Examination and Assessment of Mineral Geosites in Tabas County as a Mining-centered Geopark in Eastern Iran

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Extended Abstract

1. Introduction

Today, tourism is considered as an important economic activity across the world. Among various types of tourism, geotourism and geopark are newly growing branches which are related to geological activities (Hose, 2008; Alexandrowicz, 2006; Gordon, 2012). In geotourism, geological heritage are protected and operated within a range surrounded by specific borders called geoparks; it is accompanied by education, development, and economic growth of local communities (Amrikazemi et al., 2017). As a branch of tourism, geotourism is studied by examining and identifying the locations as well as protecting geological heritage (Amrikazemi, 2012). This type of tourism has the most significant connection to humans’ everyday activities; mines have also been closely connected to the changes and developments of human life since past to present. These places can be introduced in the form of geotourism within mining-centered geoparks. Accordingly, Tabas geopark is introduced as a mining-centered geopark and its potentials are assessed.

2. Review of Literature

In geoscience and its different subjects related to tourism (particularly geotourism), it appears essential to gain a thorough understanding of its developments and evolution during various points of time. The identification of each would guide humans towards a better recognition of different earth-related processes. One of such instances is the present study which can be referred to in tourism studies and planning, particularly in mine geotourism. There has been a number of different researchers studying geotourism potentials and the geopark at this region (Nazemi, 2009; Orouji, 2012; Abdi et al., 2013; Yahya Sheibani & Zamanian, 2014; Salmani et al., 2015; Nazemi & Maghzinajafabadi, 2010; Sheibani & Zamanian, 2016; Sheibani et al., 2016; Yahya Sheibani, 2017; Yahya Sheibani et al., 2018). The geological background of this region demonstrates a number of valuable and rare potentials, the likes of which have scarcely been found across Iran; subsequently, there has been very few studies conducted in the area of tourism and the importance of mines at this region through a technical perspective. The results of the study showed the existence of an extensive variety of mining attractions.

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alongside other geological and natural potentials as well as historical-cultural attractions.

3. Method
To identify the mines and mineral geosites in this study, many trips have taken place during a few years. In addition to mineral potentials at each mine, special attentions has been paid to their surrounding attractions such as rural areas and historical-cultural, natural and geological attractions. Two types of mines including active and old, abandoned mines were taken into account. Moreover, the assessment indices laid out by Fassoulas, Mouriki, Dimitriou-Nikolakis, and Iliopoulos (2012) were used to carry out quantitative examinations and assessments on mineral geosites.

4. Results and Discussion
Given the large area of Tabas County, its diverse types of rocks from various geological periods, and a broad spectrum of diverse minerals, Tabas can be considered as a collection of minerals. The most significant active mines in this region include Parvadeh fully-mechanized and open-air Mazino coal mines, Kamarmahdi Fluorite, Kalmard incombustible soil and bauxite, construction stones, and Chirouk foundry sand; the most important abandoned mines in Tabas includes Ozabkuh and Chah Sorb lead and zinc mines and Gazou copper. Seventy six percent of the total coal supplies in Iran are located in Tabas; as a result, the county is known as the coal industry capital of Iran. Kamarmahdi fluorite mine is considered as one of the largest fluorite mines in both Iran and the Middle-East, in which fluorite veins have appeared with a variety of colors (green, yellow, purple, amethystine, and white). Kalmard incombustible soil and bauxite mines along with the geological position of Precambrian, Paleozoic, and Mesozoic formations with beautiful appearances and stunning wrinkles as well as Kalmard andRobat-e-Khan Inns and deserts occupy a valuable position in Western Tabas. Furthermore, marbles and travertine with diverse colors are among the most important mines for construction stones. Chirouk foundry sand mine is one of the largest, most valuable mines in Iran given its production of natural, spherical foundry sands. In addition, Ozabkuh and Chah Sorb lead and zinc mines at the north of Tabas, and Gazou copper mine at the south-east of the county are valuable instances of old abandoned mines which are capable of attracting any visitor to their unique attractions.

The method proposed by Fassoulas et al. (2012) was used to assess mineral geosites. According to the results obtained from the evaluation of 9 mineral geosites, the highest scores related to educational indices respectively belonged to Parvadeh coal mines, Ozabkuh lead and zinc mines, and Kamarmahdi Fluorite mine. Moreover, Ozabkuh and Chah Sorb lead and zinc mines and Chirouk foundry sand mine obtained the highest scores in tourism value index. Finally, the highest scores on protection necessity belonged to Parvadeh coal mines, Kamarmahdi Fluorite mine, and Chirouk foundry sand mine; there should be more attention paid to these sites in terms of protection necessities.
5. Conclusion

There are a number of highly diverse geological, cultural-historical, natural, and mineral attractions in Tabas County. This city has numerous known and unknown mineral potentials, to the extent to which it occupies a special position among Iranian cities in terms of diverse mineral capabilities in high quality and quantity; the county is also known as the coal capital and one of the most important mineral centers of Iran. The most significant mining geotourism locations include active mines such as Parvadeh coal mine, the open-air Mazino coal mines, Kamarmahdi Fluorite, Kalmard incombustible soil and bauxite, construction stones, and Chirouk foundry sand mine. Furthermore, the old abandoned mines include Ozabkuh and Chah Sorb led and zinc mines and Gazou copper. As a useful instrument, the quantitative assessment method in this study can be employed for sustainable management and protection of geological heritage. In this method, the highest scores on educational indices respectively belonged to Parvadeh coal mine (21.1), Ozabkuh led and zinc mines (20.1), and Kamarmahdi Fluorite (19.3). In tourism indices, the highest scores respectively belonged to Ozabkuh and Chah Sorb led and zinc mines (16.9), Chirouk foundry sand mine (15.3), and Kamarmahdi Fluorite (14.8). Moreover, Parvadeh coal mine (16.33), Chirouk foundry sand mine (15.66), and Kamarmahdi Fluorite (15.33) obtained the highest scores in protection necessity. In addition, all mines are at a suitable conditions in terms of aesthetic aspects and landscape. However, for a more comprehensive plan, using other assessment methods appear to be of necessity by experts in different areas. One of the significant results of this applied study involves the introduction of Tabas Geopark mineral geosites in line with the preservation of geological and mineral heritage of this region in Iran; the findings can be useful in achieving future purposes at this region.

Keywords: Tabas Geopark, Geotourism, Mines, Tourism

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