

## Identification of Some of the Geotourism Sites in Iran

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**Abstract:** One of the beneficent branches of the tourism industry in the modern world is using natural attractions, geological phenomena and different climates, exploration of which necessitates identification of the geotourism sites in all the countries. Geographical breadth of Iran along with being located in the Alp-Himalaya orogenic belt has created a great potential of geological phenomena, such as volcanoes, caves, straits, geysers and a special climatic diversity in this country which is considered as one of the most attractive geotourism sites of the world because of the aforementioned potentials. Some examples of the geotourism attractions of Iran are the highest sand hills in Kavir-e Lut (the hottest place in the earth), the traces of the greatest landslides in Seimareh (Ilam province), the highest fresh-water lake at the summit of Sabalan Mountain, more than 300 spas, the second hottest spa of the world (Geinarja), 16 lagoons, 50 internal lakes, more than 100 small and large coasts and vast forests in both northern and western Iran (e.g. mangrove (Ahra) forest in Qeshm coast).

**Key words:** Geotourism • Mangrove forests • Spa • Iran • Kavir-e Lut

### INTRODUCTION

One of the new tourism developments is geotourism. Geotourism is rapidly being recognized as an exciting new direction for tourism surrounding geological and geomorphology attractions and destinations. Geotourism is concerned with sustaining or enhancing a destination's geographic character [1]. This tourism has some differences compared to the other types of tourism. Geotourism depends on scientific value, geotourism appeal, educational and historical values, international significance, cultural, social structure, biodiversity and appearance. Thus the types of tourist who are visiting these places are also different.

Geotourism sites within a spectrum of definitions. Because of this, it can be considered to be a part of concepts of sustainable tourism and ecotourism. Geotourism is a sustainable tourism activity and has contributed more economically than other tourism to local people who are taken the place in tourism [2, 3].

Due to its vast and unique natural environment, typical geographical location, diverse climates and various habitats, Iran has become one of the ideal touristic parts of the world. Immense historic potentiality and geological phenomena present in this country have

turned it into one of the most attractive geo-touristic regions of the world and according to the published statistics currently Iran is among the top five countries in the world in terms of natural attractions.

Iran is located in the western part of Iranian Plateau and in southwest of Asian Continent and is considered a middle eastern country which share a total of more than 6000 km land border with Pakistan and Afghanistan to the east; Turkey and Iraq to the west; and Azerbaijan, Armenia and Turkmenistan to the north. Although generally Iran is thought of as a desert, with an area of 1648195 km<sup>2</sup> this country is a mountainous land which mountains cover 55% and plateaus and plains, desert and saline lands and ponds and lakes cover the remaining 45% of its total area. Having as long as 2530 km and 800 km shores of Oman Sea and Persian Gulf to the south, Caspian Sea to the north, respectively, Iran, is considered to be the transitory crossroad of Asian Continent [4].

Iran is the country of counterpoints and antonyms. A country where you can stand either in a point 27 m below the sea level (Caspian Sea) or in another region in an altitude of more than 5670 m above the sea (peak of Damavand Mount) on the highest peak in western Eurasian region. In a land with an annual precipitation rate of 2000 mm at the northern parts of the country (littoral

region of Caspian Sea) and with a least annual precipitation rate (2 mm) in Kavir-e Lut, one can experience temperatures varying from -35°C to more than 45°C within one season simultaneously. Iran with a population of more than 75 million people has green plains in northern and southern regions while there are dry and scorching deserts in central and eastern parts. Authors of this paper by giving some information on geological and natural phenomena of Iran, try to introduce some of its geotourism sites.

**Discussion:** As a result of having diverse climates, various geological features and typical diverse habitats, Iran has geographical (geotops) and natural phenomena such as mountains, caves, straits and valleys, vast forests, huge geological fissures, ponds and lakes, mud volcanoes, sandy pyramids, cliff-rocky shores, ancient mines and etc which as geological heritages in the form of numerous geo-parks they may be considered a functional tool for in tourism development. Some of these geotourism sites are as follow:

**Mountain:** Iran has been situated in the mid-part of Alp-Himalaya fold belt, considered to be one of the several most important folds present in all over the

world and this is why Iran has a complex geological structure formed as a result of quaternary volcanic and epirogenic activities and mostly after cretaceous orogeny [5] (Fig. 1). Mountain areas in Iran lead to the altitude ecological belts and have very big potential from endemic or relic animal and plants points of view. At the same time, these areas provides for the irrigation of the agricultural lands and drinking water of the urban centers.

Mountains in Iran based on their formation and characteristics, fall into following categories: Orogenic, Volcanic and Horst.

Orogenic mountains are located in north, west, south and central parts of Iran. Mountain Range at the north called Alborz is connected in west to Ararat Mount in Turkey and in east through Binalud Mount Range to Hindu Kush mounts in Afghanistan and its highest peak being Damavand has an altitude of 5671 m. In geological term, Zagros Mountain range, at the west of Iran, is a very young one and in fact is one of the last mountains developed in Iran and due to the continuous pressure exerted by Arabian plate has been instable and its height is being increased. Its highest peak belongs to Dena Mount (4267m). Mountain ranges in southern Iran in a west-east direction join to Suleiman Mount in Pakistan.



Fig. 1: Location Mountains and Deserts of Iran



Fig. 3: Minyator Mountains of Chabahar (southeast of Iran)



Fig. 3: Figures of caves in Iran: (a) katalekhore in Zanjan; (b) salt cave in Qeshm Island and (c) Ali-Sadr in Hamedan

There are some dispersed mountain ranges in central Iran which separate Kavir-e Lut and Dasht-e Kavir deserts from each other and are of more than 3000 m heights. Foothills of all of these mountain ranges covered with forests dating back as far as 3 million years [5].

Damavand, Sabalan, Sahand, Taftan and Bazman mounts are amongst Iran's volcanic mountains created as the result of quaternary period volcanic activities and are currently extinct and at the stage of sulfur-producing. These Mountains have formed with the accumulation of lava and fine and coarse materials such as tuff, volcanic sands, ash and gravels [6]. There are more than 320 hot springs at the foothills of these mountains, the most important and famous of which are Sarein hot spring complex at the southern foothill of Mount Sabalan and near the Ardabil city. The above mentioned geo-tourist site receive more than 5 million domestic and foreign tourists. In some parts of Iran, resulting from fault activities mountains of Horst type have been created which are considered to be unique in their own type and boast many natural attractions such as Minyator mountains of Chabahar in eastern south of Iran (Fig. 2).

**Caves:** Caves due to its environment being quite different from one in which human lives, usually admired by human beings, so that is considered an astounding attraction in tourism. Geological characteristics and climatic conditions of Iran have led to the formation of lots of caves in this country. Based on statistics, about 1200 small and large caves have been identified all over Iran, most of which have been dispersed in western Iran which this is because of the type of sediments forming Zagros Mounts and presence of typical climatic conditions. Iranian Caves fall into two dry and wet groups. In dry caves - as their name implies - there is no sign of humidity, one example for this type of caves is "owls' cave" in Kermanshah, whereas in wet caves the presence of water and humidity is evident and they are further divided into three categories: water cave such as Ali-Sadr cave in Hamedan; humid caves such as katalekhore in Zanjan; and ice cave such as Morad Ice Cave in Gachsar (Fig. 3). Among Iranian caves, Quri-Qaleh being 3140 m long, is the longest cave in Iran and is the largest water cave in Asian Continent [7].

**Seas and Lakes:** Apart from the southern shores of Caspian Sea in north, Iran has also a vast littoral expanse





Fig. 4: Huge masses of corals of Persian Gulf

as long as 2530 km in south and along the margin of Persian Gulf and Oman Sea which are connected through Hormoz Strait with each other. This region situated in a hot climate has a completely different landscape compared with other parts of Iran. Typical geographical location, historical background and specific economic-political features of Persian Gulf and presence of many small and large sandy and saline islands, have turned this part of Iran into one of the most renowned geotourism sites in the world. High temperature in Persian Gulf region has led to intensive evaporation and increased rate of water salinity in the gulf. Based on the conducted investigations, water in Persian Gulf, resulting from hydrological cycle, in a century basis, flow into Oman Sea through Hormoz Strait. In addition to diverse marine life in Persian Gulf, there are also huge masses of corals formed over thousands of years and considered as natural attraction of Persian Gulf (Fig. 4).

Iran's typical tectonic state has led to the creation of more than 50 natural lakes. Some of these lakes are permanent, while some others are of playa type. Presence of various habitats and shelters for emigrant birds in permanent lakes of Iran such as Urmia (Orumiyeh), Parishan, Jazmuriyan, Hamoon, Tashak and Maharlu have placed this region among tourist sites in Iran.

The world's highest freshwater lake is in Iran. This lake with an approximate width of about 100 m is located at the crater of Sabalan Volcanic Mount (northwest of Iran) in an altitude of 4811 m and its water supply is through snowing and melting of permanent glaciers around the crater of the volcano. Beauties of this lake and the exquisite nature of surrounding area attract lots of tourists and mountaineers every year (Fig. 5).

**Deserts:** Vast part of eastern and central Iran consists of deserts. Mentioned as interior holes in some sources, these areas consist of two large expanses namely Kavir-e Lut Desert and Dashte-kavir Desert. Although generally are thought of as somewhere without life and existence,



Fig. 5: Figures of lakes: (a) Sabalan Lake and (b) Tashak Lake

deserts have exclusive characteristics such as its typical wild life and plant covering, however, it is an unavoidable fact that different elements of life are face to face with remarkable restrictions.

Kavir-e Lut Desert is a low-lying area as vast as 80000 km<sup>2</sup> located in southeast of Iran and owing to the fact that the slope of land is from surrounding toward the center of the desert, it is looked like an asymmetric hole. This expanse is poor in terms of water and plant covering, not to mention animals and there is only one permanent river (Birjand saline river) flowing here which barely has water throughout the year. The remaining rivers in this area are either seasonal or temporary. Based on the form of terrain and dispersion of latitudes, Lut Desert constitutes of three northern, southern and central parts. Central Kavir-e Lut is the largest and lowest part of Kavir-e Lut Desert [8].

Some of the investigators in geography field believe that the region named Shahdad Desert in Kavir-e Lut Desert, is the heat pole, in other word, the hottest point, of earth planet, such that unbelievably the temperature there reach even under 15°C at the nights in summer season (Fig. 6).



Fig. 6: Shahdad Desert in central Iran



Fig. 7: Sandy hills of Dashte-kavir Desert

Dashte-kavir Desert or Salt Desert is a filled geological hole located at the south of Alborz Mountain ranges in between provinces Khorasan, Sistan-Baluchestan, Qom and Yazd. Its length is 600 km and in east-west direction, whereas its width is 100-300 km and in northern-southern direction. In this geotourist site, presence of sandy hills (pyramids) has created spectacular views (Fig. 7).

**Forests and Islands:** In Iran, word “island” bring only the southern islands of the country to the mind, while some of the internal lakes in Iran also have several small and large islands. For example, there are 102 either carbonic or saline islands in Lake Urmia, the biggest lake in Iran, which because of continuous efforts conducted over the last 30 years to control and protect it, has been able to maintain its natural values and is an ideal habitat for various kind of animals. Of the most spectacular islands present in this lake, we can name Kabudan, Espir, Ashk, Nahid and Mehr islands. Some islands also have been created in Lakes Tashak and Bakhtgan the most renowned one being Narges Island in Tashak Lake.



Fig. 8: Qeshm Island in strait of Hormuz

Based on geological and tectonic characteristics, there are numerous residential and non-residential islands in Persian Gulf, environmentally each of them are of special importance. Ternary Islands of Booneh, Nakhoda and Dara, at the mouth of Khormosi, have formed through sediment deposition and there is no permanent residency in there. These islands are egg-laying ground for marine pigeons and have vast tidal expanse. The biggest coral mass of Iran is located in Khark island of Persian Gulf. This island is a proper habitat for gazelle. Although the Khark Island is completely an industrial island, formation of masses of coral reef around it has made it also a touristic attraction in the region as well. Iran’s biggest salt dome in the easternmost point of the Persian Gulf has led to the creation of Hormoz Island where there are rocky shores as high as 18 m.

The most vast and spectacular island of Persian Gulf is Qeshm Island located in Hormoz Strait. Short mountains covered by coral, sponge and bivalve layers dominate the island. Wind and water erosions, over the years have created spectacular and eye-catching cones and pyramids, valleys and caves and sculptures on these mountains. At the top of the mountains of the island, there are flat plains covered with plants (Fig. 8).

Old trees have grown on one of these plains known as “roof of Qeshm”. On the western part of Qeshm Island, in addition to rare and beautiful flora and fauna - which are valuable in both national and global level - unique geological phenomena such as mangrove (Ahra) forests, caves and salt domes, valleys and straits, sulfur mineral springs and dozens of sculptures carved on the heart of rocks and cliffs, have turned it into a geo-park. This geo-park is a globally recognized one and the second natural geo-park in Asia.



Fig. 9: Forest of Iran: (a) Alborz forests; (b) Arasbaran forests and (c) mangrove forests.

Although the vastest forests of Iran are either located at the northern margin of the country (northern slopes of Alborz Mountain range) or at the slopes of Zagros Mountain Range in western Iran and are the most valuable geo-touristic sites of Iran by boasting trees as old as 3 millions of years; more than 20 shelters for wild life; 350 species of birds; 12 thousands plant species; and more than 300 mammal species, there are also forests dispersed in other parts of Iran - such as Arasbaran Forests in northwest of Iran (Azerbaijan region) and Ahra Forests in Qeshm Island - where may be considered a good place for tourism because of having varied habitats and geological phenomena (Fig. 9).

### CONCLUSION

Complex and combined geological structure of Iran has led to the creation of interesting geological phenomena such as volcanic mountains, caves, straits, islands, deserts, sandy hills and coral masses all over the country and has turned it into a most attractive geotouristic sites all over world. The highest fresh water lake at the peak of Sabalan Volcanic Mount, hot springs, ponds, vast forests and spectacular geo-park of Qeshm are all examples for Iran's geo-touristic attractions mentioned in this paper.

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