

## AN OVERVIEW OF ECOTOURISM RESEARCH — ANALYSIS BASED ON WEB OF SCIENCE

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### ABSTRACT

*Having been proposed for more than 3 decades, the concept of ecotourism is one of the issues that attract much attention from the academic circle. Also, the concept of ecotourism develops with such terms as natural tourism, sustainable tourism and green tourism. With the assistance of CiteSpace5.7.R\_1, a total of 443 papers included in WOS database from 2006 to 2020 were taken as the raw data in this paper for study. Visualized map analysis was conducted from such perspectives as country/region distribution, institution distribution, journal distribution, keyword co-occurrence, surge theme and highly cited literature, etc, which is purposed to determine the developmental status of this field over the past 15 years, identify its research hotspots and frontiers, as well as provide reference for ecotourism research. According to the research results, the number of relevant literature has shown an upward trend over the past 15 years, with the focuses of research placed mainly on those countries with relatively developed tourism industry. A large majority of the studies focus attention on the preservation of natural environment. Thought the research on ecotourism and sustainable development shows an uneven trend in the distribution of countries / regions, the distribution of various regions in the world is relatively balanced with regard to high-yield institutions. In the recent 15 years, there have been various research hotspots emerging, including nature reserves, rural economic development and others. As for the trend of research, ecotourism has attached increasing significance to the correlation with the growth of local economy. Over the past 15 years, ecotourism research involves at least three major themes. In spite of this, ecotourism research remains subject to some limitations on system theory and methodology. In the concluding part of this paper, a recommendation is put forward that the government should take various measures to guide the further development of ecotourism.*



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## 1. INTRODUCTION

Ecotourism is referred to as a form of tourism that pays close attention to the experience of natural region and lays emphasis on the preservation of the natural environment. For nearly 30 years since the concept of ecotourism was first proposed, plenty of studies have been conducted to solve the key questions surrounding the significance of ecotourism, for example, why it comes into being, in what form, who participates in this activity, where it takes place, what impact it would have, and how to manage it.

## 2. LITERATURE REVIEW

Back in 2006, when Weaver came up with the concept of ecotourism, she carried out review of the academic research on ecotourism<sup>[1]</sup>. Using the data gathered from CSSCI database, Cheng Desian from Soochow University conducted a visual analysis of 185 pieces of literature from 2004 to 2014<sup>[5]</sup>. In addition, there are many other researchers exploring ecotourism from various perspectives<sup>[2-4]</sup>. In this paper, with the assistance of CiteSpace as the measurement software, a review was conducted of the ecological tourism research carried out over nearly 15 years from 2006 to 2020, for drawing reference and experience. From such perspectives as national/regional distribution, the distribution of main research institution, journal distribution, frequently cited literature, the hotspot and frontier of research, a statistical analysis was conducted of totally 443 research papers about ecological tourism included in WOS database from 2006 to 2020. Besides, knowledge map visualization was performed to clarify the path of overall development for this subject over nearly a decade, present the latest developmental trends, and provide valuable reference for future research on ecotourism. In the meantime, the following key issues are addressed. Firstly, what is the focus of the ecotourism research conducted between 2006 and 2020? Secondly, compared with other ecotourism reviews, are there any new findings about this review? Thirdly and lastly, what are the differences in the review of ecotourism research carried out in different countries?

## 3. RESEARCH TOOLS AND DATA SOURCES

As the research tool used in this paper and based on JAVA technology, CiteSpace is a scientific metrology software developed by Professor Chen Chaomei from Drexel University. This tool can be applied to conduct an in-depth analysis of the data sourced from scientific research literature, examine the fundamentals in relation to a particular area of knowledge, identify trends, and visualize it. As for CiteSpace data, the sources include Web of Science, Scopus, CNKI, NSF, and Derwent, etc. By means of database comparisons, Web of Science database was selected as the data source for this study. As an important database platform for global

academic information, Web of Science have three citation indexes (SCIE SSCI A&HCI) that follow a rigorous screening mechanism to have collected more than 12,400 authoritative and influential international academic journals. According to Bradford's law in bibliometrics, only those important academic journals in various disciplines are included. Compared with other databases, this database contains more complete data. In the process of data collection and retrieval, "ecotourism" and "ecotourism" were taken as key words and the relationship between retrieval fields is "or". The time span was limited to between 2006 and 2020, the language was limited to English, and the type of literature was limited to papers (article) and conference papers (conference paper). The research results were obtained through manual screening, the documents clearly irrelevant to this field were excluded, and the preliminary retrieval results involved 443 articles. A CiteSpace data format conversion tool was applied to convert the txt format literature derived from the WOS into a document format that can be identified and analyzed by CiteSpace. In respect of parameter setting, duration partition (Time slicing) spans from 2006 to 2020, and the span is divided annually into 15 different periods. The term source (Term source) is set as title, abstract, author keywords and additional keywords. As for the type of nodes, selection can be carried out by country, word, keyword and reference, based on which the visualization map of country/region, key words and cited documents can be obtained respectively. With regard to network clipping, a combination is adopted of minimum spanning tree, single network clipping within time slices, and combined network clipping method. The visual map generated by CiteSpace consists of multiple nodes and connections, with the size of node representing the corresponding country (region)/keyword/frequency of citation. Each ring corresponds to a different time division. The time division corresponds to the ring from far to near inside out. The thickness of the tree ring is positively correlated with the occurrence frequency of node contents in different years, and the radius of the node corresponds to the total occurrence frequency of the object to be studied. Node connection represents the frequency of co-occurrence. Moreover, the thicker the connection, the closer the relationship.

## 4. RESULTS OF LITERATURE METROLOGICAL ANALYSIS

### 4.1 Year of publication

By observing the amount of literature on ecotourism research as published over the past 15 years (Fig .1), it can be seen that the study of ecotourism in English started from 2008, with only one published. The volume of research literature published between 2009 and 2012 is relatively balanced, with the number reaching 46 by 2012, marking the first peak. Since then, the number of studies has been stabilized, before rising to 48 in 2017.

By the end of 2020, the number of documents has reached 443, and the annual number of articles is expected to reach 60 in 2021. It is expected that the number of research on ecotourism will continue to rise in the next few years. It is suggested that ecotourism has become a research hotspot, and that the atmosphere of academic research on ecotourism has come into being.

It is believed that the developmental process of ecotourism consists of three stages. More specifically, the first stage lasted from 2008 to 2012 and the fourth year, which may be closely related to the International Year of Ecotourism 2008. The second stage spanned 3 years from 2013 to 2015. The first stage shows a downward trend, while the overall trend is relatively stable.

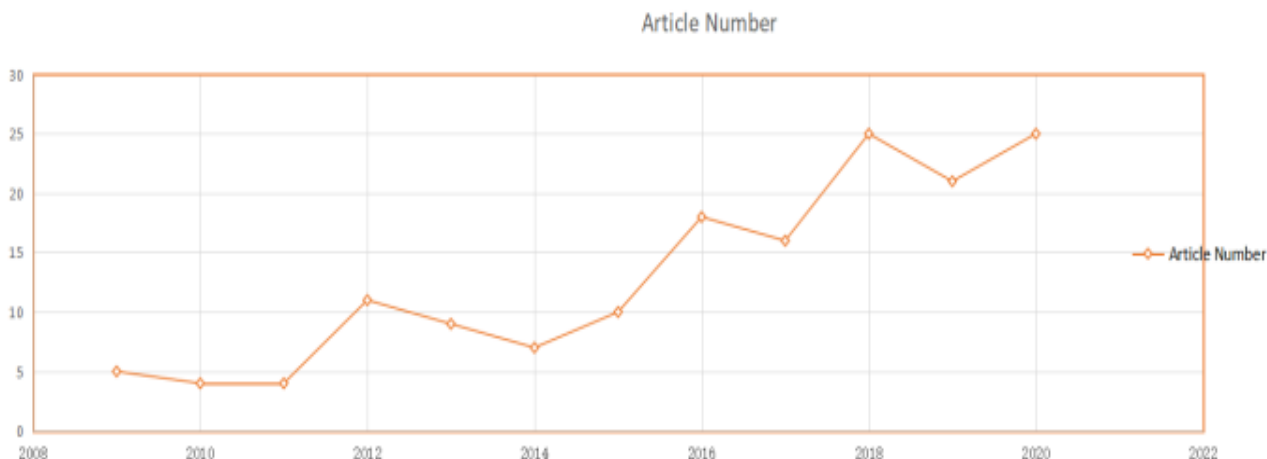


Figure 1. Amount of literature on ecotourism research as published over the past 15 years

#### 4.2 Country/area distribution

In the knowledge map of country/region distribution, node represents country/region, and its size refers to the number of communications sent by the country/region over the last 15 years. The connection between different nodes indicates the cooperation between different countries/regions. The knowledge map involves 26 nodes and 16 connections. After network clipping, there are 26 nodes and 23 connections remaining, as shown in Figure 2. According to Figure 2, over the past 15 years, the country with the largest number of communications is China, followed by the United States, Australia, Indonesia, Malaysia and others. Figure 3 shows the countries/regions ranking among the top 10. The total number of communications in China is 169, which is approximately one third of the total. The total number of communications is 17 in the United States, 15 in Australia, 13 in Indonesia, and less than 15 in Italy, India, Russia and other countries/regions. As indicated by the number of papers, the volume of communications in various countries/regions shows variation, with China, the United States, Australia, Indonesia, Russia and other countries in the leading position. From an overall perspective, these countries/areas are showing an upward trend. According to the connection between the nodes in the map, the cooperation between different countries/regions is of more significance. Therefore, these countries attach increasing importance to conducting cooperative research on tourism. In the meantime, importance is also attached to international cooperation. Among the surge themes from 2014 to 2015 are ecological tourism, rural development and

nature reserves. Since 2015, there has been no significant surge shown in themes. Thus, the following conclusions can be drawn. Firstly, the theme of the surge encompasses all respects of ecotourism development. Secondly, researchers have always attached much significance to the research of sustainable development, with a surge theme related to sustainable development from 2010 to 2017. Thirdly, the state of ecotourism in some specific areas is also the focus of attention, such as Australia, Malaysia, India and the European Union. Fourthly, the focus of research has gradually shifted from theoretical research to practical research and more attention has been brought to the enforcement and development of tourism policies. Lastly, this field continues to shows a trend of rapid development, the research object is extensive, and the content is diverse.

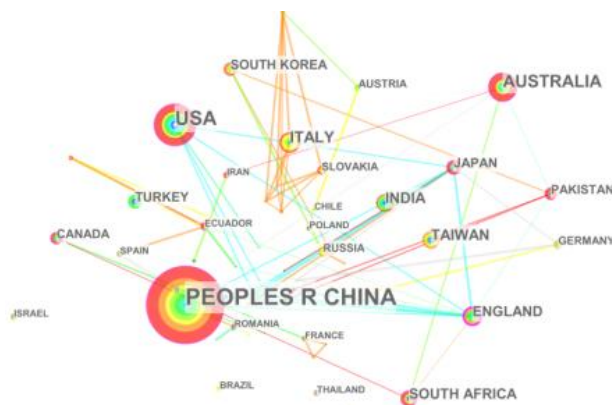


Figure 2. Countries with the largest number of communications

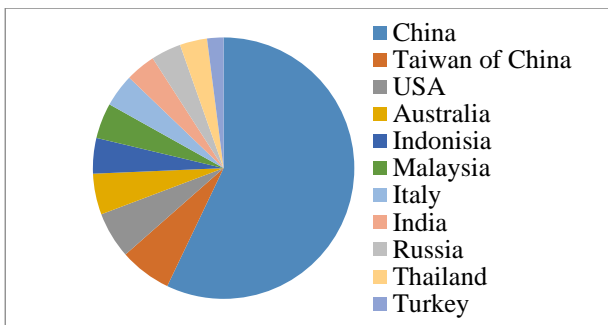


Figure 3. Countries/regions ranking among the top 10

### 4.3 Distribution of institutions

Not only does the analysis conducted of the distribution of the sending organization reveal the distribution of the author group in the field, it also provides reference to gain an in-depth understanding of the development in the relevant fields. After statistical analysis, it was found out that there are more research institutions focusing on this field. As shown in Figure 4, this paper lists only the top 10 institutions. According to the number of papers, the largest number is San Diego State University, Florida State University, Hebrew University Jerusalem, Islamic Azad University, Northwest A&F University, followed by Polytech University in Australia, Arizona State University and Floreda University in the United States, KwaZuluunatal University in South Africa, and Qule University in Finland. In addition, it can be seen that the distribution is more balanced among various regions in terms of agency issuance, with the high-yield institutions distributed across Australia, Europe, Asia, the Americas and Africa, indicating that the development of tourism is prioritized around the world.

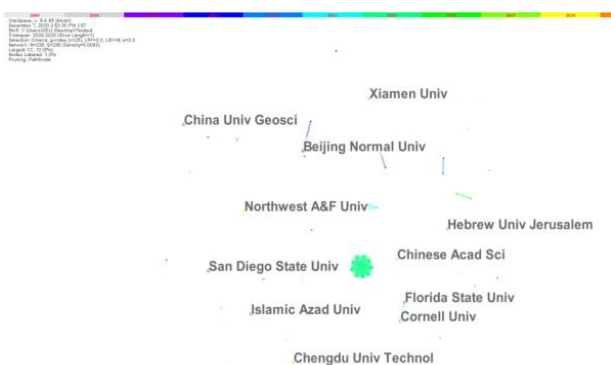


Figure 4. Lists of the top 10 institutions

#### (iv) Distribution of periodicals

Through analysis of the distribution of source journals, the distribution field of the sample literature as well as the level and characteristics of the source journals can be discovered, thus providing a basis for the research field. Since the 443 articles are widely distributed in different journals from various countries, it involves a large number of journals. It can be seen that the

published journals of eco-tourism in order include TOURISM MANANGMENT, BIOL CONSERVATION, CONSERVATION BIOLOGICAL, with more journal articles focusing on ecological TOURISM.

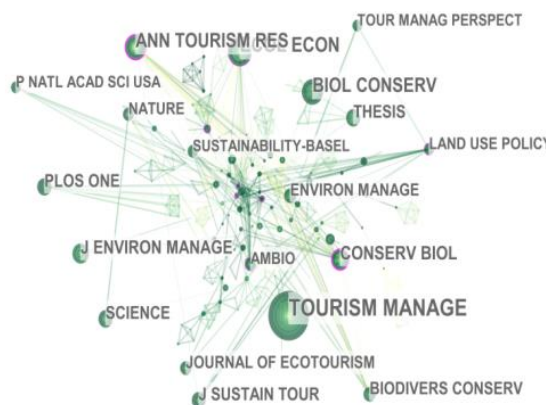


Fig. 5

### 5. RESEARCH HOTSPOTSHigh-frequency keywords

The key words reflect the subject of the article, while the keyword co-occurrence indicates its appearance in the same literature. The higher the frequency of keyword co-occurrence in a field, the closer the correlation between different keywords. The analysis of keyword co-occurrence is conducive to further understanding the relevance of various research topics within the subject area, and to comprehending the system of knowledge structure and current research hot spot [5] in a subject field. By analyzing the data collected using CiteSpace software and mapping the knowledge about keyword co-occurrence, a total of 237 keyword nodes and 135 connections were obtained, as shown in Figure 3. The nodes in the map represent keywords. Also, the larger the nodes, the more frequently a keyword appears. It is demonstrated to some extent that it is a research in this field as shown in Figures 5 and 3. Ecotourism is the key word with the highest frequency 98 percent frequency, followed by eco-tourism with a 91 percent frequency, conversation with a 60 percent frequency and fourth community with a 46 percent frequency. Other high-frequency keywords include challenge, biodiversity, benefit, behavior and so on. In addition to the aforementioned high frequency keywords, there are also turning points found in each discipline, and they can be identified by calculating the centrality (Centrality) of nodes. The greater the center, the more significant influence of the keyword in the co-word network, and the more likely it has a significant impact. Since frequency and centrality are not necessarily positively correlated, it is necessary to take account of both frequency and centrality when CiteSpace is applied to analyze research hotspots in a specific area. In the CiteSpace, Center  $\geq 0.1$ , which indicates that this node is the research hot spot [19]. In the knowledge map generated for this study, there are a



## 6. CONCLUSIONS

As suggested by Lawrence, Wickins and Phillips, ecotourism is undergoing a "crisis of legitimacy" in respect of its ability to deliver ecological and economic goals. Over the past 2 decades, there have been many scholars reflecting on ecotourism from different perspectives. Regardless of whether ecotourism realizes the preset ecological and economic goal and whether it receives popularity in general, the statistical analysis was conducted of the annual publication volume, journal distribution, organization distribution and keyword frequency of 443 WOS articles, so as to review the development of eco-tourism academic research in China in the period from 2006 to 2020. The major issues in ecotourism research were identified, so as to figure out the shortcomings of its research and the direction of future efforts. Throughout the 15 years of domestic ecotourism research, there are at least three major issues of concern.

The first one concerns ecotourism and sustainable development. Up to now, there has been a consensus reached among researchers on the idea that ecotourism is a sustainable mode of development, with some emerging development concepts gradually integrated into ecotourism research, such as ecological civilization, low-carbon tourism and so on. In spite of this, there remain various difficulties in the dynamic mechanism, evaluation criteria and practice of sustainable development for ecotourism. In addition, it is imperative to conduct scientific evaluation of the role played by ecotourism in the construction of ecological civilization and clarify the differences and associations between ecotourism and low-carbon tourism concepts in future research.

The second one relates to ecotourism development or development model. The mode of ecotourism development focuses excessively on "mode", and there are many models overlooking the "antecedents" and "consequences" of ecotourism. As for the "antecedent" exploration of ecotourism development or development model, there is a lack of stakeholder perspective, there is only limited attention paid to the composition of stakeholders and how to carry out cooperation, and the number of convincing case studies is insufficient. The "consequence" research of ecotourism development or development model is also faced with the lack of empirical research, which gives rise to an urgent need for the guidance of positivism methodology in the research methods. Among them, ecotourism marketing is frequently ignored by researchers. After the development or development mode of ecotourism is determined, the special research on ecotourism marketing deserves more attention from researchers.

The third is relevant to ecotourism resources. Despite an extension to the scope of the core definition standard of ecotourism, the core resource of ecotourism remains the natural environment, and other attractions such as

culture are associated only with secondary factors. In this regard, there are still some differences in domestic research. The concept of folklore / cultural ecotourism enhances the sustainability of cultural protection and the authenticity of experience. In the meantime, however, it desalinates the core characteristics of ecotourism based on natural environment. In part of the study, folklore / cultural ecotourism is subjected to the framework of ecotourism concept. In addition to these three themes, ecotourism research involves some crucial topics as well. For example, ecotourism occurrence area (nature reserve), business form (rural ecotourism), market (ecotourism), management (community participation) and so on. These secondary issues show obvious shortcomings in the research perspective and methodology. For example, the study of nature reserves and rural ecotourism is lacking in the guidance of system theory, the application of constructivism and pragmatism research paradigm shows a broad prospect in the field of ecotourism screening research, while the research of ecotourism community participation is extended from both micro and macro perspectives. Methodology guidance has the potential of improvement. Compared with the review of foreign ecotourism research conducted by Weaver, the answers to such questions as ecotourism industrialization, marketing, development impact, quality control and external environmental restrictions have yet to receive full support from academic research, suggesting that the academic research on ecotourism in China remains focused on the level of concept and theoretical discussion, with little attention drawn to the depth and breakthrough of its development practice. This is closely associated with the current state of domestic social development. On the one hand, there is a lack of specific regional practice for the development of ecotourism. On the other hand, the strength of the ecotourism market is constrained by the domestic mass tourism market in full swing.

## 7. DISCUSSION

Practice is the source and testament of theory, and the regional practice of ecotourism is significant to the current state of empirical, systematic and instructive deficiency in academic research. That is to say, the breakthrough to ecotourism research is determined by the industrial practice of the government which plays a vital role in the development of tourism. Government agencies should not be reliant solely on social forces to formulate ecotourism development plans or to create ecotourism areas according to policy guidance. More importantly, with the support of scientific research forces to keep track and conduct investigation for a long time, an integration is carried out regarding the relationship between ecotourism development and local residents. In this way, the academic research of ecotourism is promoted and the complementary coordination is achieved between practice and theory. In particular, as for rural eco-tourism research, the role of

government guidance is of much importance, so that more efforts shall be made from the two perspectives below:

(1) Attaching importance to the strength of scientific research and reshaping rural eco-tourism are to recognize that the development of rural eco-tourism is to attract tourists, while promoting local sustainable development. With the support of scientific research, not only can the development plan of rural ecotourism be formulated in a scientific way, the superficial cognition of public officials and academic individuals about rural ecotourism is also abandoned. Attempt is also made to avoid the conflict of goals, interests and mechanisms between external forces and internal forces. Therefore, in the process of cooperation between government and scientific research groups, there is a possibility that ecotourism and the concepts derived from it are re-constructed, with the dynamic mechanism and evaluation criteria of ecotourism sustainable development goals further clarified. In addition, the idea of system theory will receive more attention. In order for a better guidance on practice, such a virtuous circle is the most ideal outcome.

(2) Delineating demonstration areas and adjusting the establishment of rural eco-tourism demonstration zones in a timely manner through long-term follow-up surveys are crucial to formulating development guidelines and management rules. The establishment of the demonstration area is not only reflective of the performance of the government serving the people, but also creates the experimental field required to verify the financial feasibility of developing rural ecotourism and improve the theory of rural ecotourism. The scientific research team keeps monitoring the demonstration area for a long time, which is conducive to the coordination between ecotourism and rural construction, identifying and solving problems in time, and addressing the current state with regard to the insufficient diachronic, empirical and methodological aspects of ecotourism research. What is critical is to deepen the understanding as to the impact of tourism development on rural economic environment, social culture, improve the research process of community tourism, develop innovative tourism research theory and achieve the effect of "knowledge spillover".

## References:

- Ahmad, Fayyaz; Draz, Muhammad Umar; Su, Lijuan; et al. Tourism and Environmental Pollution: Evidence from the One Belt One Road Provinces of Western China. *SUSTAINABILITY*, OCT 2018, Volume: 10 Issue: 10
- Ahmed, Khalid. Environmental policy stringency, related technological change and emissions inventory in 20 OECD countries. *JOURNAL OF ENVIRONMENTAL MANAGEMENT*. NOV 15 2020, Volume: 274
- Akadiri, Seyi Saint; Lasisi, Taiwo Temitope; Uzuner, Gizem; et al. 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*. FEB 16 2020, Volume: 470-484, 23
- Ali, Alisha; Frew, Andrew J. ICT and its Role in Sustainable Tourism Development. *INFORMATION AND COMMUNICATION TECHNOLOGIES IN TOURISM 2010* )479(
- Ali, Alisha; Frew, Andrew J. ICT and its Role in Sustainable Tourism Development. *INFORMATION AND COMMUNICATION TECHNOLOGIES IN TOURISM 2010* )479(
- Ali, Alisha; Frew, Andrew J. ICT and sustainable tourism development: an innovative perspective. *JOURNAL OF HOSPITALITY AND TOURISM TECHNOLOGY* 2014,, Volume: 5 Issue: 1 Pages: 2-16
- Anser, MK; Yousaf, Z; Zaman, K. Green technology acceptance model and green logistics operations: to see which way the wind is blowing. *Front Sustain* 2020 Volume: ) 3( 1
- Anser, Muhammad Khalid, Khan, Muhammad Azhar, Nassani, Abdelmohsen. et al. The mediating role of ICTs in the relationship between international tourism and environmental degradation: fit as a fiddle. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH*
- Anser, Muhammad Khalid; Khan, Muhammad Azhar; Awan, Usama; et al. The Role of Technological Innovation in a Dynamic Model of the Environmental Supply Chain Curve: Evidence from a Panel of 102 Countries. *PROCESSES* 2020, Volume: 8 Issue: 9
- Arts, Koen; van der Wal, Rene; Adams, William M. Digital technology and the conservation of nature. *AMBIO*, 2015, Volume: 661-673
- Audia, PG; Locke, EA; Smith, KG. The paradox of success: An archival and a laboratory study of strategic persistence following radical environmental change. *ACADEMY OF MANAGEMENT JOURNAL* 2000, Volume: ) 837-853( 43
- Awan, U. Industrial ecology in support of sustainable development goals. *Encyclopedia of the UN sustainable development goals 2020*,
- Azam, Muhammad; Alam, Mahmudul; Hafeez, Muhammad Haroon. Effect of tourism on environmental pollution: Further evidence from Malaysia, Singapore and Thailand. *JOURNAL OF CLEANER PRODUCTION* 2018, Volume: 190 (330-338)

- Beer, Martin; Rybar, Radim; Kal'avsky, Michal. Renewable energy sources as an attractive element of industrial tourism. *CURRENT ISSUES IN TOURISM* 2018 , Volume: 21 (2147-2159)
- Buijtdijk, Harald; Blom, Juultje; Vermeer, Jorine; et al. Eco-innovation for sustainable tourism transitions as a process of collaborative co-production: the case of a carbon management calculator for the Dutch travel industry. *JOURNAL OF SUSTAINABLE TOURISM* 2018 , Volume: 26 (1222-1240)
- Carson, DA; Prideaux, B; Porter, R; et al. Transitioning from a local railway hub to a regional tourism system: the story of Peterborough, South Australia. *Perspectives on rural tourism geographies. Geographies of tourism and global change* 2019.
- Chen Yue, Chen Chaomei, Hu Zhigang, Wang Xianwen. *Practical Guide to Principles and Applications — CiteSpace Citation Space Analysis [M.]* and Beijing: science Press, China.
- Chen, C.C.; Tsai, J.L. Determinants of behavioral intention to use the personalized location-based mobile tourism application: an empirical study by integrating TAM with ISSM. *Future Generation Computer Systems* .2017 Volume: 96 Pages: 628-638
- Cheng De Nian. econometric analysis of domestic ecotourism research based on CiteSpace. *Tourism Forum* ,2016(1)
- Choi, Jinkyung; Almanza, Barbara; Nelson, Douglas; et al. A Strategic Cleaning Assessment Program: Menu Cleanliness at Restaurants. *JOURNAL OF ENVIRONMENTAL HEALTH* 2014, Volume: )18-24( 76
- Danish; Wang, Zhaohua. Dynamic relationship between tourism, economic growth, and environmental quality. *JOURNAL OF SUSTAINABLE TOURISM* 2018 , Volume: )1928-1943( 26
- Dogan, Eyup; Inglesi-Lotz, Roula. The impact of economic structure to the environmental Kuznets curve (EKC) hypothesis: evidence from European countries. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH* 2020(12717-12724 )
- Dunnan, L.; Jamil, K; Abrar, U; et al. Analyzing the Green Technology Market Focus on Environmental Performance in Pakistan. 2020 (1-5)
- Edgar, Graham J.; Banks, Stuart; Bensted-Smith, Robert; et al. Conservation of threatened species in the Galapagos Marine Reserve through identification and protection of marine key biodiversity areas. *AQUATIC CONSERVATION-MARINE AND FRESHWATER ECOSYSTEMS* 2008, Volume: ) 955-968(18
- Garver, JW. Development of China's overland transportation links with Central, South-west and South Asia. *CHINA QUARTERLY* 2006.(1-22)
- generation Fengju, Liu Chengyu. The research focus and trend of international language policy and planning in the past ten years — visual analysis based on Scopus database. *Journal of Beijing University of Science and Technology* ,2020(10)
- Gossling, Stefan; Hall, C. Michael. Sharing versus collaborative economy: how to align ICT developments and the SDGs in tourism. *JOURNAL OF SUSTAINABLE TOURISM* 2019. Volume: 27 (74-96)
- Han Yu, Yang Wenfeng. Rural ecotourism hot spots and trends \*—based on CiteSpace visualization perspective. *Regional governance* ,2020(7)
- Hanf, K. (1989). Deregulation As Regulatory Reform - The Case Of Environmental-Policy. In *The Netherlands. European Journal Of Political Research* .1989, Volume: 17 (193-207)
- Huberty, M; Zachmann, G. Green exports and the global product space: prospects for EU industrial policy (No. 2011/07), 2011
- Jiang, Ke; You, Daming; Merrill, Ryan; et al. Implementation of a multi-agent environmental regulation strategy under Chinese fiscal decentralization: An evolutionary game theoretical approach. *JOURNAL OF CLEANER PRODUCTION* 2019, Volume: )902-915( 214
- Joshi, Omkar; Poudyal, Neelam C.; Larson, Lincoln R. The influence of sociopolitical, natural, and cultural factors on international tourism growth: a cross-country panel analysis. *ENVIRONMENT DEVELOPMENT AND SUSTAINABILITY* 2017., Volume: 19 (825-838)
- Khan, Haroon Ur Rashid; Siddique, Muhammad; Zaman, Khalid; et al. The impact of air transportation, railways transportation, and port container traffic on energy demand, customs duty, and economic growth: Evidence from a panel of low-, middle-, and high-income countries. *JOURNAL OF AIR TRANSPORT MANAGEMENT* 2018, Volume: )18-35( 70
- Maria Helena Pestana, Alfonso Vargas Sánchez, Luiz Moutinho. The network science approach in determining the intellectual structure, emerging trends and future research opportunities - An application to senior .tourism research *Tourism Management Perspectives*, 2019 (31) 370-382
- V. Venkatraman, N. Arunkumar, Angela Chantre-Astaiza. Mapping the structure and evolution of heavy vehicle research: a scientometric analysis and visualisation. *Int. J. Heavy Vehicle Systems*, Vol. 25, Nos. 3/4, 2018



Wadu Mesthrige Jayantha, Olugbenga Timo Oladinrin. Knowledge mapping of officeworkspace: a scientometric review of studies. *Knowledge mapping of officeworkspace. Facilities* Vol. 38 2020 No. 3/4, 316-345

Wadu Mesthrige Jayantha. Bibliometric analysis of hedonic price model using CiteSpace. *Analysis of hedonic price model*, 2019 (12) 357-371

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