

کارگاه های آموزشی و سی و چهارمین گردهمایی  
و دومین کنفرانس بین المللی تخصصی علوم زمین  
۲ الی ۵ اسفند ۱۳۹۴ ایران - تهران



## Geotourism potentials of Jenni, Sardar and Tafto canyons (Case study: Tabas County)



### Abstract:

Tabas County, located in the north west of south Khorasan province, abounds in geological features and is a very valuable treasure of various geological phenomena to study and conduct geotourism activities. The existence of Jenni, Sardar and Tafto canyons through having fascinating and beautiful geological phenomena and mixing scientific features depicts valuable history of the geology of this area, and shows its uniqueness. These canyons are of the most beautiful and excellent ones existing in the desert area of Tabas (especially in the east of central Iran) and possesses a great potential for the tourism in terms of the geological, natural, cultural and historical conditions. A variety of phenomena and different erosional shapes (such as hoodoo, talus, tafoni and river erosional caves), different structural phenomena, geological outcrops, spa and beautiful waterfalls, and natural landscapes are of geotourism potentials of these canyons. Korit ancient dam, Shah Abbasi ancient arch (Tagh-e-Shah Abbasi), Gabr ancient houses and ancient petroglyphs are some other historical-cultural attractions, mixed with sceneries and special geomorphologic places (geomorphosites), bring about a considerable potential for the constant tourism.

**Keywords :** Tabas geotourism, Sardar canyon, Jenni canyon, Tafto canyon.



### Introduction

Iran has a rich culture and civilization with outstanding and unique natural environments, and the archaeological, cultural and natural attractions of Iran have provided appropriate conditions for the geotourism development (Farhatjah & Amrikazemi, 2012). Geotourism is a form of tourism, following the constant tourism objectives, and has played a significant role in developing the world tourism. In the meantime, the geoparks, as an initiative to protect the heritage of nature, geology and geomorphology, have had a crucial role to develop geotourism (Torabifarsiani & Amrikazemi, 2011). Tourist attractions can attract the tourists by its attraction rate. In this regard, the attractive structure of these phenomena is significant (Cartner, 2002).

Iran is one of the talented and able countries regarding tourism, especially geotourism through which Tabas could be identified as one of the most talented areas for geology and geotourism. This County, which is located in north west of south Khorasan, is 55460 Km<sup>2</sup> having 3.36 percent of all Iran's area. It is the largest County in Iran, and some even went further to claim Tabas is the largest County in the middle east (Saberifar & Fathi, 2005). It abounds in geological features and there is a valuable treasure of lots of geological phenomena in the County. This County has the potential to turn into a geopark (Amrikazemi, 2012; Orooji, 2012). Having different geological eras (Precambrian to now) and various geomorphological forms, Tabas was introduced as the paradise of Iran's geology by the thinkers and experts. We could see and study all the geological attractions such as tectonic, sedimentology, stratigraphy and paleontology, economic geology, etc. (Yahya Sheibani & Zamaniyan, 2015).

This study, relying on library and field studies citations, tries to introduce the geotourism potentials and capabilities of Jenni, Sardar and Tafto canyons (known as Kaal-e-Jeni, Kaal-e-Sardar, Kaal-e-Tafto in Tabas, the term Kaal in local dialect is referred to places made by waterflow and floodwater) in the eastern part of Tabas County (Figure 1) and they are significant places capable of helping Tabas turn into a geopark. Jenni, Sardar



and Tafto canyons, with fascinating and beautiful geological phenomena and mixing some scientific features such as having three origins of tectonic, erosion and karst depict a valuable geological history in this area and show their uniqueness.

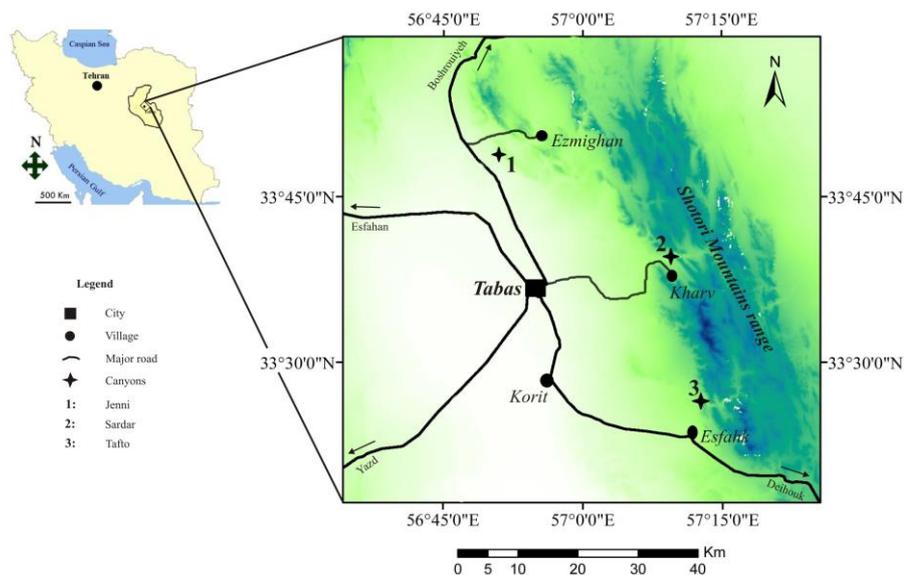


Figure 1: The roads map and location of Jenni, Sardar and Tafto canyons.

These canyons are of the most beautiful and most unique valleys of east central Iran, which exist in the desert area of Tabas, and water flow runs through them constantly. They possess high tourism potentials in terms of geology, nature and culture and history. Landscapes and special geomorphologic places (geomorphosites) inherently or in combination with cultural, historical and ecological heritage provide us with a great potential for the constant tourism (Coratza et al, 2008). This County encompasses a widespread part of block of Tabas and part of Loot block in Iran's geological divisions (Aghanabati, 2006) and Jenni, Sardar and Tafto canyons in subdivisions of block of Tabas have formed in the Shotori block and plain of Tabas contractional depression.



## Discussion

### Jenni Canyon

One of the most beautiful and most wonderful canyons of Tabas is Jenni canyon (jenha) or kaal-e-Jenni. An alive canyon full of water in the heart of scorching and desert land where the life is quite observable. Maybe the people in the past believed that reason of forming these different erosional forms in this beautiful and macabre canyon is living spirits and jinn. This canyon extends for 9 KM and is located in 33 KM north of Tabas (Boshruyeh-Tabas road) and in the west part of Ezmeighan village (one of the most unique Iran's villages in desert of Tabas, in which rice is cultivated). Jenni canyon in geological terms and various erosional phenomena along with many tortuous routes and wide, large growth of canebrakes in the floor of canyon has brought about excellent often intimidating and visionary views (figure 2- A). The oldest stones of this canyon goes back to reef and fossiliferous limestone of Esfandiar formation at the age of upper Jurassic, which formed the mountainous part of this canyon and is related to Shotori block (figure 2- B). Part of Jenni canyon located on Tabas contractional depression includes Neogene sediments and a considerable mass of alluvial sediments, where a wide range of very interesting erosional formations, geological and morphological phenomena were formed due



to loose alluvial sediments and conglomerates of Neogene, and the heights of canyon walls reaches more than 40 meters in this area.

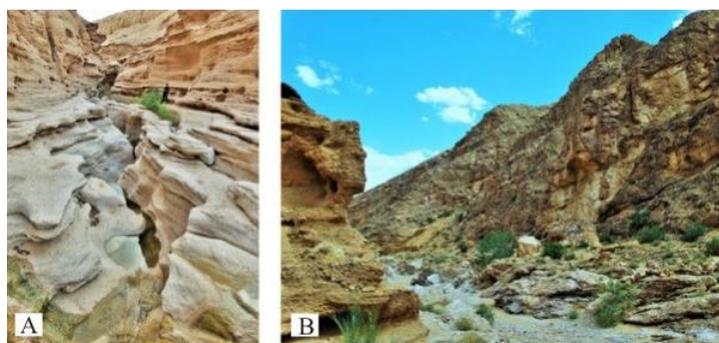


Figure 2- A: a picture of interesting erosional shapes in the Jenni walls and floor, B: the high walls of Jenni canyon in the reef limestones of Esfandiyar formation

Of geological phenomena of this canyon are angular unconformity of Neogene sediments with quaternary alluvial sediments, stream capture, meander, alluvial terrace. Tafoni, hoodoo, river erosional caves and excellent erosional formations landscapes are examples of geomorphological phenomena in Jenni canyon. Qanat, Gabr ancient houses (figure 3- B) are regarded as cultural-historical attractions of this canyon, with a wide range of geological and natural attractions existing there (figure 3- A).



figure 3- A: Beautiful sceneries of Jenni canyon and River, B: The Gabr ancient houses in the quaternary-erosional sediments

### Sardar Canyon

Sardar is one of the most popular and most beautiful canyons, which is visited by many geologists, domestic and foreign tourists. This beautiful and unique canyon is located in 26 KM east of Tabas in the Kharv tourism area (Figure 4- D). The upper carboniferous sedimentary stones in central Iran, known as Sardar formation, was only reported in this area (Aghanabati, 2006). Sardar canyon and river originates in central foothills of Shotori mountain range in a mount named Azhdar and extends to close areas of Tabas. Shotori mountain range is the paradise to be studied based on geology and geomorphology. According to geomorphology and tectonic structures in canyons, fault canyons, thrusts, inter-mountain plains, etc. all made a fascinating phenomenon geotop, through a precise planning, it could have a significant role to play in the tourism in east of Iran (Asgharimoghdam et al, 2010). Sardar canyon and river extends for 28 KM originating from a place named Cheshme ghanbar and ending in Tabas plain, from which 16 km is in alluvial sediments. The height of the walls

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of this canyon is more than 150 meter in the mountainous areas, and 50 meter in the alluvial sediments(Figure 4- C).

The other prominent features of this canyon are many historical works and natural phenomena, which is well indicative of art of sculpturing nature and human. Some of the most important geotourism and cultural-historical attractions of this canyon could be various erosional shapes (hoodoo, river erosional caves, talus), the complex of spas and Morteza Ali travertine, Nahrein Dam, ancient Iranian petroglyph, Gabr houses (most of the Gabr houses of Tabas area are seen in this canyon), and finally Shah Abbasi ancient arch (tagh-e-shahabbasi)(Figure 4- A), which is unique in its own. The specific geological terms from upper Paleozoic era (Shishtu, Sardar and Jamal formations) onwards, with alluvial terraces, meander, fossiliferous sites, angular unconformity of Shishtu and Sardar formations with the quaternary alluvial sediments, etc. are all of the other geological attractions of this unique canyon in the Kharv area. It is worth mentioning the travertine sediments around the Morteza Ali spa were built in terraced and column shapes surrounding the cracks of the canyon wall, and the white, milky and green colors have made the area extremely beautiful (figure 4- B). The plants grown around these spas were superseded in the passage of time with Calcium Carbonate solutions and remained in fossilized plant stems. The interesting point is existing the simultaneous flow of warm and cold water at a very close distance.

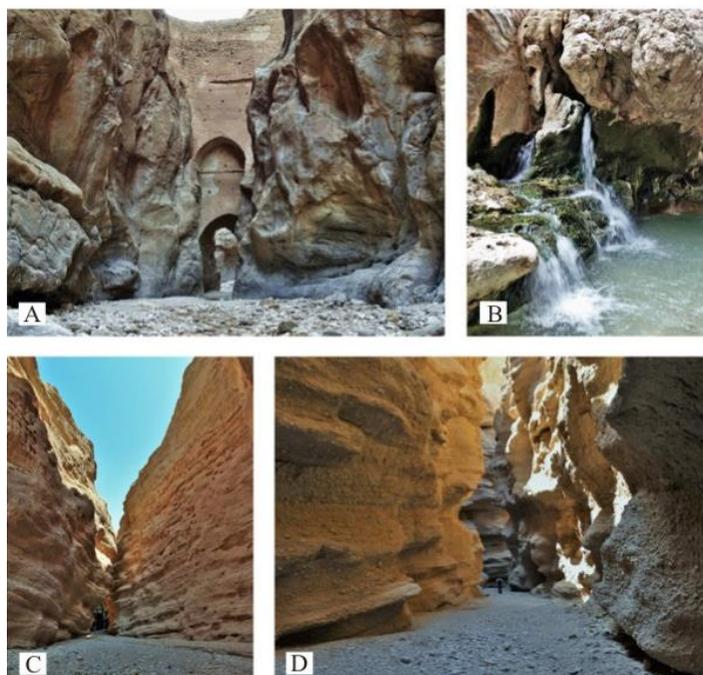


Figure 4- A: Shah Abbasi ancient arch in the Sardar canyon, B: Morteza-Ali spa spring (pay attention to the travertine sediments around the spring opening), C: Sardar canyon in the quaternary-alluvial sediments (close to Tabas), D: diversity of erosional shapes in the quaternary-alluvial walls of Sardar canyon.

### Tafto canyon

This canyon is located in 54 KM in southeast of Tabas and in north of Esfahk village. This canyon, extending for 17 kilometers, originates in Korit ancient dam and after passing the Shotori dolomitic formations, Sorkh shale and quaternary alluvial sediments makes deep canyons, so that the height of its walls reaches to more than 200 meters (in Shotori formation). 13 Kilometer of this river is in the quaternary-alluvial sediments to which the hoodoos were formed (figure 4- D) in these sediments and taluses could be seen around this river and its



surrounding foothills. Several water lakes, some are more than 70 meters long, are of attractions that could be seen in different parts, and different waterfalls (figure 4- A & C), some are 60 meters high, diverse structural phenomena (faults and folding), growth of clumps of plants and trees (wild figs and peanuts) and beautiful color of Sorkh shale along the walls of canyon have made excellent sceneries (figure 4- B). It is worth mentioning that the Korit ancient dam, known as the oldest, the highest, and the thinnest arch dam of the world, was made in the upstream of this canyon. Korit dam was repaired in the middle of 5th Hijri, and it denotes that it could be made older than the date (Daneshdust, 1997).

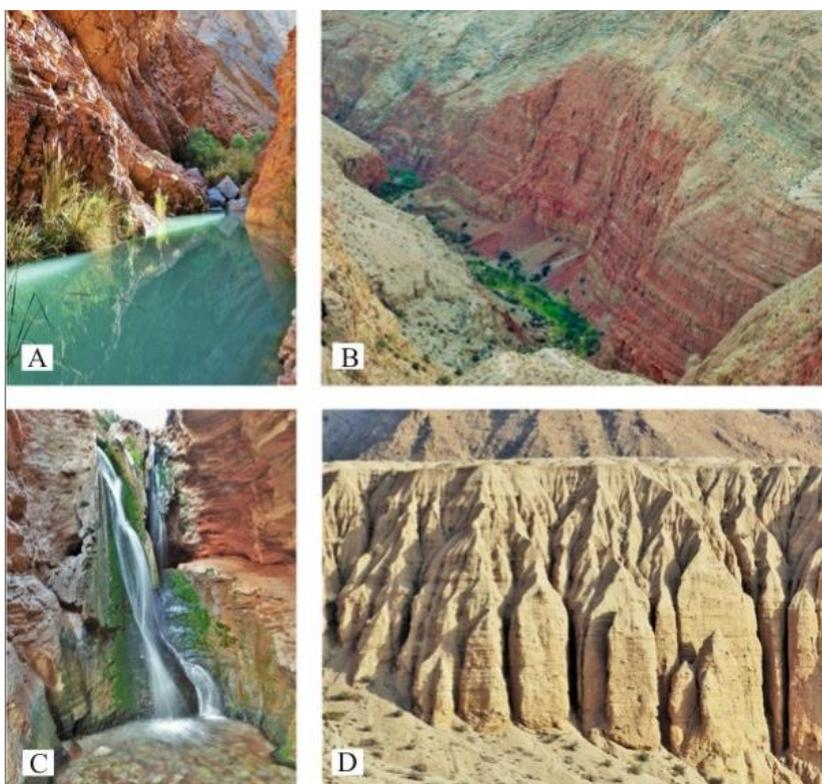


Figure 4- A: One of the formed lakes along the river and Tafto canyon extending for about 100 meter, B: A unique scenery of the walls and Sorkh shale formation and a mass growth of plants and trees in the floor of canyon, C: One of the most beautiful waterfalls, which is 7 meter high, D: Hoodoo made in the quaternary-alluvial walls.



### Conclusion

Jenni, Sardar and Tafto canyons are some of the most beautiful and the most unique canyons of Tabas County which are located in the east of central Iran. They have many potential and capabilities to have tourism (especially geotourism) in terms of geology, history-culture and nature. These canyons, having a wide range of geotourism phenomena such as beautiful springs and waterfalls, diverse erosional shapes, fossil sites, beautiful geological and morphological sceneries around these canyons, are regarded as attractions of Tabas area. The historical-cultural elements such as Korit ancient dam, Shah Abbasi ancient arch (tagh-e-shahabbasi), Gabr houses and qanats, along with the other geotourism potentials increase the significance of tourism. Meanwhile,

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these phenomena and beautiful geological and geotourism sceneries, due to being unknown among the public, require more support to make an appropriate infrastructure for the tourists; and they can turn this County into a geopark with high capabilities.



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