cover are some of the variables that contribute to erosion (Renschler et al., 1999). Additionally, some loose (sandy) soilsare more susceptible to erosion (Mekonnen et al., 2015). Insightful modeling may provide closed information regarding the current state of ground stability and erosion predispositions/tendencies, and mitigation of risks. The effects of soil erosion and deposition need to be taken into account in terms of present climate change (Lal, 2003; Liu et al., 2003; Berhe et al., 2007; Doetterl et al., 2012). Soil erosion and deposition are crucial for maintaining the equilibrium of the atmospheric carbon budget (Alexakis et al., 2013).

Human alterations of the landscape, such as reduction of native vegetation for crop agriculture and grazing, channelization of streams, and tile and ditch drainage, among other activities, have led to deeply incised channels with accelerated stream bank erosion (Zaimes et al., 2006). In Western Kazakhstan, some former modeling the process of soil erosion in the basin of small rivers of Western Kazakhstan was performed resulting in locally specific erosion actions (Chashina et al., 2020). The problem of soil erosion is a key problem for agriculture in the country, and also has an impact on the recreational sector, since recreational land use is directly related to agriculture, and agriculture depends on soil fertility and the erosion component (Ramazanova et al., 2022).

It is expensive and time-consuming to evaluate the soil erosion risks using the standard approaches (Bonilla et al., 2010). Geographic information systems (GIS) are useful for integrating field data, data from remote sensing technologies, and data from currently used soil erosion models (Moore et al., 1991; Imamoglu and Dengiz, 2017; Fernandez et al., 2003; Gitas et al., 2003).The Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) are the most frequently used erosion assessment tools (Xu et al.,2009; Udayakumara et al., 2010; Das et al., 2018).

RUSLE employs an empirical methodology based on how erosion processes work in combination with GIS landscape models (Prasannakumar et al., 2012; Ranzi et al., 2012; Renard et al., 1997; Sharma, 2010; Wijesundara et al., 2018; Ranzi et al., 2012; Wijesundara et al., 2018).The RUSLE model can predictan erosion potential on a cell-by-cell basis (Shinde et al., 2010) demarcating the spatial distribution of soil loss across a wide area. Various factors assessing the erosion potential value may be determined using the GIS tools and programs. This paper presents a multi-analytic approach using the empirical soil erosion RUSLE models integrated with GIS to estimate the soil erosion risks in the Shyngyrlau Basin, and discuss the impact of change in the land use-land cover with respect to the soil erosion ratio. The study combines the regional remote sensing data, GIS, and RUSLE data in order to detect the most accurate spatial distribution of soil erosion and analyze the effects of changes in land use and the land cover exposed to erosion. The regional soil erosion probability zones within the belt of the Central Asian parkland steppes are defined (Mhangara et al., 2012).

STUDY AREA

The study area is located in NW Kazakhstan within the Shyngyrlau River valley (Figure 1). The length of the river that is a left-bank tributary of the Ural River is 290 km^2, with a hydrological catchment area of 6940 km². The sources of Shyngyrlau are located on the Poduralsky Plateau at an altitude of 250 m. A meandering river channel with ox-bow lakes characterizes the lower reaches. Since November until mid-April the river is frozen. The waters of the river are used for irrigation and rural water supply. On the right river bank there is the city of Aksai. The water temperature is 17–26.9°C, pH 7.74–7.83.

The regional climate is continental, semi-humid, with moderately harsh winters with little snow. The average monthly temperature in January is –14.5°C, in July +22.6°C, the average annual temperature is +4.2°C. The mean annual precipitation is 268 mm, the highest average monthly precipitation is in June (39 mm) and October (32 mm), and lowest average annual precipitation is in January (8 mm). The main part of the region is occupied by steppe landscapes of elevated plains of the Poduralsky Plateau. Alluvial terraces are developed along the rivers. The area is drained towards north by the Ilek River which is a principal tributary of the Ural River) with small perennial tributary streams that dry up in summer, and the Shyngyrlau River flows in the central part of the region. Along the valley of the Utva River and the territory adjacent to the Ilek River in the north there are open grasslands of the Pre-Syrtovy Lowlands.

The regional bedrock is built by sedimentary rocks—Cretaceous chalk and limestone (the Poduralsky Plateau), overlain by marine sediments/clays of the Oligocene Akchagyl Sea, loams and sands (the Pre-Syrtovy Highlands).Within the PoduralskyPlateau, the plain is intensively dissected by an ancient, presently inactive river network into syrts, ridges and cuesta ridges, on the slopes of which erosion forms gullies and ravines. In the leveled areas, a mosaic micro-relief is

developed. On the Pre-Syrtovy Lowlands there is the Ural River valley plain geologically structured by of alluvial deposits of the Ilek and Shyngyrlau Rivers. Between the Poduralsky Plateau and the Ilek River, small sand massifs and large wavy elevations—ashiks—are developed. The influence of halokinesis (movement of large masses of salts to the surface) is manifested over the landscape. In the south there are two gravity slope sand massifs with large differences in the aeolian deposit elevation over relatively short distances—Zhar-Shagal Ridge (with the adjacent forest dacha Kara-Agash at the bottom of the slope) and the Ak-Kumy Ridge (Petrenko et al., 1998). The Shyngyrlau-Ilek *soil-geobotanical* region enters the territory of the Shyngyrlau basin in the northeast. The previously widespread colorful feather grass steppes on dark chestnut soils were largely plowed. Only some pristine areas with feather grass steppes have been preserved. Fescue, Becker fescue and white wormwood grow in these places on sandy soils. The Dzhambeity - soil and plant cover region, covering the slopes of the Poduralsky Plateau, enters the southern part of the basin. The broken geomorphic relief is represented by river valleys, gullies, and outcrops. The modern pedological variety includes chernozems, chestnut soils and solonetz. Sagebrush and secondary steppes with feather grass (tyrsa) and fescue are widespread.

Finally, in the extreme southeast, along the Pre-Syrtovy Ridge of the Poduralsky Plateau, flat-undulating spaces of Erkekov-feather grass steppes with sandy and sandy loam light chestnut soils dominate (Janaleyeva, 2010).

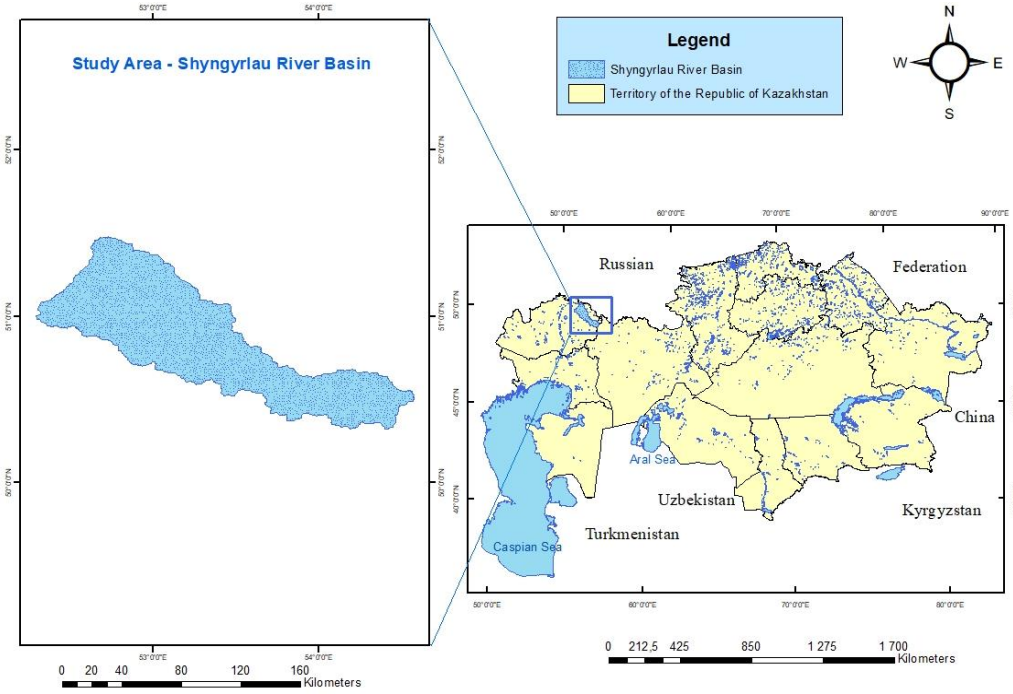


Figure 1. Map of the Research Area (Source: compiled by Ramazanova and Turyspekova in the ArcGIS program)

MATERIALS AND METHODS

Methods

The goal of the present study was to assess a spatial distribution of soil erosion in the study area using multi-analytical approach combining remote sensing, GIS, and the Revised Universal Soil Loss Equation (RUSLE). The research rational was to define the soil erosion probability and the effects of ongoing erosion in the Shyngyrlau Basin, and document the changes in land cover due to natural and anthropogenic factors.

In order to quantify soil erosion risk at various levels, including single slope, river/wadi catchment, regional, as well as global scales, several precise soil erosion models have been created during the last decades (Prasannakumar et al., 2012). Among these, there is the Universal Soil Loss Equation (USLE) (Wischmeier and Smith, 1965; Wischmeier and Smith, 1978), the European Soil Erosion Model (EUROSEM) (Morgan. et al., 1998), Soil Erosion Model for the Mediterranean Region (SEMMED) (De Jong et al., 1998), Water Erosion Prediction Model (WEPP) (Flanagan et al., 1998; Ascough et al.,1998,), the Soil and Water Assessment Tool (SWAT) (Arnold et al., 1998), and Chemicals, Runoff, and Erosion from Agricultural Management Systems (CREAMS) (Rudra et al., 1985). The USLE model has been widely usedworldwide to assess soil erosion risks. The less cost-demanding data-processing alternative is the Revised Universal Soil Loss Equation (RUSLE).

The revised model accommodates more accurate methods to estimate rainfall erosion (R), soil erodibility (K), slope length and steepness (LS), land cover management (C), and conservation practice (P) factors. Information on factors leading to soil erosion can be used as a guide for formulating appropriate soil conservation and land management plans. The RUSLE model is used to estimate the magnitude of soil erosion loss from watershed areas, the spatial distribution of soil erosion and its severity, delimiting sites vulnerable to soil erosion for both agricultural and partly forested sites. The model has several advantages: it is 1) easy to implement and understand from a functional perspective, 2) less demanding in terms of data requirements, 3) compatible with the Geographic Information System (GIS). Overall, USLE and RUSLE models are two of the most popular and widely used soil erosion models for agricultural areas throughout the world (Ramazanova et al., 2023).

The RUSLE model was estimated from remote sensing and field data, and erosion probabilities determined using GIS. Within the present study area, the RUSLE model demonstrates effectiveness compared to the USLE model (Wischmeier and Smith, 1978). In addition, RUSLE turns to be more flexible in modeling soil erosion in terms of its ability to change conditions and parameters, and is easy to integrate with a GIS for spatial analysis (Wischmeier and Smith, 1965).

The RUSLE (Renard et al., 1997) model is expressed as Eq. (1): A *R* K* LS* C* P (1)

Where: A Computed soil loss per unit area per year (t/ha per year)
R The rainfall erosivity factor (MJ mm ha^{-1} h^{-1} $year^{-1}$)
K The soil erodibility factor (t ha MJ^{-1} mm^{-1})
LS The slope length and steepness factor (dimensionless)
C The cover and management factor (dimensionless)
P The support practice factor (dimensionless)

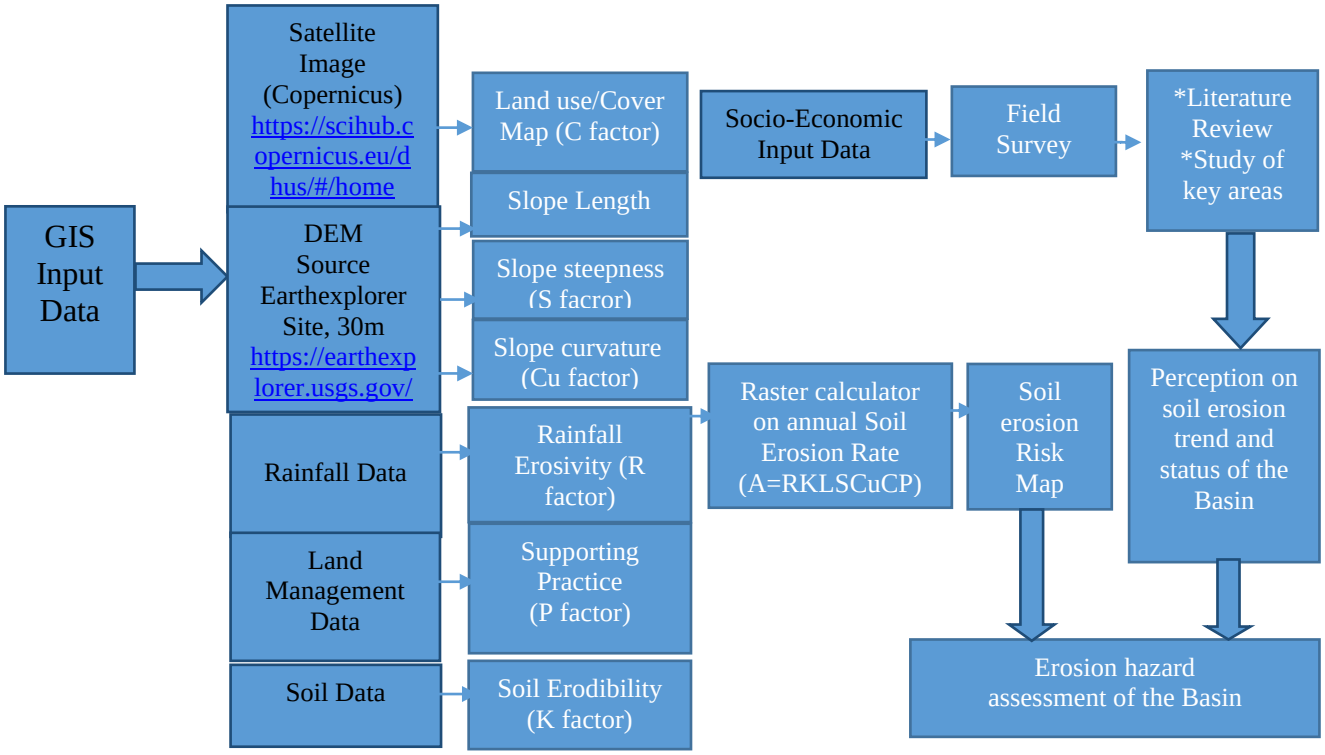


Figure 2. A diagram illustrating the application of the RUSLE model for estimating soil loss within the research area

Calculation of the RUSLE Factors:

Rainfall Erosion Factor (R)

The initial data for the implementation of the precipitation map of the study region were the statistical series of precipitation for the warm and cold periods of 2010–2021 according to Kazhydromet (Official Internet resource - RSE "KAZHYDROMET" https://www.kazhydromet.kz , 11/01/2021). Precipitation indicators were taken for each observation period per month for each meteorological station in the study region, after which the data were averaged and processed in Microsoft Office Excel. The entire region is characterized by scarcity of precipitation and high dryness of air and soil. Precipitation is unevenly distributed over the territory of the West Kazakhstan region, the average annual precipitation varies from 300 mm in the north to 170 mm in the south of the region (Janaleyeva, 2010).

For the precipitation mapping, various interpolation methods were used including the Spatial Analyst module of ArcGIS 10.1 software "Spline". This method calculates the point values based on a mathematical function that corrects the conditions of the given geographic area, resulting in a smooth surface that passes through all measurement points.

The Geostatistical Analyst module was used to interpolate the values by studying the relationships between all control (control) points and building a continuous precipitation distribution surface. This module allowed to build an interpolation model and to evaluate statistically the quality of the final results.

Factor-R, Factor erosion of sediments R connects the intensity of precipitation with the kinetic energy available for the erosion of soil particles (Wischmeier and Smith, 1978; Panagos et al., 2015). The erosion coefficient of precipitation is calculated based on the amount of atmospheric precipitation according to the following formula:

$$R=0.548257*P - 59.9 \quad (2)$$

Where, P is the average annual amount of precipitation.

Soil Erosion Factor (K)

The K-factor is a coefficient of soil erosion that reflects both the soil's susceptibility to erosion and the rate of runoff, measured under the conditions of a standard single plot. Data for defining the mechanical composition of the soil were

taken from the website *Open Land Map*, presenting a raster mosaic of the surficial land mass structure. Each value of soil texture was given its erosion resistance coefficient at the average content of organic matter in the soil. During the fieldwork in the study areas along eight key study sections, the mechanical composition of the soil was determined in addition to the type of land use and crop arable land,. The analysis of the mechanical pedological qualities (2021) completed the cartographic data (Table 2). Soils with high clay contents have low K values, around 0.05 to 0.15, because they are resistant to separation. Roughly structured, loose soils, such as sandy soils in the study area, have low K values, around 0.05 to 0.2, due to low runoff, although these soils are easily separated. Medium grain size soils, such as silty loamy soils, have moderate K values, around 0.25 to 0.4 and produce moderate runoff. Soils with high silt content are the most susceptible to erosion of all soils. They separate easily, are prone to crusting, and give high flow rates. The K values for these soils are generally greater than 0.4. Organic matter reduces erosion because it reduces the soil's susceptibility to sloughing and increases infiltration, which reduces runoff and thus erosion. The addition or accumulation of increased organic matter due to management such as manure application is represented by the C factor and not by the K factor. Soil structure influences both susceptibility to detachment and infiltration. Soil profile permeability affects K because it affects runoff.

Although the K factor was chosen to represent the soil in its natural state, past management or misuse of the soil as a result of intensive farming in the Shyngyrlau River basin can increase its erosive capacity.

Slope Length and Steepness Factor (LS)

The LS coefficient was derived from the Stone and Hilborn equation (Stone and Hilborn, 2000). The calculations and coefficients of the spatial distribution L, S is carried out in the GIS environment using the following equation:

LS=power [(Flow Accumulation)*cell size/22.13]0,4*power[sin(slope*0,01745/0,0896].

The value of the terrain steepness is expressed in degrees. Most of the space images were obtained from the US Geological Survey mapping portal https://earthexplorer.usgs.gov.The value of the terrain steepness is obtained in degrees.

Slope Curvature Factor (Cu)

The idea of this article is that the improved universal soil loss equation (RUSLE) is used along with the GIS spatial analytic techniques and satellite data, giving an assessment of the current distribution of water erosion processes and development conditions in the Shyngyrlau River basin. For the first time, the coefficient Cu (the curvature of the soil loss slope) is used based on the improved universal soil loss equation. In the study, a new factor called curvature (Cu factor) was introduced to augment accuracy of the soil loss results. Application of the above coefficient in the Shyngyrlau River basin will allow for a more accurate assessment of soil erosion.

Calculations and spatial distribution coefficients L, S, and Cu are applied in the GIS using the following equation:

$$\text{LSCu} = \left[\frac{Q_a M}{22.13}\right]^{y} \times \left(0.065 + 0.045 \times S_g + 0.0065 \times S_g^2\right) \quad (3)$$

where LSCu - Topographic factor; Qa - Flow Accumulation grid; Sg - Grid slope in percent; M - grid size (x × y), y or NN common value – dimensionless exponent, taking slope and curvature values between 0.2–0.5. The total curvature based on the Zevenbergen-Thorne algorithm can be calculated as (Zevenbergen and Thorne, 1987):

$$\text{Curvature} = -2(D + E) * 100 \quad (4)$$

$$D = \left[\frac{(z^4 + z^6)}{l^2} - Z_5\right] \qquad E = \left[\frac{Z_2 + Z_8)}{l^2} - Z_5\right]$$

where z^4 – height points in cells; l – distance between elements of the DEM (spatial resolution of the raster), units of measurement (meters). Curvature is measured in 1/m, after which it is multiplied by 100, i.e. the profile (vertical) curvature characterizes the change in the slope of the surface by 100 m along its main direction. The convex part is characterized by positive values, and the concave part is characterized by negative values, zero values are respectively characterized by a flat surface in the profile.

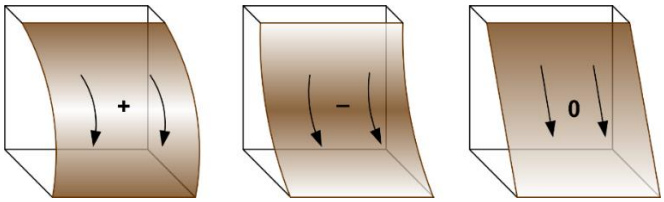


Figure 3.The profile curvature is parallel to the direction of maximum slope, characterizes the curvature of the streamline in the vertical plane (Buckley, 2010)

The range of possible values for all three curvatures ranges from –0.5 to +0.5 for areas with flat terrain and from –4 to +4 for mountainous areas [49]. Elevation of the study region ranges up to 277 m NN curvature is calculated + 0.5.

In our calculations, we used the profile curvature, which affects the acceleration or deceleration of the flow, and, therefore, affects erosion and sediment deposition, which is calculated using the ArcGIS Spatial Analyst software module.

Crop Management Factor (C)

Factor-C takes into account the type of crop and the method of tillage. It is used to determine the relative effectiveness of soil and crop management systems in terms of preventing soil loss. Factor C is used to determine the relative effectiveness of soil and crop management systems in terms of preventing soil loss. In the study region in the

north during the period of vegetative activity (from May to August) with average cloudiness, the monthly amount of photosynthetic active radiation is 284–336 MJ/(m^2 •month), in the south this figure increases to 293–348 MJ/(m^2 •month). During the period of vegetative activity during the month, the average sun shines 9.5–10.5 hours a day. By natural conditions, the study area is favorable for growing long-day plants, solar radiation indicators are sufficient to provide optimal conditions for the growth of crops. For early spring crops, the duration of the growing season is 191–212 days; for late spring crops, this figure increases from north to south by 156–180 days.

In the study area, during the growing season, at an air temperature >5°C, 3100–3800°C of heat accumulates; at an air temperature above 10°C, 2900–3600°C of heat accumulates During the warm period, on average, 112–228 mm of precipitation falls, of which 62–137 mm of precipitation falls during the period of active vegetation of crops. In the northern regions of the region for this period, about 72 mm of precipitation is provided by 90%, in the southern regions of the region; this amount drops to 44 mm, which is insufficient for the normal development of crops. On the territory of the region, the moisture coefficient is 0.33–0.74. In the northern part of the study region, the biochemical oxygen demand under natural moistening conditions exceeds 30-35 q/ha, in the central part the value of biochemical oxygen demand is from 20 to 30 q/ha, and in the southern part of the region is less than 20 q/ha.

Conservation Practice Factor (P)

One of the main land management measures aimed at the efficient use of land resources and preservation of soil fertility is anti-erosion measures. In this case, the main task is the implementation of anti-erosion measures. The development of design schemes for the use of erosion-hazardous lands determines economic technical measures for the implementation of anti-erosion actions for a certain period of time, as well as long-term goals for protecting land resources from erosion processes and ways to achieve them. In the region under study, the following types of anti-erosion measures are used (Darbayeva et al., 2020; Ramazanova et al., 2019):

- anti-erosion crop rotations,
- flat-cut processing methods,
- plowing across the slope,
- dumpless plowing,
- socketing

Table 1. Values of anti-erosion measures according to the universal RUSLE formula (P factor data) [35]

Support practice	P factor
Up and down slope	1.0
Cross slope	0.75
Contour farming	0.50
Strip cropping, cross slope	0.37
Strip cropping, contour	0.25

Factor P expresses complex anti-erosion measures aimed at protecting the upper layer of the soil cover from erosion. This factor characterizes intentional initiative forms of soil cover cultivation by land users.

The values of this factor vary from 0.01 to 1; an increase in the value characterizes the absence of coverage, a decrease in the set. For example, contour farming can reduce the value of this factor to 0.50. Since the territory of the Shyngyrlau River basin is represented predominantly by slightly undulating and slightly sloping plains, soil cultivation is mainly carried out by transverse plowing. Cross plowing technology is used on inclined surfaces up to 3°. Transverse plowing is characterized by a value of "0.75" (Table 1). The main objective of organizing anti-erosion measures is to counter erosion processes and restore the fertility of eroded soils, as well as to prevent the formation of erosion in areas with a potentially high risk of erosion processes, that is, the elimination of factors that can cause erosion processes. But planned activities can be implemented if these activities are cost-effective. In this regard, it is necessary to determine the economic feasibility of the planned anti-erosion measures. When assessing economic calculations for the implementation of anti-erosion measures, it is first of all necessary to take into account their environmental feasibility, which primarily takes into account the preservation of landscape diversity and the prevention of erosion processes.

RESULTS

The produced rainfall (R factor) maps Figure 4 (a) showed a temporally and spatially differential precipitation distribution. These variations follow the annual rainfall Figure 4 (a that has been recorded at the rain monitoring four stations in the Shyngyrlau Basin. As a rule, the data used in the calculation of the R factor, except precipitation, remain unchanged. This regularity is also characteristic of the spatial distribution of precipitation. The precipitation factor displays a value variation range from 75 to 112.6 with an increasing and decreasing trends in the north and the southwest, resp,. Figure 4 a. In general, the northern part of the studied territory has the maximum predisposition for initiation of erosion processes because of the higher rainfall and topographic gradient. The degree of erosion increases with the length of the slope.

Table 2. Key study areas West Kazakhstan region

	Key area	Coordinates	Soil structure
1	Zelenovsky	N 51°60'712" E 052°10'570"	Clayey
2	Shyngyrlausky	N 51°41'880" E 051°93'748"	Loam
3	Syrymsky	N 51°27'457" E 051°92'629"	Loess
4	Karatobynsky	N 51°18'658" E 051°10'022"	Loess
5	Burlinsky	51°43'964" 050°85'882"	Loess
6	Terektinsky	51°42'762" 050°78'121"	Diversesediments
7	Akzhaiyksky	N 51°33'221" E 050°61'142"	Diversesediments
8	Baitereksky	N 51°35'331" E 050°54'535"	Clayey

The soil erosion map Figure 4 b displays the areas where solid crystalline rocks forming the present surface are widespread with a coefficient of 0.2 which are less prone to erosion.

According to the mechanical composition of the soils in the Shyngyrlau Basin of the West Kazakhstan region, they are mainly clayey, loamy, sandy, and loess-like soils with low K values. At places, where the level of silt is high in loams the soil cover is more susceptible to erosion, there the K factor reaches a level of up to 0.32.

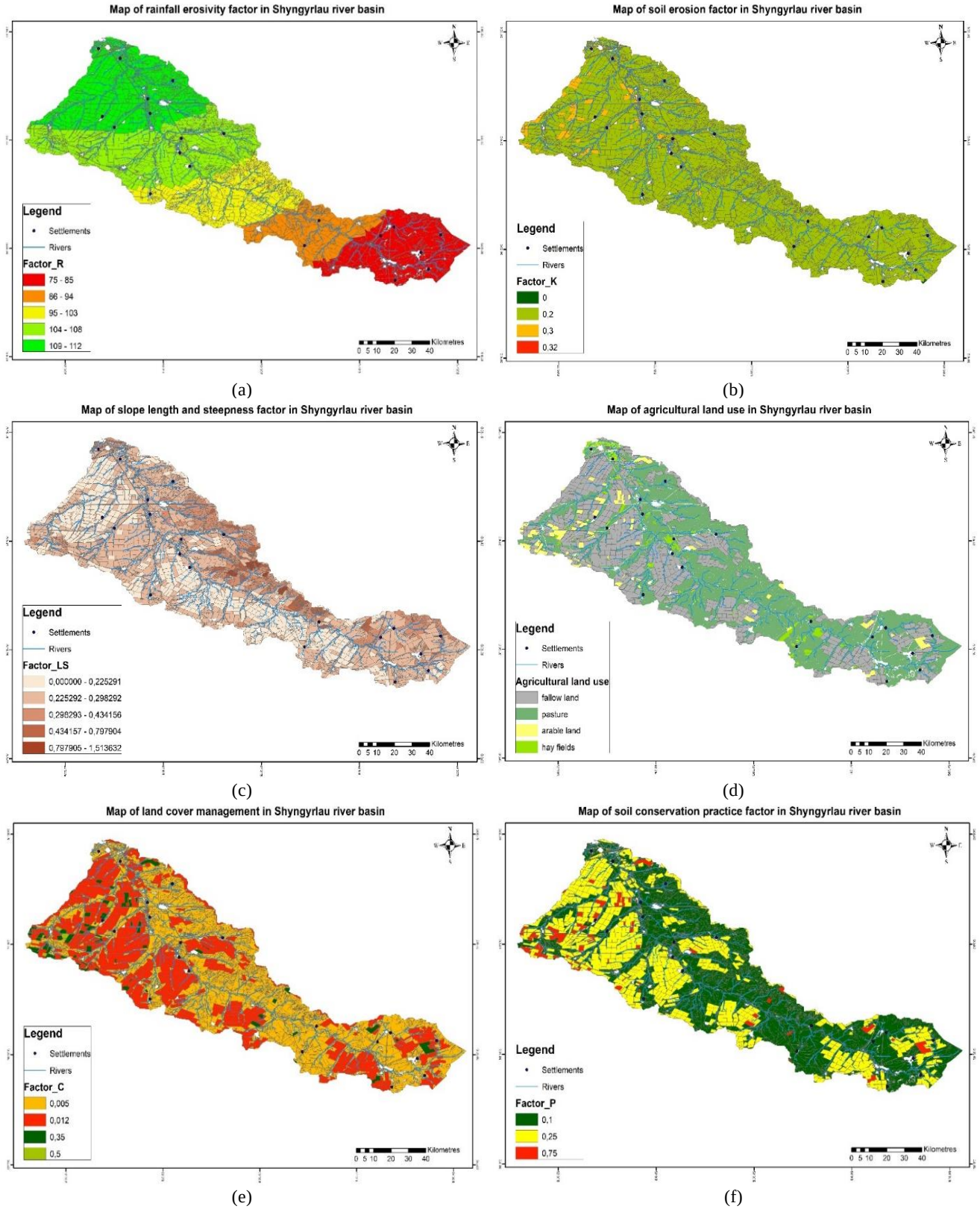


Figure 4. The RUSLE soil cover erosion parameters in the Shyngyrlau Basin: (a) Rainfall erodibility factor (R factor) for the year 2021; (b) erodibility factor (K factor); (c) slope length and steepness factor (LS factor); (d) agricultural land use; (e) cover management factor (C factor); (f) erosion control practice factor (P factor)

The steepness map was generated for the entire river basin Figure 4c. The slope rate was calculated in the GIS environment with a LS-factor of 0.0001. The value of the relief steepness of the Shyngyrlau River basin varies from 0 to 1.513 degrees. The climatic conditions of the area allow the cultivation of corn and sorghum.

The low yield of crops in the investigated river basin is due to traditional agricultural practices, and the low productivity of the irrigated lands. Other factors include frequent droughts, a low level of application of modern technologies, and an extremely low production efficiency of the irrigated land.

DISCUSSION

The conducted field investigations and analytical research provided a close assessment of the potential soil erosion dynamics in the Shyngyrlau Basin using the diagnostic multi-criteria of the RUSLE model processed by the ArcGIS software. The RUSLE approach for the regional risk erosional assessment on the territory of Western Kazakhstan was applied for the first time in spite of certain methodology limitations. The applied empirically based approach provides prediction of the long-term average annual rate of slope soil erosion using six specific factors. It estimates soil loss in similar landscape terrains and under analogous meteorological conditions. The integrated factors (R, LS, K, P, C, Cu) minimize the overall uncertainties. The newly introduced Cu-factor increased accuracy of the soil loss results.

The MAP is the key factor, along with the slope structure, inclination and the land use, affecting soil erosion. In the northern part of the study area (Taskala, Aksai, Uralsk, Yanvartsevo), >300 mm of MAP is recorded contrasting to <200 mm of precipitation in the south of the region (Taipak, Zhanakazan) (Figure 5). In general, during the warm season of the year, precipitation falls 2 times more frequently than during the cold season. In the course of a year, two precipitation maxima are observed; the first in July in the north gradually shifting southward, and the second in October.

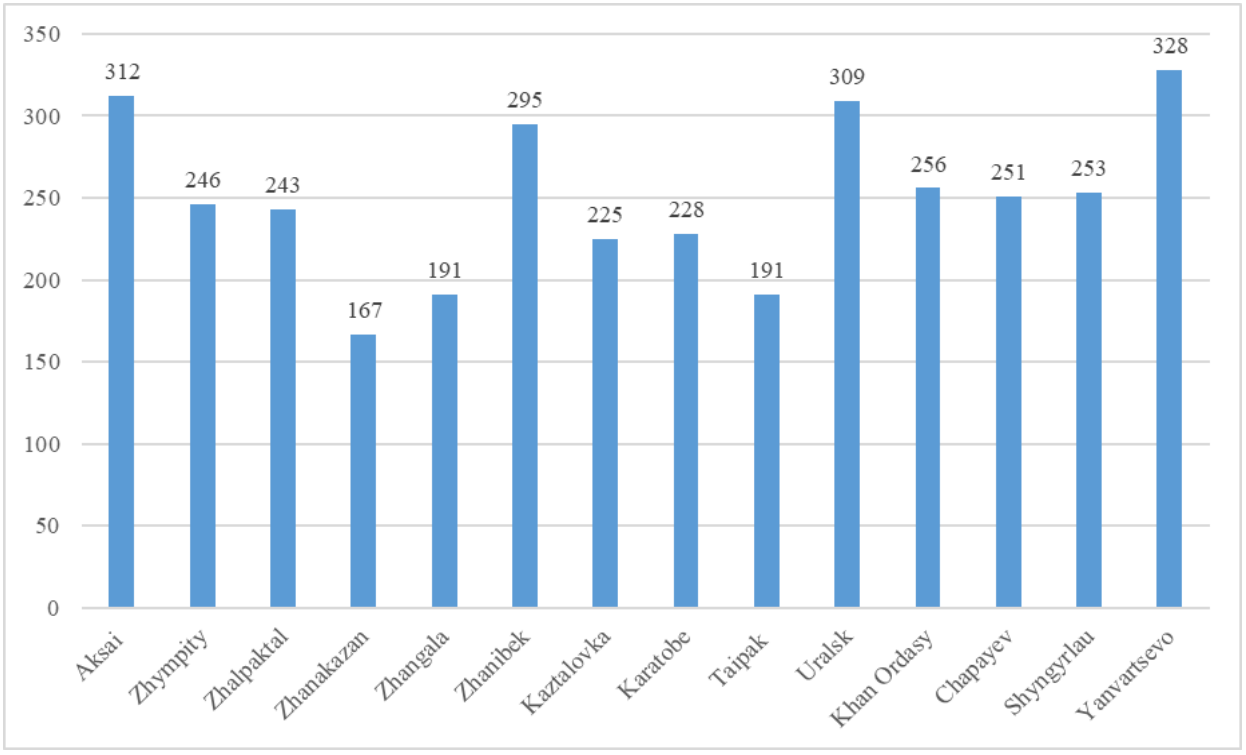


Figure 5. Average annual precipitation records of the West Kazakhstan region

According to the precipitation variation records from the weather stations, the long-term precipitation data for the warm (April–October) and cold (December–March) seasons are uniform and amount 22–23% of MAP (Table 1). The results (Figure 4 (a)) show that the precipitation regime, both warm and cold, remains moderate from year to year, and is long-term relatively stable. The frequency from 2011 to 2021 of a high rainy warm period is 21% with a probability of 2 times per decade. The repeatability of a low rainy warm period is 18% with a probability of 2 times per decade.

The K-factor is a major variation to the USLE procedure. Its values for the study area (0–0.32) asses soil erodibility with zero values least susceptible to erosion. The analytical data show that K is not constant, but varies with the season, starting from the early spring and ending in mid-autumn during the first ground freeze. Practically at all key sites (Table 2), there was a high content of clay in soils. These are the places with the low erosive risks and more consolidated top grounds. The relief model (DEM) of the Shyngyrlau River basin shows a dominantly low topography gradually decreasing from the NE to the SW. The anti-erosion measures are aimed to counteract the activated erosion processes and restore the fertility of the eroded soils, as well as to prevent erosion in the areas with potentially high ground instability. It is necessary to determine the economic feasibility of the planned anti-erosion measures because of high costs. Also environmental feasibility must take into account the preservation of the pristine landscape diversity and the prevention of erosion processes.

The climatic, geomorphic and pedological conditions predetermine the agricultural yields. The cooler years do not offer optimal predispositions for growing winter barley opposite to winter rye and wheat. This is partly due to a small snow cover and the soils' minor retention potential during early winter. The latter plants can be cultivated in the Zelenovsky, Taskalinsky, Uralsk, Terektinsky, Shyngyrlau and Borilinsky districts, as well as in the north of the Kaztalovsky, Zhanibeksky, Syrymsky, Akzhaiyksky and Karatobinsky districts. Nevertheless, during cold winters, winter wheat and rye are more likely to freeze. In the northern part of the study area, during the period of vegetative activity (from May to August) with average cloudiness, the monthly amount of photosynthetic active solar radiation is 284–336 MJ / (m^2 •month), in the south this figure increases to 293–348 MJ / (m^2 •month), with average sunshine 9.5–10.5 hours a day. The regional natural conditions provide optimal predispositions for vegetation growth and crop agriculture.

In the areas of cultivation of crops in the study area, the minimum air t ranges from –37.6° C to –41.1 ° C. Under such temperature conditions, the optimal height of snow cover that protects winter crops should exceed 23 cm. The average snow cover height throughout the region is < 23 cm along with a strong drop in air temperature. The indicator of the severity of winter according to A.M. Shulgin from 1 to 2.9 (severe) for 4 weather station according to A.M. Shulgin (Baisholanov, 2017), >3 (very severe) for 9 weather station. Such indicators do not create optimal conditions for growing winter crops, where the main reason is the low snow depth. The results conclude that the annual average soil loss estimated using the RUSLE model is about 142,419 t/ha/yr in the Shyngyrlau Basin. It is also observed that the overall erosion varies with respect to the relief, vegetation cover and the character and intensity of land use. In the most threatened places, suitable soil conservation practices are to be implemented (Figure 6).

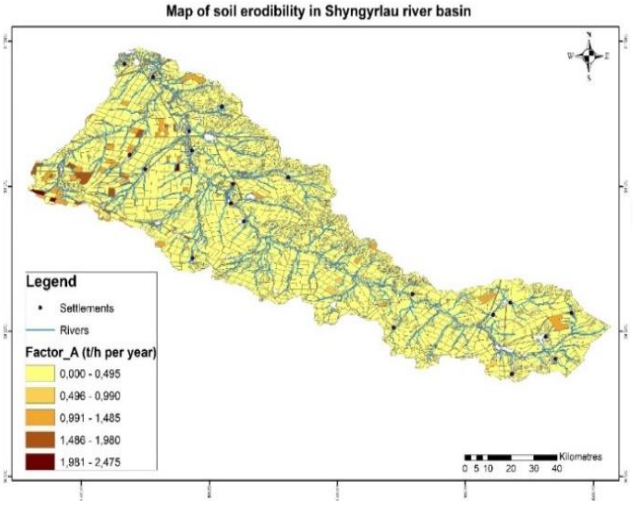


Figure 6. Soil erodibility (the Shyngyrlau river basin)

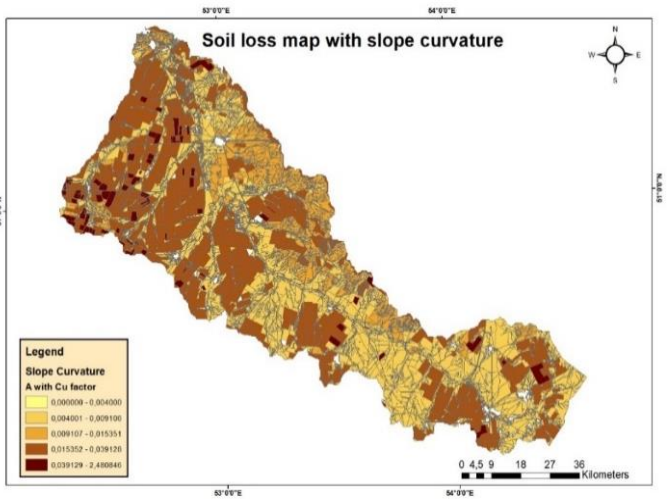


Figure 7. Soil loss map with slope curvature (the Shyngyrlau river basin)

CONCLUSION

Active recreational development, haphazard construction and operation of roads have led to a strong increase in water erosion and the formation of numerous linear erosion forms. Water erosion develops in most cases along roads laid along the thalwegs of the ancient ravine-hollow network. Light substrate and sparse vegetation cover predetermine its rapid development. The situation is aggravated by intensive grazing. Thus, in most cases, the expansion of the erosion network is caused by anthropogenic factors. The development of forms of water erosion leads to a violation of the integrity of modern natural complexes of Western Kazakhstan, which significantly reduces their stability.

The multi-proxy, satellite and GIS-based RUSLE analysis detailed more accurately the spatial distribution of places in the Shyngyrlau Basin prone to erosion. The data layers (raster maps) extracted for the K, LS, Cu, R, C, and P factors of the RUSLE model were integrated within the Arc GIS spatial analyst to quantify, evaluate, and generate the maps of soil erosion risks and its severity within the study area of Western Kazakhstan**.** The soil erosion risks show their increase in the agrarian areas due intensification of agricultural practices. The lowest Soil Erosion Factor (K) value (0.2) defines the sandy clayey soils, predominantly of a pastoral land use; the highest value (0.3) associated with clayey soils characterize the arable agriculture. According to the newly defined Cu Factor, the soil erosion in the investigated area is estimated 0.007–2.48 t/ha/yr.

Empirical soil erosion models are easy to interpret, require minimal resources, and can be worked out with readily available inputs to the areas of high erosion risk. The results define the spatial places exposed to erosion and outlined control measures in the most severely affected places. The RULSE model helps in mapping vulnerable zones susceptible to soil erosion and sediment re-deposition. Application of the model has a major significance in determination and identification of most effective management strategies aimed at the surficial erosion control. A comparison of the potential and actual soil loss helps in assessing the erosion impact of various cropping systems as well as to the choice of the proper land conservation practices. The results in of the pilot research facilitate implementation of new approaches in conservation practices of the non-cultivated (pristine) and cultivated lands, reducing soil erosion in Western Kazakhstan. They also contribute to the regional development management and provide options to policymakers for control of the present/future soil erosion risks, mitigation of degraded lands, and soil loss.

Author Contributions: Conceptualization, N.R., Zh.O., and J.C.; methodology, K.A. and A.A.; software, E.T.; writing – original draft preparation, N.R. and E.T.; writing – review and editing, J.C., analysis tools and technical assistance S.T.; A.A. and J.Kh.; supervision N.R.;. All authors have read and agreed to the published version of the manuscript.

Funding: This study was conducted within the framework of grant funding of scientists for scientific and (or) scientific and technical projects for 2021-2023 by the Ministry of Science and Higher Education of the Republic of Kazakhstan (IRN No. AP09260232).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data are available on request to the corresponding author..

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Alexakis, D., Hadjimitsis, D., & Agapiou, A. (2013). Integrated Use of Remote Sensing, GIS and Precipitation Data for the Assessment of Soil Erosion Rate in the Catchment Area of Yialias in Cyprus. *Atmospheric Research*, 131 (10), 108-124. http://dx.doi.org/10.1016/j.atmosres.2013.02.013

Arnold, J.G., Srinivasan, R., Muttiah, R., & Williams, J.R. (1998). Large Areas Hydrologic Modeling and Assessment Part I: Model Development. *Journal of the American Water Resources Association*, 34 (1), 73-89. http://dx.doi.org/10.1111/j.1752-1688.1998.tb05961.x

Ascough, J., Baffaut, C., Nearing, M., & Liu, B. (1997). The WEPP Watershed Model: I. Hydrology and Erosion. *Transactions of the American Society of Agricultural and Biological Engineers*, 40 (4), 921-933. http://dx.doi.org/10.13031/2013.21343

Baisholanov, S.S. (2017). Agroklimaticheskiye resursy Zapadno-Kazakhstanskoy oblasti: nauchnoprikladnoy spravochnik [Agroclimatic resources of the West Kazakhstan region: scientific and applied reference book]. Astana.

Berhe, A.A., Harte, J., Harden, J.W., & Torn, M.S. (2007). The significance of the erosioninduced terrestrial carbon sink. *Bioscience*, 57 (4), 337-346. http://dx.doi.org/10.1641/B570408.

Bonilla, C.A., Reyes, J.T., & Magri, A. (2010). Water Erosion Pre- diction Using the Revised Universal Soil Loss Equation (RUSLE) in a GIS Framework. *Central Chile. Chilean Journal of Agricultural Research*, 70 (1), 159-169 http://dx.doi.org/10.4067/S0718-58392010000100017

Buckley, A. (2010). Understanding curvature rasters / ArcGIS Resources. https://blogs.esri.com/esri/arcgis/2010/10/27/understanding-curvature-rasters/

Chashina, B., Ramazanova, N., Atasoy, E., Berdenov, Z., & Ilieş, D.C. (2020). Natural recreation potential of the West Kazakhstan region of the Republic of Kazakhstan. *GeoJournal of Tourism and Geosites*, 32(4), 1355–1361. https://doi.org/10.30892/gtg.32424-580

Das, B., Paul, A., Bordoloi, R., Prakash, O., & Pankaj, T. (2018). Soil erosion risk assessment of hilly terrain through integrated approach of RUSLE and geospatial technology: A case study of Tirap District, Arunachal Pradesh. *Modeling Earth Systems and Environment*, 4, 37–381. http://dx.doi.org/10.1007/s40808-018-0435-z

Darbayeva, T.N., Ramazanova, B., Chashina, Z., Berdenov, E., Mendybayev, J.A., Wendt, & Atasoy, E. (2020). Modeling soil erosion in the Chagan river basin of the west Kazakhstan with using RUSLE and GIS tools. *J. Environ. Biol.*, 41, 396-404. http://doi.org/10.22438/jeb/41/2(SI)/JEB-18

De Jong, S., Paracchini, M., Bertolo, F., Folving, S., Megier, J., & De Roo, A. (1999). Regional Assessment of Soil Erosion Using the Distributed Model SEMMED and Remotely Sensed Data. *Catena*, 37, 291-308. http://dx.doi.org/10.1016/S0341-8162(99)00038-7

Doetterl, S., Van Oost, K., & Six, J. (2012). Towards constraining the magnitude of global agricultural sediment and soil organic carbon fluxes. *Earth Surface Processes and Landforms*, 37 (6), 642-655. http://dx.doi.org/10.1002/esp.3198.

Fernandez, C., Wu, J.Q., McCool, D.Q., & Stockle, C.O. (2003). Estimating water erosion and sediment yield with GIS, RUSLE and SEDD. *Journal of Soil and Water Conservation*, 58 (3), 128-136.

Flanagan, D.A., & Nearing, M.A. (1995) USDA Water Erosion Prediction Project: Hillslope Profile and Watershed Model Documentation. *USDA-ARS, National Soil Erosion Research Laboratory*, West Lafayette.

Gitas Loannis, Z., Minakou, D., Silleos, Ch., George, N., & Karydas, Christos, G. (2009). Multi-temporal soil erosion risk assessment in N. Chalkidiki using a modified USLE raster model. *EARSeL eProceedings* 8, 40-52.

Gunawan, G., Sutjiningsih, & D., Sulistioweni, *H. (2013).* Soil erosion estimation based on GIS and remote sensing for supporting integrated water resources conservation management. *International Journal of Technology*, 4(2), 147–156.

Imamoglu, A., & Dengiz, O. (2017). Determination of soil erosion risk using RUSLE model and soil organic carbon loss in Alaca catchment (Central Black Sea region, Turkey). *Rendiconti Lincei*, 28 (1), 11-23. http://dx.doi.org/10.1007/s12210-016-0556-0

Janaleyeva, K.M. (2010). Fizicheskaya geografiya Respubliki Kazakhstan [Physical Geography of the Republic of Kazakhstan]. Eurasian National University L.N. Gumilev, Astana, Kazakhstan.

Lal, R. (2003). Soil erosion and the global carbon budget. *Environment International*, 29 (4), 437-450. http://dx.doi.org/10.1016/S0160-4120(02)00192-7

Liu, S., Bliss, N., Sundquist, E., & Huntington, T.G. (2003). Modeling carbon dynamics in vegetation and soil under the impact of soil erosion and deposition. *Global Biogeochemical Cycles*, 17 (2), 1074. http://dx.doi.org/10.1029/2002GB002010.

Mekonnen, M., Keesstra, S.D., Baartman, J.E., Ritsema, C.J., & Melesse, A.M. (2015). Evaluating sediment storage dams: structural off-site sediment trapping measures in northwest Ethiopia. *Cuadernos de Investigación Geográfica*, 41(16). https://doi.org/10.18172/cig.2643

Mhangara, P., Kakembo, V., & Lim, K. (2012). Soil Erosion Risk Assessment of the Keiskamma Catchment, South Africa Using GIS and Remote Sensing. *Environmental Earth Science, 65*, (7), 2087-2102. http://dx.doi.org/10.1007/s12665-011-1190-x

Morgan, R., Quinton, J., Smith, R., Govers, G., Poesen, J., Auerswald, K., Chisci, G., Torri, D., & Styezen, M. (1998). The European Soil Erosion Model (EUROSEM): A Dynamic Approach for Predicting Sediment Transport from Fields and Small Catchments. *Earth Surface Processes and Landforms*, 23, 527-544. http://dx.doi.org/10.1002/(SICI)1096-9837(199806)23:6<

Moore, I.D., Grayson, R.B., & Ladson, A.R. (1991). Digital terrain modelling: A review of hydrological, geomorphological, and biological applications. *Hydrological Processes*, 5(1), 3-30. https://doi.org/10.1002/hyp.3360050103

Nearing, M.A., Jetten, V., Baffaut, C., Cerdan, O., Couturier, A., Hernandez, M., Le Bissonnais, Y., Nichols, M.H., Nunes, J.P., Renschler, C.S., Souche're, V., & van Oost, K. (2005). Modeling response of soil erosion and runoff to changes in precipitation and cover. *Catena*, 61, 131-154.

Official Internet Resource - RSE "KAZHYDROMET" https://www.kazhydromet.kz , 11/01/2021.

Panagos, P., Ballabio, C., Borrelli, P., Meusburger, K., Klik, A., Rousseva, S., Tadić, M.P., Michaelides, S., Hrabalíková, M., Olsen, P., Aalto, J., Lakatos, M., Rymszewicz, A., Dumitrescu, A., Beguería, S., & Alewell, C. (2015). Rainfall erosivity in Europe. *Sci Total Environ*, 1 (511:801-14). https://doi.org/10.1016/j.scitotenv.2015.01.008

Prasannakumar, V., Vijith, H., Abinod, S., & Geetha, N. (2012). Estimation of soil erosion risk within a small mountainous sub-watershed in Kerala, India, using Revised Universal Soil Loss Equation (RUSLE) and geo-information technology. *Geoscience Frontiers*, 3(2), 209–215. http://dx.doi.org/10.1016/j.gsf.2011.11.003.

Petrenko, A.Z., Dzhubanov, A.A., Fartushina, M.N., Irkalieva, R.M., Ramazanov, S.K., Sdykov, M.N., Darbaeva, T.E., Kolychenko O.T., & Chernyshev, D.M. (1998). Prirodno-resursnyy potentsial i proyektiruyemyye ob"yekty zapovednogo fonda Zapadno-Kazakhstanskoy oblasti [Natural resource potential and projected objects of the reserve fund of the West Kazakhstan region]. West Kazakhstan Humanitarian University named after A.S. Pushkin, Uralsk, Kazakhstan, 174 p.

Ramazanova, N.Y., Berdenov, Z.G., Ramazanov, S.K., Kazangapova, N.B., Romanova, S.M., Toksanbaeva, S.T., & Wendt, J. (2019). Landscape geochemical analysis of steppe zone basin Zhaiyk. News of the National Academy of Sciences of the Republic of Kazakhstan. *Series of Geology and Technical Sciences*, 4 (436), 33-41. https://doi.org/10.32014/2019.2518-170X.95

Ramazanova, N., Ozgeldinova, Z., Tursynova, T., Asylbekov, K., Turyspekova, E., Toksanbaeva, S., & Zhanabayev, D. (2022). Analysis of the impact of soil erosion in the Embulatovka River Basin on the development of recreational conditions of the natural resource state of the West Kazakhstan region. *GeoJournal of Tourism and Geosites*, 43(3), 866–871. https://doi.org/10.30892/gtg.43304-898

Ramazanova, N., Ozgeldinova, Z., Turyspekova, E., Akhmedova, A., Tursynova, T., Toksanbaeva, S., Demeuov, A., & Ayapbekova, A. (2023). The influence of recreation on the processes of soil erosion in the forests of the West Kazakhstan region. *GeoJournal of Tourism and Geosites*, 50(4), 1350–1355. https://doi.org/10.30892/gtg.50415-1133

Ranzi, R., Le, T.H., & Rulli, M.C. (2012). A RUSLE approach to model suspended sediment load in the Lo river (Vietnam): effects of reservoirs and land use changes. *Journal of Hydrology*, 422 (423), 17-29. http://dx.doi.org/10.1016/j.jhydrol.2011.12.009

Renschler, C.S., Mannaerts, C., & Diekkrüger, B. (1999). Evaluating spatial and temporal variability in soil erosion risk - rainfall erosivity and soil loss ratios in Andalusia, Spain. *Catena*, 34, 209-225.

Renard, K.G., Foster, G.R., Weesies, G.A., McCool, D.K., & Yoder, D.C. (1997). Predicting Soil Erosion by Water: a Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE). *Agriculture Handbook*, 703. USDA, Washington DC.

Rudra, R.T., Dickinson, W.T., & Wall, G.J. (1985). Application of the CREAMS Model in Southern Ontario Contions. *Transactions of the American Society of Agricultural and Biological Engineers*, 28 (4), 1985, 1233-1240. http://dx.doi.org/10.13031/2013.32417

Sharma, A. (2010). Integrating terrain and vegetation indices for identifying potential soil erosion risk area. *Geo-Spatial Information Science*, 13(3), 201–209. http://dx.doi.org/10.1007/s11806-010-0342-6

Shinde, V., Tiwari, K., & Singh, M. (2010). Prioritization of micro watersheds on the basis of soil erosion hazard using remote sensing and geographic information system. *International Journal of Water Resources and Environmental Engineering*, 2 (3), 130-136.

Stone, R.P., & Hilborn, D. (2000). Fact Sheet, Universal Soil Loss Equation. *Ministry of Agriculture, Food and Rural Affairs: Guelph, ON, Canada*, p. 12.

Udayakumara, E.P.N., Shrestha, R.P., Samarakoon, L., & Schmidt-vogt, D. (2010). People's perception and socioeconomic determinants of soil erosion: A case study of Samanalawewa watershed. *Sri Lanka International Journal of Sediment Research*, 25, 323–339.

Wijesundara, N.C., Abeysingha, N.S., & Dissanayake, D.M.S.L.B. (2018). GIS-based soil loss estimation using RUSLE model: A case of Kirindi Oya river basin. *Sri Lanka Modeling Earth Systems and Environment*, 4(1), 251–262. http://dx.doi.org/10.1007/s40808-018-0419-z

Wischmeier, W.H., & Smith, D.D. (1965). Predicting Rainfall Erosion Losses from Cropland East of the Rocky Mountains, Agricultral Handbook, 282, Agricultural Research Service, US Department of Agriculture, Purdue Agricultural Experimental Station.

Wischmeier, W.H., & Smith, D.D. (1978). Predicting Rainfall Erosion Losses: A Guide to Conservation Planning," Agricultural Handbook, 537, US Department of Agriculture, Washington DC.

Xu, Y.Q., Shao, X.M., & Peng, J. (2009). Assessment of soil erosion using RUSLE and GIS: a case study of the Maotiao River watershed, Guizhou Province, China. *Environmental Geology*, 56, 1643-1652.

Zaimes, G.N., Schultz, R.C., & Isenhart, T.M. (2006). Riparian land uses and precipitation influences on stream bank erosion in Central Iowa. *Journal of the American Water Resources Association*, 42 (1), 83-97. https://doi.org/10.1111/j.1752-1688.2006.tb03825.x

Zevenbergen, L.W., & Thorne, C.R. (1987). Quantitative Analysis of Land Surface Topography. *Earth Surface Processes and Landforms*, 12, 47-56. http://dx.doi.org/10.1002/esp.3290120107

Article history: Received: 25.09.2023 Revised: 24.11.2023 Accepted: 20.12.2023 Available online: 29.12.2023

GeoJournal of Tourism and Geosites

Year XVI, no. 4 supplement, vol. 51, 2023

ISSN 2065-1198
E-ISSN 2065-0817