

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

Vesal Yahya Sheibani ¹

Instructor, Department of Geology, Payam Noor University of TabasCenter, Tabas, Iran

Received: 5 May 2018

Accepted: 12 February 2020

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 & Zamaniyan, 2014; Salmani et al., 2015; Nazemi & Maghzinajafabadi, 2010; Sheibani & Zamaniyan, 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

1. Corresponding author. E-mail: sheibani@pnu.ac.ir

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 led 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 and Robot-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 led 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 led and zinc mines, and Kamarmahdi Fluorite mine. Moreover, Ozabkuh and Chah Sorb led 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 Tabasgeopark 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

References (In Persian)

1. Aghanabati, S. A. (2004). زمین‌شناسی ایران [Geology of Iran]. Tehran, Iran: Geological Survey and Mineral Exploration of Iran.
2. Ahmadi, A., Taftian, Y., Mousavi, S. H. (2016). ارزیابی منطقه اورامانات جهت توسعه ژئوتوریسم و با هدف پیشنهاد منطقه به عنوان ژئوپارک ملی – جهانی [Assessing Awramanat region for the development of geotourism, for proposing the region as a national-world geopark]. *Quantitative Geographical Researches*, 4(4), 1-16.
3. Amrikazemi, A. (2009). اطلس میراث زمین‌شناختی ایران [Atlas of geological heritage of Iran]. Tehran, Iran: Geological Survey and Mineral Exploration of Iran.
4. Amrikazemi, A. (2012). اطلس میراث زمین‌شناختی ایران [Atlas of geological heritage of Iran]. Tehran, Iran: Geological Survey and Mineral Exploration of Iran.
5. Amrikazemi, A. (2017). ژئوپارک‌های جهانی یونسکو و چشم‌انداز آن در ایران «اصول فلسفه، آیین ژئوپارک‌های جهانی [UNESCO global geoparks نامه اجرایی و دستورالعمل ثبت» همراه با معرفی ژئوپارک جهانی

- and its outlook in Iran: “principles, philosophy, regulations, registration instructions” and introducing Qeshm global geopark]. Tehran, Iran: Vajehpardaz Andisheh.
6. Arbabi Sabzevari, A. (2014). ارزیابی توانمندی‌ها و قابلیت‌های ژئوتوریسم در توسعه پایدار (مطالعه موردی: سراب دربند در شهرستان صحنه) [The assessment of geotourism capabilities and potentials in sustainable development (Case study: Darband pond in Sahneh)]. *Natural Geography*, 7(26), 65-86.
 7. Daneshdoust, Y. (1977). طبس شهری که بود: بناهای تاریخی طبس [Tabas, the town that was: the monuments of Tabas]. Tehran, Iran: Soroosh.
 8. Dowling, R. K. (2012). ژئوتوریسم [Geotourism] (M. Farhatjah, & A. Amrikazemi, Trans.). Tehran, Iran: Rahi.
 9. Hashemi, S. M. (2012). مطالعه و بررسی کانی‌زایی مس در منطقه گزو [Exploring mineralization of copper in Gazo region]. Paper presented at the *First Conference on Mine and Related Sciences*, Islamic Azad University, Tabas, Iran.
 10. Jadidi, R., & Amrikazemi, A. (2017). ژئوپارک‌های معدن محور چرخشی سبز در فعالیت‌های [Mining oriented geoparks; a new turn in mineral activities]. *Land and Mining Sciences*, 13(138), 8-9.
 11. Maghsoudi, M., Alizadeh, M., Sharifi, A., & Hosseinipour, S. (2014). ارزیابی کمی ژئومورفوسایت‌های منطقه تخت سلیمان با استفاده از روش فاسیلوس و همکاران با تأکید بر توسعه ژئوتوریسم [Quantitative assessment of Geomorphosites of Takht Soleyman region using the model provided by Fassoulas et al., emphasizing on geotourism development]. *Quantitative Geographical Researches*, 3(11), 22-37.
 12. Mahdavi, A., Karimpour, M. H., Heidarian Shahri, M. R., & Malekzadeh Shafaroudi, A. (2013). زمین‌شیمی و تفکیک توده‌های نفوذی، ارتباط آن با کانی‌سازی و تفسیر [Geochemicas and discrimination of intrusive bodies, its relationship with mineralization and the interpretation of IP/IS data in Gazo prospecting area]. *Advanced applied, Geology*, 8, 47-60.
 13. Mohammadi Araq, A., Nekuie Sadri, B., Hashemi, S., & Bataie, A. (2016). ناسایی و ارزیابی میراث زمین شناسی پیرامون جهانی تخت سلیمان به منظور تأسیس ژئوپارک پیشنهادی [The evaluation of geoheritage for development of geotourism in Takab area, Northwest of Iran]. *Geosciences*, 25(99), 123-132.
 14. Orouji, H. (2012). مکانیابی ژئومورفوسایت‌های بهینه گردشگری با فرآیند تحلیل [Locating the optimum tourism geomorphosites using ANP and their Evaluation through geomorphotouristic Models (Case Study: Tabas city)], (Unpublished master's thesis). Tehran University, Thran, Iran.

15. Priouzi, M., Ghaderi, M., Rashidnejad Omran, N., & Rastad, A. (2009). شواهد تازه‌ای از کانی‌زایی، درونزادی و شاره‌های درگیر در کانسار فلوریت چینه کران کمرمهدی-جنوب باختری [New evidences on mineralization, diagenesis and fluid inclusions at Kamar-Mehdi strata bound fluorite deposit, southwest Tabas]. *Iranian Journal of Crystallography and Minerology*, 17(1), 83-94.
16. Saberifar, R., & Fathi, Z. (2005). [Historical geographical and tourist of Tabas]. Tehran: Noor Elm.
17. Sabokkhiz, F., Hejazi, Z., & Moghadasin, M. (2012). تحلیل ژئوتوریستی غار خاصه [Analyzing geotourism of Khas-e-Tarash cave by Pralong method]. *Geography and Environmental Planning*, 23(2), 69-86.
18. Salari, M., Shahabi, H., & Salari, M. (2016). [Management (recognition and prioritize) of geomorphosites using Entropy and Saw methods (Case study: Sardasht city's geomorphosites)]. *Quantitative Geographical Researches*, 4(4), 166-180.
19. Yahya Sheibani, V., & Zamaniyan, E. (2015, Februar, 22). - اینه و معدنی [Mineral attractions and engineering monuments of Tabas county: A geotourism view]. Paper presented at 33th National Geoscience Congress. Geological Survey and Mineral Exploitation of Iran, Tehran, Iran.
20. YahyaSheibani, V. (2017). چشم اندازه‌های ژوراسیک در میراث زمین شناختی طبس [Jurassic outlooks in geological heritage of Tabas]. In A. AhmadzadehHeravi (Ed.), *1st international congress on Jurassic of Iran and neighboring countries (ICJI)* (pp. 282-288). Mashhad, Iran: Geological Survey of Iran, North - East Territory.
21. Yamani, M. Moghali, M. & Jafari, F. (2013). بررسی تأثیر ژئوتوریسم با استفاده از مدل SWOT (مطالعه موردی: تخت سلیمان) [Geotourism effect of using tourism to improve the SWOT (Case study: Takht-E-Soleyman)]. *Journal of Physical Geography*, 6(19), 17-32.

References (In English)

1. Alexandrowicz, Z. (2006). Geopark - nature protection category aiding the promotion of geotourism (Polish perspectives). *Geoturystyka*, 2(5), 3-12.
2. Fassoulas, C., Mouriki, D., Dimitriou-Nikolakis, P., & Iliopoulos, G. (2012). Quantitative assessment of geotopes as an effective tool for geoheritage management. *Geoheritage*, 4(3), 177-193.
3. Gioncada, A., Pitzalis, E., Cioni, R., Fulignati, P., Lezzerini, M., Mundula, F., & Funedda, A. (2019). the volcanic and mining geoheritage of San Pietro Island (Sulcis, Sardinia, Italy): the potential for geosite valorization. *Geoheritage*, 11(4), 1567-1581.
4. Gordon, J. E. (2012). Rediscovering a sense of wonder: Geoheritage, geotourism and cultural landscape experiences. *Geoheritage*, 4(1-2), 65-77.

5. Hose, T. A. (2005). Landscapes of meaning: Geotourism and the sustainable exploitation of the European, In *Unpublished presentation and workshop for the Institute of Geography*. Lausanne: University of Lausanne.
6. Hose, T. A. (2008). Towards a history of geotourism: Definitions, antecedents and the future, Geological Society of London. *Special Publications*, 300(1), 37-60.
7. Hose, T. A. (2012). 3G's for modern geotourism. *Geoheritage*, 4(1-2), 7-24.
8. Kocan, N., & Yucesoy, N. (2016). Kizilcahamam - Camlidere Geopark (Ankara / Turkey) with its geological heritage values and geotourism planning. *Journal of the Geological Society of India*, 87(1), 112-118.
9. Maghsoudi, M., Moradi, A., Moradipour, F., & Nezammahalleh, M. A. (2018). Geotourism Development in World Heritage of the Lut Desert. *Geoheritage*, 11(2), 501-516.
10. Nazemi, M., & Maghzi Najafabadi, S. (2010). A view on the geotourism attractions of the Tabas area - east of Iran. Paper presented at *The 1st International Applied Geological Congress*. Islamic Azad University - Mashad Branch, Mashhad, Iran
11. Nezafati, N. (2006). Au-Sn-W-Cu-Mineralization in the Astaneh- Sarband Area, West Central Iran including a comparison of the ores with ancient bronze artifacts from Western Asia. PhD, Eberhard-Karls-Universita'tTu'bingen, 116 p.
12. Reynard, E. (2008). Scientific Research and Tourist Promotion of Geomorphological Heritage. *GeografiaFisica e DinamicaQuaternaria*, 31(2), 225 -230.
13. Tarkian, M. (1982). An upper cretaceous copper mineralization of porphyry type at Gazu, East Iran, N. Jb, Miner.
14. Yahya Sheibani, V., & Zamaniyan, E. (2016). Geotourism potentials of Jenni, Sardar and Tafto canyons (Case study: Tabas County). Paper presented at *33th Geosciences Congress, Geological survey and Mineral Expolration of Iran*, Tehran, Iran.
15. YahyaSheibani, V., Zamaniyan, E., & Amrikazemi, A. (2018). Introdusing the potentials of Tabas Aspiring Geopark. *8th International Conference on UNESCO Global Geopark, Adamello Brenta Geopark*, Trentino, Italy.
16. Yahya Sheibani, V., Zamaniyan, E., & Nazemi, M. (2016). Structural phenomena of Kalmard area (west of Tabas) from the perspective of geotourism. Paper presented at *33th Geosciences Congress, Geological Survey and Mineral Expolration of Iran*. Tehran, Iran.

How to cite this article:

Yahya Sheibani, V., (2020). Examination and assessment of mineral geosites in Tabas County as a mining-centered geopark in Eastern Iran. *Journal of Geography and Regional Development*, 17(2), 191-215.

URL <http://jgrd.um.ac.ir/index.php/geography/article/view/76465>