

Research Article

Journal of Economic Research & Reviews

Root Cause Analysis of Barriers to Mining Tourism Development in Iran: A Study Based on Thematic Analysis

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Submitted: 2026, Sep 18; Accepted: 2026, Oct 01; Published: Under Process

Citation: Hedayati, S.S. (2026). Root Cause Analysis of Barriers to Mining Tourism Development in Iran: A Study Based on Thematic Analysis. *J Eco Res & Rev*, 6(2), 01-10.

Abstract

Mining tourism, as one of the emerging and specialized branches of tourism, combines geotourism, industrial tourism, and cultural heritage, providing a unique opportunity for revitalizing dormant mining areas, creating sustainable employment, and preserving industrial and geological heritage. The Islamic Republic of Iran, with its special geological position in the Alpine-Himalayan orogenic belt and its unparalleled diversity of mineral resources, is considered one of the world's most suitable countries for mining tourism development. However, this industry faces numerous barriers and challenges in Iran that have seriously hindered the exploitation of this enormous potential. The present study aimed to identify the root causes of barriers to mining tourism development in Iran using a mixed-methods approach (qualitative-quantitative). In the qualitative phase, data were collected and coded through in-depth semi-structured interviews with 16 experts in the fields of tourism and mining until theoretical saturation was achieved, employing thematic analysis. In the quantitative phase, a researcher-made questionnaire with 5 questions and a five-point Likert scale was distributed among 12 experts after confirming face and construct validity ($KMO=0.908$) and reliability ($\alpha=0.98$). The findings revealed that the barriers to mining tourism development in Iran can be categorized into four macro-level dimensions: structural-institutional barriers (multiplicity of decision-making bodies, legal gaps, lengthy registration processes for mines), infrastructural-service barriers (lack of welfare and accommodation facilities, poor access routes, lack of safety infrastructure), socio-cultural barriers (unfamiliarity, weak advertising and information dissemination, lack of awareness among travel agencies), and economic-managerial barriers (managers' disinterest, perceived needlessness, insignificance of tourism revenue for state-owned mines). The results indicate that addressing these barriers requires an integrated approach, institutional synergy, reform of upstream laws, investment in infrastructure, public education and cultural development, and shifting the purely extractive view of mines. Mining tourism can serve as an effective strategy for economic diversification, creating sustainable employment in deprived areas, and preserving the country's industrial and geological heritage.

Keywords: Mining Tourism, Barriers to Development, Thematic Analysis, Iran, Sustainable Development

1. Introduction

In recent decades, the tourism industry has been recognized as one of the most dynamic and profitable sectors of the global economy, and many countries, particularly developing ones, have regarded it as a strategic cornerstone for achieving sustainable development and diversifying their income resources [1]. In this context, new and more specialized forms of tourism have emerged in response to the growing demand for authentic and unique experiences that transcend conventional mass tourism [2]. Mining tourism, as an emerging yet historically rich branch, represents a compelling

fusion of geotourism, industrial tourism, and cultural heritage, centering on visits to both active and abandoned mines, while encompassing an understanding of geological processes, extraction history, and socio-economic impacts [2,3]. This form of tourism offers a unique opportunity for revitalizing dormant mining regions, generating sustainable employment, and safeguarding industrial and geological heritage, while simultaneously providing educational and adventure experiences for tourists [2,4].

The Islamic Republic of Iran, owing to its distinctive geological

position within the Alpine-Himalayan orogenic belt and its unparalleled diversity of mineral resources, is recognized as one of the world's most promising countries for the development of mining tourism [2,3]. The presence of over 70 types of minerals and thousands of active and abandoned mines across the country has transformed Iran into a vast museum of geological and mining attractions, possessing substantial potential to attract both domestic and international tourists [5]. From historical salt and gemstone mines to large-scale lead, zinc, copper, and coal mines, each can narrate a unique story of the land's history, culture, and industry [2]. Nevertheless, despite these exceptional capacities, mining tourism in Iran has failed to secure its rightful position within the national economy and tourism industry, and in practice, it faces numerous obstacles and challenges that severely impede the exploitation of this immense potential [4,6].

Although preliminary steps have been taken in recent years to introduce and develop this branch of tourism such as the launch of the first mining tourism project at the Angouran lead and zinc mine in Zanjan Province in 2020 evidence indicates that this movement has proceeded at a sluggish pace and has been fraught with numerous structural and managerial barriers. Existing research demonstrates that despite the high geotourism potential in Iran, basic infrastructure, including accommodation facilities, access roads, and welfare services in many mining regions, has hampered tourism development [6]. Furthermore, studies indicate that in the 2023 Travel and Tourism Development Index, Iran ranked 73rd among 119 countries, reflecting a profound gap between potentials and the current state of affairs, and underscoring the necessity for a systematic analysis of developmental obstacles [5,7].

The obstacles to mining tourism development in Iran constitute a multifaceted and complex phenomenon, which is not limited solely to capital shortages or inadequate physical infrastructure, but is rooted in deeper layers, including weaknesses in the planning system, institutional incoordination, legal and regulatory challenges, environmental concerns, socio-cultural constraints, and a lack of awareness and specialized knowledge among key stakeholders [3,4,7]. Among these obstacles are public resistance due to environmental apprehensions, the absence of fundamental infrastructure for tourist accommodation, weak interaction between the private and public sectors, the predominance of a purely extractive perspective toward mines while neglecting their tourism and heritage dimensions, as well as the lack of effective branding and marketing for mining tourism destinations [4,5]. In this regard, a precise identification and root-cause analysis of these obstacles are of critical importance, not only for the development of mining tourism, but also for the realization of broader objectives such as the resilience economy, sustainable rural development, and the creation of productive employment in disadvantaged and mineral-rich regions of the country [1]. To the extent that a recent study explicitly emphasizes the necessity of public-private collaboration as a cornerstone for the sustainable development of mines based on tourism potentials, considering it a key factor for achieving developmental goals [4].

Given this research gap and the imperative of systematically addressing the underdevelopment of mining tourism, the present study has been formulated with the primary objective of "root-cause analysis of obstacles to mining tourism development in Iran." Employing a qualitative approach and thematic analysis as a systematic strategy for identifying, analyzing, and reporting conceptual patterns within qualitative data, this study seeks to uncover hidden layers and fundamental causes of these obstacles by delving into the perspectives and experiences of key stakeholders (including experts, managers, entrepreneurs, and local communities involved in the mining and tourism sectors) [4]. Thematic analysis, as a flexible and rich methodological tool, enables the identification of latent themes within interview transcripts and can yield a deeper understanding of the socio-cultural and institutional complexities of this field [3]. This research aims to provide a comprehensive and well-grounded classification of the identified obstacles, thereby laying the groundwork for the formulation of effective policies and practical strategies by planners and decision-makers in the mining and tourism sectors. The findings of this study can serve as a roadmap for transforming the threat of abandoned and stagnant mines into sustainable tourism opportunities, preserving mining heritage, improving the livelihoods of local communities, and ultimately contributing to the diversification of the national economy and reducing dependence on oil revenues [2,6].

2. Theoretical Foundations and Literature Review

2.1. Theoretical Foundations of Mining Tourism

Mining tourism, as one of the emerging and specialized branches of tourism, has garnered increasing attention from researchers and development planners in recent years. This type of tourism is considered a fusion of geotourism, industrial tourism, and cultural heritage, focusing on visits to both active and abandoned mines, while encompassing an understanding of geological processes, extraction history, and socio-economic impacts [2]. In other words, mining tourism serves as a bridge between natural and man-made tourism; for the transformations wrought by humans upon the natural environment of mines have created a novel and unique landscape that offers a pristine and fascinating experience for tourists [1].

From a conceptual standpoint, mining tourism is significant not only for the geological and industrial aspects of mines but also possesses valuable cultural character and is typically accompanied by the active cultivation of tourism [2]. According to Różycki and Dryglas (2017), mining tourism has been proposed as an opportunity for the development of mining regions and can mitigate the effects of industrial, social, geological, and demographic decline in a region by leveraging their historical past and potential as tourist attractions [8]. In this regard, Singh and Ghosh (2021) contend that mining tourism can serve as a sustainable alternative for the development of post-mining regions, paving the way for sustainable development by addressing environmental, economic, and social challenges in a study emphasizing the Kryvyi Rih region of Ukraine, demonstrated that the development of mining tourism can guarantee the sustainable development of old industrial regions and, by diversifying the economies of these areas, maximize social,

economic, cultural, and environmental benefits [9,10].

At the international level, there are successful examples of transforming abandoned mines into tourist destinations, among which the Wieliczka Salt Mine in Poland and the Big Pit National Coal Museum in Wales can be cited, illustrating how mining heritage can be employed to create economic opportunities, preserve industrial culture, and regenerate regional identity. However, international experience suggests that the success of mining heritage tourism depends not only on the intrinsic value of the remaining industrial remnants but also on governance structures, interpretative strategies, and the capacity of local actors to adapt global heritage practices to specific ecological, cultural, and institutional contexts [11].

2.2. Domestic Literature Review

In Iran, despite the high potential of geotourism and the unparalleled diversity of mineral resources, research in the field of mining tourism does not have a long history. Nevertheless, in recent years, preliminary steps have been taken toward identifying and introducing these capacities in a comprehensive study entitled "Geotourism of Mining Sites in Iran: An Opportunity for Sustainable Rural Development," examined the geotourism potentials of ancient and active mines in Iran and argued that mining sites possess geological, industrial, cultural, social, economic, historical, and anthropological potentials for tourism development [2]. They proposed that tourism development at mining sites should be pursued within the framework of geotourism, through the implementation of a strategy of public education regarding geological processes, cultural and historical transformations, and heritage conservation.

In another study aiming to present a model for sustainable development of mines in Iran based on tourism potentials, employed content analysis, Delphi, and interpretive-structural modeling methods to identify twelve key factors [4]. Their findings indicated that, from the experts' perspective, innovative regeneration of mines based on a tourism perspective, improvement of tourism infrastructure, enhancement of regional social capital, and growth of tourism-based businesses and employment are considered the most effective pathways for sustainable development of mines utilizing tourism potentials. Furthermore, they emphasized the necessity of public-private collaboration as a cornerstone for the

sustainable development of mines. At the operational level, Iran has initiated the development of mining tourism since 2020 with the launch of the first project at the Angouran lead and zinc mine in Zanjan Province [6]. Additionally, the feasibility study for transforming the historical Kani Kula coal mine in Zirab County into Iran's first mining museum park reflects the national resolve to capitalize on these capacities [12]. Rastegaran (2024), referring to Turkey's experience, which earns approximately 800 million dollars annually solely through specialized tourism in the mining and natural resources sector, has emphasized the necessity of formulating a new strategy for the development of this industry in Iran [7].

2.3. International Literature Review

At the global level, extensive research has been conducted in the field of mining tourism and industrial heritage, each addressing this phenomenon from various perspectives. Yang et al. (2026), in a study examining China's national mining park system, analyzed the dynamics of governance and local innovation in the country's post-industrial transition [11]. They found that mining heritage tourism in China emerged not through market demand but as an unintended consequence of institutional layering of central government policies. This study identified two distinct development pathways: recreational parks centered on ecological restoration, and experiential parks that utilize industrial systems for commercially oriented immersive experiences.

Patsiuk et al. (2023), through a study of the Kryvyi Rih region of Ukraine, structured the theoretical approaches to the concept of mining tourism and identified the key objects of interest for consumers of this tourist destination [10]. They analyzed global trends in the transformation of industrial areas for mining tourism needs and, based on assessing the suitability of various mining facilities, proposed their utilization in thematic tour programs. Furthermore, Singh and Ghosh (2021), in a theoretical study aimed at evaluating the potential of mining tourism as a sustainable alternative in coal-rich regions of India, argued that on the one hand, active mines can host tourism as a secondary economic activity, generating additional employment for locals and extra revenue for owners, and on the other hand, introducing tourism into post-mining heritage landscapes can pave the way for sustainable development [9].

Row	Researcher(s) (Year)	Country Region	Topic/Research Focus	Methodology	Key Findings
1	Ghazi et al. (2021) [2]	Iran	Geotourism of mining sites and sustainable rural development	Review-analytical study	Iranian mines possess geological, cultural, and historical potentials for tourism development and sustainable employment generation
2	Baqeri et al. (2024) [4]	Iran	Sustainable development model for mines based on tourism potentials	Content analysis, Delphi, interpretive-structural modeling	Twelve key factors were identified, including innovative regeneration, infrastructure, and social capital
3	Nikbakht et al. (2023) [12]	Iran (Kani Kula Mine)	Feasibility study of transforming a historical mine into a mining museum park	Descriptive-analytical and field studies	The Kani Kula coal mine has the capability to become Iran's first mining museum park
4	Yang et al. (2026) [11]	China	Governance dynamics and local innovation in mining heritage tourism	Multi-level policy analysis and comparative case studies	China's mining heritage tourism emerged as an unintended consequence of institutional layering of government policies
5	Patsiuk et al. (2023) [10]	Ukraine (Kryvyi Rih)	Mining tourism as a guarantee for sustainable development of industrial regions	Theoretical and empirical methods (field observations, content analysis)	Conceptual approaches to mining tourism were structured, and key objects of tourist interest were identified
6	Singh & Ghosh (2021) [9]	India	Mining tourism as a sustainable development alternative in coal-rich regions	Theoretical study with a critical approach	Mining tourism can pave the way for sustainable development in post-mining regions
7	Rastegaran (2024) [7]	Iran	The necessity of a new strategy for Iran's tourism development	Analytical-news report	Turkey earns \$800 million annually from mining tourism; Iran requires a strategic revision
8	Tehran Times (2022) [6]	Iran (Zanjan Province)	Investment in mining tourism at the Angouran mine	News report	Iran's first mining tourism project has been launched at the Angouran mine and requires infrastructure development

Table 1 : Literature Review Table

3. Research Methodology

The present study is applied in terms of objective and descriptive-survey in terms of nature, conducted using a mixed-methods approach (qualitative-quantitative). In the qualitative phase, this research seeks to identify and trace the root causes of obstacles to mining tourism development in Iran through an in-depth analysis of the perspectives and experiences of experts in this field, while in the quantitative phase, it addresses the prioritization and validation of the qualitative findings. The mixed-methods approach was selected for this study because the complex and multifaceted nature of the obstacles to mining tourism development necessitates both a deep and exploratory understanding of the phenomenon (qualitative approach) as well as more precise measurement and prioritization of the identified factors (quantitative approach) [13]. The method employed in the qualitative phase of the research is thematic analysis, so as not to impose any mental preconceptions on participants or force a predetermined framework upon their opinions [14]. Qualitative methods are highly suitable for the exploratory understanding of topics that have not been extensively studied, as they do not require predefined variables and allow the position of the phenomenon to emerge from within the data [15]. The quantitative phase of the research was conducted with the aim of prioritizing and ranking the identified obstacles and determining the significance of each from the experts' perspective, utilizing multivariate statistical techniques [16].

The statistical population of this study comprised all experts

and specialists active in the fields of tourism and mining across Iran who had at least 5 to 20 years of continuous and effective experience in these two domains. Given the specialized nature of the research topic and the lack of easy access to all members of the population, a non-probability purposive sampling method of the snowball type was employed. Snowball sampling is a non-probability method used in situations where the units of study are not easily identifiable, and the researcher gains access to subsequent individuals through the introduction provided by initial participants [17]. In this method, 16 individuals were selected from among the identified experts using the snowball technique, and following the researcher's persistent follow-ups, 12 of them ultimately participated as the final statistical sample in the quantitative phase of the study. Furthermore, in the qualitative phase, the interview process with experts continued until the point of theoretical saturation was reached; that is, the researcher achieved theoretical saturation at the fifteenth interview; however, to ensure greater certainty, interviews were continued up to the sixteenth participant [18]. Participants in the study were selected from among senior experts of the Ministry of Cultural Heritage, Tourism and Handicrafts, faculty members of universities under the Ministry of Science, Research and Technology with expertise in tourism, management, and planning, as well as expert specialists in the fields of geology and mining, to ensure diversity of perspectives and comprehensive coverage of the various dimensions of the topic [19].

Given that no validated standard questionnaires or scales existed for measuring the obstacles to mining tourism development in Iran, the researcher proceeded to design the research instrument after an in-depth review of scientific sources, dissertations, and articles related to the research topic. The data collection instrument in the qualitative phase consisted of semi-structured in-depth interviews, designed using open-ended questions. These interviews were conducted with the aim of discovering and identifying the various dimensions of obstacles to mining tourism development from the experts' perspective, and their questions were formulated based on the theoretical foundations and literature review. In the quantitative phase, a researcher-developed questionnaire comprising 5 main questions, based on a five-point Likert scale (ranging from "very low" to "very high"), was designed, the items of which were extracted from the findings of the qualitative phase and the identified themes.

The designed questionnaire was examined after confirming its face validity through an initial distribution and solicitation of opinions from 14 specialists in the fields of tourism and mining, and the implementation of necessary revisions. Furthermore, the construct validity of the questionnaire was assessed through exploratory factor analysis, which yielded a KMO value of 0.908, indicating sampling adequacy and the suitability of the data for factor analysis [20]. The reliability of the questionnaire was also calculated using Cronbach's alpha coefficient, which yielded a value of 0.98, indicating very high reliability of the research instrument [21]. The questionnaires were distributed to the statistical samples through dual modes, and following the researcher's repeated follow-ups, a total of 12 completed questionnaires were collected.

In the qualitative phase of the research, the data obtained from in-depth interviews with experts were analyzed using thematic analysis. Thematic analysis is defined as an analytically inductive analysis in which the researcher, through the classification of data and the identification of patterns both within and across data, arrives at an analytical typology [22]. In another definition, thematic analysis is the coding and analysis of data with the aim of understanding what the data say and what semantic patterns are embedded within them [23]. The thematic analysis process in this study was conducted based on the six-step approach of Braun and Clarke (2006), which includes: 1) familiarization with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the final report [22]. The coding process proceeded as follows: after each interview was completed, the audio file was listened to in its entirety from beginning to end, and the key points raised by the interviewees were written down as descriptive sentences and labeled. In the next stage, descriptive themes with semantic affinity and thematic similarity were grouped into a single category, and by selecting an appropriate new theme and title for them, a new classification was undertaken, and basic themes were formed.

In the quantitative phase of the research, for the purpose of analyzing the questionnaire data, the Kolmogorov-Smirnov test

was first used to examine the normality of the data distribution [24]. Given that the results of the K-S test indicated a non-normal distribution of the data, but relying on the Central Limit Theorem and considering the sample size to be sufficiently large, the assumption of normality of the data was considered for subsequent analyses [25]. Furthermore, the one-sample t-test was employed to examine the significance of the mean scores for each item from the experts' perspective, and second-order confirmatory factor analysis was utilized for the prioritization and validation of the identified dimensions and components of obstacles to mining tourism development, using the opinions of academic elites and tourism practitioners [16]. Statistical analyses were performed using SPSS version 26 and Lisrel version 8.5 software.

Determining the reliability of qualitative findings is a critical stage in the research process. In this study, to ensure the reliability of the findings derived from thematic analysis, the inter-coder reliability method was employed [26]. For this purpose, two independent coders undertook the coding and classification of the conducted interviews, and their percentage of agreement was calculated. According to the criterion proposed by Coyle (1996), an agreement rate of sixty percent or more regarding an interview is considered an acceptable method for confirming the reliability of the analysis [27]. In addition, to validate the findings of the qualitative phase, member checking, peer debriefing, and data triangulation methods were utilized to ensure the accuracy and precision of the findings [28]. In the quantitative phase, as previously mentioned, the validity and reliability of the questionnaire were confirmed through exploratory factor analysis and Cronbach's alpha coefficient, indicating the high credibility of the measurement instrument.

In conducting this research, all ethical considerations pertaining to human research were observed. Prior to the commencement of each interview, the research objectives were fully explained to the participants, and their informed consent was obtained. Participants were assured that their information would remain confidential and that the research findings would be reported in aggregate form without mentioning individuals' names. Additionally, participants were informed of their right to withdraw at any stage of the research, and all interviews were recorded with their permission.

4. Research Findings

In this section, following the introduction of the extracted themes, the stage of further examination of the data collected through interviews with twelve experts from the tourism and mining industries was undertaken. Subsequently, the data were refined based on the objectives and main research questions, and after categorization and identification of the conceptual categories constituting the themes, conceptualization and coding were performed. Thereafter, the data were tabulated and illustrated, and the thematic map derived from this information is presented.

4.1. Obstacles to Mining Tourism Development in Iran

The main conceptual categories constituting the extracted themes:

Theme	Conceptual Categories Constituting the Theme	Interviewee Code(s)
Challenges	Safety and security conditions in state-owned mines	(11) ∙ (15) ∙ (17) ∙ (110) ∙ (111)
	Legal vacuum in upstream laws	(18) ∙ (111)
	Security-oriented approach toward foreign tourists	(11)
	Research gap	(11) ∙ (19)
	Distance from tourist routes	(12)
	Lack of visibility / Being unknown	(12) ∙ (14)
	Scattered distribution of mines across the country	(12) ∙ (17) ∙ (19)
	Lack of minimum welfare facilities	(13) ∙ (16) ∙ (19) ∙ (112) ∙
	Lack of cooperation from private owners	(12)
	Insignificance of mining tourism revenue for state-owned mines	(12) ∙ (110)
	Absence of legal mechanisms for transferring abandoned mines to the private sector	(13)
	Multiplicity of decision-making bodies and lack of stability among officials	(13)
	Lack of rehabilitation and beautification of mines, especially underground ones	(16)
	Access roads	(12) ∙ (16) ∙ (111)
	Managers' disinterest in tourism affairs	(18)
	Sense of self-sufficiency	(18)
	Lengthy registration process for mines	(110)
	Rent-seeking in this field	(18)
	Lack of information dissemination and awareness in this field	(110) ∙ (111)
	Lack of safe infrastructure	(110)
	Weak advertising / Promotion	(112)
	Distance of mines from tourist routes	(12) ∙ (19)
	Lack of awareness among travel agencies	(111)

Table 2 : Conceptual Categories Constituting the Theme

The two-letter codes appearing in the table refer to the interviewees. For example, the code (111) denotes the eleventh interviewee. The letter "I" stands for "Interviewee," and the number indicates the sequential order of the interviewee.

1) Safety and Security Conditions in State-Owned Mines

- Many mines do not provide adequate safety and health conditions for attracting tourists. Consequently, to attract tourists, at least the minimum safety requirements for tourists must be provided (11).
- The harsh working conditions in mines and the natural conditions surrounding mining areas pose challenges to tourist safety; therefore, many mine owners are not receptive to tourist visits under these circumstances (15).
- Most mines in Iran are state-owned, and for public sector managers, mine security is a top priority, which in turn leads to reluctance to accept tourists, particularly foreign visitors (17).
- For many mine managers, especially those of state-owned mines, mining revenues are so substantial that they forgo the income generated from attracting tourists and are unwilling to host tourists (111).
- 2) Legal Vacuum in Upstream Laws
- The absence of legal mechanisms and the existence of cumbersome regulations for transferring mines to the private

sector have hindered the growth of this industry (18).

- The lack of synergy and cooperation among governmental institutions has created instability in investment in mining tourism, and this issue has not been defined within the laws pertaining to industry and mining (11).
- 3) Security-Oriented Approach Toward Foreign Tourists
- Foreign tourists are still viewed through the lens of espionage, and this security-oriented perspective represents the greatest challenge to the prosperity of mining tourism (11).
- 4) Research Gap
- Sufficient research has not been conducted in the field of mining tourism, which has resulted in this form of tourism remaining unknown to mine owners and the general public (11).
- Many people are still unfamiliar with this type of tourism and its objectives, and there are no documented reports available on this form of tourism (19).
- 5) Distance from Tourist Routes
- The itineraries of tours in Iran follow specific routes, and mines are very sparse along these routes; consequently, visits to mines cannot be incorporated into tour programs (12).
- 6) Lack of Visibility / Being Unknown
- Mines are not recognized as tourist destinations in Iran and have remained unknown; for this reason, they lack the

- credibility of a destination for Iranian tourists and are more often considered as the final point of a journey (I2).
- When tourism is discussed in Iran, only historical and cultural tourism come to mind, and other dimensions remain unknown to the general public (I4).
- 7) Scattered Distribution of Mines Across the Country
- When we intend to take inbound tourist tours to mines, the mines are scattered and located in small towns with very limited welfare facilities (I2).
 - The geographical expanse and vastness of the country have led to the dispersion of mines, and this issue complicates the planning for launching tourist tours in terms of time and transportation (I7).
 - The mines in the country are remote and not easily accessible (I9).
- 8) Lack of Minimum Welfare Facilities
- The primary prerequisite for attracting tourists is adequate accommodation facilities, which are absent in all mines across the country, and this constitutes the most important condition for attracting tourists (I3).
 - Tour operators take into account the comfort and welfare of tourists to ensure the return on their investment, and they are never willing to risk taking passengers to a place lacking accommodation conditions (I6).
 - A critical issue in the tourism industry is the lack of accommodation facilities and collective lodging in mines, which renders tourist safety precarious (I9).
 - If we consider geotourism within the domain of tourism, access roads and pathways inside mines, as well as the type of lodging and tourist amenities, pose significant challenges (I12).
- 9) Lack of Cooperation from Mine Owners
- Typically, mines are either privately owned, with owners not granting visiting permissions, or are under state protection with entry restrictions and security-based prohibitions (I2).
- 10) Insignificance of Mining Tourism Revenue for Mine Owners
- For the government, foreign exchange earnings from tourism are not a priority, and for private owners, mining revenue is paramount, while mining tourism remains an unfamiliar concept (I2).
 - Return on investment is meaningful in mining production, and welcoming tourists holds no place for managers (I10).
- 11) Absence of Legal Mechanisms for Transferring Abandoned Mines to the Private Sector
- The most significant challenge in transforming a mine into a tourist destination is the absence of a legal mechanism. Although the physical infrastructure of a mine exists, changes have been made to the natural landscape, and costs have been incurred, cumbersome regulations are the primary obstacle to converting the site into a tourist area. Only the Angouran lead and zinc mine has received a tourism operation license from the Zanzan Cultural Heritage Organization (I3).
- 12) Multiplicity of Decision-Making Bodies and Lack of Stability Among Officials
- Many abandoned mines have applied for change of use, but the Ministry of Industries and Mines, due to extensive and successive changes in officials and lack of stability, has been unable to maintain the necessary mechanisms, and there is no unified procedure for transfer to the private sector (I3).
- 13) Lack of Rehabilitation and Beautification of Mines
- After mines are abandoned for any reason, unsightly scenes are left behind in nature and are simply left as they are, with no action taken to beautify the area. A working group involving the Ministry of Industry and Mine, Cultural Heritage, and the Environmental Protection Organization should be established, as is the case in other countries that generate revenue from abandoned mines and carry out beautification efforts to encourage private sector investment in tourism (I6).
- 14) Access Roads
- Access roads to mines are difficult and impassable, not designed for tourists, and have their own specific conditions (I2).
 - Routes should be designed for mines to make them more accessible to tourists, with defined road safety measures (I6).
 - Transportation and the safety of mining roads are significant challenges, as most mines are located outside cities and are difficult to access, thereby compromising passenger safety (I10).
- 15) Managers' Disinterest in Tourism Affairs
- Managers and mine owners are not particularly interested in tourism, regarding it as disruptive to their programs, and do not welcome it (I8).
- 16) Sense of Self-Sufficiency
- Managers of state-owned mines have not experienced economic change, and because their revenue levels are high, they are not inclined to explore alternative income-generation methods (I8).
- 17) Lengthy Registration Process for Mines
- The process of registering an abandoned mine as a tourist attraction requires a lengthy procedure, and the prevailing bureaucracy in governmental offices, along with a lack of transparency in regulations, discourages investors (I10).
- 18) Rent-Seeking
- Mine registration is not granted to just anyone, and the phenomena of rent-seeking and bribery are rampant in this process (I8).
- 19) Lack of Information Dissemination and Awareness in This Field
- The most important challenge is the lack of awareness and information in the field of mining tourism; we have not had any websites or mining tourism groups through which the public could obtain information in this regard (I10).
 - Brief training should be provided, and the necessary tools and means for information dissemination are still lacking (I11).
- 20) Lack of Safe Infrastructure
- We lack the necessary infrastructure for safety, accommodation, and equipment; for example, we do not have safety measures in caves, nor the required infrastructure for museums; there is no clear definition for mining tourism; and from a geological perspective, there is a lack of necessary education and

awareness—since awareness and information dissemination generate motivation among the public (I10).

21) Lack of Awareness Among Travel Agencies

- Because this type of tourism has not become widespread, travel agencies fear low public turnout and lack of return on investment; therefore, necessary training should be provided in this area (I11).

22) Weak Advertising / Promotion

- For years, working in mines has been perceived as a high-risk occupation, and this image comes to mind; for those familiar with the attractions, this initial perception is not accurate. Some imagine that mining work falls more within the research domain than recreation, because they think of it as a high-risk activity, and this is due to the lack of advertising in this field (I12).

23) Distance from Tourist Routes

- Tourist routes are designed in such a way that they rarely encompass cities with numerous mines, and the dispersion of mines causes them to fall outside the tourist routes (I2).
- Iran's mines are remote and sometimes unknown, and access to them is not easily and readily possible (I9).

Examination of the Conceptual Categories Constituting the Theme of "Challenges"

The examination of the conceptual categories constituting the theme of "Challenges," derived from interviews with experts in tourism and mining regarding mining tourism, reveals a range of both micro and macro factors that have confronted this phenomenon with various challenges.

5. Discussion and Conclusion

The present study was conducted with the aim of root-cause analysis of obstacles to mining tourism development in Iran, employing a mixed-methods approach and thematic analysis. The findings of this research revealed that the obstacles to mining tourism development in Iran constitute a multifaceted, complex, and deep-rooted phenomenon, classifiable into four macro-level categories: structural-institutional obstacles, infrastructural-service obstacles, socio-cultural obstacles, and economic-managerial obstacles. These findings are considerably aligned with the results of previous studies, including those of Baqeri et al. (2024), which emphasized the vital role of cross-sectoral collaboration and innovative regeneration of mines, as well as the findings of Ghazi et al. (2021), which pointed to the multifaceted potentials of mining sites for tourism development [2,4].

From a structural-institutional perspective, the results indicated that the multiplicity of decision-making bodies, the absence of transparent legal mechanisms for transferring abandoned mines to the private sector, legal vacuums in upstream laws, and the lengthy and bureaucratic process of registering mines as tourist attractions constitute the most significant structural obstacles. This finding is consistent with the research of Yang et al. (2026) in China, which addressed the impact of institutional layering of government policies on the formation of mining heritage tourism,

suggesting that success in this domain depends, more than any other factor, on governance structures and institutional coherence [11]. Furthermore, the security-oriented approach toward foreign tourists and the purely extractive perspective on mines, which were raised in the interviews as fundamental challenges, reflect the lack of a strategic and macro-level vision toward mining tourism as a revenue-generating and development-oriented industry at the governance level [7].

In the infrastructural-service dimension, the research results demonstrated that the lack of minimum welfare and accommodation facilities, inadequate access roads, absence of safety infrastructure, and failure to rehabilitate and beautify mines constitute serious obstacles to mining tourism development. This finding is consistent with the report by Tehran Times (2022), which emphasized the weakness of basic infrastructure in mining regions, and indicates that even in the presence of political will and appropriate planning, the lack of physical infrastructure creates an undeniable barrier to attracting tourists, particularly international visitors [6]. Notably, some experts also pointed to the shortage of communication and information infrastructure, such as specialized websites and social media platforms related to mining tourism, reflecting a digital gap in the introduction of these capacities.

In the realm of socio-cultural obstacles, the lack of recognition of mining tourism as a tourist destination in the minds of the general public and even tourism industry professionals, weak advertising and information dissemination, and the lack of awareness among travel agencies were identified as the most significant challenges. This issue is consistent with the perspective of Singh and Ghosh (2021), who emphasized the necessity of shifting public attitudes toward mines and the extractive industry, and introducing them as recreational-educational attractions [9]. Moreover, the resistance of mine managers, particularly those in state-owned mines, toward welcoming tourists due to a sense of self-sufficiency and lack of understanding of the economic benefits of tourism, indicates a deep divide between the mining and tourism sectors and the absence of a shared discourse between these two domains.

From an economic-managerial perspective, the findings indicate that the most significant challenge is the insignificance of tourism revenue for state-owned mines. This issue, which was explicitly raised in the interviews, suggests that as long as senior mine managers do not recognize tourism as a complementary and strategic source of revenue for the sustainable development of mining regions, and as long as the necessary economic incentives for entering this field are absent, the development of mining tourism will face a fundamental obstacle. This finding stands in contrast to the results of Patsiuk et al. (2023), which emphasized the role of mining tourism in guaranteeing the sustainable development of old industrial regions, and reflects the weakness of Iranian managers' awareness regarding the long-term benefits of this industry [10].

Overall, the findings of this research indicate that the obstacles to mining tourism development in Iran are systemic and interrelated,

and their removal necessitates a comprehensive and integrated approach in which synergy among responsible institutions (the Ministry of Cultural Heritage, the Ministry of Industry, Mine and Trade, the Environmental Protection Organization, and the private sector) and the formulation of transparent and incentive-based laws are prioritized. Furthermore, public education and cultural development, the establishment of physical and digital infrastructure, and a shift away from the purely extractive view of mines are considered fundamental prerequisites for the development of this emerging industry. Ultimately, given Iran's high potential in this field, mining tourism can play a role as an effective strategy for economic diversification, creation of sustainable employment in deprived areas, and preservation of the country's industrial and geological heritage.

Recommendations for Policymakers and Decision-Makers

Based on the findings of the present study, which indicate the multifaceted and systematic nature of obstacles to mining tourism development in Iran, it is recommended to policymakers, planners, and decision-makers in the mining and tourism sectors that, adopting an integrated and synergistic approach, they should first undertake the revision and reform of upstream laws and the formulation of transparent and incentive-based legal mechanisms for the transfer of abandoned mines to the private sector with the aim of transforming them into tourist destinations. Furthermore, by establishing a specialized investment fund for mining tourism with the participation of both the public and private sectors, they should facilitate the financing of accommodation, service, safety, and communication infrastructure in mining regions. Additionally, conducting specialized training courses and capacity-building programs for mine managers, tourism experts, tour guides, and local communities with the objective of raising awareness regarding the economic, social, and cultural benefits of mining tourism and shifting the purely extractive perspective on mines, alongside the design of information campaigns and national branding in domestic and international media, the creation of a specialized mining tourism website and application, and the introduction of mining tourism routes at international tourism exhibitions, are considered unavoidable necessities for the development of this emerging industry. Finally, establishing a comprehensive database of active and abandoned mines with potential for transformation into tourist attractions with the participation of the Geological Survey and Mineral Explorations Organization, and preparing a strategic roadmap for the development of mining tourism at both national and provincial levels, along with establishing communication with leading countries in the field of mining tourism such as Poland, China, and Turkey for the purpose of knowledge transfer, attracting foreign investment, and developing inbound tourism, can lay the groundwork for a fundamental transformation in this field, converting the threat of abandoned and stagnant mines into sustainable tourism opportunities, preserving mining heritage, and improving the livelihoods of local communities [2,4,11].

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