

RESEARCH ARTICLE

The relationship between cultural tourism and transportation: A global perspective

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ABSTRACT

The importance of tourism and cultural values for countries, regions, or areas is increasing day by day. Cultural tourism includes many activities with a wide scope. Transportation, on the other hand, is a factor that directs tourists' choices in terms of tourism, providing access to the areas they have visited or will visit. The research aims to reveal the factors affecting the relationship between cultural tourism and transportation. For this purpose, the focus is on cultural tourism and transportation research in the WoS database. The bibliometric analysis method was used in the application. Important inferences were obtained by evaluating 433 studies in the literature. As a result of the analysis, authors who have conducted intensive research on the subject, publication production amounts, efficiencies, organizations, citations, highlighted keywords, changes over time, trends, co-occurrence networks, thematic maps, and thematic developments are included. In their research, the authors frequently emphasized the words tourism, sustainable tourism, development, transportation, China, cultural tourism, rural tourism, sustainable development, accessibility, and sustainable. The results reveal that sustainability and accessibility are effective factors in cultural tourism and transportation. The study shows that in the network of relationships, tourism, heritage, accessibility, transport, cultural tourism, management, and cultural heritage have strong connections. The findings indicate that in the relationship between cultural tourism and transportation, accessibility, management mechanisms, and cultural heritage values are highly influential. Regarding centrality and density, rural tourism, tourism development, sustainable and ecological tourism, Mexico, rural development, colonialism, competitiveness, Istanbul, and renewable energy demonstrate strong relationships. These results show that rural development, competitiveness, and colonialism play a significant role in the relationship between cultural tourism and transportation. Regarding Türkiye, Istanbul's central and dense network of relationships has been influenced by its accessible location and tourism potential. The results provide a unique and different perspective on the literature.

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INTRODUCTION

Culture has direct effects on tourism. Culture has reached an important position in tourist travel. In this respect, the impact of culture on tourism is increasing day by day [1]. Many actors are effective in the development of an area in terms of cultural tourism, infrastructure suitability, public management, information levels, marketing, advertising, cultural tourism economy, tourist activities, space, and time [2]. These actors contribute to the effectiveness and continuity of cultural tourism in any region (area). Just because an area has cultural characteristics is not sufficient for the development of cultural tourism. One of the factors that are effective in ensuring development is transportation opportunities. In

addition to factors such as advertising, promotion, presentation style, and appeal of cultural values, the width of the transportation network should also be taken into account to maintain the vitality and continuity of tourism. In recent years, transportation activities as well as cultural tourism have been effective in the development of countries, regions, cities or rural areas. The research aims to clarify the relationship between cultural tourism and transportation with the help of literature. Cultural tourism and transportation have close relationships with many environmental actors. Especially in the global environment, the scope of cultural values and transportation networks influences individuals' tourism activities.

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The development of tourism involves increasingly complex economic, social and environmental challenges [3]. In this respect, determining tourism trends and examining global problems related to all types of tourism is important in increasing regional and international cooperation [4]. The development of the tourism sector contributes to the revival of the economy, especially in touristic regions, increasing income and reducing unemployment with new job areas [5]. Correctly transferring the cultural riches created by tourism and making them interesting for local or foreign tourists is an important condition for long-term gains. In addition to economic formations, there are many social, technological and environmental actors in cultural tourism activities.

Sustainable development of tourism depends on transportation and tourism coordination. Government policies, transportation infrastructures, demands and participation of the local community are effective in this coordination [6]. The development of transportation infrastructure facilitates the mobility of individuals. This contributes to the tourism sector and economic development [7]. In this respect, well-designed transportation and road networks have a key role in the efficiency of transportation systems [8]. Today, investments in transportation infrastructures allow tourists to travel from one area to another safely, comfortably and quickly. Minimizing costs in transportation helps more tourists travel in cultural tourism activities. This has led to greater investment in rail and maritime transport in many countries, regions or cities. In addition, arrangements have been made for ease of access in transportation networks in order to fully ensure cost minimization.

There are very few studies on the relationship between transportation and tourism that reveal the effects of transportation. Social, economic and spatial inequalities are very important for tourism. In this context, tourism and transportation have rarely been systematically examined in research [9]. Taking into account this gap in the literature and especially the research carried out in recent years, activities related to both transportation and cultural tourism have been researched from a holistic perspective. Increasing the visits of local and foreign tourists in cultural tourism activities is possible with the systematic functioning of transportation facilities. New perspectives can be gained to the literature through the relationship between cultural tourism and transportation.

In previous studies, no research has been found that examines the relationship between cultural tourism and transportation through a review of the literature. In this context, the aim was to fill an important gap in the literature. Analyzing the companies operating in the transportation and cultural tourism sectors, tourists, and regions (such as cities or countries) from a thematic or geographical perspective could provide unique contributions to the literature. Methodologically, there is a need to increase the number of studies conducted on this topic in the international literature. It is hoped that the research results will contribute to addressing this need.

Technological advancements and changes have led to significant transformations in the needs and expectations of societies. This has impacted both transportation and cultural tourism in various ways. Time has become an important resource in terms of transportation and tourism activities. In this regard, the need to make the best use of time has necessitated ensuring easy access to cultural tourism and transportation activities and creating a happy and safe environment from a cultural perspective. The research

highlights that cultural tourism and transportation are inseparable concepts in the literature. In this context, within the scope of the research objectives, the study includes authors who have conducted extensive research on the topic, the publication output of the authors, their productivity, the most effective organizations, author citations, emphasized keywords, changes in concepts over time, trends, co-occurrence networks explaining the relationships between words, thematic maps, and thematic developments. From this perspective, the research results will discuss the problems or solutions that authors frequently highlight in studies conducted in the field of cultural tourism and transportation. The relationship strength of the concepts that authors most frequently emphasize will be revealed. Ultimately, the concepts deemed important in cultural tourism and transportation will provide unique contributions to the literature.

LITERATURE REVIEW

Culture Tourism

Culture tourism; It is a type of tourism that is expressed as places where tourists systematically visit cultural values in order to experience what they see outside the places where they live. Cultural tourism has four subtypes: cultural ecotourism, indigenous cultural tourism, eco-cultural tourism and socio-cultural tourism [10]. In addition to the fields of art, music and history, cultural tourism is also evaluated within the scope of religion, gastronomy, industrial heritage, events, festivals and architectural features [11]. In this respect, cultural tourism; It can be evaluated within the scope of study tours, cultural trips, performing arts, festivals, cultural travel, visits to monuments and sites, travels to examine folklore, art and nature [12]. In this respect, the scope of cultural tourism is quite wide. Bringing the cultural values of societies into tourism allows tourists to have good experiences.

In cultural tourism, there is the destruction of natural areas. For example, air pollution is a reason for this situation. The destruction of culture has spiritual and emotional consequences. This situation can also be caused by the destruction of social values and corruption in terms of history and consciousness [13]. Similarly, factors such as the decrease in resources, deterioration in quality, sustainable tourism understanding, the spread of tourism throughout the year, tourists' boredom with the classical tourism concept, different expectations, excitement and holidays have supported the formation of an alternative tourism concept [14]. In this respect, the development of cultural tourism has changed day by day depending on the expectations of tourists and relevant stakeholders. Thanks to technological advances, artificial intelligence applications, virtual reality and digitalization used in tourism have further increased the effectiveness of cultural tourism.

Countries with tourism resources have not had the opportunity to develop different types of tourism at a competitive level [15]. In terms of cultural tourism, cultural resources were evaluated in two parts in terms of static attractiveness and effectiveness. Sources with static appeal include monuments, theme parks, museums, architectural-artistic works, and sculptures. It has been observed that the activities include cultural-historical events, dance, music, theatre, language-literature, and festivals-artistic activities [16]. Famous historical figures, legends, myths, historical stories, and folklore were among the most effective cultural resources that could attract the attention of tourists. It has

been stated that other cultural resources include castles, fortresses, and urban features [17]. It has been understood that cultural tourism has many individual, spatial, and social features. In this respect, cultural tourism is formed with the systematic features of multifaceted activities.

The increase in the number of cities day by day makes cultural tourism the driving force of economic growth [18]. Taking advantage of the growing market of cultural tourism should be systematic and strategic [19]. Increasing the tourism potential of cities is directly proportional to their economic development and transportation facilities. Investments in tourism contribute to increasing the number of domestic and foreign tourists. This makes the existence of cultural tourism more functional. Gong et al. [20] stated that people's living standards and disposable incomes are high in cities with high GDP. They emphasized that this situation contributes more to the development of tourism.

Sustainability in Cultural Tourism

Tourism is one of the fastest-growing and developing industries worldwide. One of the most important components of this industry is cultural tourism. Cultural tourism activities generate discussions about sustainable tourism [53]. With the development of tourism, concerns about the degradation of the ecological and socio-cultural environment have led to the establishment of a globally inclusive sustainability framework [33]. In terms of cultural tourism, ensuring sustainability requires the protection of cultural gains and values. Ensuring sustainability is a social responsibility, both in terms of environmental factors and for preserving the past and transferring it to the future in a proper manner.

In the literature, Loulanski and Loulanski [51] stated that cultural heritage is valuable in terms of cultural tourism, and its sustainability from cultural, environmental, social, and economic perspectives must be ensured, wisely used, and preserved. Durovic and Lovrentjev [33] linked environmental sustainability in cultural tourism to activities such as environmental protection, infrastructure and water management, ecosystem preservation, and pollution prevention. Li et al. [52] expressed that places with cultural tourism could design organizations that promote education and participation to preserve and manage environmental sustainability. Aydın and Alvarez [54] emphasized the importance of sustainable initiatives in tourism that possess attractive, unique, and well-organized environmental characteristics in terms of cultural tourism.

Transportation

The transportation infrastructure has a structure that focuses on meeting the needs and requirements of each individual at the highest level and encourages the creation of new products for tourism [7]. In this respect, transportation is very valuable for cultural tourism. Transport and transportation facilities constitute an important component of tourism [21]. Many tourists in the world prefer tourism, the sea, mountains, and interesting country adventures in different countries [22]. Transportation facilities are an effective factor in these choices. Transportation becomes even more important, especially for tourists who have limited time and want to visit many places. Transportation is provided by different vehicles or facilities all over the world. In terms of cultural tourism, transportation has many commercial, socio-cultural, economic, political, legal, and educational impacts. While transportation contributes to the development of countries and regions in terms of tourism revenues, it also helps to

develop tourism and increase the qualifications of those operating in this sector.

Information-communication technologies, which can eliminate distance and time limit barriers in terms of tourism culture, reveal the importance of physical location and socialization factors to achieve economic breakthroughs and success. Cities and regions compete for foreign investments in cultural tourism. Various cultural opportunities, lifestyles, and quality of life are effective factors for success [23]. Although technological advances change rapidly, the importance of transportation in cultural tourism is increasing day by day. People want to physically see, experience, and feel many tourist areas or values. This situation requires adequate transportation facilities as well as cultural values. A developed transportation network creates an advantage in the formation of foreign investments.

Investments in the transportation infrastructure of countries make serious contributions to the continuity of cultural tourism. In addition to the promotion of cultural areas, the developed transportation infrastructure increases the number of visitors. Jiang et al. [24] emphasized that tourism in China has developed rapidly since 2000 and that investments in infrastructure, especially transportation, have increased. They also stated that with the increase in transportation infrastructure, the number of tourists and the country's attractions are constantly increasing. Nag and Sarkar [25] stated that Bishnupur city of India has road connections, but there is no railway, water, and air transportation around it. They emphasized that this situation negatively affects the tourism of the region and that there is very little information about the cultural heritage of the city.

Developed land, sea, air, and railway transportation networks of areas with cultural tourism opportunities can contribute to the development of sustainable cultural tourism. This situation brings with it many opportunities such as employment, economic income, and local or regional development. The research emphasizes the importance of cultural tourism and transportation networks as they complement and support each other. The fact that countries have cultural values is not enough in terms of tourism activities. Bringing these values into cultural tourism through transportation activities will lead to long-term material and moral gains. Creating cultural tourism and transportation opportunities will help develop strong policies for the future.

Transportation's Role in Accessibility

Transportation connects individuals, goods, and services to various destinations. In this regard, tourism is entirely related to travel and plays a vital role in the accessibility of transportation [59]. Accessibility is defined as the ease of reaching a particular area through a specific transportation system. The services provided in transportation have the potential to interact with accessibility [55]. Transportation systems provide essential services, particularly for cities [58]. In this context, regions with accessible transportation options contribute to the vitality of cultural tourism.

In terms of cultural tourism, accessibility, and transportation impact tourists' satisfaction levels. This situation serves many areas from cultural, social, and economic perspectives. In the literature, Antipova et al. [56] stated that accessibility in transportation systems can determine the connections and accessibility between regions across a country. Miller [57] mentioned that in terms of accessibility, transportation policies are related to travel times and can vary according to demand and supply. Jamei et al. [60] emphasized that the

safety and quality of transportation services for individuals' activities affect the use of the transportation system.

Relationship between Sustainability, Accessibility, and Rural Tourism

Ensuring sustainability in rural tourism contributes to tourist loyalty and satisfaction. In rural tourism, attention must be paid to all aspects of the community, as well as environmental and economic interactions [63]. From this perspective, rural tourism is an economic activity that promotes local development. In the areas of rural tourism, activities such as sports, adventure, hunting, hiking, climbing, health tourism, arts, educational travel, and heritage are involved [62]. In rural tourism, databases providing information about accessibility, accommodation, promotion, and other services can be developed to support tourism. This is highly effective in ensuring sustainability [65]. The contribution of accessibility to sustainability can enable strategic initiatives to be implemented in rural tourism activities.

Tomej and Liburd [61] emphasized that in regions with intensive tourism activities, a developed transportation network can lead to more tourist visits, generating positive social and economic outcomes. Ivona [62] stated that sustainable rural tourism, characterized by a balanced relationship with nature, a focus on humans, and the promotion of an ecological lifestyle, can yield satisfactory results through the best practices. Fons et al. [64] highlighted that the lack of road and internet access in rural tourism areas is a factor that limits development opportunities in terms of tourism.

Research conducted in the literature generally shows many concepts related to cultural tourism and transportation. The study will reveal the relationship between cultural tourism and transportation, focusing on the concepts that are particularly emphasized in various studies. This will help highlight the gaps, common perceptions, relational outcomes, current themes, and conceptual outcomes that can be suggested for future research in the relationship between cultural tourism and transportation. Based on the research findings, studies conducted in the fields of transportation and cultural tourism will be expressed from a holistic perspective.

MATERIALS AND METHOD

The research focuses on cultural tourism and transportation studies with the help of the Web of Science (WoS) database. No language restrictions were applied in the research analysis. All types of publications (such as articles, books, and conference papers) were included in the study. No category restrictions were applied in the research. No regional or geographical area restrictions were applied in the research.

R is a program that can be used in areas that may change constantly, such as bibliometric analysis. The flexibility and high speed of the R program help integrate other statistical applications with R packages [26]. Since bibliometric is software written with R packages, it has features that can be examined, changed, and improved by employees. In this respect, bibliometric analyses can be used in very broad and general data analyses [27]. Bibliometric analyses include performance analyses and scientific mapping applications. In this respect, the structure of a field can be summarized by analyzing the social and structural relationships between different research components such as authors, countries, subjects, and institutions [28]. Additionally, relationships between units can be revealed by using scientific maps in

bibliometric analyses. These relationships are represented as graphs or networks (different bibliometric networks) [29]. R Studio and bibliometric analysis methods were used in the application. The research aimed to clarify the relationship between cultural tourism and transportation by using both performance analysis and scientific mapping methods. The research consists of research included in the WoS database on 27.01.2024 under the title "Cultural tourism and transportation". There was no language or regional limitation in the research. In terms of the research sample, it was observed that there were a total of 433 publications in WoS on the subject of cultural tourism and transportation. The analysis results were evaluated based on these publications. The research framework is presented in Figure 1.

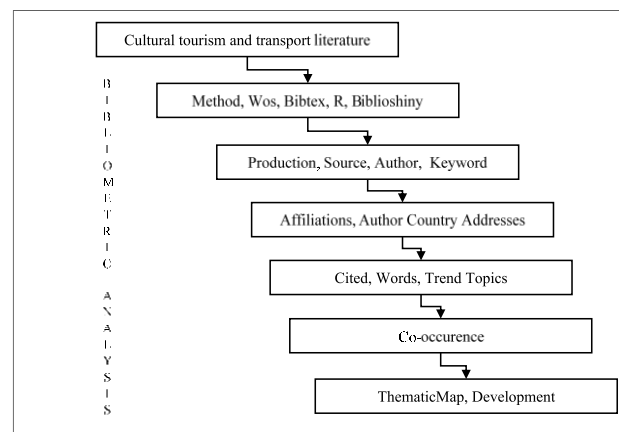


Figure 1. Cultural tourism and transport framework

The main reason for choosing the bibliometric analysis method in the research is the lack of any bibliometric studies explaining the relationship between cultural tourism and transportation. Additionally, the ease of access to up-to-date information through bibliometric analyses is another factor. The popularity of the analysis program in recent years and its ability to provide scientists with a wealth of information also made it a preferred choice. Data on the studies conducted in the literature on the topic were accessed automatically via a Bibtex file. In this regard, the research dataset was obtained from the WoS database using a Bibtex file. The analysis was performed using the R program with the biblioshiny application. The wide data pool of the R program was utilized. It has been emphasized in the literature that the R package program is highly flexible in integrating bibliometric analyses [26]. Moreover, it is noted that bibliometric analyses are continuously developing with the R program. Scientifically, the bibliometric analysis method has been highlighted as highly reliable [66]. It has been observed that the analysis results in the research produced valid outcomes. The Bibtex file downloaded from WoS provided valid results in the bibliometric analysis document. The research results showed that keywords and co-occurrence networks generally produced reliable outcomes. Based on the research findings, this study serves as an example for future research to conduct similar studies.

RESULTS

As a result of the analysis, general literature information regarding 'cultural tourism and transportation' research is included. The annual scientific publication production amount is expressed. The relationship between source, author, and keyword is revealed. Author productivity over

time is included. The most relevant organizations researching the subject are indicated. The country addresses of the corresponding authors are set forth. The most cited sources globally are explained. Authors' co-citation networks are shown. The most relevant words on the subject are expressed. The keywords that the authors emphasized most in their research are explained. The changes in the keywords emphasized by the authors over time are revealed. Highlighted keywords are shown when they are trending. Co-occurrence networks of keywords highlighted by the authors are indicated. Keywords highlighted in the thematic maps, especially in the motor themes section, are explained. Finally, information on the thematic development of the highlighted keywords is included.

In the research, studies revealing the relationship between cultural tourism and transportation are included. In this respect, information such as the number of research on the subject in the literature, authors, research years, annual growth rates, publication sources, documents, number of authors, references used, citations, and annual growth rates are included.

Table 1 shows that cultural tourism and transportation research was carried out between 1996-2024. In the analysis, it was understood that there were 433 documents in 315 sources regarding the subject. The annual growth rate of cultural tourism and transportation research was 5.92%. There are a total of 1115 authors who researched the subject, and the number of single-author studies was 97. The international co-author rate is 16.4%, with an average author rate of 2.83 per publication. In cultural tourism and transportation research, the authors used 1664 keywords and benefited from 17711 references. The average year of research was 6.55 and the average number of citations for each research was 9,319. Research on cultural tourism and transportation outcomes has shown that it can be developed over the years. It has been observed that many authors have conducted research on this topic at both national and international levels. It is anticipated that more research could be conducted on this subject in the future, regarding annual

documents and citation rates per publication. Figure 2 below shows the annual scientific productivity of research conducted on cultural tourism and transportation.

In Figure 2, the productivity of cultural tourism and transportation research has been calculated by the authors over the years. It has been observed that research on the subject reached its maximum level in 2023. There has been a generally linear increase over the years, especially after 2008. Although a decrease was observed in 2018, research rates have continuously increased in the following years. Since the research analysis was carried out in January 2024, it is estimated that the research rates may be higher at the end of 2024. In the research, interaction with the sources published by the authors who researched cultural tourism and transportation, the authors, and the keywords they used in their research were included. The overall increase in cultural tourism and transportation research over the years suggests that more studies could be conducted.

Figure 3 shows the sources where the authors published; they are listed as Journal of Mountain Science, Sustainability, Journal of Hospitality and Tourism Management, Land, Journal of Asian Architecture and Building Engineering, and International Journal of Environmental Research and Public. The authors who researched the subject are Wang Y., Duan Y., Li Y., Lin HH., Liu Z., Chen X., Pagliara F., Zhang Y., Meng Q., Zhang H., Zhao Y., Dawson. J., Huang Y., Kang J., Li J., Li X., Zhang J., and Ali L. It was seen that the keywords that the authors used extensively in their research were cultural tourism, tourism industry, China, gis, transportation, rural tourism, sustainability, and tourism development. Figure 3 shows which keywords the authors generally use in cultural tourism and transportation research and the sources from which they publish. For example, it is understood that the keyword transportation is frequently used in the Ali L. sustainability resource. It has been observed that the journals that have published extensively on the relationship between cultural tourism and transportation are Sustainability and Land. The authors in the figure have generally emphasized the concepts of cultural tourism and the tourism industry.

Table 1. General literature information on cultural tourism and transportation

Main Information					
Timespan	Sources	Documents	Annual growth rate	Authors	Authors of single-authored
1996:2024	315	433	5.92%	1115	97
International co-authorship	Co-authorsh per doc	Author's keywords	References	Document average age	Average citations per doc
16.4%	2.83	1664	17711	6.55	9.319

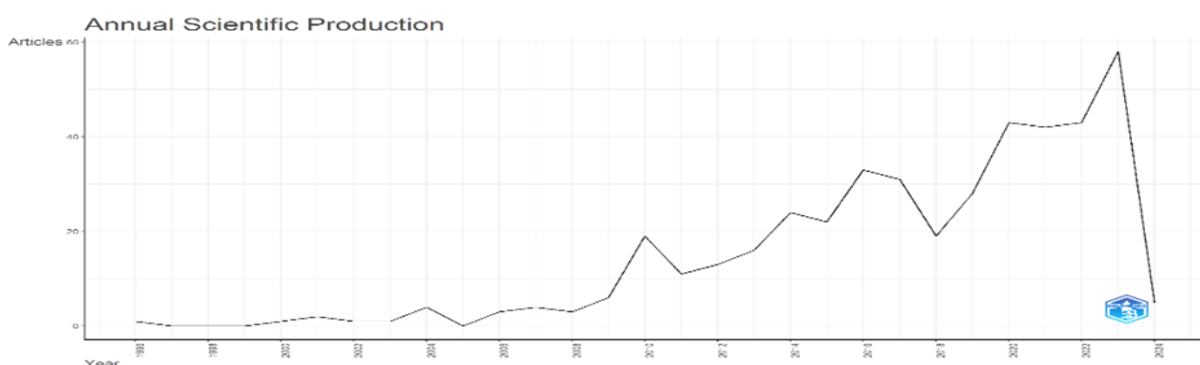


Figure 2. Annual scientific production amount of cultural tourism and transportation

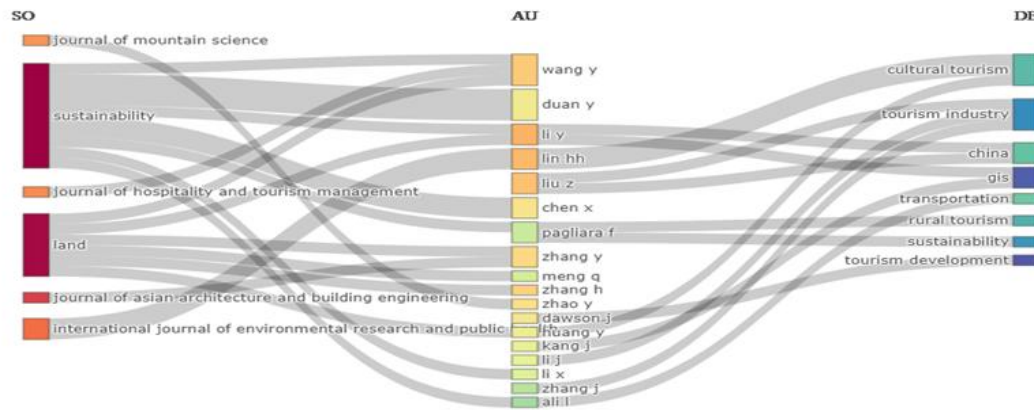


Figure 3. Cultural tourism and transportation source, author and keyword match

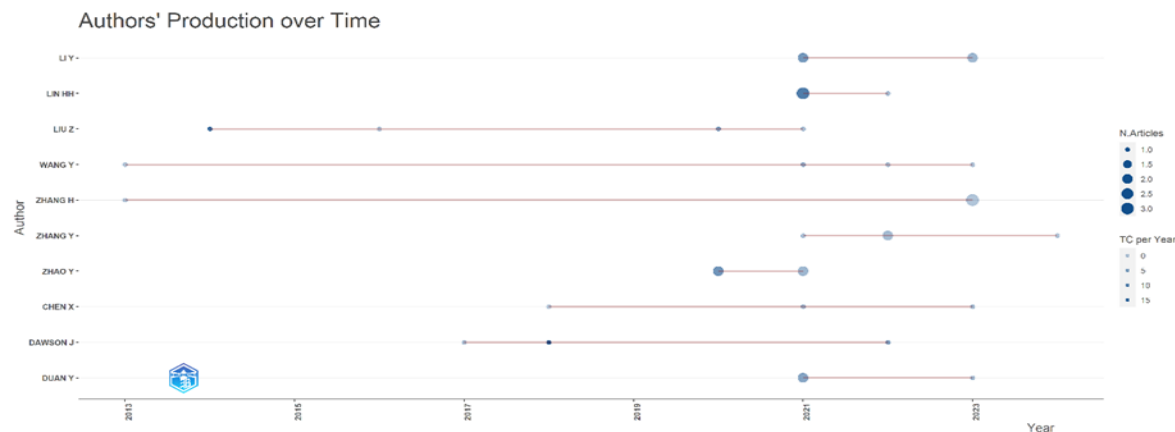


Figure 4. Productivity of writers on cultural tourism and transportation over time

In Figure 4, the authors who conducted intensive research on cultural tourism and transportation and their productivity by year are examined. The analysis program showed that there were authors who conducted intensive research in 2013 and beyond. As a result of the analysis, Li Y. in 2021-2023, Lin HH. in 2021-2022, Liu Z. in 2014-2021, Wang Y. and Zhang H. in 2013-2023. It has been understood that they were quite productive in the 1960s. Additionally, Zhang Y. in 2021-2024, Zhao Y. in 2020-2021, Chen X. in 2018-2023, Dawson J. in 2017-2022, and Duan Y. It has been observed that they carried out intensive research in 2021-2023. The analysis reveals that the authors who have conducted the longest research on cultural tourism and transportation are Wang Y. and Zhang H.

Figure 5 shows the most relevant organizations conducting cultural tourism and transportation research. As a result of the analysis, it was understood that the most relevant organization was the 'Institute of Geographic Sciences and Natural Resources Research (Chinese Academy of Sciences)'. It was seen that they were listed as Univ Florida, Univ Complutense Madrid, Univ Teknol Mara, Beijing Normal Univ, Hong Kong Polytech Univ, Univ Sains Malaysia, Beijing Union Univ, Lakehead Univ, and Univ Naples Federico II. The analysis results revealed that universities are carrying out intensive work on cultural tourism and transportation.

Figure 6 shows the country addresses of the authors who conducted intensive research on cultural tourism and transportation. In the analysis, single-country publications of the corresponding authors were revealed with SCP and multi-country publications with MCP. As a result of the analysis, it

was understood that, in terms of the corresponding authors, Chinese authors mostly conducted research on cultural tourism and transportation. Additionally, it has been observed that authors from the USA, Turkey, Italy, Indonesia, Mexico, Spain, Russia, Korea, Poland, Australia, Brazil, India, Malaysia, Canada, Iran, Portugal, Romania and France have carried out very intensive research on the subject. In terms of single-country publications, it was seen in the research that authors from Turkey, Russia, and Portugal carried out intensive research. Other country writers generally produced multi-country publications.

Figure 7 shows the most cited global sources on cultural tourism and transportation. As a result of the analysis, it was understood that the publication 'Quan S., 2004, Tourism Management' was among the most cited sources. Continuing, 'Zeng Z., 2020, Tourism Geographies', 'Tang Z., 2014, Ecological Indicators', 'Dawson J., 2018, ARCTIC Journal', 'Funk DC., 2007, Tourism Management', 'Rajesh R., 2013, PASOS Collections', 'Rowen I., 2016, Annals of the American Association of Geographers', 'Mcdowall S., 2010, Asia Pacific Journal of Tourism Research', 'Chang IC., 2016, Telematics and Informatics' and 'Rodriguez-Hidalgo A., 2017, Journal of Human Evolution' authors, publication years and places of publication are included. The results have generally shown that tourism journals publishing on the topic receive a high number of citations. This indicates that transportation journals need to be more active. This could be due to the limited number of transportation journals. There is a need for more journals publishing in the field of transportation.

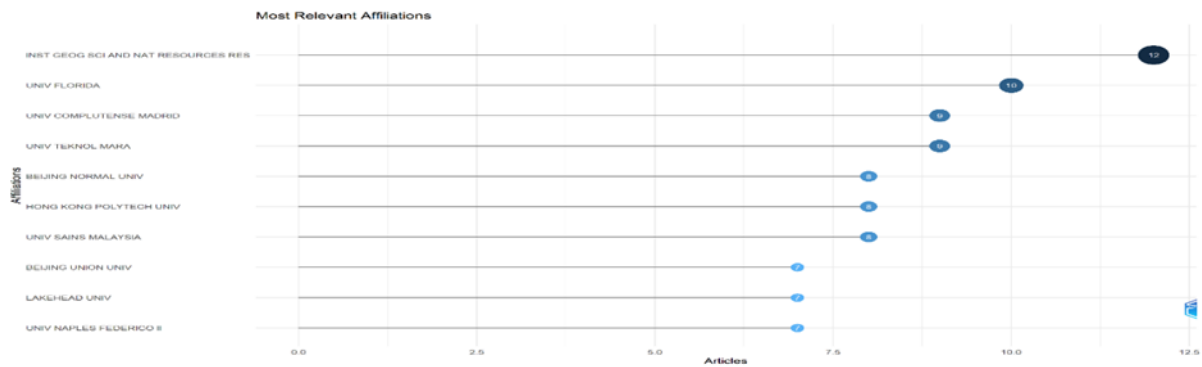


Figure 5. The most relevant organizations conducting research on cultural tourism and transportation



Figure 6. Country addresses of the corresponding authors who conducted research on cultural tourism and transportation

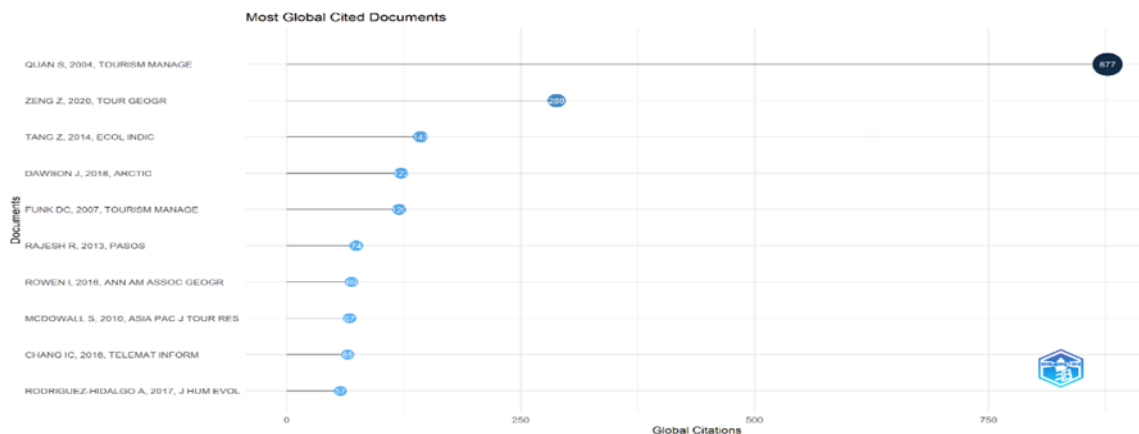


Figure 7. Globally most cited sources on cultural tourism and transportation

Figure 8 shows co-citation networks in the authors' research on cultural tourism and transportation. In the literature, research on the subject has included citation formation networks. As a result of the analysis, Dwyer L. 2003, Crouch GI. 1999, Ritchie J. 2003, Buhalis D. 2000, Hassan S. 2000, Porter ME. 1990, Crouch G.I. 2011 was seen to constitute some of these networks. In analysis Hair J. 2010, Fornell C. 1981, Hu LT. 1999, Podsakoff PM. 2003, Styliadis D. 2014, and Mcgehee N. 2004 studies also found that they have strong common networks. In research, Murphy P. 2000, Baloglu S. 1999, Kim H. 2003, Chen CF. 2007, Gartner W. 1993, Crompton J. 1979 and many other relevant authors have been observed to have a common citation network on cultural tourism and transportation.

Figure 9 lists the keywords frequently used by authors on cultural tourism and transportation. The analysis result showed that the word tourism was emphasized the most in the literature. Other words emphasized by the authors: Are listed as sustainable tourism, development, transportation, China, cultural tourism, rural tourism, sustainable development, accessibility, and sustainable. The results showed that sustainable tourism, rural tourism, and accessibility are important as well as sustainability in cultural tourism and transportation research.

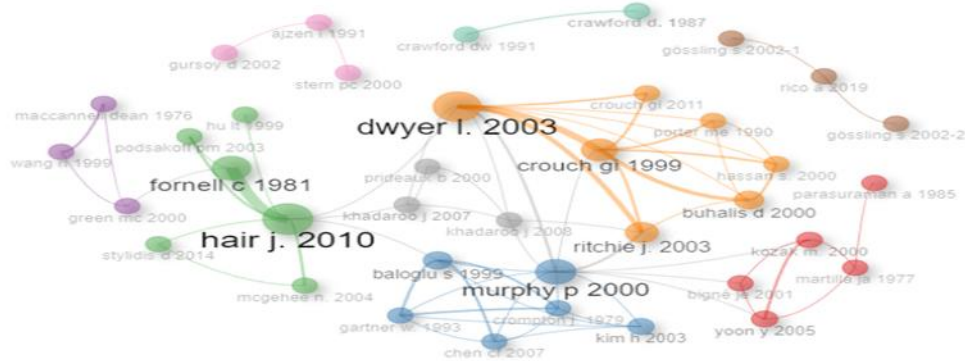


Figure 8. Common citation network of authors on cultural tourism and transportation

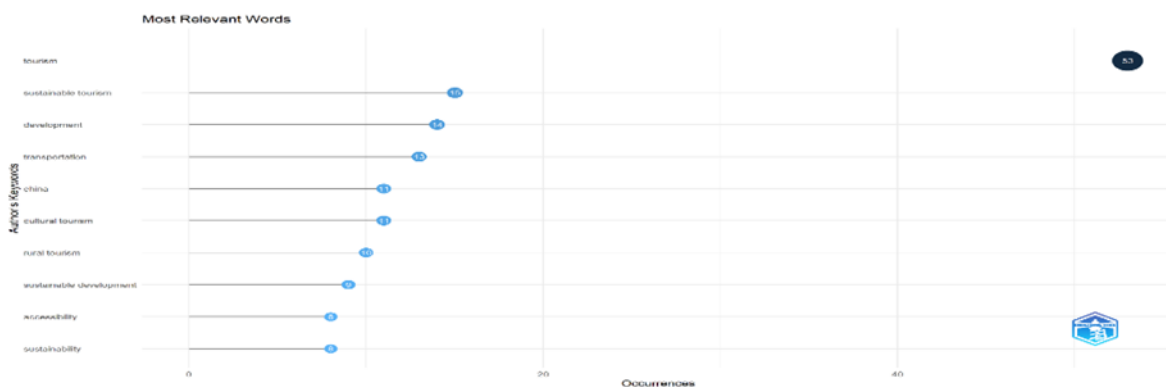


Figure 9. Words most related to cultural tourism and transportation

Figure 10 shows the words that the authors emphasize most in cultural tourism and transportation research in the literature, in a slightly expanded form. The analysis result showed that the most emphasized word was tourism. Other emphasized words as a result of the research: "sustainable tourism, development, transportation, China, cultural tourism, rural tourism, sustainable development, sustainable, accessibility, travel, culture, gis, tourism development, transport, ecotourism, environment, landscape, sustainable, analysis, climate change, conservation, consumption, cultural differences, ecology, planning, satisfaction, system, tourists, heritage tourism, Turkey, management, perception, urban planning, carbon emissions, constraints, covid-19, cultural, economic, geopolitics, hotels, experience, destination image, events, ecological tourism". The results indicate that sustainable practices, environmental attitudes, accessibility, management mechanisms in tourism activities, and overall planning are considered valuable in cultural tourism and transportation.



Figure 10. Keywords emphasized by the authors about cultural tourism and transportation

Figure 11 shows the changes over the years in the keywords that the authors frequently emphasize in cultural tourism and transportation research. In the analysis, 'tourism' is at the top of the most emphasized words from the 2000s to the present, especially in recent years. Considering the rankings in recent years, they are listed as 'sustainable tourism, development, transportation, cultural tourism, accessibility, rural tourism, sustainable development, China and sustainability'. This ranking has shown that, in cultural tourism and transportation, sustainability practices and accessibility opportunities are generally important.

Figure 12 shows the trending times of the keywords emphasized by the authors in cultural tourism and transportation research. In the analysis, sustainability in 2022-2023, China 2020-2023, tourism industry 2018-2023, sustainable development 2014-2021, accessibility 2018-2022, travel 2019-2022, cultural tourism 2015-2021, heritage 2012-2020, cultural heritage 2017-2021, tourism 2014-2022, tourism development 2016-2020, landscape 2016-2018, development 2012-2022, transportation 2017-2022, rural tourism 2014-2019, sustainable tourism 2011-2019, culture 2013-2018, transport 2011-2016 and sustainable it has been observed that they were quite trending words in 2009-2015. The results indicate that the concepts with the longest trends are development, heritage, sustainable development, tourism, sustainable tourism, and cultural tourism. This highlights the importance of ensuring the sustainability of cultural tourism heritage and its gains.

Figure 13 shows the co-occurrence networks of the keywords emphasized by the authors in cultural tourism and transportation research. In Figure 13, the concepts that the words are related to are expressed. As a result of the analysis, it was understood that the concepts of tourism, heritage, accessibility, transport, cultural tourism, management, cultural heritage, and China have strong relationships. In the

research, the words tourism, development, transportation, and sustainable also revealed strong relationships. In practice, travel and transportation also have relationships. As a result of the analysis, it was observed that the concepts of tourism industry and cultural differences, the words economic and carbon emissions, the concepts of rural tourism and ecological tourism, and the words climate change and ecology have strong relationships separately. The results have shown that cultural, social, economic, and environmental factors are highly influential in the relationship between cultural tourism and transportation.

The themes in the upper right section include "motor themes" with high centrality and intensity. The words within the theme have strong internal and external connections with each other [4]. In the thematic map in Figure 14, the changes in terms of centrality and density of the keywords emphasized by the authors in cultural tourism and transportation research are examined. Concepts in the motor themes section with high centrality and intensity were examined. Words in the first group of motor themes; They are listed as rural tourism, tourism development, sustainable, ecological tourism, Mexico, rural development, colonialism, competitiveness, Istanbul, renewable energy. In the second group; are sustainable development, nature-based tourism, public recreational access and integrated planning, resource protection, scenic conservation, scenic corridors, scenic landscape protection, and traditional villages. The third group of motor themes; consists of the words landscape, constraints, outdoor recreation, discrimination, ethnicity, national parks, participation, and visitation. The fourth group; consists of the concepts of Turkey, Canakkale, cultural landscape, Hong Kong, identity, production, and urbanization.

In the fifth group; The words heritage tourism, factor analysis, rural areas, social, and space are included. Sixth group; It consists of the concepts of geographically weighted, ict, spatial distribution, and tourist arrivals. The results have shown that in the relationship between cultural tourism and transportation, centrality, and density, different geographies have been extensively studied, and the ecological environment, sustainable tourism practices, accessibility opportunities, and socio-cultural actors are influential.

Figure 15 shows the thematic developments of the keywords emphasized by the authors in cultural tourism and transportation research. There was no year limitation in the analysis. The keywords highlighted by the authors were selected in the analysis program. As a result of the analysis, the thematic development of cultural tourism and transportation research covered the years 1996-2019 and 2020-2024. Authors between 1996-2019; frequently emphasized the concepts of Mexico, planning, tourism, impacts, cultural tourism, gis, sustainable tourism, sustainable development, transportation, tourism industry, tourist satisfaction, and urban planning. In 2020-2024, they frequently emphasized the words tourism, tourism industry, rural tourism, planning, urban planning, China, environment, sustainable development, stakeholders, climate change, and conservation. The analysis reveals that some concepts highlighted between 1996-2019 have been replaced by different terms in the years 2020-2024. For example, the term 'cultural tourism' has been replaced by 'tourism' and 'sustainable development' in recent years. Additionally, the concept of 'tourist satisfaction' has been replaced by an emphasis on the word 'environment' in recent years.

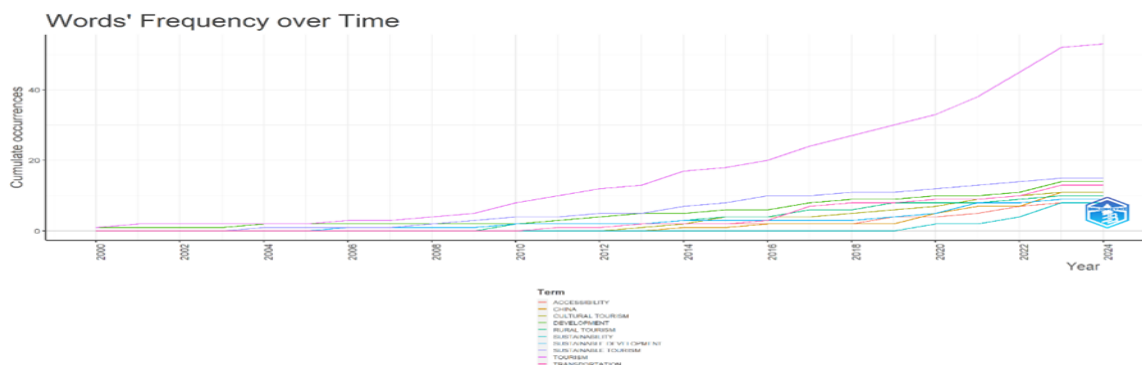


Figure 11. Changes in the words emphasized by authors about cultural tourism and transportation over time

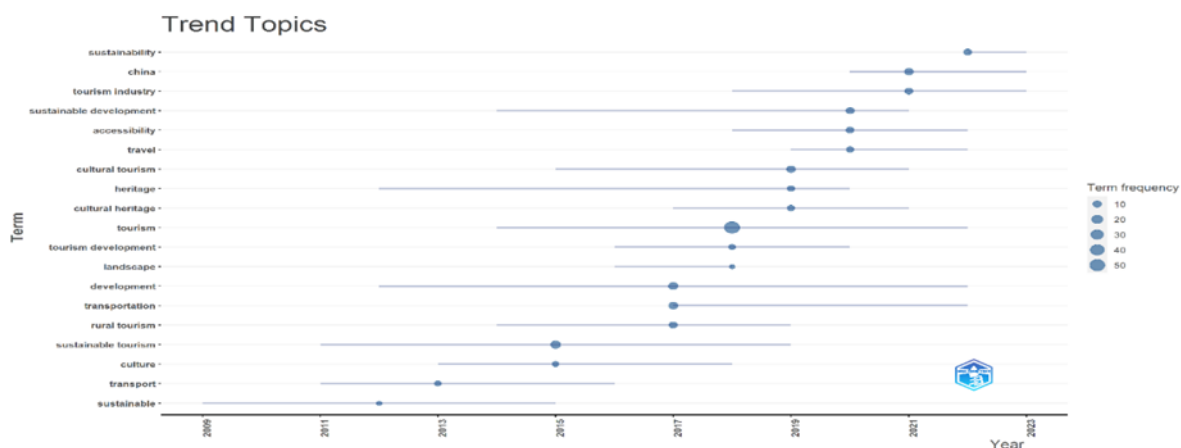


Figure 12. Trending times of highlighted keywords related to cultural tourism and transportation



Figure 13. Cultural tourism and transportation research co-occurrence network

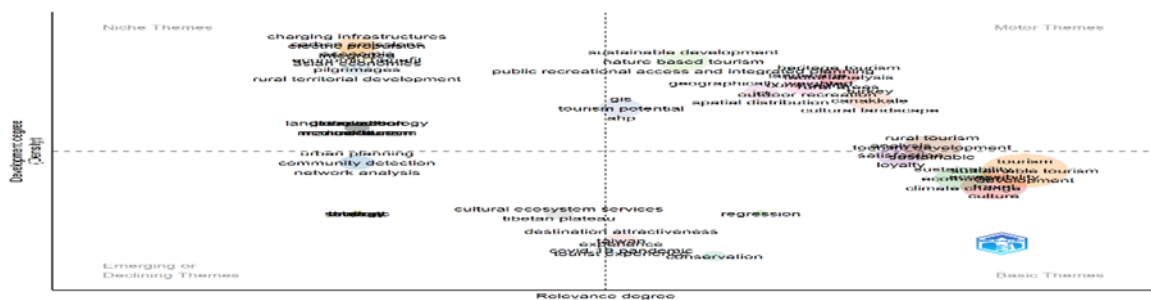


Figure 14. Thematic mapping of research on cultural tourism and transportation

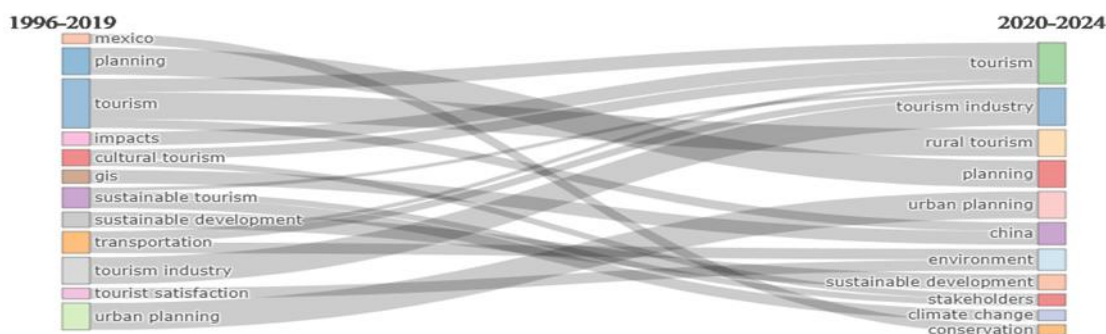


Figure 15. Thematic development of research on cultural tourism and transportation

DISCUSSION

In the analysis, it was understood that cultural tourism and transportation have strong relationships with each other. Transportation opportunities are very valuable in cultural tourism events between countries, regions, or cities. Cultural tourism activities are expected to develop further in areas where transportation is easy. Improvement in transportation facilities contributes to the increase in tourist visits. Having a reliable and planned structure of areas with cultural values for tourism also contributes to the development of material or spiritual gains. In the literature, Hall [9] emphasized that in terms of tourism and transportation, planning regarding transportation and land use in host countries is important for tourists and the tourism industry. Hall stated that tourism, which has become a constantly growing global activity, has a structure that affects natural and cultural environments. Vergori and Arima [30] stated that most of the tourists coming to Italy come for cultural activities and use air transportation (where low-cost carriers are effective) as a mode of transportation. In their research, they emphasized that travel by car and train was lower in 2016 compared to

2002 and that railway transportation was effective in holiday travel.

In the research, it was understood that the concepts of sustainability, sustainable tourism, and sustainable development are frequently emphasized by the authors in cultural tourism and transportation research. Sustainability can be among the main goals of many countries in terms of cultural tourism and transportation. Sustainability moves are very effective, especially in the economic development of countries, in terms of tourism and transportation. Russo and Borg [31] stated that there are historical regional differences between cities in terms of cultural tourism. They emphasized that sustainable tourism should be taken into consideration for systemic and spatial harmony in the creation of modern cities in terms of accessibility. Eser et al. [32] emphasized that a planned and sustainable structuring should be provided to open cultural structures and values, which are sources of touristic supply, to tourism. Durovic and Lovrentjev [33] emphasized that sustainability must be ensured to reduce environmental pollution in terms of cultural tourism and that economic sustainability can be achieved with high-quality cultural and touristic products. They stated that sustainable

developments in cultural tourism have an impact on host societies in terms of socio-cultural, cultural heritage, public security, cultural identity, and quality of life. They stated that transportation planning of cultural routes and facilities should be done effectively in tourism activities. Putro et al. [34] emphasized that correct transportation policies are needed to support protected areas of sustainable natural-cultural tourism. Stoice et al. [3] stated that to develop sustainable cultural tourism, it is important to make improvements in the protection, maintenance, and promotion of museums, monuments, and all cultural tourism targets.

In the analysis, it was observed that concepts such as development, tourism development, sustainable development, and transportation development were frequently emphasized by the authors. Development in cultural tourism and transportation is very valuable in terms of continuity in tourism activities. The development of regions, areas, or countries in terms of tourism culture or transportation opportunities allows more tourists to visit. This shows that development can be directly proportional to cultural, social, and economic development. Bahçe [35] emphasized that local people, non-governmental organizations, and environmentalists should act in cooperation with administrators to prevent the negativities related to cultural tourism and control the development processes. According to Ermawati [5], to develop and protect the cultural tourism of a place, preservation of historical buildings, traditional products, and sites, reduce air pollution, create awareness of the love of culture to the society, improve social media promotions, cooperation with hotels and government institutions and its cultural image can be improved.

In the cultural tourism and transportation review, the concept of Turkey was included in the fourth group of keywords and motor themes emphasized by the authors. Turkey represents an important location in terms of transportation as it is surrounded by seas on three sides and connects the continents of Europe, Asia, and Africa. Turkey's historical identity, traditions, and natural and physical features contribute to the richness of cultural tourism. In the 21st century, the promotions, advertisements, and transportation opportunities made by countries to keep their tourism dynamism alive affect the cultural activities of many tourists. In this respect, Turkey's strong cultural tourism and transportation facilities allow many local and foreign tourists to visit. Okumus et al. [36] stated that Turkey missed opportunities in cultural tourism. They stated that Turkey has rich and unique cultural resources and that it can provide unforgettable cultural experiences to tourists with its center and cultural environment.

In the analysis, it was observed that transportation is quite effective in terms of cultural tourism. Improved transportation facilities in cultural tourism and other types of tourism activities allow more tourists to visit. Low transportation costs and risks for tourists may be effective in choosing a cultural tourism area. The holistic attractiveness of cultural tourism and transportation contributes to the continuity of tourist visits. Kantawateera et al. [37] stated that policymakers should make transportation policies and facilities appropriate when creating tourism policies and plans. Yu et al. [38] revealed that if the transportation network had a low-density level in Shaanxi, China, between 2006 and 2019, transportation network development, heritage tourism, and new urbanization development positively affected this situation. Zhang and Wen [6]

emphasized that the coordination between the tourism economy and transportation increased steadily in the Shaanxi region between 2003 and 2021.

In the analysis, it was observed that the concept of rural tourism was frequently emphasized by the authors. It has been observed that it has become very popular in recent years and reveals strong relationships in terms of centrality and density. In today's modern world, people want to have a holiday surrounded by nature in rural tourism areas. This situation contributes significantly to the day-to-day development of rural tourism. In addition, cultural tourism activities in rural areas affect the preferences of many tourists with their unique values (such as food and beverage culture, natural beauty, and historical value). Quan and Wang [39] stated that more rural tourism capital can be created by making local foods or food tourism interesting in rural areas. Matei [40] emphasized that rural tourism is especially preferred for those living in the stressful conditions of cities and that it offers a natural, pure, clean, pleasant, and refreshing opportunity. Matei stated that tourism activities in rural areas are a serious source of income. Matei also stated that sectoral development can be further diversified by preserving the diversity of resources regarding traditions, gastronomy, culture, and rural tourism.

It is seen that the words heritage, heritage tourism, and cultural heritage are frequently emphasized by the authors and are among the trending words. The cultural heritage, which is planned to remain from ancient times to the present and from the present to the future, is very effective in the continuity of tourism. Cultural heritage provides serious tourism income to countries in many areas. A valuable image perception can be created in areas where cultural tourism and transportation opportunities are developed. The cultural heritage of countries must be transferred to the next generations in a protected manner. This contributes to the raising of conscious generations and the viability of historical resources. Shishmanova [41] generally emphasized that marketing and advertising in the image of the country (such as village-land) can become a marketable commercial product by creating a suitable environment for tourism and investment. Shishmanova stated that cultural heritage is an important element of the image. Zhang et al. [42] established evaluation systems in terms of cultural heritage in the Xi region and revealed that the most important basic component is historical factors. They stated that the Qin region showed interest in historical and cultural places and increased and enriched the cultural heritage. Nag and Sarkar [25] emphasized that cultural heritage has made significant contributions to tourism for years. They stated that cultural heritage lacking protection poses a problem in terms of tourism.

In practice, it has been understood that the concepts of cultural tourism and transportation have strong relationships. Transportation possibilities affect tourists' location preferences in carrying out cultural tourism activities. Additionally, areas with cultural diversity may be more attractive to tourists. Transportation difficulties and failure to meet expectations may create negative emotions in tourists. This situation affects the sustainability of cultural tourism areas. Aranburu et al. [43] emphasized that centrality and urban mobility directly affect the environmental sustainability of cultural tourism and that having tourism resources in a central location also reduces transportation costs. Seyfi et al. [44] researched tourists in Paris, which has the most visited museums in terms of cultural tourism. Researchers evaluate the criteria to be evaluated within the

scope of service quality of cultural tourism by tourists; they listed them as public transportation, taxis, tour guides, accommodation, shopping opportunities, traffic, security, and crowd. They stated that the negative elements perceived by tourists include traffic, crowds, and pickpocketing.

It has been understood that the concepts of tourist, tourist satisfaction, and tourist arrivals are used by the authors in cultural tourism and transportation studies. Tourists are people who are curious about the cultural opportunities in different parts of the world and travel to these regions to bring innovations to their lives. Tourists' satisfaction with the regions they visit can be an effective advertising tool. Tourists with high satisfaction may recommend these regions to other people or tourists. The more tourists come to a region, the greater the socio-cultural interaction and economic gain. Vasiliadis et al. [45] stated that they have a proactive approach to meeting the needs of tourists who take cultural activities into account and that they care about experiences in their travels.

In the analysis, it was observed that Covid-19 was among the keywords frequently emphasized by the authors in their research. During the Covid-19 period, bans disrupted the effectiveness of cultural tourism and transportation activities. The lockdown policies implemented by countries have disrupted tourists and tourism-related activities. This situation has led to the implementation of alternative policies for the tourism sector, as in many areas. In the research, it was also understood that the concepts of tourists and destination image were among the highlighted keywords. Recently, in addition to Covid-19, destination practices have affected the cultural tourism activities of tourists. Kalvet et al. [46] emphasized that in Covid-19, travel and tourism are among the sectors most affected by the crisis. Zeng et al. [47] emphasized that the 'tourists-guides-destinations' relations before Covid-19 in the world will turn into the 'tourists-robots-destinations' relationship after Covid-19. Campoy-Muñoz et al. [48] revealed that Covid-19 significantly reduced cultural tourism revenues in Spain in 2020.

It has been observed that concepts such as cultural tourism, culture, cultural heritage, and cultural environment are frequently emphasized in cultural tourism and transportation studies. It is understood that cultural values are generally effective in cultural tourism and transportation. Continuity of effective policies is needed to create the permanence of cultural heritage and increase the effectiveness of cultural environments. In the literature, Lin et al. [49] emphasized that factors such as preserving the style of old buildings, strengthening the infrastructure, and providing a safe walking environment are effective in preserving the value of cultural assets. They also stated that integrating transportation, cultural landscape, infrastructure and local visibility with historical and cultural resources can contribute to the development of cultural tourism.

In practice, it has been observed that the concept of accessibility is frequently used by authors and is effective in cultural tourism and transportation studies. Accessibility provides many material or moral gains in the promotion of cultural opportunities, development of tourism, and regional activities. Šablíková [50] attributed the biggest advantage of a city in terms of tourism to the ease of access from both outside and inside. Šablíková emphasized that in addition to easy transportation by walking, cycling, train, or bus, high standards, natural and cultural features, and accommodation opportunities create a destination advantage in terms of tourism.

The study observed that in the relationship between cultural tourism and transportation, various concepts are influential from environmental, cultural, social, economic, and administrative perspectives. This indicates that cultural tourism and transportation activities operate like links in a chain. A disruption in one of the links affects the functionality of the other links. For example, if a beautiful area (or location) that is the subject of tourism is limited in terms of both communication and transportation accessibility, it leads to a decrease in the number of visiting tourists. From this perspective, cultural tourism and transportation activities can be considered as a whole.

CONCLUSIONS

As a result, it has been observed that those involved in cultural tourism and transportation must make effective decisions regarding sustainability and accessibility. It is understood that individuals should protect environmentally valuable areas with tourism potential and cultural significance. It has been prioritized that all values related to cultural tourism should be passed on to future generations as they are. The economic benefits generated by the tourism and transportation network should be carried out within a specific plan. As a result of the research, it was understood that cultural tourism and transportation have intense relations. In this context, the concepts of tourism, heritage, accessibility, transport, cultural tourism, management, cultural heritage, and China have revealed strong relationships together. In their research, the authors frequently emphasized the words tourism, sustainable tourism, development, transportation, China, cultural tourism, rural tourism, sustainable development, accessibility, and sustainability. The strongest relationships in terms of the centrality and density of the keywords highlighted in the analysis; have been observed that it is among the concepts of rural tourism, tourism development, sustainability, ecological tourism, Mexico, rural development, colonialism, competitiveness, Istanbul, and renewable energy. In recent years, researchers have frequently emphasized the words tourism, tourism industry, rural tourism, planning, urban planning, China, environment, sustainable development, stakeholders, climate change, and conservation.

Theoretical Implications

Cultural tourism and transportation networks, along with planning related to transportation and land use, are crucial for tourists and the tourism industry. Transportation contributes to the vitality and development of cultural tourism. The sustainable development of tourism depends on the coordination between transportation and tourism. In terms of cultural tourism, centrality, and urban mobility directly affect transportation costs and environmental sustainability. Correct transportation policies must be implemented to support the protected areas of sustainable natural-cultural tourism.

The increasing urbanization day by day has turned cultural tourism into the driving force of economic growth. In this regard, cities and regions are in competition for foreign investments within the framework of cultural tourism. A planned and sustainable structure must be established for the opening of cultural structures and values to tourism. In terms of accessibility, a sustainable tourism approach should be considered for systemic and spatial harmony in the creation of new cities. Cultural tourism is related to history, art,

religion, music, tours, festivals, and architectural structures. To prevent the negative impacts of cultural tourism and manage its development processes, collaboration between local communities, civil society organizations, environmentalists, and managers is necessary. Societies should preserve the value of cultural assets and the style of old structures. Additionally, they must strengthen infrastructure to ensure a safe tourism approach. In terms of cultural tourism, sustainability should be ensured to reduce environmental pollution.

Practical Implications

Cultural tourism and transportation have strong relationships in terms of the continuity and development of tourism. For cultural tourism to gain a sustainable quality, all societies bear significant responsibility. In the 21st century, the promotions, advertisements, and transportation opportunities that countries make to keep their tourism dynamics alive affect the cultural activities of many tourists. In this regard, the functionality of a country's transportation network plays a crucial role in the development of the European and global tourism industry. A developed transportation infrastructure significantly contributes to cultural tourism activities. The development of land, sea, air, and railway transportation networks in cultural tourism areas strengthens the understanding of sustainable cultural tourism. While transportation contributes to the development of countries and regions in terms of tourism revenues, it also helps the development of tourism and the improvement of the qualifications of those working in the sector. Accessibility provides many material and immaterial gains in the promotion, development, and activities of cultural tourism. In this regard, the importance of transportation in cultural tourism is increasing day by day. Considering cost minimization in transportation creates the opportunity for more tourists to travel in cultural tourism activities. Investments in the transportation infrastructure of countries provide significant contributions to the sustainability of cultural tourism. The development of tourism culture and transportation opportunities in regions, areas, or countries contributes to the growth and development of tourism activities. Cultural tourism has many individual, spatial, and societal features. In terms of cultural tourism, transportation has commercial, socio-cultural, economic, political, legal, psychological, traditional, and educational impacts. Artificial intelligence applications, virtual reality, and digitalization used in tourism contribute to the development of cultural tourism, especially in terms of communication and accessibility.

Cultural tourism and transportation have systematic characteristics in terms of tourism activities. Transportation has affected the cultural, social, commercial, political, military, and artistic activities of societies in many areas. Transportation opportunities have supported the vitality of cultural tourism activities in the regions. The development of regional, national, and international transportation networks has made it easier to transfer and promote cultural tourism values. Within the scope of cultural heritage owned by societies, there are cultural tourism resources such as history, art, religion (or beliefs), museums, excursions, music, cultural travels, nature, festivals, gastronomy, and monuments (or architectural structures). Facilitating access to these resources creates material or moral gains in terms of tourism vitality. Making arrangements that may be attractive to tourists in tourism activities strengthens the promotion of cultural tourism resources.

Future Research and Limitations

In future research, the importance of digitalization, metaverse, and artificial intelligence applications in the realization of cultural tourism and transportation activities can be emphasized. The effects of cultural resources, natural beauties, and transportation activities on the increase of tourism revenues can be examined. In cultural tourism and transportation activities, the main factors that create the perception of a safe zone for tourists can be investigated.

The research was designed to reveal the relationship between 'cultural tourism and transportation' in the WoS database on 27.01.2024. In the analysis, it was observed that there are a total of 433 resources in WoS. The analysis results of the research are limited to these sources. R program and bibliometric analyses were used in the application. In the literature, authors who researched the subject, sources, highlighted keywords, trend times of keywords, relationships of concepts, thematic maps, and general productivity are included. It is planned to contribute to the literature with the research results.

DATA AVAILABILITY STATEMENT

The authors confirm that the data that supports the findings of this study are available within the article. Raw data that support the finding of this study are available from the corresponding author, upon reasonable request.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest with any individual, institution, or organization in the preparation, evaluation, or publication of this study.

USE OF AI FOR WRITING ASSISTANCE

Not declared

ETHICS

There are no ethical issues with the publication of this manuscript.

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