

Comprehensive scientometrics analysis of international research in the field of mining tourism potential

Hasan Baqeri^a, Hassan Dehghan Dehnavi^{a,*}, Shahnaz Nayebzadeh^a, Mozhde Rabbani^a, Mohamad Taqi Honari^b

^aDepartment of Management, Yazd Branch, Islamic Azad University, Yazd, Iran

^bDepartment of Industrial Management, Yazd Branch, Islamic Azad University, Yazd, Iran

(Communicated by Abasalt Bodaghi)

Abstract

Many countries and governments that seek to achieve economic prosperity and benefit from the power and other benefits derived from it; they consider the tourism industry as a golden opportunity. Considering the vast amount of mines in Iran and stating that mining has many positive and negative effects on the environment due to its vastness. Scientometrics is one of the reliable tools for evaluating materials and information sources and identifying research areas and drawing connections between these areas in the form of a thematic map. Using this technique to gain a comprehensive insight related to the potential of mining tourism for the sustainable development of mines is a new action and provides a comprehensive understanding of published articles and research for researchers. This study, which follows the interpretative paradigm, is a type of descriptive study that was conducted using a systematic review method and using the search terms defined in the web of science database in the title of the articles and in the time period of 1955 to 2022. Published research in the field of mining tourism has been deeply investigated. After searching, screening and qualitative evaluation of studies, the final analysis of 52 articles and in-depth analysis of selected articles showed that the most research in the field of tourism in the field of mining is related to 2020 and China, Australia and Slovakia respectively. They have the highest number of research and communication between authors.

Keywords: Mining Tourism, Sustainable Development of Mines, Systematic Review, Scientometrics
2020 MSC: 62P05

1 Introduction

Although mining and its related industries have a valuable and positive role in the economic and social components of sustainable development with job creation and wealth creation, it has been criticized because of its role in the third component of sustainable development, i.e., the environment. Also, according to the increasing demands of the global society for minerals, the mining industry faces challenges in order to continue its activities which include the exploration of minerals and metals, environmental protection and social responsibilities. In developing countries, especially Iran, which has rich mineral resources, if the components of sustainable development in the mining industry are not considered, not only does it not result in development but also it causes social and economic backwardness [11].

*Corresponding author

Email addresses: b398738@gmail.com (Hasan Baqeri), denavi2000@yahoo.com (Hassan Dehghan Dehnavi), snayebzadeh@iauyazd.ac.ir (Shahnaz Nayebzadeh), mrabbani@iauyazd.ac.ir (Mozhde Rabbani), mthonari@iauyazd.ac.ir (Mohamad Taqi Honari)

Tourism is in fourth place in the global rank or, according to some scholars, in second place among the most important industries for the exportation of goods and services. Because of it, many thinkers consider tourism an industry. Tourism as an industry has a fundamental characteristic that distinguishes it from other industries: the points of production and consumption are simultaneous in terms of location. Another essential and important characteristic of tourism is its relationship with globalization in many production sectors and in the field of goods and services [9].

Industrial uneven development has resulted in different problems, threatens and challenges in the world such as; poverty and hunger, increasing inequality in and between countries, marginalization, youth unemployment, health problems, the growth of violence and terrorism, the loot of natural resources and the vast destruction of the environment. The existing challenges show the fact that countries cannot continue their healthy and optimal life without paying attention to sustainable development [12]. In recent years, concerns about sustainable development have been increasingly considered in many countries and industries. The United Nations World Commission on Environment and Development defines sustainable development in its 1987 report "Our Mutual Future" as: "Development that meets current needs without threatening the ability of future generations to supply their own demands." There is general acceptance that sustainable development includes the consideration of environmental, economic and social aspects, which the foundation of good governance supports. After accepting the concept of sustainable development by a wide range of companies and governments, they began to integrate the aspects of sustainable development into their activities [8].

In recent years, ecological and environmental considerations have led to paying attention to tourism. In fact, tourism has been considered suitable for promoting the economic development of each country and the native people of the region and conserving the natural, environmental and cultural values of tourism regions. Therefore, the development of this sector is considered one of the main goals of planners. The development of tourism activities can create many jobs in the labor market and lead to creating a chain of activities through direct and indirect employment [5]. A brief look at the development of the tourism industry shows us that the vision of different countries regarding the development of tourism totally differs from each other according to their different political, cultural, and social purposes; but the priority of most of these countries is the development of economic dimensions. On the other hand, tourism is one of the most dynamic economic activities that have an important role in the sustainable development of regions. Management and planning for tourism development with high potential is the priority of countries' tourism programs [17].

The geotourism of mines is included in important sectors if geotourism attractions of every country which has different attractions such as, observing different kinds of stones especially precious stones, observing the methods of mining and the history of mine. The mining tourism is a part of historical tourism which is related to history and establishment. One of the reasons of paying attention to mining as a tourist region is the interest in the environment, culture and historical heritage of extractive industries [16]. On the other hand, according to the importance of environmental protection during the development of tourism industry and considering the fact that the groups intending to visit the mines during their visit to the tourist mining site, consciously or unconsciously are influenced by the controlled conditions of the environment in these places, they will be usually required to show a better appearance of their cultural performance and vision and social commitment, and they are committed to prevent the negative effects of environmental destruction; in this way, tourism mining can convert to a type of green tourism [4].

Mining and its related activities are developing very fast. The continuous development and progress of the exploitation of mineral resources have led to producing minerals in large quantities and at low prices, which has led to increasing the amount of soil and stone shifting, production stripping, and produced waste. Furthermore, according to the short life of mines' activities, an appropriate plan should be provided to reduce the effects of the end of mining. It is necessary to conduct an environmental assessment of the mining region to identify the potential for sustainable development to have an effective plan to reduce these effects. One of the solutions to reduce the impact of mining activity on the environment is to use tourism potential. Since the discussion of identifying the potential of mining tourism in the sustainable development of mines can be effective. Therefore, the current research is going to determine the potential of mining tourism through a systematic approach.

2 Literature Review and Theoretical Foundation

2.1 Mining Tourism

Using mining fields as a tourism attraction is common in many countries, and thus, mining tourism is converting to a distinguished position in tourism. The mining industry is an important economic activity in many countries having mines, and also tourism has become a serious way of job creation, income and foreign currency income [2]. Tourism is one of the largest current global industries and has an appropriate portion of gross domestic product (GDP) and

employment. Its main investment is "tourism attractions" that are going to be sold to its potential consumers, i.e., tourists. The number of attractions is continuously growing, and there is a clear sign that the travelers of the new generation prevent from the traditional form of holidays and new destinations in abnormal places flourishing. Mining fields are new attractions that have become popular and taken a strong position in the tourism industry. Mining tourism deals with a landscape in which mining activities are influential enough to change physical and cultural spaces and to make them distinguished and visitable [14]. Mining tourism mostly focuses on the remainder of mining activities and mining heritage. Individuals, who participate in mining tourism, are attracted by the possibility of guided tours through the underground operations of previous mines or even still active ones, technical equipment and their buildings. Also, it is considered an independent course that is conducted in order to study abandoned mines, the remainders of mining activities and mining heritages with the purpose of conserving cultural-historical values and using them in tourism [13]. Mining tourism can be considered an important process that helps in interpreting mining heritage and contributes to the next resource of employment and commercial activity after the end of mining. It can be evaluated as a driving force that can encourage the economic potential of mining heritage and can help its conservation by creating income [7].

2.2 Citation Indexes

2.2.1 SNIP Index (Source Normalized Impact per Paper)

This index, proposed by Leiden University, measures the citation impact by measuring the citation based on the total citations in a subject area. This index is calculated by evaluating the citations based on the total number of citations of the relevant subject area (the citation potential of the database in the relevant field) in order to correct the differences between the fields in terms of citation behavior and also in terms of the degree of coverage in the database. In the calculation of the SNIP index, the same idea as the impact factor of magazines has been used. This means that the average citation of an article is calculated and placed in the numerator of a fraction. Therefore, in the numerator of a fraction, we place [3]:

$$\text{The raw impact factor of magazines in 2009} = \frac{\text{The abundance of the citation in the intended year to published articles in three past years}}{\text{The total number of citable published articles in the same 3}} \quad (2.1)$$

The raw impact factor is divided by the citation potential of the database in the relevant field in order to correct the differences between the fields in terms of citation behavior and also in terms of the degree of coverage in the database. The citation potential is the average of the number of references (three-year) of, for example, 2006-2008 to the article in one magazine, i.e. [3]:

$$\text{Citation potential} = \frac{\text{The abundance of the citation (one to three-year) in the citing magazines to the relevant magazine}}{\text{The number of articles citing magazines (in 2009)}} \quad (2.2)$$

2.2.2 SNIP Formula

$$\text{SNIP or impact factor to normalized} = \frac{\text{The raw impact factor of the region in 2009}}{\text{The citation potential in the fields covered by the magazine in 2009}} \quad (2.3)$$

2.2.3 SJR Index (Scientific Journal Rankings)

This index is more suitable for network citations of very large and heterogeneous journals. SCImago uses the SJR Journal Ranking Index to compare journals, which is calculated in two steps. First, each magazine has a similar amount and importance. The importance of the journal is shown by me , and the total number of journals in the database is shown by N , i.e., I/N . The "SCImago Journal & Country Rank" index determines the scientific influence of a journal by considering two factors, the number of citations and the importance or credibility of citing journals. This amount is calculated by dividing the valued average of citations in a determined year by the number of articles in the previous three years [1].

2.2.4 IPP index (the number of citations per published article in the magazine)

The IPP index (Impact per publication) is the index of "impact per document or the raw impact factor of the journal, which is similar to the "Impact factor" in the JCR database. It is calculated based on dividing the citations of the articles of the previous three years by the number of articles of these three years for a determined year [1]:

$$\text{IPP index} = \frac{\frac{\text{The amounts of citations in a year}}{\text{The research sources in the previous three years}}}{\text{The total number of publications in the same three years}} \quad (2.4)$$

2.2.5 H Index

The H index scores the results of a researcher's work during his/her lifetime by calculating the number of citations. The quantity (number of articles) and quality (number of citations) are both considered important by the H index. The accurate measurement of the H index depends on the comprehensiveness of the databases. The H index only includes articles that have citations equal to or greater than H, so it is a more balanced index. The H index of a researcher includes the H number of his/her articles, each of which has been cited at least H times. For example, if an author has 6 articles, each of which is cited at least 6 times, the H index of that author will be 6. To obtain the H number, after searching, the articles should be sorted in descending order according to the citations, and the number of the articles should be compared to the number of citations so that the number of citations is equal to or greater than the number of the articles [10].

2.2.6 Y Index

This index attempts to solve the weaknesses of other indexes by considering quality and quantity. In order to do so, the impact factor as the index of quantity and equal to acceptance and the ranking base on the value or page rank as the index of quality is used. The Y index is the impact factor multiplied by the pitch rank and actually the quantity multiplied by the quality, and it tries to measure the scientific credibility qualitatively as much as possible [10].

$$V(vj) = \text{ISI IF}(vg) \times \text{PRw}(vj) \quad (2.5)$$

2.2.7 M Index

The H index of every researcher depends on the duration of his research activity. Because by passing the time, the number of articles and citations to it increases. Because of it, the M index was introduced to compare researchers in different stages of their activity. This parameter is obtained as a result of dividing each researcher's rank by his/her scientific age. Scientific age means the number of years that have passed since the publication of his/her first article [10].

2.2.8 SSI index (Subject Sameness Index)

The subject sameness index was introduced by Tirgar et al. in [15] and was published in European Science Editing magazine. The formula of subject sameness is as the following [10]:

$$SSI = SSP/TP, \quad (0 \leq SSI \leq 1) \quad (2.6)$$

where: SSI = the number of articles on the same subject or synonyms of the researcher divided by the total number of his articles in a certain period of time, SSP = the number of articles on the same subject or synonyms of the researcher during a certain period of time in which there is at least one repeated subject keyword or synonym and TP = total number of articles published by a researcher in a certain period of time.

According to the formula, if a researcher has 30 articles in a 10-year period, and 5 of them are on the same subject, his or her subject sameness index is equal to (0.16). The higher the number obtained is greater than one, the greater the degree of subject sameness is and the closer to one, the less the degree of subject sameness (or there is a lot of scattered work), and if the obtained number is zero, it means that none of the researches of the researcher have thematic relations and are not related to each other [10].

3 Methodology

The methodology of the current research is based on an interpretive paradigm, and its orientation is basic because it intends to find the intellectual paradigm of international researchers in the tourism potential indexes in the field of mining. The approach of current research is inductive because it is obtained from the part to the whole, and its model is quantitative. According to the purpose of conducting the research, the exploratory approach governs the research, which is conducted in a single section. Based on this protocol, the researchers conducted a systematic study of all the research articles published in the web of science database about tourism in the field of mining, which was published from 1955 to 2022, and analyzed the data by using VOSviewer software version 1.6.11. This software is used to cluster and illustrate subjects, as well as co-occurrence analysis of words and form the structure of scientific fields; also, this software can be used to investigate the connections between authors, organizations and countries in the studied field.

To search and obtain research articles published in the web of science database in the tourism terms in the field of mining and related indexes in order to obtain maximum sensitivity (criterion in the field of obtaining the maximum relevant evidence) and minimum irrelevance (criterion in the field of obtaining minimal irrelevant evidence) and improving the validity of the research, AND, OR, NOT operators and the search strategy were used in the title as follows:

Tourism

AND

Mine

A WHERE conditional statement can be combined with AND, OR and NOT operators.

AND and OR operators are used to extract records that require more than one condition:

If all conditions are true AND the operator extracts the intended record.

If only one of the conditions is true OR operator extracts the intended record.

The NOT operator also shows the records that are against the defined condition.

For example, the following relation (AND) shows all records of the "Customers" table in which the country field is equal to the value "Germany" and the city field is equal to the value "Berlin" :

$$\begin{aligned} &1 \text{ SELECT } * \text{ FROM Customers} \\ &2 \text{ WHERE Country} = ' \text{Germany}' \text{ AND City} = ' \text{Berlin}' \end{aligned} \quad (3.1)$$

The following relation (OR) shows all records in the "Customers" table in which the city field is equal to the value "Berlin" or "München":

$$\begin{aligned} &1 \text{ SELECT } * \text{ FROM Customers} \\ &2 \text{ WHERE City} = ' \text{Berlin}' \text{ OR City} = ' \text{München}' \end{aligned} \quad (3.2)$$

The following relation (NOT) shows all records of the "Customers" table in which the country field is not equal to the value "Germany":

$$\begin{aligned} &1 \text{ SELECT } * \text{ FROM Customers} \\ &2 \text{ WHERE NOT Country} = ' \text{Germany}' \end{aligned} \quad (3.3)$$

Also, AND, OR, and NOT operators can be combined. For example, in the following relation, all records of the "Customers" table in which the country field is equal to "Germany" and the city field is equal to "Berlin" or "München" is shown:

$$\begin{aligned} &1 \text{ SELECT } * \text{ FROM Customers} \\ &2 \text{ WHERE Country} = ' \text{Germany}' \text{ AND (City} = ' \text{Berlin}' \text{ OR City} = ' \text{München}'); \end{aligned} \quad (3.4)$$

Also, in the section of article type, Article and Review was selected. In this way and according to the mentioned points above, 52 articles were obtained in the Web of Science database. Based on the scientific judgment of the researchers, these articles were screened in three stages; diagram 1 shows the process of screening and transfer of preliminary studies to the final analysis.

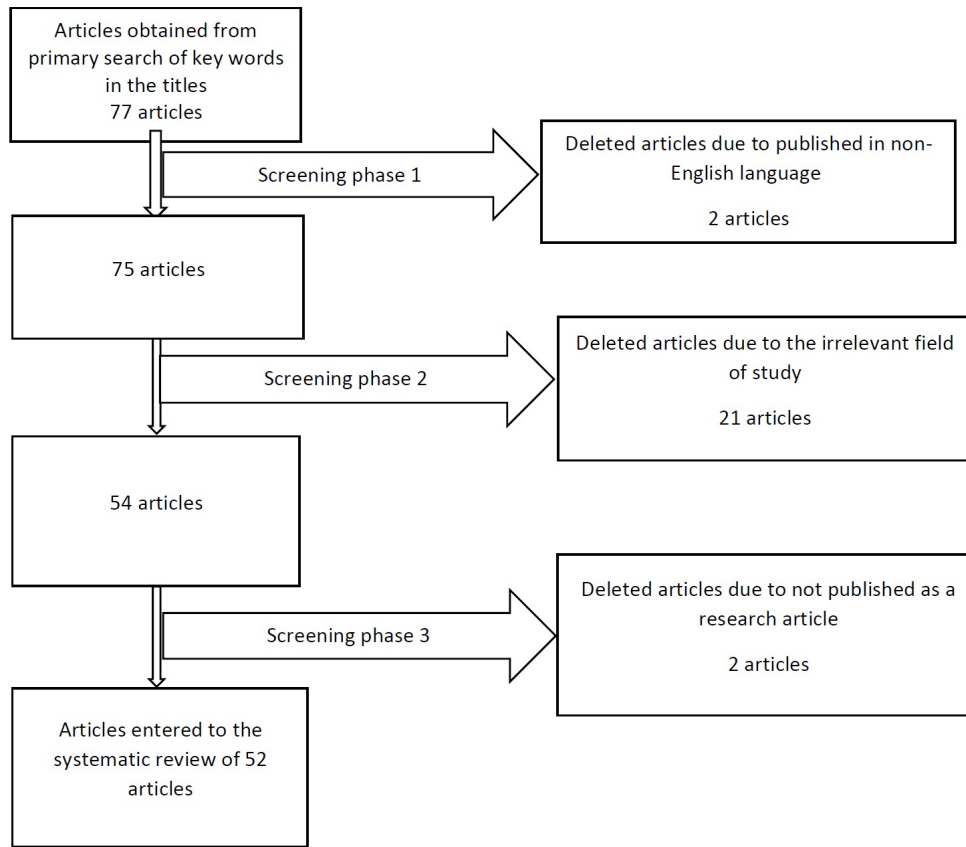


Figure 1: Screening diagram and choosing studies

4 Findings

After searching, screening and evaluating the articles qualitatively during the scientific process of screening to achieve the highest number of articles related to the research purposes, in the end, 52 articles were reviewed. In the following, a comprehensive analysis of the most important authors and countries, along with frequently repeated keywords, was provided as the scientific mapping using VOSviewer software. The H-index is a criterion to rank a scientist or researcher, which shows the two variables of his/her efficiency and scientific impact. The H-index calculation method is such that when a researcher has an H-index of 10, it means that he/she has published 10 articles that have been cited at least 10 times in other articles; Therefore, the H-index shows both the number of articles and the number of citations for each article. This index has a good performance in comparing active scientists in a common field and is considered a criterion to compare the scientific strength of researchers in that field.

Formally, if f is the function that corresponds to the number of citations for each publication, we compute the h-index as follows: First we order the values of f from the largest to the lowest value. Then, we look for the last position in which f is greater than or equal to the position (we call h this position). For example, if we have a researcher with 5 publications A, B, C, D, and E with 10, 8, 5, 4, and 3 citations, respectively, the h -index is equal to 4 because the 4th publication has 4 citations and the 5th has only 3. In contrast, if the same publications have 25, 8, 5, 3, and 3 citations, then the index is 3 (i.e. the 3rd position) because the fourth paper has only 3 citations:

$$\begin{aligned}
 f(A) = 10, f(B) = 8, f(C) = 5, f(D) = 4, f(E) = 3 &\rightarrow h - index = 4 \\
 f(A) = 25, f(B) = 8, f(C) = 5, f(D) = 3, f(E) = 3 &\rightarrow h - index = 3
 \end{aligned}
 \tag{4.1}$$

If we have the function f ordered in decreasing order from the largest value to the lowest one, we can compute the h -index as follows:

$$h - index(f) = \max\{i \in \mathbb{N} : f(i) \geq i\} \quad (4.2)$$

In the current research, among all 52 articles published by different authors, based on the report of the web of science database, the H index has been reported at 14, which indicates the strength of the scientific credibility of the research conducted on the subject of mining tourism.

The citation index [6] means using the contents of an article by other researchers in such a way that the more the sources and contents of the articles are cited and referenced, the more the amount of citation (citation index) of the article increases. Also, increasing referencing and referring to a researcher has a direct relationship with the increase of the H index of that researcher.

The h -index has been found in one study to have slightly less predictive accuracy and precision than the simpler measure of mean citations per paper. However, this finding was contradicted by another study by [6]. The h -index does not provide a significantly more accurate measure of impact than the total number of citations for a given scholar. In particular, by modeling the distribution of citations among papers as a random integer partition and the h -index as the Durfee square of the partition, Yong. arrived at the formula:

$$h \approx 0.54\sqrt{N} \quad (4.3)$$

where N is the total number of citations, which, for mathematics members of the National Academy of Sciences, turns out to provide an accurate (with errors typically within 10–20 percent) approximation of h -index in most cases.

The average citations per item in this study based on the report of the web of science database is 20.37, which means that on average, each of these articles has been cited more than 20 times by other researchers, and the contents of each of them have been used more than 20 other articles; following that 1059 articles have cited these 52 articles totally 956 times, it can be said that the research conducted on the subject of mining tourism has high credibility.

4.1 Analyzing the conducted research according to the subject field

According to the report of the web of science database about the articles reviewed in this research that was published in the years 1955 to 2022, the top ten subject areas are presented in the following table among 52 articles. The statistics indicate that nearly 42% of the articles were published in the subject area of leisure and tourism, and the variety of articles on the subject of environmental science and green sustainability shows the importance of tourism in the mining sector and its sustainable development and shows that researchers in the field of tourism have also paid attention to the issue of mining tourism and its sustainable development, and fortunately, scientific attention in this field is promising. It can be argued that the growing importance of tourism in the mining industry has made the researchers of this field help the managers of this industry and have conducted experimental research in this field.

Table 1: The top ten subject areas of tourism research in the field of mining

Row	Subject area	The number of published articles	The percentage of published articles in each field to all 52 articles
1	Leisure and tourism	21	40.38%
2	Interdisciplinary geology	11	21.15%
3	Environmental science	10	19.23%
4	Environmental studies	10	19.23%
5	The technology of green sustainability science	7	13.46%
6	Processing the minerals of mines	7	13.46%
7	management	5	9.61%
8	Sociology	4	7.69%
9	Regional studies	3	5.76%
10	The geography of the region	3	5.76%

4.2 Analyzing the Conducted Researches According to the Year of Publication

As shown in the graph below, the results of the analysis of the articles in the web of science database show that from 1955 to 2022, the progress of research and the growth of scientific productions on mining tourism has an upward trend, and the number of articles in this field has been increasing since 2014, and before that, it had many ups and downs; in other words, the analysis of the published research under studying shows that 2020 is considered to be the most important year of mining tourism, and researchers have published their research in this year more than any other year (12 articles).

After 2014, in the following years, the upward trend in the publication of articles in this field has continued and shows the research interests of scientists in this subject. The growth of scientific research in a field often happens because of the emphasis of governments and societies or the scientific demand to apply the knowledge of researchers in practice, and according to the change of the paradigm governing the mining tourism industry in the world and modifying the charter of sustainable development of mines by tourism through active organizations in this field, the attention of scientists of different fields to researches focused on mining tourism will bring a bright future for this industry.

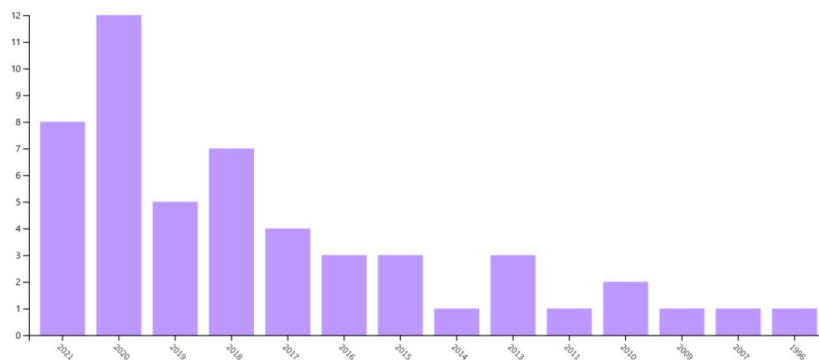


Figure 2: the graph of the trend of publication of articles by year in the field of mining tourism

4.3 Conducted Research according to the Most Important Authors

Graph 3 shows a list of the top ten famous authors in the field of mining tourism; this table is arranged according to the number of articles by these authors.

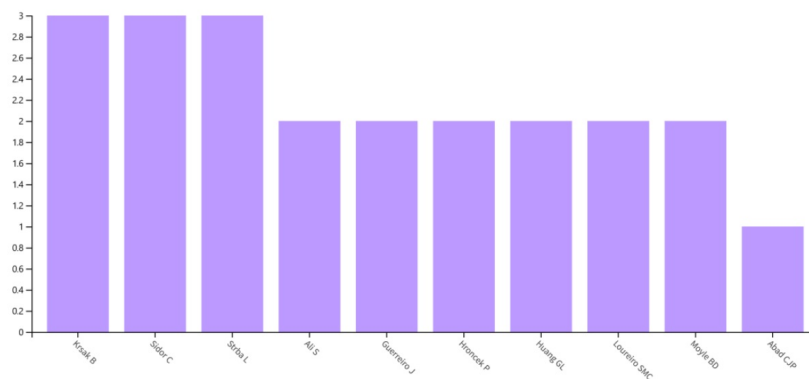


Figure 3: The graph of the top authors in the field of mining tourism

In addition, the dispersion among the authors in the graphic map shows the almost inappropriate and insufficient coordination between the authors in the field of the research study. It can be obviously seen in the density map in Figure 4. Although there are no hot spots on this map, there is a relatively equal density among the authors. Therefore, if more and wider studies are conducted with more connections to the authors and more connections, coordination and research activities are provided between universities and research centers among different authors; also, researchers consider referencing and citing each other's works, ultimately creating denser maps can be achieved, and a field can be established to strengthen the connection power in the network.

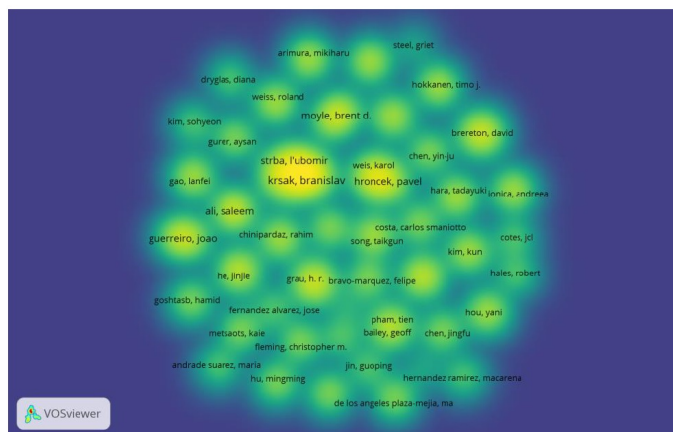


Figure 4: The density map of cooperation in writing between authors

4.4 Conducted Research according to countries

The following graph, which is the output of the Vosviewer software, shows that China is the source of research in the field of mining tourism, followed by Australia and Slovakia in the second and third ranks; obviously, these countries have bigger circles in the picture and this shows the greater influence of these countries as well as their wider participation in the production and publication of scientific articles in this field. In this diagram, each color represents a cluster and based on the analysis of 52 articles in this research, considering the presence of at least 3 articles, 7 countries are placed in three clusters totally that are separated by different colors. As can be seen, some connection lines between some countries have more thickness (strength), and in some cases, the lines are less thick. To explain this issue in the graphic maps resulting from the application of scientometric techniques and illustration of bibliographic networks, it can be pointed out that the thickness of the connection lines between social entities in the network is caused by the more extensive and closer connection of research in the studying field. The thickness of the connection lines in the diagram below is high between the countries of Australia and Spain and less between the other countries; therefore, it is possible to suggest to the researchers of clusters with less scientific connection to consider mutual research activities in their agenda and by increasing, international research cooperation in the field of mining tourism, which has led to thicker lines of scientific connection between countries, increases their scientific credibility in such charts. Also, the authors of the articles in these countries can provide a basis to strengthen the connection power in the network by referencing and citing each other's works.

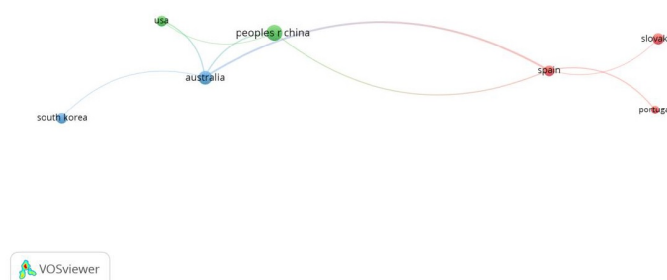


Figure 5: The clustering diagram of countries publishing the articles on mining tourism

4.5 The Analysis of Conducted Researches according to the KeyWords

One of the most frequent words used in the research relevant to mining tourism can be seen in the diagram below; different color in this diagram shows that some of the words are placed in a cluster to the co-occurrence, and the output of the software shows the existence of 6 clusters in different colors. The size of the circles illustrates the degree of using keywords by the authors of the articles, so some words are shown with large circles and some with small circles. Words such as tourism, mining, and tourism mining have larger circles, which shows the high degree of use in articles as keywords, which indicates that these words have been recorded as the keywords with more occurrences

among the keywords in these 52 articles; on the other hand, in the graphic map of figure 6, which shows the map of keywords based on the degree of connection power between words, the connection of some words to each other is shown by thick lines and some by thin lines. This difference is because of the degree of connection of words and their use in articles mutually by authors. For example, the thick lines between the words tourism and mining indicate that these words have been used and examined simultaneously and mutually by the authors of the articles that conducted research in the field of mining tourism. On the other hand, the words which are connected by thin lines, which show few connections between them and other words in the graphic map, are the words that have been paid less attention by tourism researchers in the field of mining, and there is probably a research weakness in these cases. According to this issue, it can be said that researchers and scientists should mention words with a larger circle and thicker lines as keywords in their research in order to increase the possibility of citing articles and the possibility of connecting to other researchers in the world. In addition, research weakness in some cases due to less occurrence in these 52 articles and a weaker connection to co-occurring words is also a very important point.

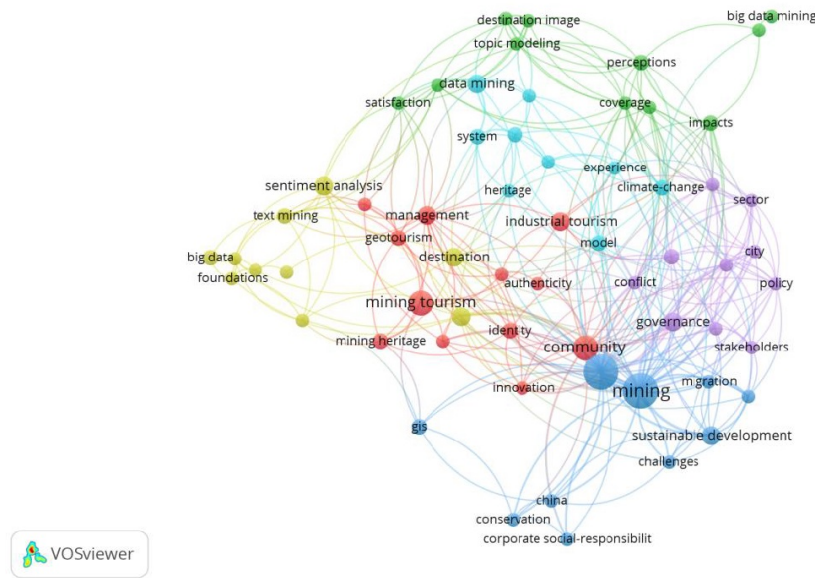


Figure 6: The clustering diagram of keywords used in the articles on mining tourism

In addition, the dispersion of keywords in the graphic map shows mostly inappropriate and insufficient coordination between using keywords among the authors in the research in the field of study. It can be clearly seen in the density map of figure 7. Although there are some relatively hot spots on this map, there is not a good density between the keywords used in the articles of the authors.

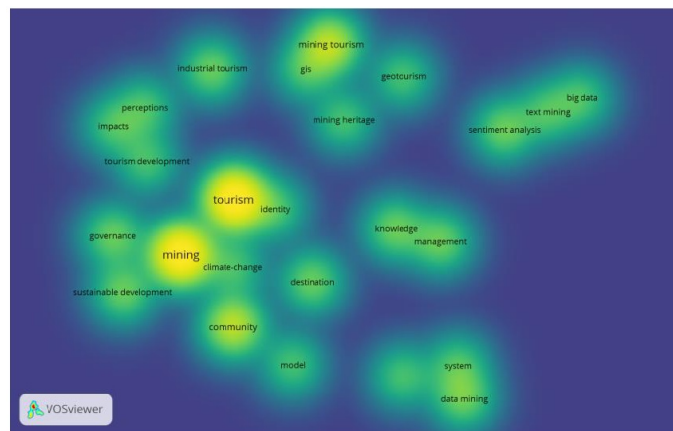


Figure 7: The density map of co-occurrence between keywords according to at least three mutual keywords

5 Discussion and Conclusion

To conduct new research, it is necessary to achieve a comprehensive insight into the results of past research; unfortunately, most of the research is started without a comprehensive review of the scientific research results, and this rework and waste of time and money about the activities of scientists in a scientific field are unacceptable. In fact, it can be said that many of the researches which are conducted in the form of theses and the dissertations of students have a superficial insight into the results of the scientific studies of the researchers in the past, and this weakness in the critical investigation of the background has led to weaknesses in conducting modern researches.

Current research has evaluated a set of conducted researches scientifically during 67 years in mining tourism with new insight, and a new area has been provided to researchers who are interested in research in this field. In the current research and by searching the web of science database, 77 articles on mining tourism were found from 1955 to 2022, and 52 articles were extracted in the field of study during three stages of screening. VOSviewer version 1.6.11 software was used to analyze the data. Statistics show that the number of articles published on tourism in the field of mining is not enough, which indicates that researchers in the field of tourism and sustainable development should pay more attention to it and conduct more extensive research in this field.

The comprehensive review of published articles on the web of science database showed the most important authors, countries, fields of study, articles and keywords in this field. This issue helps researchers who need this information to conduct new research.

Knowledge acquisition on the source of research in the field of mining tourism and sustainable development, as well as the most active authors in this field, can help researchers to find the most important authors and the most important research organizations in different countries and future research will be conducted by stronger support of former researches' results. Of course, if a researcher intends to conduct research in this field, the least used keywords will give him/her the opportunity to do something new, and if a researcher intends to improve the citation index of his/her articles, choosing the most used keywords can give him/her this opportunity; in this way, by introducing the emerging trend of scientific research in the field of mining tourism, this research has played a significant role in improving the knowledge of this field. Using the concepts and potentials of tourism in the field of sustainable development can be subjects that attract the attention of researchers due to being neglected, despite their undeniable importance.

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