

# The Challenges of Geotourism in Egypt: A Case Study of Wadi Al-Hitan

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**Abstract** Due to its novelty as a new distinctive form of tourism, geotourism has not been studied much. However, the Middle East consists of a rich geodiversity, which is regrettably not well known by the public. Despite the development of geotourism, very few studies have investigated issues pertaining to it in the Middle East, particularly, in Egypt. Therefore, the aim of this paper is to identify the concept of geotourism and to explore the challenges of geotourism in Wadi Al-Hitan. This research adopted a quantitative approach by using single case study to achieve the aim, objectives and research questions. Data collection involved multiple sources of evidence, i.e. questionnaire, and direct observation. 61.5% was the average response rate. Statistical Package for Social Sciences (SPSS, version 16) program was used for analysing data. The results indicated that awareness and knowledge of visitors about the concept of geotourism are still less than the academic and official staff. It also found that the concept of geotourism needs to be known for the local community. The results showed that there were different challenges facing geotourism in Wadi Al-Hitan. A major contribution of this study is related to enhance the understanding of geotourism concept. The current research added to the growing geotourism literature through its review of the pervious academic research, generation of new ideas and interpretation of rich data collected from the different sources. Also, the current study contributes to theory through study extending our understanding of geotourism and its tourists in the Middle East, in particular, Egypt.

**Keywords:** Geotourism, Geotourist, Geosite, Geology, Geomorphology, Geotourism Challenges, Egypt

## LITERATURE REVIEW

### INTRODUCTION

Geotourism concept was developed and promoted from the early 1990s onwards (Hose, 1995). The term passed into general usage in the early 1990s, although its antecedents date back to the seventeenth century (Stokes et al., 2003; Frey et al., 2006). Joyce (2006) argues that geotourism is a relatively neoteric term not yet appearing in dictionaries. It can be seen as an augmentation of tourism generally and parallel to ecotourism in particular. According to, Heggie (2009) and National Geographic (2011) geotourism was born as a new global phenomenon since 1997. Geotourism research began to flourish about a decade ago, and it is still in a "young" stage of development.

Gray (2004) mentioned that there has been an emergent market for geotourism activities either independently or as a part of ecotourism activities and the growth of geotourism can be illustrated by four perceptions as below (Allan, 2013); *firstly*, a large number of tourists seek holidays in rural and natural landscape. *Secondly*, geological sites have a high esthetic value which has attracted international and domestic tourist. *Thirdly*, there are many types of local geological activities. *Fourthly*, geotourism include several attractive and recreational activities. The relationship between the geological and the tourism activities has not been interest of the researcher, however, its importance which cannot be ignored (Humairi and Hawamdeh, 2006). Archaeological and cultural tourism are still the dominant tourist pattern in the Middle East and Egypt. The mental image of the international tourist on the Middle East has been associated with archaeological, historical and heritage

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tourism sites. However, the diversity of the geological sites in the Middle East, there is lack of research and studies related to geotourism (Allan, 2013).

However, Egypt has a rich geological diversity not known to the public. This is due to the lack of studies and research in Egypt (Soliman and Abou-Shouk, 2016), in order to explore and enhance this geological diversity. As well as, the weakness of the trend towards geotourism products in tourism discourse in Egypt, and the lack of marketing and tourism promotion programs for geotourism. Also, Most of the geotourism sites in the Middle East need to improve their infrastructure, and the visitor Centers (Allan, 2013).

Additionally, El Bedewy, (2013) reported that Africa and Arab countries with their many magnificent sites have suitable to be the global Geoparks. In Egypt, there are many sites that deserve to be declared as Geoparks, but there is no geoparks in Egypt. In term of the development of geotourism, Joyce (2006) and Allan (2011) mentioned that geotourism is a new concept and most dictionaries do not offer the meaning of this construct. Therefore, strength was added to the main purposes of this paper, which were to identify the concept of geotourism and to explore the challenges of geotourism in Wadi Al-Hitan.

## Geotourism Concept

Early definitions of geotourism stressed tourism related to geology and geomorphology, though some drifted into other concepts such as education, sustainability, conservation and more (Frey et al., 2006; Ollier, 2012; Wang et al., 2014). Later definitions, largely fostered by National Geographic, treat the topic as related to geography, or more simply place, and concentrate on the extraneous topics such as sustainability, conservation and so forth which should be part of any form of tourism. Geotourism came into common usage from the mid-1990s onwards. Ollier (2012) explained that geotourism is tourism with some connection to geology or geomorphology. The first widely published definition was that of Hose (2008:37):

The provision of interpretative and service facilities to enable tourists to acquire knowledge and understanding of the geology and geomorphology of a site beyond the level of mere aesthetic appreciation.

Geotourism is a new phenomenon, which emerged in the tourism literature during the last two decades, and whose meaning suffered from global consensus (Dowling & Newsome, 2006). This matched with, Allan (2011) geotourism is a new term for a relatively old idea, and as such there still remain conflicting definitions.

Dowling and Newsome (2006:3) provide another definition of geotourism based mainly on geology and geomorphology,

“The ‘geo’ part pertains to geology and geomorphology and the natural resources of landscape, landforms, fossil, rocks and minerals, with an emphasis on appreciating the processes that are creating and created such features”. Interestingly, Dowling and Newsome (2010:3):

Geotourism is a distinct subsector of natural area tourism firmly entrenched in ‘geological’ tourism.

On the one hand, Dowling and Newsome (2010:1) provide the following definition:

Geotourism is sustainable tourism with a primary focus on experiencing the earth’s geological features in a way that fosters environmental and cultural understanding, appreciation and conservation, and is locally beneficial.

Consequently, geotourism constitutes a “branch of cognitive tourism and/or focused at experiences, based on discovering geological sites and processes, as well as receiving aesthetic impressions in contact with them”(Zgłobicki and Baran-Zgłobicka, 2013:137). According to, Sadry (2009) and Dowling (2011) reported that the following definition is the most recent definition of geotourism that includes the wider aspects of tourist activity;

A knowledge-based tourism, an interdisciplinary integration of the tourism industry with conversation and interpretation of a biotic nature attributes, besides considering related cultural issues, within the geosites for the general public (Sadry, 2009:17).

Geotourism is a form of natural area tourism that specifically focuses on geology and landscape. It promotes tourism to geosites and the conservation of geo-diversity and an understanding of earth sciences through appreciation and learning. This is achieved through independent visits to geological features, use of geo-trails and viewpoints, guided tours, geo-activities and patronage of geosite visitor centres (Dowling, 2011:1).

Additionally, Joyce (2006) contends that the definition of geotourism needs to be explored further; as a contemporary concept, geotourism draws on both geology and tourism. As well, Mulec and Wise (2012:213) geotourism definition refers to “the art of explaining the meaning and significance of sites visited by the public”. Also, Joyce (2007: 27) suggested a working definition of geotourism:

People going to a place to look at and learn about one or more aspects of geology and geomorphology.

Additionally, the proposed definition from National Geographic (2012):

Tourism that sustains or enhances the geographical character of a place - its environment, heritage, aesthetics, culture, and the wellbeing of its residents.

Therefore, geotourism can potentially benefit both the tourist and the region itself because when geotourism is practiced, it can provide the tourist with an authentic experience while holistically sustaining the destination's unique qualities (Boley, 2009).

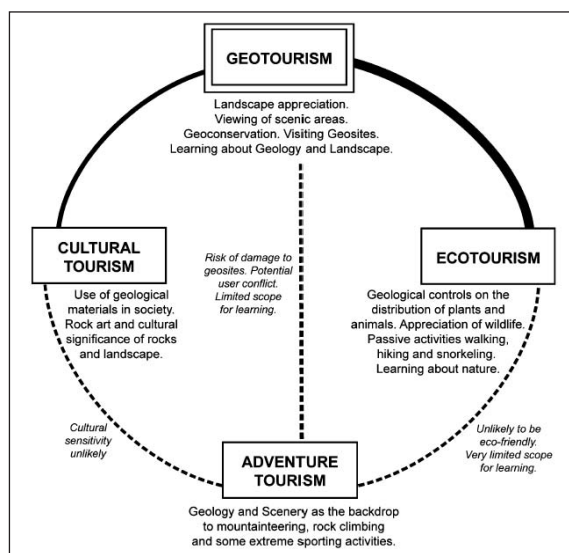
Summarizing, geotourism is a relatively new approach in the tourism literature. The literature has two general approaches to the concept of geotourism (Allan, 2011). Firstly, Hose (1995) and Dowling and Newsome (2006) mentioned that geotourism is a reflection of the real value of the geological and geomorphic features. Secondly, Spencer (2010) and National Geographic (2012) reported that geotourism has a purely geographic theme.

Consequently, the researcher proposed definition for geotourism as below;

Geotourism is a form of natural areas tourism that focuses on geology and geomorphology. Also it refers to travelling to geosite for enjoying, learning and getting experience.

## The Relationships of Geotourism with Other Forms of Tourism

The scope of geotourism activities has mingled with other tourism, such as, adventure tourism or ecotourism (Allan, 2015). The study of Dowling and Newsome (2006:6) mentioned that “geotourism is a part of natural area tourism and ecotourism”, and this similarity with Allan (2011:24) reported that “geotourism may be understood in relation to natural and cultural tourism”. Dowling and Newsome (2010) reported that it has links with ecotourism, cultural tourism and adventure tourism but is not synonymous with any of these forms of tourism.



**Fig. 1: The Relationship between Geotourism and Other Forms of Tourism**

(Source: Dowling, 2001:3)

Figure 1: indicated the relationship between geotourism and other forms of tourism. There are a strong link between geotourism and ecotourism as represented by the bold line connecting geotourism with ecotourism (Allan, 2012) in the previous figure and to a lesser extent with cultural tourism; the dashed lines connecting geo, cultural and ecotourism with adventure tourism (especially hard forms that overlap into extreme sporting activities) are more tenuous in regard to concepts of sustainability and an appropriate learning environment, both of which are essential aspects of natural area tourism (Newsome and Dowling, 2010).

## Geotourism, Geopark and Geosite

Geotourism and geoparks aims to promote the local economy and public awareness about geology, by increasing the number of tourist visiting well-structured geological attractions, play an important role in the development of the local economy (Newsome and Dowling, 2010). Geoparks are different to other forms of traditional parks, such as national parks, in that they foster appropriate sustainable development within their artificially created borders (Newsome et al., 2012). The core difference is actually that in a national park in most countries and at least in certain zones, no human and/or development activities are allowed to take place due to a very strict protection status. The last but not the smallest difference between geoparks and national parks is the emphasis of the geopark on geological heritage and their introduction as tourist attractions in addition to ecological, cultural, historical, and archaeological aspects (Farsani et al., 2011). Additionally, El Wartiti et al. (2008, 415), define a geosite as;

A site or an ‘area’, a few square meters to several square kilometres in size, with geological and scientific significance, whose geological characteristics (mineral, structural, geomorphic and physiographic) meet one or several criteria for classifying it as outstanding (valuable, rare, vulnerable, endangered).

The difference between a geosite and geopark is that a geosite is “a small-sized place of geological heritage,” whereas a geopark is a large-scale place that may contain other types of attraction and heritages, such as the archaeological, ecological, historical and cultural (Tapiador, 2007).

**H1: There are significant differences between respondents on the awareness level of geotourism concept.**

## The Geotourism Features of Wadi Al-Hitan

Wadi Al-Hitan in Egypt's Western Desert is only place in the world where the skeletons of families of archaic whales can be seen in their original geological and geographic setting

of the shallow nutrient-rich bay of sea of some 40 million years ago. The fossils and sediments of different periods and levels reveal many millions of years of life and are valuable indications of the palaeoecologic conditions, of Eocene vertebrate and invertebrate life and the evolution of these ancestors of modern whale (UNEP, 2005). Ibrahim (2008) indicated that the geological features of Wadi Al-Hitan are also superb: mushroom-like rocks. They are of sandstone. The rounded thin body of these rocks, in comparison with the top, are due to the air erosion. Wonderful Sand Dunes series are plentiful in the site. They are also stripped by means of the wind.

According to Newsome (2006) there are many geological interesting places and features have become tourism attraction places such as landscape, landforms, mountains, fossils (Garofano and Govoni, 2012; Errami et al., 2015), soils, rocks, and the use of stone and minerals by humans. Also, Sadry (2009) and Johnson et al. (2010) classified geotourism in to: Geological (craters, lava caves, islets, mountains, waterfalls, coastlines, coral reefs, beaches, cliffs) and Geomorphological sites, Anthropological (in caves and mines) sites, Geothermal and volcano destinations, and Geological heritage.

According to WRPA (2006), reported that Wadi Al-Hitan has a lot of fossils approximately 406 identifiable whale and sea cow skeletons and other bones like, *Basilosaurus Isis* (see Figure 2) which back to 37-42 million years ago during the Eocene, *Sirenia* (see Figure 3), *Dorudon atrox* (40-42 million years ago) whales (see Figure 4), Sawtooth Fish (see Figure 5), and Marine turtle that is the largest of 5 found in Wadi Al-Hitan. Also, dozens of species have been identified in it such as, urchins, sharks, rays, bony fishes, crocodiles and sea snakes. Additionally, plant fossils have been identified like *Teredolites* tree that must have been sunk and was beached during 40-42 million years ago in the Middle Eocene, Fossilized Mangrove tree (see Figure 6), and sea-grasses. There is also a rich invertebrate fauna, including nummulites, molluscs including gastropods, bivalves and nautiloids, echinoids and crabs.

## The Geological History (Geoheritage) of Wadi Al-Hitan

Over the last 40 million years, two sets of geological processes have shaped the land one set has built up the landscape while the other is continually trying to tear it down. Throughout the Eocene, a warmer global climate prevented ice from forming at the north and south poles which the ancient Mediterranean Sea is called the Tethys Sea and its shoreline ran across northern Egypt. This sea had reached as far south as to where Luxor is now located and began to retreat northward. After that, the Earth's climate cooled and this allowed an ice cap to form at the South Pole which caused the Tethys Sea to recede and reveal the land now known as Egypt. Wadi al-Hitan had a more humid

climate during the late Eocene period that the heavy rains formed rivers which relocated a lot of rock (see Figure 7) and sediment that carved out the cliffs of Wadi Al-Hitan (IUCN, 2005).



Fig. 2: *Basilosaurus isis* - Wadi Al-Hitan.



Fig. 3: *Sirenia* - Wadi Al-Hitan.



Fig. 5: *Dorudon Atrox* - Wadi Al-Hitan



**Fig. 5: Sawtooth Fish - Wadi Al-Hitan.**



**Fig. 6: Fossilized Mangrove tree - Wadi Al-Hitan.**



**Fig. 7: Rocks - Wadi Al-Hitan.**

(Source: the researcher's own photo taking during the observation process)

## Geotourism's Challenges

The challenge to geotourism in any region or country is to develop its tourism capacity and the quality of its products without adversely affecting the geo-environment that maintains and nurtures it. Geotourism as any form of new tourism, there are a number of issues related to its growth (Dowling, 2011). The challenges of geotourism will be discussed as below;

### Problem of Interaction between Tourism and Geology

Garofano (2012) reported that there is still a problem of interaction between tourism and geology, tourism is depend on recreational activity, meanwhile geology is use a scientific activities. On the other hand, Joyce (2010) highlighted that not all areas of research investigated by geology, there is some activities suitable for geotourism. Additionally, there are many reported poor success cases of tourism projects based on geotourism, because of lack of understanding of the users' profile. Geotourism is not well known so they have small customer number (Garofano, 2012).

### The Name of 'Geotourism'

An issue central to the growth of geotourism globally is the meaning ascribed to the word geotourism. Generally there still remains conflicting in geotourism definitions (Ngwira, 2015). It is understood to be 'geological' tourism but the National Geographic continues to use the word to mean 'geographic' tourism (Dowling, 2011). As well, Bajada (2009) mentioned that the most challenging issue is the low public awareness on the values of geotourism. This is mainly due to the fact that knowledge regarding the geotourism has so far been limited to scholars and academic.

### Weather challenges

According to, Newsome et al. (2012) some challenges that faced geotourism such as, weather condition (unstable temperatures and relative humidity can cause deterioration of fossils exposed to the open air). The most fragile fossils are covered by shelters that protect them from rain. Stone walls also used to protect the fossil from water runoff, it also constructed around the fossil to protect from visitors who may inadvertently damage a site (Dowling and Newsome, 2010).

At present, the Earth faces problems such as global warming, air pollution, unsustainable activities, unsustainable tourism etc., most of which have occurred due to a shortage of strategies for the popularisation of earth sciences (geology,

geography, geomorphology and geoconservation) (Farsani et al., 2014).

## Unaware visitor

The visitor impact/management problems and various negative impacts are evident at many geotourism sites around the world (Dowling & Newsome, 2006). Some sites can become significantly degraded as a result of the cumulative impacts of visitation. The lack of visitor guidelines and absence of interpretation to guide visitors can also be viewed as an additional negative impact (Newsome, 2006). On the other hand, Newsome et al. (2012) lack of management, poor maintenance and especially in the absence of appropriate education and monitoring are considered the main challenges of geotourism.

Dowling and Newsome (2006) indicate that landscapes, landforms, rocks and fossils can all be negatively impacted upon by some bad practices by local populations or visitors unaware about the geological values and the landscape itself. Additionally, Ibrahim (2008) reported that some of both visitors and locals' people are collecting fossils for different reason such as; souvenir making, it also some visitors carving their names name to commemorate their visit to the valley.

## Management challenges

The majority of geotourism destinations are facing problems of low economic development, unemployment, and a high level of emigration (Farsani et al., 2013). On the other hand, lacking, the existing "tourism system" (infrastructure, services, operators) was not properly taken into account, there was lack or absence of specific economic, sustainability and development evaluations (Garofano, 2012). On the other hand, Druguet et al. (2015) reported that the lack of effective geoconservation plans under specific protection policies and regulations make this geological heritage extremely vulnerable to bad use and degradation.

However, the geoheritage and geosites have confronted many challenges, such as the accessibility and infrastructure issues, the lack of awareness and information about the local geoheritage and its value, the interpretation issues, and the lack of tourist guide (Errami et al., 2015). According to, Brilha (2009) there is no structured strategy integrating the inventory, geotourism, valuing, interpretation and monitoring of geosites, and there is no proper national institution responsible for the implementation of such a geotourism strategy. Additionally, limit of financial resources and the lack of funds are considered the most challenging of geotourism (Bajada, 2009).

## Political conflict

Recent wars and political conflicts in Middle East together with the Egyptian revolution are considered the main challenges of geotourism. This is supported by Morakabati (2011), who stated that parts of the Middle East can be regarded as being among the least preferred tourism destinations in the world and that travellers' perception of the region as a whole has in recent years generally gone from bad to worse.

Additionally, Hose (2005), Gates (2006), Ibrahim (2008), Garofano (2012), Dong et al. (2014) and Migoñ and Pijet-Migoñ (2015) there are some obstacles and challenges of geotourism such as;

1. One critical problem is the poor interpretation of the geological features in the geosite,
2. A lack of funding affects of geotourism. There are no funding agencies that truly address such geotourism-type projects.
3. The lack of clear demarcation of potentially interesting features to geotourists in the field severely limits the effectiveness of geotourism.
4. Also, there is a lack of tourist guide, and in general guide should study geology course and be trained to be relevant to explain geosite.
5. The environmental impact such as; insects and small animals like mice are causing damage to the fossils.
6. The withdrawal of geoscientific content from the syllabuses in primary education could explain the public's lack of knowledge about the importance and meaning of geotourism.

**H2: There are significant differences between the respondents on the challenges of geotourism in Wadi Al-Hitan.**

## Methods

The case study research approach represents a proper methodology to answer the research questions (Yin, 2009). A single case study was used to achieve the research aim, and research question. Quantative data collection methods included; firstly, questionnaires for visitors, Academic/experts and official staff. Questionnaire was broken into four sections including; the respondent's demographic profiles, concept of geotourism, geotourism attractions, and the challenges of geotourism in Wadi Al-Hitan. Secondly, direct observation used checklist for observe the issues related to accessibility, infrastructure, sign board, visitor center, food and beverage outlets, and ambulance unit. Sampling adopted in the current research were; a random sampling used for selecting the participants at random, this type of

sample gives the each participant equal opportunities to be selected, which included; visitors who want to see the attractions in Wadi Al-Hitan; and a purposive sampling used for selecting specific respondents who visit Wadi Al-Hitan and have experience and knowledge in the current study domain which included; academic (academic staff at Faculty of Tourism and Hotels, Fayoum University and academic staff at Faculty of Science, Fayoum University)/experts (the person who has knowledge, experience and skills in

geology and tourism) and official staff (Fayoum Tourism Authority, Protected Management of Wadi Al-Rayan, and Egyptian Environmental Affair Agency). Population size of the number of visitors of Wadi Al-Hitan in 2016 was 5031 (WRPA, 2016), and according to, Katz (1997) recommended the formula for random sample ( $n = N/1+Ne^2$ ), for visitor sample see Table1. 61.5% was the average response rate. Statistical Package for Social Sciences (SPSS, version 16) program was used for analysing data.

**Table 1: The number of questionnaire forms distributed and received along the case study**

| Category         | No. of forms distributed | No. of forms received |               | Percentage of Valid forms |
|------------------|--------------------------|-----------------------|---------------|---------------------------|
|                  |                          | Valid forms           | Invalid forms |                           |
| Visitors         | 370                      | 231                   | 15            | 62.4                      |
| Academic/experts | 100                      | 48                    | 5             | 48                        |
| Official staff   | 32                       | 30                    | 2             | 93.7                      |
| Total            | 502                      | 309                   | 22            | 61.5                      |

## RESULT AND DISCUSSION

### The Concept of Geotourism

The results of the current study that (51.9%, 95.8%, 90 %) of the visitors, the academic and official respectively were selected the right concept of geotourism. Similarity with, Dowling and Newsome (2006) mentioned that the geotourism definition is based mainly on geology and geomorphology. While (38.9%, 4.2%, 6.7%) of visitors, academic and official respectively were defined geotourism as ecotourism, this

matched with Robinson (2008) and Vanneste et al. (2016) that geotourism has the same objectives as ecotourism, but geotourism seeks to explain the beauty of landscapes and landforms. While, Beeton (1998) highlighted that there is a difference between geotourism and ecotourism. However, geotourism is viewed as a type of ecotourism that focuses on geosites (Reynard, 2008). While, 21 (9.1%) of visitors respondents were selected the concept of cultural tourism and only one official respondent select the cultural definition see Table 2.

**Table 2: The Respondent's Awareness about Geotourism Concept**

| Variables                                                                                                                        | Visitors      |      | Academic & Experts |      | Official     |     |
|----------------------------------------------------------------------------------------------------------------------------------|---------------|------|--------------------|------|--------------|-----|
|                                                                                                                                  | Freq. (N=231) | (%)  | Freq. (N=48)       | (%)  | Freq. (N=30) | (%) |
| Travelling to areas that have historical and cultural viable.                                                                    | 21            | 9.1  | -                  | -    | 1            | 3.3 |
| Travelling to natural areas did not suffer from any pollution or damage and the natural balance did not subjected to the defect. | 90            | 38.9 | 2                  | 4.2  | 2            | 6.7 |
| Travelling to areas characterized by diverse geological and geomorphology such as rocks, minerals, fossils, and landscapes.      | 120           | 51.9 | 46                 | 95.8 | 274          | 90  |

F test/Analysis of variance (ANOVA) was carried out, to identify the variance between the respondents on the awareness of geotourism concept. Results for significance regarding the purposes of this study were based on a  $P \leq 0.05$  confidence level. Also, ANOVA test was selected to compare group means and discover group differences. The results indicated there was statistically significant between

visitors on the concept of geotourism,  $F(1, 229) = 5.082$ ,  $p = 0.025$  (see Table 3). On the other hand, the results showed that  $F(1, 46) = 0.602$ ,  $p = 0.442$ , so there was not significant between academic on the concept of geotourism. Finally, the following table highlighted that there was not significant between official staff on their awareness of geotourism concept,  $F(1, 229) = 0.782$ ,  $p = 0.384$ .

**Table 3: Results of One-Way analysis of variance test comparing opinions of the respondents on geotourism concept.**

|          |                | Sum of Sq. | DF  | Mean Square | F     | Prob.         |
|----------|----------------|------------|-----|-------------|-------|---------------|
| Visitors | Between Groups | 2.159      | 1   | 2.159       | 5.082 | <b>0.025*</b> |
|          | Within Groups  | 97.279     | 229 | 0.425       |       |               |
|          | Total          | 99.437     | 230 |             |       |               |
| Academic | Between Groups | 0.025      | 1   | 0.025       | 0.602 | <b>0.442*</b> |
|          | Within Groups  | 1.892      | 46  | 0.041       |       |               |
|          | Total          | 1.917      | 47  |             |       |               |
| Official | Between Groups | 0.148      | 1   | 0.148       | 0.782 | <b>0.384*</b> |
|          | Within Groups  | 5.318      | 28  | 0.190       |       |               |
|          | Total          | 5.467      | 29  |             |       |               |

\* Significant at the 0.05 alpha level.

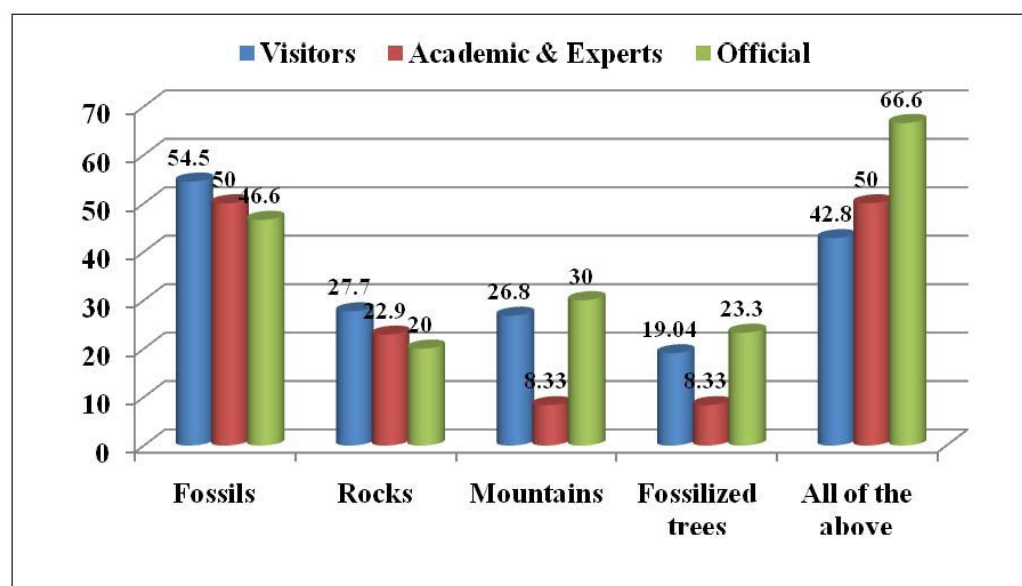
Therefore, the alternative hypothesis was accepted for visitors which declared that there are significant differences in the respondents' answers on the concept of geotourism. While the null hypothesis was accepted for academic and official staff which referred that there are not significant differences in the respondents' answers on the concept of geotourism.

### Geotourism Attraction at Wadi Al-Hatin

As noted in the literature review, there are many geological interesting places and features have become geotourism attraction such as; fossils, mountains, coasts, landforms, rocks, waterfalls, soils, fossilized trees and caves (Newsome and Dowling, 2010). In addition to, geotourism classified as; geological (craters, lava caves, mountains, waterfalls, coastlines, coral reefs, beaches), geomorphological sites,

geological heritage, and geothermal and volcano destinations (Sadry, 2009; Johnson et al., 2010).

The results of the visitors reported that fossils are highly rated (54.5% of the sample), (42.8%) of the respondents were interested to see all attractions (fossils, rocks, mountains, fossilized trees). (27.7%) of the participants were interested to see the rock. Similarly with the academic results (50%) of respondents were interested to see fossils and the same percentage (50%) the respondents were completely interest to see all attractions (fossils, rocks, mountains, and fossilized trees). While, the results of the official staff revealed that (66.6%) of the respondents were completely interest to see all attractions (fossils, rocks, mountains, and fossilized trees). (46.6%) of the respondents were interested to see fossils. From the viewpoint of geotourism, this is mainly based on natural values (geosites), this stands out as very positive see Figure 8.



**Fig. 8: The Respondents in Certain Types of Geotourism Attraction in Wadi Al- Hitan**

## Challenges of Geotourism in Wadi Al-Hitan

In the context of challenges of geotourism, geotourism as any form of new tourism, there are a number of issues related to its growth (Dowling, 2011). The challenges of geotourism will be discussed as below;

### The Concept of Geotourism is not Clear

Generally there still remains conflicting in geotourism definitions (Ngwira, 2015). It is understood to be 'geological' tourism but the National Geographic continues to use the word to mean 'geographic' tourism (Dowling, 2011). As well, Bajada (2009) mentioned that the most challenging issue is the lack awareness of geotourism concept. With regard to that, the results indicated that (96%) of the academic and experts were completely agreed with this problem. While (80%) official staff representing their agreed that the concept of geotourism is not clear see Table 4.

### Confusion between Ecotourism and Geotourism

Literature review revealed that there is a confusion and interaction between geotourism and ecotourism concept. Some user thought that ecotourism is geotourism, but Beeton (1998) highlighted that there is a difference between geotourism and ecotourism. In contrast to ecotourism, geotourism occurs in working landscapes where people and the environment coexist (Boley et al., 2011). Geotourism is not limited to protected or pristine areas as many ecotourism definitions suggest. Geotourism can be seen as more eco-friendly than ecotourism (Robinson, 2008). Results of this study showed that (81.2% academic, 82.7% official) of the respondents were agreed that there is confusion between the ecotourism and geotourism.

### Lack of Geotourism Tourist Guide

The results of this study showed that (78.8%) of the visitor respondents were agreed that there is a lack in geotourism tourist guide. Additionally, the results of academic and official staff revealed that (93.7%, 80%) of the respondents were agreed with this statement respectively. These results matched with Ibrahim (2008) who reported that there is a lack of tourist guide, and in general guide should study geology course and be trained to be relevant to explain geosite. It also matched with Errami et al. (2015) that geotourism has many challenges, such as the lack of awareness and information about the local geosite, the interpretation issues and lack of tourist guide. In addition, observation results indicated that

the majority of tourist guide did not have geology courses or training course in the geology of Wadi Al-Hitan.

### Tourism Infrastructure was Undeveloped

The literature review reported that infrastructure play an important role in geotourism development. However, the geoheritage and geosites have confronted many challenges, such as the accessibility and infrastructure issues, and the lack of sustainability of geoheritage (Errami et al., 2015). The results confirmed that the infrastructure in Wadi-Al-Hitan was undeveloped (73.2%) of visitor respondents were completely agreeing with these statements. (79.1%) of Academic respondents were agreed or strongly agreed that infrastructure was undeveloped, five were neutral. Finally, (53.3%) of the official respondents were agreed, which mean that the study area had undeveloped infrastructure.

In addition, the observation data reported that the track was not suitable and needs to continuous maintenance. It cut in certain parts by the endurable movement of sand dunes. It showed that there was not medical service or ambulance point in Wadi-Al-Hitan and the observation noted that only one ambulance point it far 35km from Wadi-Al-Hitan. It observed that there was not telephone network in place which effects the communication between visitors and tourist groups.

### Lack of Pamphlet and Brochures with Different Language

The result showed that (85.4) of the academic respondents were agreed this statement and (53.3%) of the official respondents were agreed that there is lack of brochures in Wadi Al-Hitan. The results matched with, Neto de Carvalho and Rodrigues (2009) there is a lack of interpretative information available to visitors and no coordination to ensure geosites management.

Consequently, Migoñ and Pijet-Migoñ (2015) declared successful interpretation remains a key challenge in further geotourism, and several associated practical issues are pointed out such as choice of terminology, uncertainties in scientific understanding and stand-alone attractiveness of geoheritage

### Visitor Centers aren't Available

According to, Ibrahim (2008) explained that the most challenging of Wadi Al-Hitan geosite is no tourist information desk; he also recommended that it should have information centres. The results noted that (54.8%) of visitors were completely agreeing with this problem. While,

the observation results reported that there is visitor center, but no one provided information or explain the guidelines and the instructions to visitors to the visitor.

### Lack of Sign Board in Place

The result of the current study reported that (52.4%) of visitors were agreed this problem. In addition to, observation result found that there is a lack of road signs and tracks signs in the place which might cause the visitors and tourists lost in the dessert. The observation noticed that the sign board was only available in the entrance of Wadi-Al-Hitan and at each of its major features.

### Low Level of Food and Beverage Service

The results noted that (63.4%) of the respondents were completely agreeing this problem. The observation found that there is a cafeteria used for serving food and beverage to the visitors. This cafeteria only served drinks and biscuits. It also the observation found that this cafeteria was closed for long time because it has a problem with Egyptian Environmental Affairs Agency (EEAA). However, the literature review revealed that geotourism development needs to present local food to the customer (Zouros, 2009).

### Lack of Marketing Programs for Geotourism

Geosite should promote its products to its visitors through making of local handicrafts such as the production of fossil casts and souvenirs by local enterprises (Mulec and Wise, 2012). Geosite should have various recreation activities that help raise public awareness about the geotourism concept,

important and value of geosite (Zouros, 2009). Also, for the development of geotourism marketing, geological heritage should be linked to educational aims, economic use, (Palacios et al., 2012) innovation and network activity. In contrast, the result of the current study reported that the majority of (91.6%) of academic respondents were completely agreed this problem sample. While (56.6%) of the official respondents were agreed as well.

### Some Visitors Tend to Carve their Names to Commemorate their Visit to the Valley

According to, Dowling and Newsome (2006) some sites can become significantly degraded as a result of the cumulative impacts of visitation. The lack of visitor guidelines and absence of interpretation to guide visitors can also be viewed as an additional negative impact (Newsome, 2006). On the other hand, Newsome et al. (2012) lack of management, poor maintenance and especially in the absence of appropriate education and monitoring are considered the main challenges of geotourism.

On the other hand, Dowling and Newsome (2006) indicate that landscapes, landforms, rocks and fossils can all be negatively impacted upon by some bad practices by local populations or by visitors unaware about the geological values and the landscape itself. Additionally, Ibrahim (2008) reported that some of visitors carving their names name to commemorate their visit to the valley. The result showed that (79.2%, 63.3%) of academic and official respondents were agreed or strongly agreed that some visitor carve their name to commemorate their visit to the valley respectively.

Additionally, the observation data reported that some visitors are collecting some fossils see the following Figure 9.



**Fig. 9: Some Visitors Collecting Fossils during Their Visit**

(Source: the researcher's own photo taking during the observation process)

## Lack of Sense of Security and Safety

Recent wars and political conflicts in Middle East together with the Egyptian revolution are considered the main challenges of geotourism. This is supported by Morakabati (2011), who stated that parts of the Middle East can be regarded as being among the least preferred tourism

destinations in the world and that travellers' perception of the region as a whole has in recent years generally gone from bad to worse.

The result claimed that (57.8%, 85.4%) of the visitors and academic respondents were agreed that lack of security considered the main challenge of geotourism in Wadi Al-Hitan. While (41.3%) of the official respondents were disagree this statement.

**Table 4: The Results of Challenges of Geotourism in Wadi Al- Hitan**

| Challenges of geotourism                                                         |          | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|----------------------------------------------------------------------------------|----------|----------------|-------|---------|----------|-------------------|
| The concept of geotourism is not clear                                           | Academic | 64.6           | 31.4  | 4.2     | -        | -                 |
|                                                                                  | Official | 36.7           | 43.3  | 13.3    | 6.7      | -                 |
| Confusion between ecotourism and geotourism.                                     | Academic | 35.4           | 45.8  | 18.8    | -        | -                 |
|                                                                                  | Official | 24.1           | 58.6  | 10.3    | 6.9      | -                 |
| Lack of geotourism tourist guide                                                 | Visitors | 34.6           | 44.2  | 9.5     | 8.2      | 3.5               |
|                                                                                  | Academic | 58.3           | 35.4  | 4.2     | -        | -                 |
|                                                                                  | Official | 36.7           | 43.3  | 3.3     | 16.7     | -                 |
| Tourism infrastructure is undeveloped                                            | Visitors | 41.6           | 31.6  | 13.9    | 7.4      | 5.2               |
|                                                                                  | Academic | 45.8           | 33.3  | 10.4    | 8.3      | 2.1               |
|                                                                                  | Official | 20             | 33.3  | 23.3    | 23.3     | -                 |
| Lack of pamphlet and brochures with different language                           | Academic | 25             | 60.4  | 12.5    | 1        | -                 |
|                                                                                  | Official | 13.3           | 40    | 26.7    | 13.3     | 6.7               |
| Visitor centers aren't available                                                 | Visitors | 17.1           | 37.7  | 25.9    | 14.9     | 4.4               |
| Lack of sign board in place                                                      | Visitors | 17.5           | 34.9  | 26.6    | 14       | 7                 |
| Low level of food and beverage service                                           | Visitors | 28.5           | 34.9  | 19.7    | 5.7      | 2.2               |
| lack of marketing programs for geotourism                                        | Academic | 25             | 66.6  | 4.2     | 4.2      | -                 |
|                                                                                  | Official | 26.6           | 30    | 30      | 10       | -                 |
| Some visitors tend to carve their names to commemorate their visit to the valley | Academic | 14.6           | 64.6  | 16.7    | 2.1      | 2.1               |
|                                                                                  | Official | 30             | 33.3  | 20      | 3.3      | 13.3              |
| Lack of sense of security and safety                                             | Visitors | 21.3           | 36.5  | 22.2    | 11.7     | 8.3               |
|                                                                                  | Academic | 14.6           | 70.8  | 6.2     | 6.2      | -                 |
|                                                                                  | Official | 13.8           | 10.3  | 34.5    | 31       | 10.3              |

Additionally, the current research was carried out independent samples T-test to identify the significant between two groups (academic and official) for the challenges of geotourism. the results showed that the significant of the challenges of geotourism between academic and official staff were identified as below; the concept of geotourism is not clear  $t(27) = -0.441, 1.411$ ,  $Sig.(2-tailed) = 0.662$ , 0.170; the confusion between the concept of ecotourism and geotourism,  $t(27) = -1.064, 0.665$ ,  $Sig.(2-tailed) = 0.297$ , 0.512; lack of geotourism tourist guide,  $t(27) = -0.723, 1.498$ ,  $Sig.(2-tailed) = 0.476$ , 0.146; infrastructure is undeveloped,

$t(27) = 0.318, 1.690$ ,  $Sig.(2-tailed) = 0.753$ , 0.103; lack of pamphlet and brochures with different language in place,  $t(27) = -0.933, 0.682$ ,  $Sig.(2-tailed) = 0.359$ , 0.501; lack of marketing programs for geotourism areas,  $t(27) = 1.112, 1.711$ ,  $Sig.(2-tailed) = 0.276$ , 0.099; some visitors tend to carve their names to commemorate their visit to the valley,  $t(27) = -1.286, 2.842$ ,  $Sig.(2-tailed) = 0.209$ , 0.008; lack of sense of security and safety,  $t(27) = -0.165, 0.200$ ,  $Sig.(2-tailed) = 0.870$ , 0.843.

Consequently, the results revealed that there are not statistically significant differences between academic

and official respondents concerning the challenges of geotourism. Therefore, the null hypothesis was accepted and the alternative hypothesis was refused.

## SUMMARY AND CONCLUSION

To sum up, the results indicated that awareness and knowledge of visitors about the concept of geotourism are still less than the academic and official staff. It also found that the concept of geotourism needs to be known for the local community. It also reported that most of Wadi Al-Hitan visitors were interesting to see fossils, rocks, mountains, fossilized trees. These attractions could enhance the enjoyment of understanding the geosite.

The results of the current study revealed that major challenge facing geotourism in Wadi Al-Hitan were; the concept of geotourism still not clear for audience it also there is lack awareness of geotourism definition; there was confusion and interaction between geotourism and ecotourism; there is no geotourists guide; lack of pamphlet and brochures in different language and the interpretative information not available for Wadi Al-Hitan visitors.

Also, the results reported that there is a lack in sign board in place and food and beverage services were limited. The results found that the number of employees were not enough to control the negative of tourism on the environment. It observed that some visitors collecting fossils and carve their names on the fossils. Additionally, lack of sense of security and safety were considered the major obstacles facing geotourism in Wadi Al-Hitan.

## RECOMMENDATION

### Recommendations for Protected Management of Wadi Al-Rayhan

1. Put tickets for entering Wadi Al-Hitan to accurate count the number of visitor to the site.
2. Provide the open museum with cameras to watch visitors and prevent the negatives effects.
3. Improve food and beverage services in Wadi Al-Hitan through providing variety of food and beverage for visitors.
4. Provide geotourism training courses for tourist guide.
5. Prepare materials that can be used to assist in interpreting geosite include: tourist information books, map, brochures, and information panels with different language.
6. Activate the role of visitor centers and information desk by employed suitable number of staff to inform visitors about the geotourism and educational activities in geosite.

7. Provide Wadi Al-Hitan with telephone network which effects the communication between visitors and tourist groups.
8. Provide training program for employee to improve their awareness of the importance of geotourism in Wadi Al-Hitan.
9. Protect fossils from thefts through accompany visitor inside the site.
10. Geosite should promote its products to its visitors through making of local handicrafts such as the production of fossil casts and souvenirs.

### Recommendations for Fayoum Tourism Authority (FTA)

1. Marketing of Wadi Al-Hitan as a new form of geotourism destination.
2. Make various recreation activities that help raise public awareness about the geotourism concept, important and value of Wadi Al-Hitan geosite.
3. Prepare a series of scientific and cultural events including; scientific lectures, documentary films, international and national scientific conferences and meetings for promoting Wadi Al-Hitan as geosite.
4. Encourage schools and universities to organize student visits Wadi Al-Hitan geosite.
5. Improve the infrastructure services, transportation, and safety and security in Wadi Al-Hitan.

## Limitation and Future Research

Like any other studies, this study has a number of limitations: getting access to the primary sources of data was not easy, it was very difficult and challenging matter; the study was carried out in only one geosite, the study areas did not include all types of geosites in Egypt; the literature showed there had been clear lack of prior research studies on geotourism. Future research should address more geosite in Egypt; it also should undertake to test the findings of this research.

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