GEOTOURISM AND GEOPARK DEVELOPMENT IN IRAN: EXPLORATORY ANALYSIS OF OPPORTUNITIES AND CHALLENGES

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ABSTRACT: The abundance and diversity of geological phenomena in Iran — which geologists have labeled a "1.5 million km² geological museum" — makes this country a paradise for nature-based tourism. For more than 20 years, theoretical and practical efforts have been made to introduce and develop the concept of geo-heritage and geo-tourism in Iran. Together with the country's rich cultural features, introducing geographical areas in the larger context of geoparks have been considered by geologists. The first geopark in Iran and in the Middle East joined the Global Network of Geoparks (GGN) in 2006, and two other geoparks were signed as members of the GGN by 2023. In 2016, UNESCO defined "geoparks" as areas larger than a pedestrian distance, where the same or different types of geo-sites exist together with all other aspects of the area's natural, cultural and intangible heritages. These areas which have significant geo-scientific, cultural, social, economic, historical and anthropological potential for tourism are managed with a holistic concept of protection, education and sustainable development.

This study aims at analyzing the importance of geo-tourism and geoparks in Iran; and to consider the country's historical and gradual geo-tourism development to define the preliminary results in terms of opportunities and main challenges. For this purpose, exploratory research of conducted scientific publications obtained from archives have been analyzed by focusing on information on the geographical, geological, administrative and sociological aspects of geo-tourism areas to characterize strategies for geo-heritage conservation and geoparks in Iran during the 2001-2023 period. The findings allow us to realize that taking advantage of the geoheritage potential to create geoparks and expanding geotourism opportunities within this framework is considered to

be one of the important means of promoting sustainable tourism development in Iran. We discovered several challenges when applying sustainable tourism development principles at the operational level, including the management of geoheritages sites and a lack of general policies. Despite this, however providing a snapshot of the geosociological landscape and discussing several regional opportunities, pathways and practical attempts will lead to prosperous sustainable tourism development in Iran.

KEYWORDS: Geo-Sociological; Sustainability; UNESCO Global Geoparks; Geological Heritage; Middle East

INTRODUCTION

Geotourism is one of the concepts that has been developing in the field of tourism in the last two decades. It is emerging as a new global phenomenon (Dowling, 2009) and is growing of the new concepts in tourism academy and at the same time of the new products in tourism industry. Global studies on the field of geotourism show that it is one of the most important areas of development from the conservation's perspective. It includes geodiversity phenomena and geosites (Erikstad, 2008; Gray, 2013), links biotic and abiotic nature and cultural features (Dowling, 2014), geotouristic potentials (Pralong, 2005), valuable geomorphosites in protected areas (Trueba, 2005) geomorphosites' management (Corteza et al., 2008), mythological aspects (Piccardi & Masse, 2007) and tourism and recreational values (Hose, 2012).

It can be specified that the attention to geotourism and geoheritage conservation was officially raised when UNESCO introduced the new subject in geosciences called "geopark" with a holistic concept of protection, education and sustainable development (Farsani et al., 2014). As a result, the attention to geotourism as one of the ways to achieve sustainable development (Tsaur, 2006) increased significantly. Numerous geosites and geomorphosites with various levels of geoheritage value and geotourism potential have been identified worldwide (Ólafsdottir, 2018) as a necessary step for the establishment of Geoparks and geotourism development (Farsani et al., 2014).

The first geology studies in Iran introduce the country as a paradise for geologists with great range of geological features (Nabavi, 2000). Its geomorphic features constitute a great potential for geotourism due to the size and diversity of their landforms and related processes (Pourfaraj et al., 2020). According to the wide spectrum of the country's geological heritage, there is a high potential for geotourism in the field of tourism development. Having an outstanding

natural environment and geological interests as well as a rich culture and civilization makes Iran a great geotourism destination with possibilities of establishing and developing geoparks Amrikazemi, 2014).

Given Iran's great geotourism potential, the present study seeks to show the importance of geo-tourism and geoparks development in Iran, to consider its historical and gradual geo-tourism development, and discussing the preliminary results of opportunities and future challenges for geotourism in the Iranian context.

EXPLORING THE CONCEPT OF GEOTOURISM

In its early narrow definition, geotourism is described as a geology-based tourism that provides interpretive and service facilities to enable tourists to visit geological sites, acquiring knowledge and understanding of earth sciences (Hose, 1995). Focusing on geological approaches that highlight geodiversity as a basis for geotourism foundation, Gray (2008) and Hose (2012) introduced three key interrelated aspects of modern geotourism: geoconservation, geohistory, and geo-interpretation. Based on this, geotourism is perceived as a new form of nature-based tourism, that goes beyond simply observing geological phenomena and understanding geosciences; it includes a conservation element as well as an interpretive component (Dowling, 2014).

A geographical approach to promoting geotourism was proposed by the National Geographic Society arguing that geotourism can include a broader range of tourism such as cultural tourism and ecotourism, sustaining or enhancing the geographical character of a place including the identity of a territory, and taking into consideration its environment, culture, aesthetics, heritage and the well-being of residents (National Geographic, 2005). This approach to geotourism incorporated the concept of sustainable tourism stating that it should promote the conservation of all distinctive assets of a place from nature to culture and history (Dowling, 2020). In other words, geotourism is viewed as a branch of sustainable tourism that seeks to preserve all natural and human attributes that make a given location distinct from others (Ghazi et al., 2013).

The shift from a geological view to a geographical one is a consequential shift, that has brought focus from 'geotourism as a form' to 'geotourism as an approach' that is more aligned with sustainable tourism (Dowling, 2020). Therefore, geotourism can be introduced as a comprehensive form of sustainable tourism that encompasses a variety of sustainable tourism

areas such as rural tourism (Olive, 2003), cultural and heritage tourism (Ilbery et al, 2007) community-based and nature-based tourism (Ceballos, 1996).

Closer to sustainable tourism, Pralong (2006) proposed his idea that geotourism could be a component of regional economic development generating profitable tourism through the development of geoparks. The concept of geopark was already held in the late 1980s. In the context of sustainable tourism,

geoparks have been established to create enhanced employment opportunities for the people who live there and foster economic benefits for them (Newsome, 2010). The concept was renewed "as areas larger than pedestrian distance, where the same or different types of geo-sites exist together with all other aspects of the area's natural, cultural and intangible heritages" by UNESCO (2016). It is a wise and valuable initiative by UNESCO earth sciences which seeks the participation and cooperation of the local communities in issues related to the conservation and sustainable use of territory, especially geological heritage (AmriKazemi, 2013; Maghsoudi et al., 2019).

METHODOLOGY

The methodology used in this study is based on official data collected from national statistics, Global Geoparks Networks (GGN), UNESCO Global Geoparks (UGGP), national and international archives, and scientific databases from Iran, focusing on the period 2001-2023. Firstly, we gathered data from exploratory studies on geotourism and geoparks in Iran. 157 scientific papers were analyzed including Persian and international studies. Secondly, we compiled information on essential aspects to understand Iran's strategies on geotourism, geoheritage conservation and geoparks based on geographical, geological, administrative and sociological characteristics. We conducted content analysis on the collected data and obtained results and findings that provide a general understanding of the situation of geotourism in Iran.

The paper addresses a comprehensive introduction to geological heritage in Iran. In the following sections, the most important features of Iran's geoturism are discussed. Due to the high number of geoheritage sites, this work only describes the most relevant ones.

IRAN GEOLOGICAL FEATURES AND HERITAGE

Iran, also known as Persia, is a mountainous, arid, and ethnically diverse country located in the Middle East and Southwest Asia with an area of 1.65 million km^2 and 83.5 million inhabitants (2021). It has borders with Pakistan and Afghanistan to the east, Turkey and Iraq to the west, and

Azerbaijan, Armenia, and Turkmenistan to the north. In the south, it reaches the Oman Sea and Persian Gulf. About 55 % of the country is mountainous and the remaining 45 % is comprised of plateaus, plains, deserts, saline lands, ponds, and lakes (Ghazi et al., 2013). Geographically, we must highlight a central desert plateau surrounded by high mountain ranges on all sides. The abundance and diversity of geological phenomena in Iran labeled by geologists as the '1.5 million km^2 geological museum' formed it as a paradise for nature-based tourism (Amrikazemi, 2010).

Geological description

The geological development of Iran has been discussed as a theory of plate-tectonics (Berberian, 2014). According to this theory, the collision of Arabian and Iranian plates is the cause for the upfolding of the Zagros mountains, and for the continuing volcanic and dramatic earthquake activities that characterize large parts of the country. From a global tectonic point of view, it is also believed that geological structure of Iran is in the middle part of the Alpine-Himalayan orogenic belt (Maghsoudi, 2020). Three main structural units or zones could be distinguished in the geology of Iran (GSI):

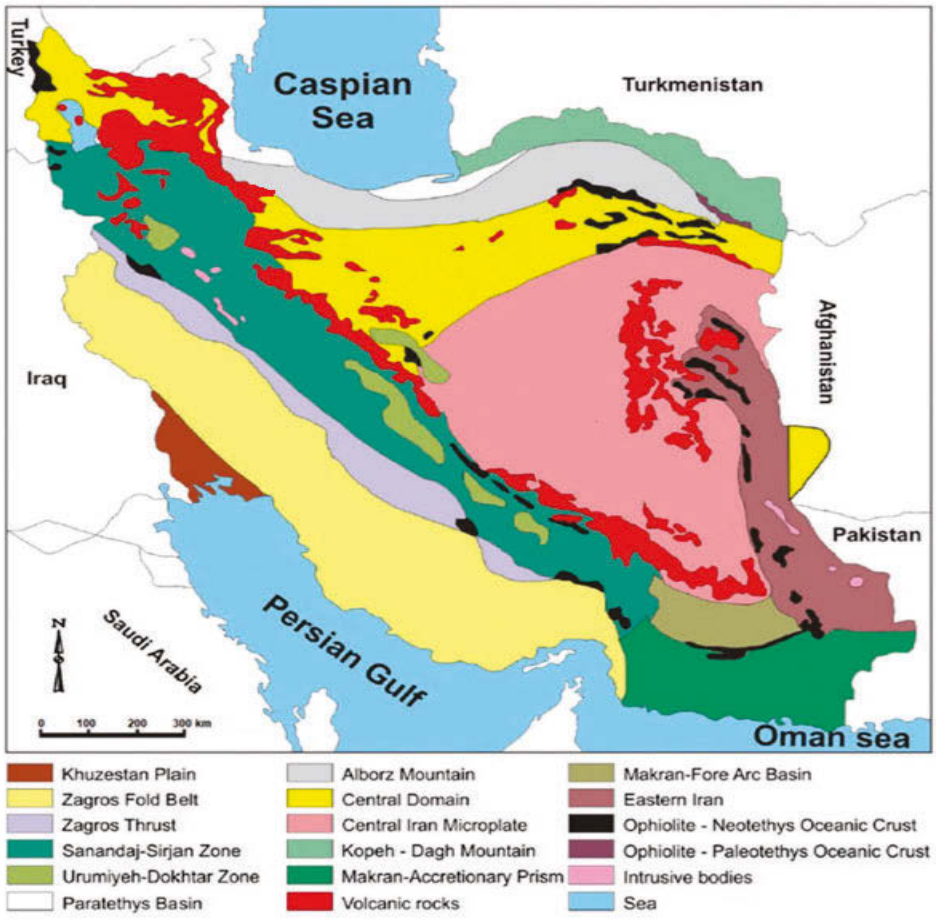
a The southern unit has a crystalline basement consolidated in the Precambrian time and a platform type of Paleozoic development, comprising the Zagros folded belt, southern and southwestern parts
of Zagros. This section formed a part of the Arabian Plate that was located on the margin of Rodinia and Pannotia in the Neoproterozoic, and of Gondwana in the Paleozoic and Mesozoic. Qeshm UGGp is part of the tectonic zone represented by the southern part of the deformed forehead or the convergent belt, as well as by the margins of the compression and collision plates of the Iranian-Arabic continent.

b The central unit, which comprises the central Iran and the Alborz, is interpreted as an assemblage of fragments that were in the vicinity of the Arabian Plate and formed a marginal section of Rodinia and Pannotia in the Neoproterozoic and of Gondwana in the Cambrian, Ordovician, Silurian and Devonian. These fragments or microplates were fused together and made the Iranian Plate which was rejoined by Gondwanic Afro-Arabia in the Late Cretaceous. Tabas UGGp located within the Tabas block is a part of the central unit that has endured several important orogenic phases and epeirogenic activities from the Permian to the Quaternary (Aghanabati, 2006).

c The northern unit is separated from the central unit by the North Iran Suture. It is characterized by continental crust including remnants of more or less cratonized former

Paleozoic oceanic crust that seems to reflect the Paleotethys. The northern unit represents a marginal strip of the Hercynian realm of Central Asia- broadly overlapped by the Alpine realm. It was deformed and largely consolidated by the Early Cimmerian folding and the Late Alpine folding. The northern unit comprises the South Caspian Depression and the Kopet Dagh Range. Aras UGGp is part of this geological unit, of the Lesser Caucasus terrane shaped by the collision of Iran- Eurasia plates in the late Triassic and then and the Arabian-Central Iran microcontinents in the late Miocene.

Fig.1 Structural map of Iran



Source: Afrasiabian et al., 2021

The overall geological units of Iran were differentiated into sub-structural and sedimentary zones firstly by Stöcklin (1968), and Eftekharnejad (1980), renewed by Berberian (1981) and Aghanabati (2006). Maghsoudi (2020) introduced a new structural zonation for the country in the following sedimentary-structural units (Fig.1).

Geological heritage

A wide variety of geological features and phenomena can be traced by the effects of active plate tectonic. There are eight main groups and sub-groups classifying and categorizing geological phenomena (Amrikazemi, 2013) that characterize geotourism development in Iran:

1 Sedimentary phenomena have a wide diversity and are widespread throughout Iran. Caves, mud volcanoes, travertine springs, deserts, and glaciers are among the various forms and shapes considered as sedimentary phenomena in Iran. The most suitable geomorphosites of the Lut plain such as Gandom Beryan for sustainable geotourism planning (Raeisi et al., 2022), the formation of numerous and diverse sedimentary basins with different lithofacies (Salehi, 2023) in Tabas UGGp. The unique and attractive features of Katale Khor and Ali Sadr Caves in northwestern Iran have made the local area a geotourism destination (Afrasiabian, et al., 2021). Mud volcanoes are another example of rare sedimentary phenomena of nature that are visited as a fascinating geosite in Sistan and Balouchestan Province (Derafshi, 2022). The Sahand Volcano and Urmia Lake also have high potential to attract tourists (AmriKazemi, 2010). Locations such as Ramsar in the north, Sarein in the northwest and Mahallat in the west include mineral and hot springs along with stunning natural landscapes.

2 Erosion phenomena include a major part of the spectacular geological phenomena in Iran. It is mostly outstanding in the deserts and on the south coasts wherein it has created various forms. Such forms can be found in Qeshm Island UGGp (Amrikazemi, 2013) resulting from erosion and can be identified as the works of 'Erosion Sculpturing', and in the Lut desert (Maghsoudi, 2020)

3 Magmatism and metamorphism phenomena in Iran date back to the Precambrian era. Sanandaj-Sirjan which spreads along the northwest to southeast, is the largest and most important metamorphic area in Iran. Alamkooh mass and Iran's Quaternary volcanoes (Damavand, Sahand, Sabalan, Taftan and Bazman) date from some of Iran's metamorphic phenomena which are considered highly valuable from a geotourism development perspective. For instance, compared with sedimentary rocks, a wide distribution of igneous and metamorphic rocks such as granite, marble, quartzite, etc., are also significant in Tabas UGGp (Yahya Sheibani, 2023).

4 Structural phenomena of the Iran Plateau formed due to plate tectonics. The huge land area of central Iran, which in the past and in a geologically simplified way was equated with the "Median mass" is in fact an extremely complex geological structure (Idem, 1971) with great potential for the development of geotourism in Iran. The beach scarps,

wonderful wave-cut cliffs in the southeast of Iran, the grand graben in Arjan plain along with a higher number of salt domes such as Jashak salt dome in Bushehr province, Namakdan salt dome in Qeshm Island UGGP, Hormoz salt dome in Hormoz Island (Akbarian, 2020), the hills and several folding and fault forms in Zanjan province (Afrasiabian et al., 2021) have turned the land of Iran into perfect treasure of structural phenomena unique in this regard.

5 Geological specimens are among the most significant features of geotourism development in Iran. Including minerals, fossils, rocks and beautiful stones, natural gas and oils that are considered attractions for geotourism development. Many fossil bones obtained from Maraqe geosite in the northwest of Iran consisting mainly of the alternations of tuffaceous sandstone and mudstone (Kamei et al., 1977). A variety of geosites in Iran with geological specimens such as Maraqeh in east Azerbaijan (Ajayebi, 2023) with similar types of fossils, the high share of fossil fuels such as oil and gas in the north of Ilam as long as the source of natural bitumen, coal, clay, quaternary sand,

copper, iron, and ornamental stone (Ahmadi et al., 2021) viewed as a significant site for geotourism. The Gachsaran Formation in southwestern Iran and Tabas has yielded significant fossil finds dating back millions of years. The northwest of Iran has rich deposits of minerals and natural resources. The present diversity of minerals and mining activities in this region is an attraction for geotourists who want to know more about mineral formation and the mining industry (Ghazi et al., 2013).

6 Engineering Geology Phenomena such as sinkholes, slumps, and fissures in the earth are another group of geological aspects (Ajayebi, 2023) that have research significance and are considerated in geotourism. One of the glorious instances of such phenomena is found in Tabas UGGp and Aras UGGp. The rock avalanche of Seymareh in Lorestan Province is the world's biggest landslide that has taken place in the Zagros' Mountain range and provided broad bedding for geotourism research (Jadidi et al, 2017).

7 Cultural Geology is a social part of geoscience that has a significant relationship with archaeological studies and geotourism. There is evidence of cultural values of geoheritage sites, geoheritage in urban spaces, cultural landscapes and the contribution of geoheritage to their identity, mining and quarrying heritage, connections with natural disasters, history of science and art in Iran. For instance, the travertine springs and cones of Takht-e Soleymān in northwest of Iran are not only morphologically interesting phenomena, but also archaeologically and historically important attractions (Khoshraftar, 2019). Khorzaneh in Hamedan city is also among geosites with historical and archeological values

creating a balance between geoheritage and geotourism (Mohamadianmansoor, 2022). Numerous traditional villages that provide a glimpse into the country's rural life and cultural heritage, such as Meymand, Abyaneh, Masuleh, and Kandovan feature distinctive geological and geographical values as well as architecture, local crafts, and time-honored customs that have been preserved for centuries. Ancient mining is also an interesting feature of geo-archeology. Several geological attractions in mining sites in Iran have scientific and geoheritage value. Some old mining sites have been resurrected and thereby gradually converted into geosites. The Nakhlak lead mine in Anarak-Khore zone in central Iran, which have been turned into Iran's first mining museum, holds a very significant value as a geotouristic site. The Talmessi copper mine is a historic mine where some artifacts and slag pieces were found (Mehdipour, 2021). Tabas UGGp also includes valuable metallogenic zones with historical, educational, cultural, and social value (Sheibani, 2023). The Kandovan rock village in the Oskou District is an outstanding example of the region's unique geoarchaeosites in Iran (Ghazi et al., 2013).

8 Geological landscapes are the most common features between ecotourism and geotourism. Iran's landscapes and landforms are highly influenced by climate (morphoclimatic region), geology (structure and stratigraphy), and topography (Maghsoudi, 2020). The combination of these factors generates a variety of landscapes and landforms around and inside Iran. Mountains, waterfalls, rivers, valleys, glaciers, deserts, etc., can be categorized in this group of geological aspects as well as other geological phenomena with aesthetic value. The gorgeous landscape of the highest summit of Iran, Damavand, located in the central part of Alborz Mountain, has made the areas around it a geotouristic destination. The most interesting landscapes are related to the geosites marginally arranged on the more solid, mountainous structures, located on the south-western and north-eastern sides of the Yazd-Ardakan Plain (Dincă, 2023). The only active mountainous glacier in Iran, Alam Kouh in Alborz Mountain's central area, is one of the most famous ecotourism destinations with a huge number of mountaineers and climbers over the year, offering beautiful landscape that can be seen from a range of viewpoints around. Several coastal sand dunes and ergs located between Hormuz strait and Chabahar City are potential geotourism hubs for southeast Iran (Maghsoudi, 2020).

HISTORICAL DEVELOPMENT OF GEOTOURISM AND GEOPARKS IN IRAN

Geotourism activities in Iran were initiated in 1999 when the first academic study on geotourism in Iran was presented by Nabavi (2000b) at the geoscience conference held by Geological Survey and Mineral Exploration of Iran (GSI). Following that, intensive and extensive studies on the measurement of geological attractions with the aim of finding geotourism potentials were carried out by the same governmental agency.

In the 10th International Ecotourism Conference held in 2002 in Cairns, Alireza Amrikazemi, one of GSI specialist with a large experience in research on geotourism, gave a speech titled "Introducing Geotourism in Iran". GSI has been formally and practically recognized as the leading entity in identifying, registering, and preserving Iranian geological heritage (Amrikazemi, 2017). Together with universities and non-governmental associations, GSI has conducted various studies and projects assessing opportunities for geotourism, the impacts of geotourism on local community development, and many other issues related to geology as a tourism resource and its protection. The “Atlas of Geopark and Geotourism Potentials of Iran” was published in 2009 and the “Geoheritage Atlas of Iran” in 2013 by Amrikazemi under the supervision of GSI.

Iran’s National Geosciences Database has paid serious attention to the issue of geotourism. Among the most prominent activities of this center are the publication of the Qeshm Geotourism Atlas, provincial geotourism reports (such as Fars, Lorestan, Zanjan, Esfahan, Tehran), Tehran Geotourism Map, and the Atlas of Geology of Paths (Ziaee, 2020). These were the first books composed after a decade of research and fieldwork and they thoroughly explored Iran’s geotourism potentials (Ajayebi, 2023). The Department of Geotourism and Geoheritage established by GSI in 2012 to recognize the studies and activities in the field of geotourism, prepared several reports and studies with the aim of identifing the opportunities for geotourism across the country. With the collaboration of the private sector and NGOs, many other contents on the concept of geotourism and geoconservation have been produced, including book translations into Persian, geological guidelines for tour operators, reports and many documentaries about Iran’s geotourism attractions. Moreover, the educational program in the subject of geotourism has been developed by providing various lecture programs for provincial managers and stakeholders, designing training courses for local communities to introduce the geotourism concept and geoconservation, and providing them with the idea of geoproduct related to geological phenomena in the region.

Following the idea of the collaboration between European Geopark Networks and UNESCO and the formation of the Global Geopark Networks (GGN) in 2004, Qeshm Geopark, located in Qeshm Island

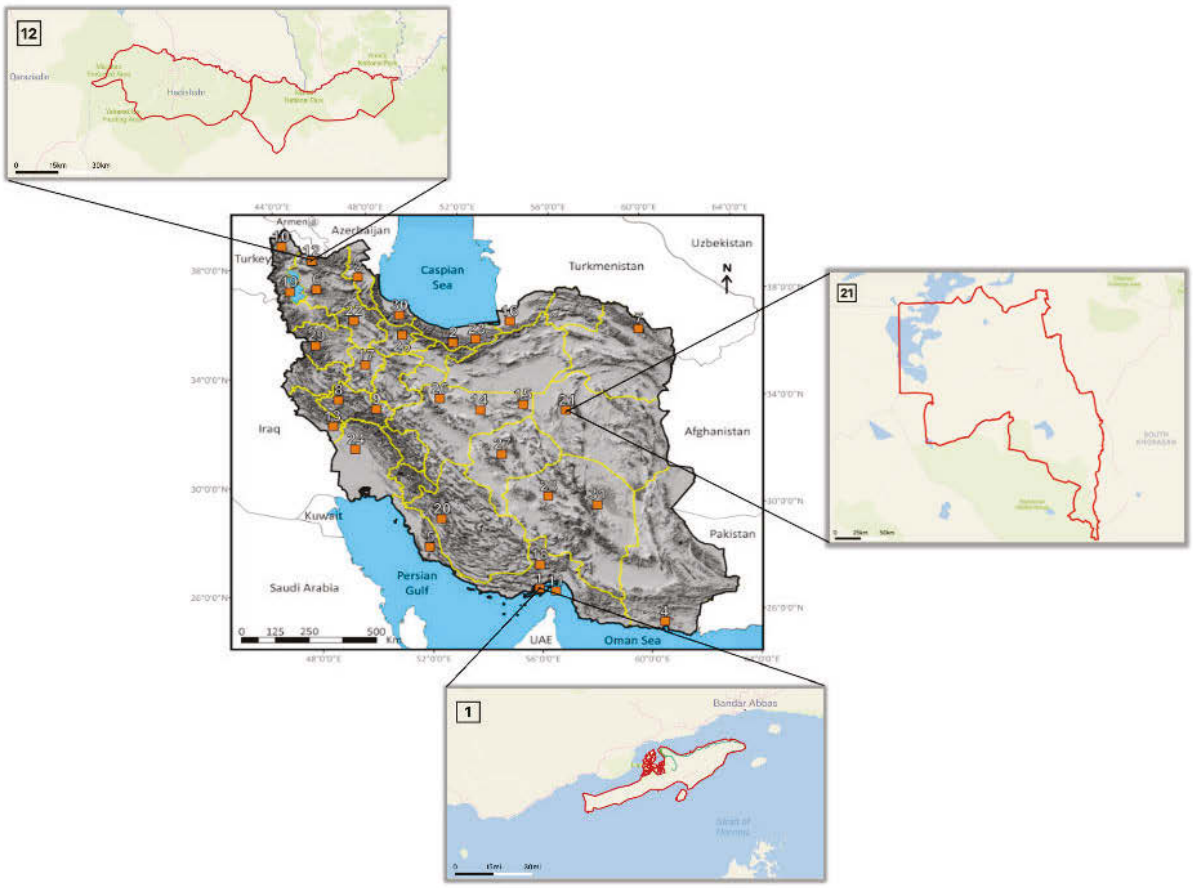
Free Zone (Hormozgan Province in the south of Iran) joined GGN in 2006 as the first geopark in the Middle East. Due to the lack of implementation of basic and necessary principles in Qeshm Geopark, GGN expert's annual evaluation resulted in a yellow card. In case of solving the deficiencies, and according to the standards of this network, Iran's membership in GGN would be extended for another four years. The changes in the Geopark's management structure and the lack of attention to GGN's warnings led Qeshm Geopark to receive the red card and thrown out of the Network in 2010. After changes in the national and provincial governments between 2009 and 2012, many proposals of potential geoparks provided by specialists to be represented in GGN faced a lack of support and were postponed by relevant authorities. In 2017, after more changes in the national government, a lot of efforts made by the new management of Qeshm Geopark, with the support of the local community, experts and the executive management of the Qeshm Free Zone Organization resulted in readmitting Qeshm Geopark to GGN.

Two proposals of Tabas County in the east and Aras County in the northwest of Iran were presented to GGN in 2019 as candidates for becoming GGN members. The evaluation of new candidates took years by improving and evolving their projects to become UNESCO GGN members. Both geoparks received final approval from the UNESCO Global Geoparks Council and Executive Board for joining the UNESCO GGN in 2023.

Distribution of Iranian geoparks

Iranian Geoparks are distributed in three different territories from a geographical point of view (Fig.2). Qeshm UGGp is the first Geopark in Iran and the Middle East, which has been a member of GGN since 2006. It is located in Hormozgan Province, in the south of Iran. This Geopark has an area of 2063 km^2, including Qeshm Island, Mangrove Forest area, Hengam Island, and Dolphins' Bay. Qeshm Island is the largest island in the Persian Gulf and runs parallel to the south coasts of the Hormuz Strait. The highest point of Qeshm Island is Namakdan Mount with 397 meters. It has also the world longest salt cave, 6600 meters in length. The island includes 3 cities and 66 villages with 120,000 inhabitants mainly working in fishing and trading.

Fig. 2 Location of the Iranian UGGPs (1: Qeshm Island UGGP; 12: Aras UGGP; 21: Tabas UGGP) and 28 proposed geoparks marked with orange rectangles (They are listed by name in the source map).



Tabas UGGp is the second Geopark in Iran, and has been a member of GGN since 2023. It is located in South Khorasan province in the east of Iran. This Geopark covers an area of 22,771 km^2 and lies between two vast deserts in Iran: Lut Desert and Great Desert (Dasht-e-Kavir).

It includes Nayband Mountain, and three districts of Central, Dastgerdan, and Deyhuk. The landscape varies from plains to high mountains and active tectonics shaped its valleys (Sardar, Jenni, Tafto, etc.). Deserts and sand dunes are among the other typical landforms of the area. The highest point in the area is Nayband Mount (3009 meters above sea level). This leads to significant temperature differences during day and night (almost 50 °C) and dry-hot winds (Sheibani, 2023). The area includes cities and villages with 72,617 inhabitants mainly working in various mines in the region. Throughout history, the area has served as a highway linking the south and west to the east and northeast of Iran.

Source: Own elaboration based on Sheibani & Zamanian (2023).

Aras UGGp is the third Geopark in Iran and has been a member of GGN since 2023. It is located in Jolfa County (Aras Free Zone) in the northwest of Iran covering an area of 1,670 km^2. The region can be divided into two main districts of Central and Saih Roud. The Aras River acts as the border between Iran, Armenia and Nakhichevan (Azerbaijan), delineating the northern boundary of the Geopark. The Permian-Triassic Boundary observed in this Geopark is considered the most important geological feature with international significance. The lowest and highest points in this area range between 400 and 3,347 meters above sea level. Kiamaki Mount in the northern part of the province is the highest peak. The semi-arid climate in this area means results in very hot summers and very cold winters (+40°C to -10°C). Approximately 65,000 people live in this area, mainly working in farming, gardening, and trading.

Aside from these, more than 30 areas were proposed as potential geological areas to establish new geoparks throughout the country (Amrikazemi, 2017).

Evolution of geotourism policies

The growing attention to geotourism and related studies, coupled with the need for effective strategies for sustainable tourism development in the country, has increased its consideration among public policy makers. Public policies can play a crucial role in determining the decision-making framework and implementing necessary measures for the geotourism development. These public policies not only can coordinate the activities of related organizations and institutions, but also effectively provide the general welfare of local communities around geological attractions. From 2001 to 2018, a total of 353 legal resolutions were approved by various governmental bodies (Islamic Consultative Assembly, Delegation of Ministries, Department of Environment, Supreme Council of Environmental Protection, and Supreme Council of Urban Planning and Architecture), with 58 of them being geotourism public policies at the national and provincial level (Ranjbar et al., 2019).

These public policies can be classified into five categories: 1) development of geological attractions, 2) development of infrastructures, 3) development of management and institutional elements of

geotourism, 4) development of residential facilities and services, and 5) development of transportation. The most active period of policy-making was in 2005-2006, with 27 policies focused on the development of geological attractions. Introducing touristic areas around the

geosites was a priority for policy makers (Ranjbar et al., 2019). Geoparks Regulations were approved in 2013 by the Commission on Infrastructure, Industry, and Environment of the Government Council (Sheibani, 2023). Then, The Geological Survey of Iran in cooperation with the Iranian Tourism Organization and the Iranian Department of Environment, began creating geoparks in the country. Another possibility of protecting valuable and unique geological phenomena is by registering them as national heritage. Among the national natural heritages of the country, we can mention Damavand volcano and Kogan cave, which are considered as important geosites in the country (Amrikazemi 2013) and are registered as national heritages in order to be protected.

DISCUSSION

Nowadays, geotourism offers a new and exciting path for tourism development due to geological and geographical attractions and destinations. Analysis of data collected from scientific research conducted in the last twenty years shows a wide range of geoheritage opportunities in Iran and focuses so far on identifying and introducing geological attractions, adding them to the country's geosites as opportunities on geotourism development. The geodiversity of landscapes and geomorphological landscapes, in association with the body of knowledge about the earth history and geological processes provide for immense scope within the context of potential geosites (Nekoui, 2018). Over the last two decades, numerous studies have been conducted on geoheritages and the diversity and evaluation of geomorphosites because of the development of a number of geosites in Iran.

Considering the geological and geographical features as well as the cultural and ecological values of geosites, the heritage values of geomorphosites (Moradi et al., 2021), diverse landscapes, and cultural heritage, Iran holds a significant place in terms of geotourism development. The country has the potential to become a leading geotourism destination in the region and attract travelers from around the world seeking unique and enriching experiences. As Lee and Jayakumar (2021b) discussed, by bringing attention to numerous geological features illustrating the Earth's billion years of rich history and providing insights into past climate change events, geoheritage sites and geoparks can contribute to achieving sustainable development goals. For example, the western part of the Sahand area is an important area for geotourism development and has promising potential to become a Global Geopark (Ghazi, et al 2013). The proposal of some national parks such as Golestan (Northeast), Arsbaran (Northwest), and Urmia (Northwest), or other areas

such as Maragheh (West), presented by scholars to be registered as new geoparks, constitute other good examples.

Geotourism is a conservation element as well as an interpretive component (Dowling, 2014) to preserve all natural and human attributes that render a given location distinct from other (Ghazi, 2013). By highlighting the importance of conservation and protection of geosites, including geological formations, mineral deposits, fossil sites, etc., visitors are encouraged to adhere to responsible guidelines, minimize their environmental impact, and respect the formations and wildlife habitats. The studies that have been analyzed show that geotourism as an approach which is more allied with sustainable tourism (Dowling, 2020) strengthens the economies of local communities in Iran. They emphasize that the expansion of tourism in geosites leads to a fair distribution of income at a regional level and, to some extent, contributes to sustainable development by bridging the development gap between different regions.

Geotourism in Iran holds significant potential due to its diverse landscapes, rich geological heritage, and cultural history. However, several challenges may hinder its development. Most of the scientific studies about geotourism in Iran are devoted to the assessment of geological heritage's possibilities for geotourism and their effects. However, geotourism development does not seem homogenous. Issues such as public policies and conservation management, which play a key role in the development of geotourism, have received less attention from policymakers, especially the national government. Despite the evolution of geotourism policies, these policies only contribute 16.43% to the country's total public policies. This is because these policies mostly concentrate at the province scale and in one or more areas within a specific province, mainly focusing on the development of geological attractions (Ranjbar, 2019). This causes the one-dimensional growth of relevant policies in a short period of time.

The Geological Survey of Iran (GSI) has been a pioneering organization for identifying and developing geodiversity and geological heritage. However, the lack of geotourism policies to guide its development activities and provide the necessary infrastructure, facilities, services and education is one of the main issues that geotourism is facing. This may slow down the development of geotourism in the long term and potentially cause the emergence of negative effects, especially at the environmental and social level, including damage to the geological heritage and negative impacts on the local community.

CONCLUSIONS

The present study has shown the unique geodiversity and geoheritage features in Iran which are of great value as geological and geotourism sites of the country. The geodiversity in the Iranian landscapes recognized through scientific knowledge about the Earth's history and geological processes provide an immense scope within the context of potential geosites. Based on the geologically diverse attractions of Iran, geotourism is likely to be a successful candidate in tourism development. However, since geotourism utilize geological features as its main attraction, it is extremely important to protect them by having a comprehensive management plan. Still the value of most of the geological and historical heritage of Iran is relatively unknown. The country has been actively working on establishing geoparks to promote geotourism and protect its geological heritage, including geological formations, mineral deposits, fossil sites, etc. The establishment of Iran's first geopark, Qeshm Geopark, in 2006, marked a significant milestone, albeit with challenges and setbacks. Subsequent efforts led to the proposal and approval of additional geoparks, such as Tabas and Aras Geoparks, highlighting Iran's commitment to integrating geotourism into its tourism landscape. Iran often intertwines with its rich cultural heritage, allowing visitors to explore geological sites alongside historical landmarks, ancient ruins, and traditional villages. This integration, alongside introducing geoparks, enhances the overall visitor experience and promotes locals to know more about geology, and hence, help in popularizing geosciences and environmental conservation. The evolution of geotourism policies, backed by legal resolutions and governmental support, underscores the recognition of geotourism as a strategic component of Iran's tourism development agenda. However, during recent years governmental and provincial barriers seem to leave negative effects on tourism policy making, including geotourism and its development, and reducing the successful effort in favor of effective protection of geological heritages. The results presented in this communication are limited since they belong to a preliminary phase of an ongoing PhD research. This exploratory advancement aims at discussing these initial findings with experts participating in the XIX AGE-UGI International Colloquium 2024. Future works will provide further insights on specific issues such as demand, public policies, and educational values of geoparks in Iran.

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