

## **The Introduction of the Geotourism Specialities of Zagros Gorges, Fars Province, Iran**

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### **Abstract**

*Zagros Mountains in Fars Province contain exclusively beautiful geomorphologic specialties such as gorges, caves, waterfalls and etc.that splendid and immense gorges are more important than the other geotourism attractions. Some of them, like Boraq gorge, lying along the Kor River, are unique. Neighboring some of these beautiful natural phenomena with the historical monuments and cultural reserves, with international importance, such as Persepolis and Pasargadae, variety of ethnic groups and attractions of tribal life, as well as the mineral and fossil reserves of the province, cause the region to become one of the most important sources of tourism not only in national but also in an international scale. Considering the importance of geology and the exclusiveness of some phenomena, it is distinguished to preserve these heritages, according to sustained growth framework and also it is necessary to prepare welfare facilities for those who would like to travel and visit these historical, cultural and geomorphological heritages. In this article it is tried to introduce the most beautiful gorges of Fars Province and their effects on geotourism industry development.*

**Keywords:** *Fars Province, Sustained development, Geotourism, Gorge, Zagros*

### **1 Introduction**

Nowadays tourism industry is considered as an extending industry by most of the developed societies. Geotourism is one of the main branches of tourism industry, dependent on nature, and introduces geological phenomena and their location to the tourists. Geotourism uses the geomorphology, geotechnique, geophysics, geochemistry and climatology sciences to introduce the earth attractions to people, interested in nature.

The most important aim of geotourism is preserving the environment and its landscapes and also preventing the human from destroying these heritages. So recognition and introducing some regions on earth geotourists, to visit these places. In our country, Iran, the geomorphologic phenomena w, having at least one important geosite, can play an important role in leading new groups of tourists, named ith beautiful and attractive landscapes in Zagros Mountains, are very important to amuse the tourists. [3]

Gorges are the most beautiful landscapes among these phenomena in Fars Province. Some of these gorges are formed perpendicular to mountains axis and connect paths between different mid-plains in Zagros Mountains, used by natives and animals from thousands years ago. The Paleolithic evidences from at least late Pleistocene in the Zagros Mountains show that many sites have formed near hydrographic features such as natural passes and narrow valleys in related to hunting animals [8]. So these regions have both archaeogeological and archeological besides the geomorphological significances.

Neighboring the historical and worldwide famous heritages, such as Persepolis and Pasargadae in Fars Province with some of these gorges, and also cultural and climatic specifications of the region, create many interesting tourism complexes. Most of these complexes have potential to register as a geopark in the United Nations Educational Scientific and Cultural Organization (UNESCO). [4]

## **2 Discussion**

### **2.1 Geology and Geomorphology of Studied Area**

Fars province is located in the south central region of Iran. Geomorphology of Fars Province is affected by physical specification of different geological formations. Also because of Fars Province location in Zagros Mountains, this region impressed by geological structures and related fractures.

The constructor rocks of this region are defined in 2 parts: 1 - Rocks older than Quaternary that are hard and to some extent compacted. 2- Quaternary and Recent sediments that are loose and construct surface alluvium.

Quaternary and Recent Sediments are mainly in plains between mountains, coastal flats, and so on. Older sediment sequences in Zagros region are folded by folded Alpine phases and has constructed long anticline and syncline structures in the region with NW-SE, E-W and NE-SW (in north of Bandar Abbas) sequences.

It is tried to discuss the morphology of High and Folded Zagros because the investigated area is located in these zones. These two zones are similar to some extent but highest mountains of Zagros, resistant carbonate rocks, high cliffs, crags and highest crests with more than 2500m difference in elevation are located in High Zagros Zone. Existence of narrow valleys in shape of U, located between mountains, and rivers with N-S position toward Persian Gulf are the morphologic specifications of this zone.

Simply Folded Belt, at Zagros Mountains, is continued with NW-SE orientation but this is changed to E-W toward the main Zagros faults and East region. Axis of main structures (anticlines and synclines) is affected by this situation and sometimes the function of faults causes a local change in this continuity. The morphology of Folded Zagros is affected by anticline and syncline structures. Most of these folds are parallel with general position of mountains. Existence of salt domes is the other morphological specifications of this zone. Some of these domes occupy more than 100 km<sup>2</sup>. Because of the upward movement, from deep toward the surface, of these domes many different types of rocks (Igneous, Metamorphic and Sedimentary rocks) can be seen in such structures. Some of erosive shapes in Zagros, caused by water erosion function, are Gorges, Falling Valleys (Ruz) and Linear Valleys. A narrow water pathway, interrupted the mountain axis, is named Gorge. The equivalent words for this term are Cluse and Gap. If the water pathway interrupts anticline axis, it is called (Cluse) and if it interrupts axis of Bulkhead structure or Hogback, it is called (Gap). So the gorges are the sign of non-coordination of water net with earth structure. [2]

Creation of gorges in Zagros Mountains is affected by three factors. [9]

- 1- Tectonics- By creating the fractures in massive limestone.
- 2- Lithology- Solubility of limestone.
- 3- External Process, such as erosive and solving ability of water.

Shapes of gorges in Zagros Mountains are affected by lithology and thickness of layers. Large and deep gorges with vertical walls are created in most of the anticlines, that Asmari limestone constructs the external layers. [2]

Establishment orientation of gorges in Zagros Mountains is one of the interesting specifications of them, than the other gorges in other mountains. Water net has interrupted the mountains in a perpendicular orient to their axis, to reach the base level of Persian Gulf, during the evolution of Zagros Basin and altitude variation in the region. In fact, the tectonical structures, such as faults and joints are very important in this orienting. [8]

On the other hand, the main karstic areas of Iran are in Zagros Mountains. Extension of carbonate formations in Zagros Mountains is about 102490 km<sup>2</sup> (55.4% of whole karstic regions in Iran). This factor causes the karstification event extending in this area. Abundant folding, faults and fractures of limestone layers have positive role in water transporting and karstification event extending. In some specific conditions, that faults have interrupted the connection of limestone layers, it have negative role in underground water transporting. [10]

The limestone rockshelters and caves, as the results of karstification, are found in a wide range of geomorphological settings in the Zagros. Paleolithic cave and rockshelter sites in the west central and southwest of the Zagros Mountains suggest that the geomorphological settings of these sites are important agents in controlling the nature and rate of sediment deposition. All of these regions are located in the various karstic geomorphic terrains of the Zagros Mountains. [7]

Confining the limestone layers between the shale and marl impermeable layers and as the result, creation of springs, such as Sheshpeer spring and Margoon waterfall, is the other hydrogeological specification of Zagros. [11]

## **2.2 Introducing the Gorges Touristic Attractions, Considering the Natural, Geomorphological and Historical Specifications**

- Some of gorges in Zagros Mountains are beautiful and geomorphological landscapes, such as Hyghar Gorge with vertical walls and more than 100m depth. This gorge is nicknamed Grand Canyon of Iran. [5]

- Unique karstic phenomena in some gorges, such as Margoon waterfall that is the result of water eruption from karstic holes on a vertical faulted wall with about 60m height. This phenomenon is one of the most interesting geological phenomena in Iran and also in the world. [14]

Another aspect of these phenomena is water eruption from limestone rocks of Chellegah Gorge, created an attractive view. Another value of this gorge is the appearance of black shale of Kazhdomi Formation, which is a natural museum of macroscopic fossils. [4]

- Another interesting views in these gorges are caves, which are the internal karstic phenomena. These caves are very beautiful landscapes because the existence of Stalactites and Stalagmites, such as karstic caves in Boragh Gorge, Momtaz Cave, Shapoor Cave, Ban bou Cave, Kangohar Cave and Zahak Cave. Because their specific situation, some of these caves are being used by human from thousands years ago. For ex. Eshkaft-e Gavi is a large cave on the Marv Dasht plain on the lower Kur River Valley and is one of the few archaeological sites in the region to preserve both Middle Paleolithic and Upper Paleolithic occupations. [12]

- Ancient monuments of splendid Persian civilization, located in some of these gorges, such as historical cave-named Shapour- in Chogan gorge, which is among high cliffs, are engraved on the gorge walls, and also Bishabour historical monuments which are located in the gorge exit.

Ancient monuments such as Ghale dokhtar, fire temple, and historical relief in Tangab region and also engravings on cliffs and flagstones which are along Pulvar River of Bolaghi gorge between Pasargadae and Persepolis indicate that the region had been kingly road in past times.

- Interesting tectonic structures for example horizontal platforms or benches, situated in Bostanak gorge( Behesht-e-Gomshode), come into existence because of tectonic activities (There are one hundred and twenty six benches in).The gorgeous terraced slight of gorge and root fixation of plants in secondary lime sediments have created one of the most interesting geological and natural phenomena. [6]

-Natural attractions: gorges that because of being situated in different latitude have contrasting climates with pretty, diverse plant covering. Some of them like Sepidan gorges have dense plant covering, contained oak, almond, and Persian turpentine trees; and some of them like gorges of Lamerd region are full of thick palm-groves and reed-brakes. Hence existence of beautiful nature is one of the tourist attractions of some gorges. [13]

- Tribal attractions of gorges that have been used as the way of tribes migration. For instance Hyghar, Ganbil and Bavan gorges. Choosing these gorges as appropriate ways in order to reach diverse climates has made Fars province one of the most important areas from the view point of tribes.

### 3 Conclusion

Economy of our country is dependent on oil and gas. Attendance to tourism industry is so necessary according to ending these sources. Tourism heritages are constant assets.

Fars Province has many geological and specific geomorphological heritages in Zagros Mountains and also has many historical and cultural attractions for tourists such as Pasargade and Persepolis.

It is being tried to introduce the geotourism attractions (with emphasis on gorges) beside the historical and cultural heritages in Fars Province. So to preserve these heritages and for economic development of country, it is suggested to establish geoparks in this region.

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