

Evaluating the Geotourism capabilities of Eastern Alamut area based on GAM model

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Abstract

Land heritage and necessity of planning in order to safeguard this heritage is one of the greatest challenges facing the researchers of untouched spaces and international natural heritage. One of the most important instruments in this approach is considering tourism capabilities in the form of geological attractions and geomorphology of the land heritages and its bond with economical, cultural and social features of tourism. Geotourism plays an unparalleled role in the development of economic, cultural and environmental effects on land management and planning for the conservation and sustainable development of the geological heritage. The Alamut area of Qazvin, along with the legacy of land, is a significant destination in the country from the cultural and social point of view. In order to reach the goals of the sustainable development, it is important to identify the crucial geosites of the region and analyze them based on their different geo-tourism values. In the meantime, East Alamut is one of the areas that can attract many tourists with a variety of natural phenomena. In this study, using satellite images, geological maps, and field studies, 10 East Alamut lands with higher geo-touristic attraction were selected. In the final review of geo-tourism assessment based on the GAM method, the geosite of the Kalayeh Moalem was identified as one of the top geosits due to its scientific value in national level, having aesthetic, cultural and social values, and the existence of a set of functional, economic, and tourist services values. Evan Lake is also in the second priority due to high geological diversity, its ecological and cultural values, easy access, tourism services, appropriate infrastructure and also aesthetic and protective values. Alamut historical area, next to the Garmarud Valley is on next priority.

Keywords: Geotourism, eastern Alamout, GAM method.

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Introduction

Geotourism is a nascent phenomenon. This concept is expressed in terms of two geological and geological characteristics (Mokhtari, 2015). Geotourism is a branch of nature-based tourism, which has grown dramatically over the last few years (Turner, 2013). In geotourism, geomorphologic phenomena are more prevalent than other geological phenomena. These audiences are not only geomorphologists and geologists, but also ordinary tourists and nature lovers. Today, most tourism markets are influenced by geotourism, which is influenced by the abundance of tourists who seek natural attractions that are completely unique (Fakhari et al, 2014). In terms of geography and geotourism Iran has been known as the geological heaven (Amri Kazmi, 2012). Geotourism means tourism in geological landscapes (Haj Alilo & Nekoei Sadr, 2011). Geotourism, according to Hose (2006), is a service and interpretation facility designed to enable tourists to acquire knowledge, geological understanding and geomorphology, along with their participation in the development of earth sciences, beyond the mere perception of the pure beauties of a place. Geotourism means tourism that preserves and improves the geographic identity of a place, and not only the environment, but also the cultural and aesthetic heritage of the place, and most importantly, the well-being of the locals (Pereira, 2007). In general, tourism, related to natural phenomena, has a deep link with the sustainability of tourism in each region, and in order to preserve the diversity, biological and natural richness of the environment, managing this type of tourism is also very important (Tsaur, 2012). This can be done through independent visits of geological sites, using geotours (geological trails) and watching the landscape, holding guided tours, activities related to geological themes (Newsom and Dowling, 2006).

Research Background

Hoos (2012) considers the two elements of geological conservation and geological interpretation as the main factors that should be

considered as the basis of any method for achieving sustainable geotourism in geosites and geomorphic cultures. Nesome et al. (2013) explored the potential of geotourism and raised awareness of the geological and environmental heritage on an island in eastern Madagascar. Safari et al. (2013) investigated the ecotourism zoning of Zanjan province with an emphasis on geo-morphological parameters. In this study, a phase model was used to zone the appropriate ecotourist locations. Fakhari et al. (2014) evaluated Geoconservation with emphasis on tourism ground (Case Study: suggested Geo-park in Damavand area) Evaluation of geotourism characteristics of desert landforms (Maghsudi et al, 2004). ,assessment of ecotourism capability of geomorphic sites in the basin of Kharabah mill (Mokhtari, 2010), assessing geological potential of Ali Sadr Cave GeoPark for Sustainable Economic and Social Development of the Region (Ilderimi et al, 2011), and Comparison of Geomorph site evaluation methods in development of Hormozgan province tourism (Yamani et al,2011). Recently, Mirkatuli et al. (2016) studied and evaluated the geological heritage in the geopark of Cheshmeh Badab Surat by the Pereira and Reynard methods. Zahmatkesh et al. (2017) investigated geomorph tourism and evaluated the geo-morph sites capability of Qeshm geo-park using Pereira method.

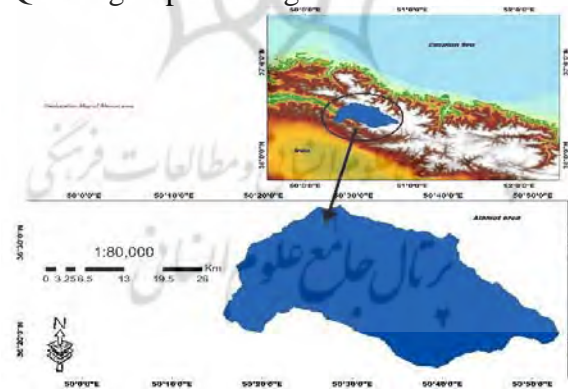


Fig1: Location of Alamut area in Qazvin province and Iran

Location of the region under study

Alamut area is located in the north and northeast of Qazvin, in the mountainous region of Alborz, between 36 degrees and 18 minutes to 35 degrees, 35 minutes north latitude and 50 degrees, 18 minutes to 50 degrees and 51 minutes east. From the north, it is limited to the west

of Mazandaran and Ramsar (two thousand and three thousand mountains), and from the south to Taleghan and Abeyek, from the south west to Qazvin and from the west to Abhar and the lower Tarom.

Mehtod

This research is applied in terms of purpose and quantitative and qualitative in terms of the nature of data analysis. Research data has been compiled through field studies, library studies, and documentation. The variables of this research include a set of variables related to geotourism and the evaluation of geosites including scientific, conservation and tourism values that are fully explained in the section on the introduction of geosites assessment methods. The method of data analysis is descriptive-analytical. The Geostationary Assessment Model (GAM) is a model for the physical evaluation of geomorph sites to measure the planning and management of natural heritage sites and turn them into tourist destinations. This model has been used for one of the mountains in the country of Serbia in 2011. The model is composed of two groups of core values and complementary values: core values include scientific / educational, aesthetic and conservation values and complementary values include functional and tourism values.

Resultes

At this stage, the selection of geosites in the Alamut area and their assessment is a criterion. In order to select the geosites of the Alamut area for the evaluation of geotourism, various criteria and indicators have been used. The use of these criteria is due to the diversity of geological and geomorphological phenomena in the region and the recognition of the conditions of any phenomenon for inclusion in the list of geosites: including scientific value, attractiveness for tourists, scarcity, diversity in the geosite list, distribution, which Finally, ten geosites were selected from different geosites for evaluation, as shown in Table 1. geotourism evaluation was performed by GAM method. The evaluations were carried out through field studies in combination with other data and a set of values for the model for Alamut geotourism was investigated. In the general assessment of the geotourism of the Alamut area, it should be said that they are favorable conditions for the representation of all geosites in the

Alamut region. In the final review of the geotourism evaluation based on the GAM model, the geosite of the Kalayeh Moalem was determined as one of the superior geo-sites due to the scientific value at national level, having aesthetic, cultural values and the existence of a set of functional economic, tourism services values. . Evan Lake is also in the second priority due to high geological diversity, its ecological and cultural values, easy access, tourism services, appropriate infrastructure and also aesthetic and protective values. Alamut historical area, next to the Garmarud Valley is on next priority. The final results of geotourism with the above method show that the results of geosites are close to each other. However, in the final results table, Evan geosites, Kalayeh Moalem, Alamut and the Garmarud valley have more values and enjoy better potential for the development of geotourism.

Table 1: Results of total values of Alamut geosites using GAM method

| Criteria | Piche Bon Falls | Garmarud valley | Cirque Evanek - Dinerud | Valley Atan | Valley of the Andaj | Cliffs of Andaj | Circus of Kochnan | Alamut | Claie moalem | Evan lake |
|---|-----------------|-----------------|-------------------------|-------------|---------------------|-----------------|-------------------|--------|--------------|-----------|
| Scarcity | 0/25 | 0 | 0/25 | 0 | 0/5 | /5 | /25 | 0/25 | 0/5 | 0/25 |
| Being Representative | 1 | 1 | 0/75 | 0/75 | 1 | 1 | 0/75 | 0/75 | 1 | 0/75 |
| Level of Interpretation and Consciousness | 1 | 1 | 0/75 | 0/75 | 1 | 0/75 | 0/75 | 0/75 | 1 | 1 |
| Knowledge and awareness | 0/5 | 0/5 | 0/25 | 0/25 | 0/25 | 0/5 | 0/25 | 0/5 | 0/5 | 0/75 |
| Number of points of view | 0/75 | 0/75 | 1 | 0/75 | 0/75 | 1 | 1 | 0/75 | 1 | 1 |
| Appearance level | 0/5 | 1 | 1 | 1 | 1 | 1 | 1 | 0/5 | 1 | 0/5 |
| Nature and scenery | 1 | 1 | 0/5 | 1 | 1 | 1 | 0/5 | 1 | 1 | 1 |
| Environmental suitability | 0/75 | 0/75 | 0/5 | 0/75 | 0/75 | 0/5 | 0/5 | 0/75 | 0/5 | 0/5 |
| Damage situation | 0/75 | 0/75 | 1 | 0/75 | 0/75 | 1 | 1 | 0/75 | 0/75 | 0/75 |
| Level of protection | 0 | 0/25 | 0 | 0/25 | 0/25 | 0 | 0 | 0/5 | 0/25 | 0/25 |
| Vulnerability level | 0/25 | 0/5 | 0/75 | 0/5 | 0/5 | 0/5 | 0/25 | 0/5 | 0/5 | 0/25 |
| Visitor Capacity | 0/5 | 0/75 | 0/75 | 0/75 | 0/75 | 0/5 | 0/75 | 0/5 | 0/75 | 0/5 |
| Access | 0/25 | 1 | 0/25 | 0/75 | 0/5 | 0/75 | 0/25 | 1 | 1 | 1 |
| Supplementary natural values | 0/75 | 0/75 | 0/25 | 0/75 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/75 |
| The value of human evolution | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/25 | 0/25 | 0/25 |
| Proximity to the communication network | 0/25 | 0/25 | 0 | 0/25 | 0/25 | 0/25 | 0 | 0/25 | 0/25 | 0/25 |
| Other functional values | 0/5 | 0/5 | 0/25 | 0/5 | 0/25 | 0/5 | 0/25 | 0/75 | 1 | 0/75 |
| Promotion and promotion level | 0/5 | 0/5 | 0 | 0/25 | 0/5 | 0/5 | 0 | 1 | 0/25 | 1 |
| Visitor Center | 0/75 | 1 | 0/5 | 0/75 | 0/75 | 0/75 | 0/5 | 0/75 | 0/75 | 0/75 |
| Organized visits | 0/5 | 0/5 | 0 | 0/5 | 0/75 | 0/25 | 0 | 1 | 0/25 | 1 |
| Interpreting templates | 1 | 1 | 0/75 | 0/75 | 1 | 0/75 | 0/75 | 0/75 | 1 | 1 |
| Number of Visitors | 0/5 | 0/5 | 1 | 0/5 | 0/75 | 0/5 | 0 | 1 | 0/25 | 1 |
| Tour guide services | 0/5 | 0/5 | 0/25 | 0/5 | 0/5 | 0/5 | 0/25 | 0/75 | 0/75 | 0/75 |
| Tourist infrastructure | 0/5 | 0/5 | 0/25 | 0/5 | 0/5 | 0/5 | 0/25 | 0/75 | 0/75 | 0/75 |
| Boarding services | 0/5 | 0/5 | 0/5 | 0/5 | 0/5 | 0/5 | 0/75 | 0/5 | 1 | 0/5 |
| Restaurant service | 0/75 | 1 | 0/5 | 0/75 | 0/75 | 0/5 | 0/5 | 1 | 1 | 1 |

In this method, geosites are considered in two parts of the value and complementary value. According to the results of the main values (Table 2), which are scientific and conservation values and beauty, the geosite of the Calae moalem, Valley of the Andej, Garmarud Valley, and Cliffs of Andej are more important and desirable.

Table 2: Results of the main values of Alamut geosites using GAM method .

| Geosite | Scientific and educational | Aesthetic | Protective | Original value |
|-------------------------|----------------------------|-----------|------------|----------------|
| Claie moalem | 0/83 | 0/88 | 0/56 | 2/27 |
| Valley of the Andej | 0/75 | 0/88 | 0/56 | 2/19 |
| Cliffs of Andej | 0/75 | 0/88 | 0/5 | 2/13 |
| Garmarud valley | 0/67 | 0/88 | 0/56 | 2/1 |
| Cirque Evanek - Dinerud | 0/58 | 0/75 | 0/63 | 1/96 |
| Kochnan Circus | 0/58 | 0/75 | 0/63 | 1/96 |
| Valley Atan | 0/5 | 0/88 | 0/56 | 1/94 |
| Alamut | 0/58 | 0/75 | 0/56 | 1/9 |
| Piche Bon Falls | 0/75 | 0/75 | 0/38 | 1/88 |
| Evan Lake | 0/67 | 0/75 | 0/44 | 1/85 |

According to the results of the complementary values (Table 3), Evan Lakes and Alamut have the best conditions, and in this regard, they differ significantly from the results of the main values.

Table 3: Results of complementary values of Alamut geosites using GAM method.

| Geosite | operational | Tourism | Complementary |
|-------------------------|-------------|---------|---------------|
| Evan Lake | 0/6 | 0/9 | 1/5 |
| Alamut | 0/55 | 0/8 | 1/4 |
| Claie moalem | 0/55 | 0/7 | 1/2 |
| Garmarud valley | 0/5 | 0/7 | 1/2 |
| Valley of the Andej | 0/4 | 0/7 | 1/1 |
| Piche Bon Falls | 0/4 | 0/6 | 1/0 |
| Valley Atan | 0/45 | 0/6 | 1/0 |
| Cliffs of the Andej | 0/4 | 0/6 | 1/0 |
| Cochnan Circus | 0/15 | 0/3 | 0/5 |
| Cirque Evanek – Dinerud | 0/15 | 0/3 | 0/5 |

Table 4: Results of values of Alamut geosites based on GAM method.

| Geosite | Final Value |
|------------------------|-------------|
| Claie moalem | 3/49 |
| Evan Lake | 3/32 |
| Alamut | 3/28 |
| Garmarud valley | 3/28 |
| Valley of the Andej | 3/25 |
| Cliffs of the Andej | 3/11 |
| Valley Atan | 2/94 |
| Piche Bon Falls | 2/89 |
| Circus Kochnan | 2/44 |
| Cirque Evanek – Dinrud | 2/41 |

In the final review of Geotourism assessment based on the GAM method, the geosites of the Claie moalem, due to its national scientific value, has aesthetic values, cultural values, social values, and a set of functional, economic, and tourism services as one of the top geosites

Was determined. Evan Lake is also on the top of the list due to its high geodetic value, high ecological and cultural values, easy access, tourist services, proper infrastructure, aesthetic value and protection. Alamut cliffs are next to the Garmarud Valley

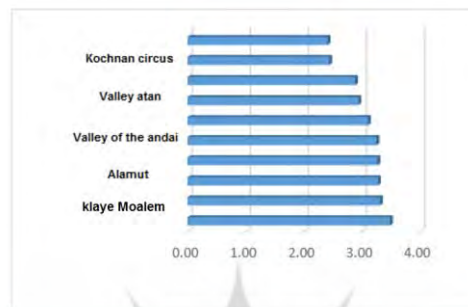


Fig 2: the results of the final values of the geosites of the Alamut area using the Gam method

Discusstion

The Alamut area has a very long distance background. On the other hand, most of the geosites are large scale and highly visible, so that they can be seen in several angles at a distance of several kilometers. The location of the Alamut area is highly desirable in terms of geotourism. It is located in the direction of the passage of passengers to the north, adjacent to the geotouristic attractions of the northern regions such as Tonekabon, located in the central Alborz area, which is a large geo-tourist area. Proximity to the city of Qazvin, and also a short distance from Tehran and Karaj megacities, which actually indicate proximity to a population center, is one of the privileged features of the position of Alamut geotourism. The geosites of the region have no particular complexity and can be understood from the perspective of the general public. The vulnerability in Alamot geosites is very limited, and even for high-end geosites, such as Evan and Alamut, there is little. Alamut area, regardless of whether it is a geotourist area, can be considered as a cultural-historical region. However, there are several challenges and problems in the geomorphology of Alamut area, including the scarcity of geosites, low public participation, various natural and human hazards, relatively poor tourism services, etc. However, by combining the results, the three following geosites enjoy the most favorable potentials for the development of geotourism: Kalaye Moalem, Evan and Alamut, these

geo-sites, while possessing the attractions and geological values (especially Lake Evan and Kalaye Moalem), have high tourism services and infrastructures. Their phenomena, processes, and forms are simple and visible. Their level of attractiveness is transcendental, and among them the lake Evan and Alamut are welcomed by numerous tourists. Also, the historical and cultural values of these geosites (especially the Evan and Alamut) are very high and have a beautiful landscape. However, although they are less vulnerable, their vulnerability is high and planning needs to be done in this regard. Secondly, it should be noted that geosites of Gramarud valley, the Piche bon waterfall, Andij valley and the Andij rocks are in the second priority in terms of geotourism development, and can be prepared for presentation to the tourism market through more investment. It seems that three geosites of the Circus of Evanak-Dinhe Rud and Kochnan -Atan as well as the Valley of Atan do not have favorable conditions for the development of geotourism. About Atan Valley the reason is mainly due to the lack of scarcity or lower diversity, and the weakness in tourism services and infrastructure, and about the Circus peaks, its greater distances from population centers, the lack of tourism services, ecological weaknesses, very difficult access, low tourist coverage and lack of tourism. Limitations of geological heritage values are more influential than other issues.

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