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PROSPECTS FOR THE DEVELOPMENT OF GEOTOURISM IN CRETE, GREECE

Abstract: Geotourism is an alternative form of tourism that has attracted global interest in recent years as it is considered that it can contribute to the sustainability of destinations. This paper focuses on the island of Crete, Greece, a popular holiday destination, and seeks to explore the level of geotourism development in the island and its contribution to sustainable tourism development. In order to meet this aim, qualitative research using semi-structured in-depth interviews with ten key informants was conducted. Crete has the unique advantage of having two geoparks in its region, which are included in the Global Network of UNESCO Geoparks. According to the participants these geoparks are an integral part of the natural heritage of Crete and can be the basis for the development of geotourism on the island, which can contribute to the protection of the geological environment, the promotion of geoheritage, the environmental education and the sustainable development of local communities. However, geotourism in Crete is in its infancy, but the future prospects are positive as long as serious problems and pathogens are effectively addressed. Findings and discussion of this study are useful to policy-makers, academics and industry practitioners interested in geotourism.

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Key words: geotourism, geoparks, geoheritage, sustainable tourism development, Crete, Greece

INTRODUCTION

In the last decades, the relationship between tourism and the environment has been put at the center of discussions, both by the academic world and by the policymakers involved in tourism development at the international, national and local levels. The adoption of the mass tourism model in many destinations is intertwined with the intense use of tourist resources, causing significant alterations and, in

some cases, irreparable damage to sensitive ecosystems of the host destinations, radically transforming the environmental, cultural, social and economic character of the place. The result is that tourism moves against the long-term benefits of local communities to preserve their distinctive characteristics and resources (Coccosis, Tsartas 2019). In response to the above situation, the concept of sustainability has emerged as a major concern that should be at the core of any tourism development strategy (Taliouris, Trihas 2017). The interest in sustainability arose partly from the negative impacts brought about by the rapid and unplanned tourism growth in many destinations worldwide (Baloch et al. 2023; Schönherr et al. 2023). These impacts include environmental damage and pollution, economic leakage, erosion of the socio-cultural structure and identity, to name a few. The growing awareness of the negative social, economic, cultural, ecological impacts of tourism development combined with the intense criticism received by the model of mass tourism, cultivated the ground for a new consideration in tourism policy. A consideration which will not only focus on the elimination of negative impacts, but should go hand in hand with the characteristics and particularities of the place, joining a wider framework of strategy for a sustainable development. UNWTO (2013, p. 10) defines sustainable tourism as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities”. Consequently, a strategy for sustainable tourism development constitutes a dynamic process of continuous evolution and adaptation until a balance is reached between (Coccosis, Tsartas 2019): (a) the efficiency of the economy, (b) social equity and justice, and (c) the protection of the environment.

Policy-makers and academics (Georgakopoulou, Delitheou 2020; Gezici, Salihoğlu 2016) propose alternative forms of tourism to achieve sustainable tourism development. This alternative development model was proposed as a solution to the negative effects of mass tourism (Ajie et al. 2022; Karacaoğlu 2023), as on the one hand it is in line with the principles of sustainability, while on the other hand it has less prefabricated features, allowing the autonomy of tourists in the destination. Essentially, alternative forms of tourism respond to the changing preferences of tourists for more “active” vacations and authentic experiences, intertwined with their particular motivations and interests. One form of nature-based tourism that gains considerable attention in recent years due to its positive effects in the host destinations is geotourism (Kim et al. 2023).

In this context, the aim of this paper is to explore the level of geotourism development in a well-established tourism destination, Crete island in Greece, in a period in which local authorities and Destination Management Organizations (DMOs) focus on sustainability and the enrichment and revivification of the island’s tourist product, through the development of alternative forms of tourism. Following this introduction, next sections present the literature review and the study area and the research methodology. The results section then follows and finally this paper is concluded by highlighting implications of the research, as well as limitations and directions for future research.

LITERATURE REVIEW

Geotourism can be defined as “tourism which focuses on an area’s geology and landscape as the basis for providing visitor engagement, learning, and enjoyment” (Chen et al. 2020, p. ix). According to Chen et al. (2015), geotourism aims to transform in a sustainable way geology and the natural landscape into tourism resources to attract visitors and tourists, provide them geoscience knowledge, and finally encourage appreciation and development of a sense of place and value for conservation. Geotourism highlights the unique geological and geomorphological characteristics of the landscape, while with a more holistic approach that has been adopted today, it connects geodiversity with biodiversity, culture, local architecture, gastronomy and other values of the territory (Kubalíková 2019; Ma et al. 2023; Quesada-Valverde, Quesada-Román 2023; Tamang et al. 2023). Although these en-

dogenous particular characteristics of the territories on which the development of geotourism is based have always existed, it is only recently that academics, policy-makers and practitioners have discerned a potential for their exploitation for tourism-related purposes (Braga et al. 2022).

At a time when destinations and the tourism industry are turning their attention to sustainability driven by increased environmental awareness and changing traveler preferences (Belias et al. 2023), geotourism is being recognized as fostering sustainable tourism development by generating benefits for conservation, communities and the economy (Miśkiewicz 2024). In fact, most definitions of geotourism today emphasize the concept of sustainability. Geotourism is consistent with the principles of sustainability as it makes optimal use of environmental resources, maintaining essential ecological processes and helping to conserve geoheritage and geodiversity¹. It focuses on unique experiences that promote visitors' understanding and appreciation of geosites, foster environmental and cultural conservation and benefit local population (Galvão et al. 2022). Several authors (Dowling, Pforr 2020; Jia et al. 2023; Miśkiewicz 2024; Torabi Farsani et al. 2012) argue that geotourism can enhance sustainable development in destinations, through the generation of socio-economic benefits, host community wellbeing, and conservation.

Geotourism is a concept in tourism studies that in recent years has attracted increasing academic interest, resulting in a growing body of available studies. Most of these studies focus on the development potential of geotourism in different regions, geoconservation, management of geotourism and geoheritage, new geosite and geomorphosite assessment models, and the role of geotourism and geoparks in sustainable tourism development (Ólafsdóttir, Tverijonaite 2018).

Geotourism activities are usually developed within geoparks, which also constitute an important tool towards sustainable development (Ólafsdóttir, Tverijonaite 2018), focusing on the triptych: geotourism, geoconservation, and education (Ferreira, Valdati 2023). According to UNESCO, geoparks are defined as “single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development”². The unique value of geoparks arises from their scientific, aesthetic, cultural, and recreational characteristics (Jia et al. 2023). Geotourism is not the only activity that is developing in geoparks (Pásková 2022), as well-managed geoparks serve multiple educational, environmental, scientific, cultural and recreational purposes (Wadhawan 2021). The role of geoparks in the participation of local communities in the conservation of natural and geological heritage is also very important (Farsani et al. 2014). Today, a big number of geosites and geomorphosites with different levels of geoheritage value and geotourism potentials have been identified worldwide (Ólafsdóttir, Tverijonaite 2018). Important for the reputation and development of geoparks is their inclusion in one or more of the international networks of geoparks that currently operate. The most famous of these is the UNESCO Global Geoparks Network which currently includes 195 geoparks in 48 countries³.

STUDY AREA

Crete, with 624,408 inhabitants, is the largest and the southernmost island in Greece and the fifth largest in the Mediterranean⁴. It is a well-established holiday destination visited by approximately 5.5 million tourists via its two international airports in 2023, 15.3% of the total international arrivals

¹ <https://www.unwto.org/sustainable-development> (accessed: 12.11.2024).

² <https://en.unesco.org/global-geoparks> (accessed: 12.01.2024).

³ <https://en.unesco.org/global-geoparks> (accessed: 12.01.2024).

⁴ https://elstat-outsourcers.statistics.gr/Census2022_GR.pdf (accessed: 15.11.2024).

by air in Greece⁵. The island is also well served by ferries, while it accepts a significant number of cruise ships; 447 cruise ships with 638,623 passengers in 2023 according to Hellenic Ports Association⁶. The tourism development of Crete, as in the other Greek islands, is based to a very large extent on mass tourism (3S – sea, sun, sand), with the consequence that it suffers from all the pathogens and negative impacts of this development model, such as overtourism, seasonality of demand, economic leakage, environmental degradation, spatial concentration of tourism infrastructure, intense competition, dependence on tour operators and charter flights.

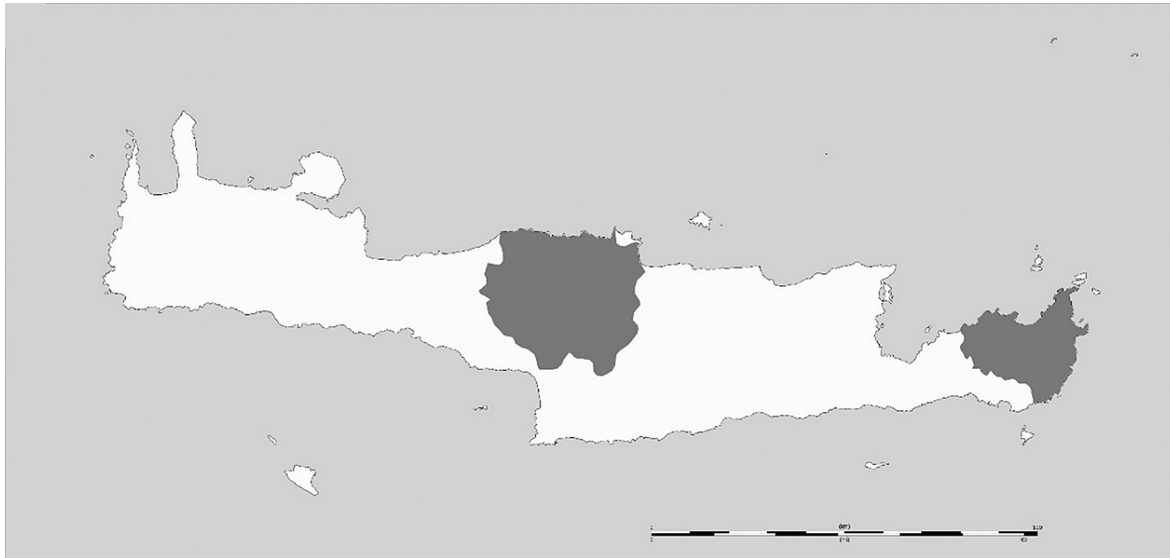


Fig. 1. Map of Crete island with the two UNESCO Global Geoparks

Source: authors' elaboration.

On the other hand, Crete is an island that has experienced intense geophysical changes over the years. The physiognomy of the island is characterized by strong contrasts such as high mountain peaks (Lefka Ori, Psiloritis Mountain, Lasithi mountains), gorges, caves, sharp rock lands, sandy and rock bays. Crete has two geoparks, one in Psiloritis Mountain and one in Sitia area (see Figure 1). *Psiloritis Geopark* was founded in 2001 and due to its superb geodiversity, it was first included in the Global Geopark Network in 2004, and later in the UNESCO Global Geoparks Network in 2015. It extends over an area of 1,159 km² on the central part of Crete (see Figure 2). *Sitia Geopark* covers an area of 517 km² on the easternmost edge of the island (see Figure 3), and in 2015 was included in the UNESCO Global Geoparks Network⁷. Both geoparks are characterized by a large number of geotopes while both of them host an impressive geological heritage. They actively contribute in the global efforts for the conservation of the environment, of the natural and cultural heritage, as well as of the sustainable development of local communities through geotourism and the other forms of alternative tourism, such as ecotourism, hiking, caving, biking tourism etc. Both geoparks offer

⁵ <http://www.ypa.gr/en/profile/statistics> (accessed: 15.11.2024).

⁶ <https://www.elime.gr/> (accessed: 15.11.2024).

⁷ <https://en.unesco.org/global-geoparks> (accessed: 12.01.2024).

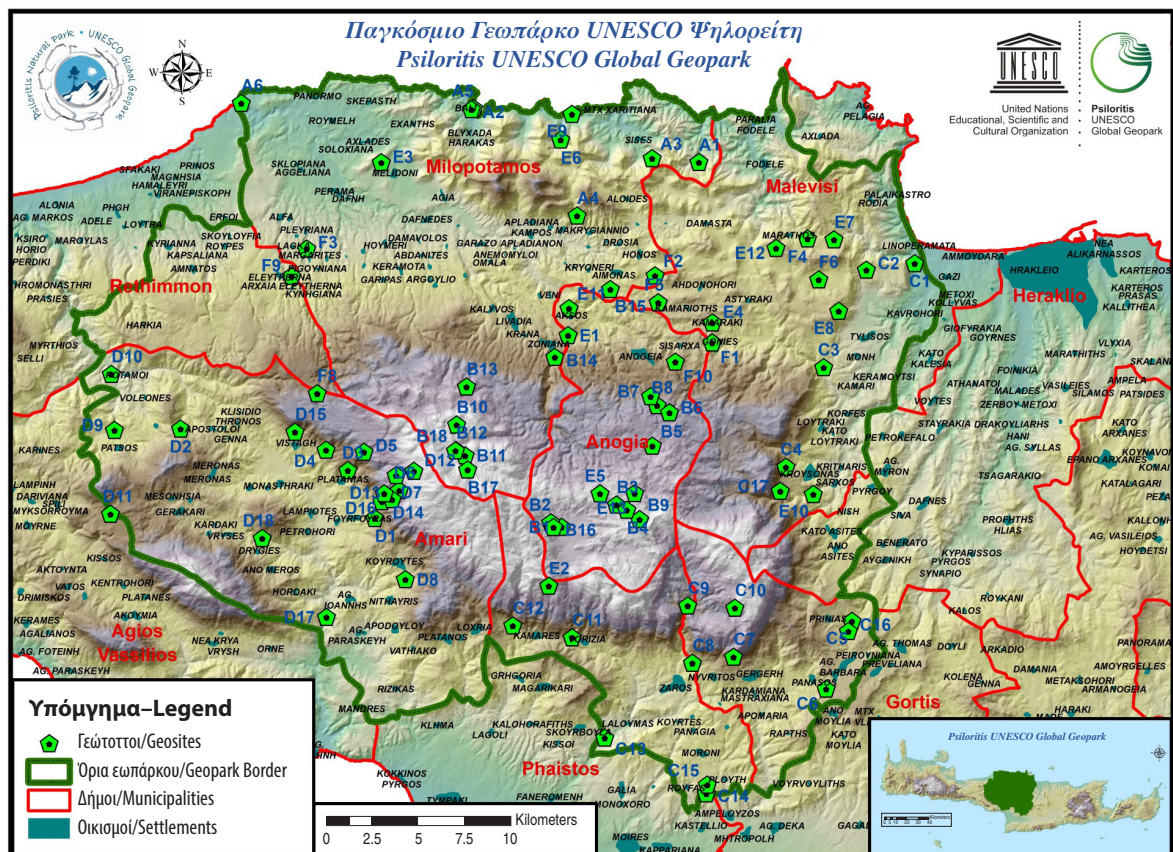


Fig. 2. Map of Psiloritis UNESCO Global Geopark

Source: Psiloritis UNESCO Global Geopark.

opportunities for both recreation and education, as well as many activities to the visitors on a number of mapped geotrails⁸.

RESEARCH METHODOLOGY

As mentioned in the introductory section, the aim of this paper is to explore the level of geotourism development in Crete and its contribution to sustainable tourism development. In order to meet this aim, a sample of ten key informants was selected, who are related with the two geoparks on the island, either as scientists or managers, entrepreneurs or government representatives. The profiles of the respondents are presented in Table 1. For the purpose of confidentiality and anonymity, a code was assigned to all participants (R1 to R10). Qualitative research using semi-structured, in-depth interviews followed in order to examine: (a) the level of geotourism development in Crete based on the two geoparks, (b) the advantages of geotourism over mass tourism, (c) the characteristics and motivations of the visitors of the two geoparks, (d) the contribution of geotourism to the sustainable development of the island, (e) the interest of local communities to participate in the management of geoparks, (f) the possible interest from travel agents for organized excursions to the geoparks, (g) the

⁸ <https://en.unesco.org/global-geoparks/psiloritis> (accessed: 21.10.2023); <https://www.sitia-geopark.gr/> (accessed: 21.10.2023).

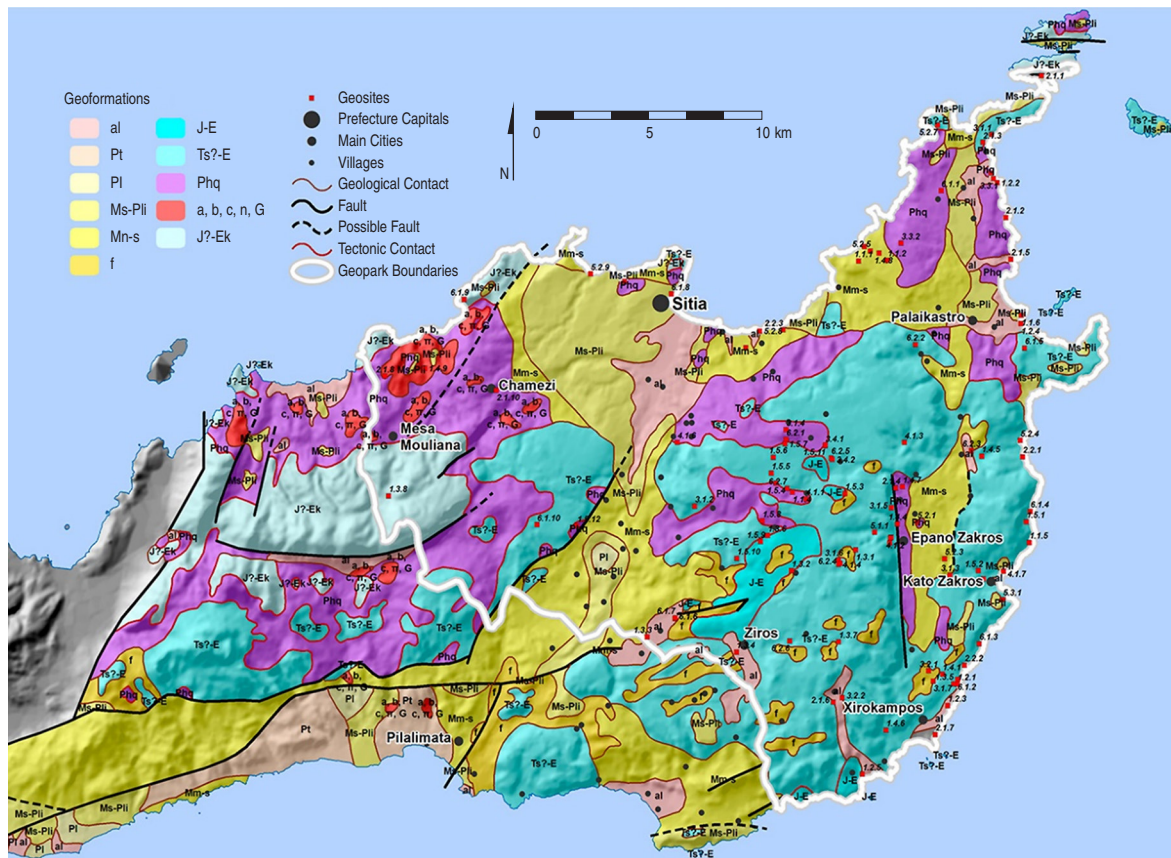


Fig. 3. Map of Sitia UNESCO Global Geopark
Source: Sitia UNESCO Global Geopark.

Table 1. Profile of the participants

Code	Profile
R1	Former president of the Greek National Tourism Organization
R2	Owner and manager of a travel agency specialized in alternative tourism
R3	Coordinator of the Greek Geoparks Forum, Director of the Natural History Museum of Crete, Vice-Chairman of the Management Committee of Psiloritis Geopark
R4	Coordinator of Sitia Geopark
R5	Coordinator of Psiloritis Geopark, Director of AKOMM-Psiloritis SA Development Company
R6	Owner of a travel agency specialized in alternative tourism
R7	Geologist specialized in Geoparks, Geotourism, and G.I.S.
R8	Owner of a travel agency specialized in alternative tourism
R9	Coordinator of LEADER Programme
R10	Administrative member of the Nature-Mountaineering Association of Sitia

Source: authors' elaboration.

problems faced by geoparks and other inhibiting factors that hinder the development of geotourism in Crete, and finally (h) the critical factors for the further development of geotourism in Crete. The ten interviews took place during June 2020. The interviews recorded and later transcribed. Then, content and thematic analysis was applied to analyze the transcripts.

RESULTS

Initially, the discussion focused on how important are the geoparks of Psiloritis and Sitia for the development of geotourism in Crete and to what extent geotourism has been developed on the island. All participants stressed the importance and role of the two geoparks in Crete, but without considering that there is a satisfactory geotourism development. Specifically, R3 emphasizes that there are three main axes around which the UNESCO World Geoparks should move: protection of the geological and natural environment, education, and development of geotourism as a key tool for sustainable development of the region. Also, large parts of the geoparks are protected by many regimes (forest or archaeological laws) and by NATURA 2000, while they include mainly non-urban areas characterized by valleys, coastal zones and rural landscapes. R1 states that just because the two geoparks meet the criteria for their inclusion in the European and Global Geoparks Networks, it is a great advantage, but unfortunately geotourism has not developed on the island as much as it could, as the model of mass tourism is still dominant. R2 points out that the two geoparks are important for different reasons each; Psiloritis Geopark due to its various mountain ecosystems, while the Sitia Geopark for the combination of rich and extensive coastal environment with that of the hinterland. However, he argues that the abiotic environment (climate, rocks, soil morphology, etc.) consists the dominant attraction for geotourists. In his opinion, it is too early to talk about the development of geotourism in Crete, since only a few groups of students from Great Britain, Israel, France and Germany have shown interest in recent years, while no major tourist office in the world or tour operator proposes Crete as a geotourist destination. R8 agrees that the two geoparks are a strong point for the development of geotourism on the island of Crete, although this type of tourism is still in its infancy.

All participants without exception agree on the advantages of geotourism in relation to mass tourism, referring to the responsible, alternative tourism that simultaneously with the enjoyment and entertainment of visitors contributes to the sustainable development of the environment and society. There is a relative differentiation in the benefits, which certainly lies in the subjectivity of each one as to what he considers to be a benefit and the degree to which it should exist. In particular, R1 emphasizes that in a predominantly mass tourism destination, “any development of significant demand for geotourism in Crete would have the advantages of the development of other thematic forms of tourism, e.g. cultural tourism, ecotourism, etc.”. R10 states that the geotourist who experiences geoparks, always seeks to return again and that it is possible to extend the tourist season. According to R4, geotourism gives a human dimension to tourism and the fact that a geopark contains all the ecological, geological, historical and cultural characteristics of an area, makes it very attractive to the visitor. In addition, the local authorities are given the opportunity for rational development, distribution of local products with UNESCO certification, extension of the tourist season and profits to local communities. The island of Crete that relies on tourism needs the mass tourist as well as the alternative traveler-explorer, comments R8. The geotourist is interested in supporting the local economy by buying local products, does not seek out set-up folk shows but instead the spontaneous ones, appreciates even a simple treat in a café, is aware of the environment, and enjoys contact with the locals. The alternative tourist will look for his experience outside the summer season, while if he stays satisfied, he will return with relatives and friends. R9 emphasizes that the main advantage of geotourism is the promotion of the living and abiotic environment of the geoparks and has the potential to offer much

to the tourism of Crete which is unfortunately limited mainly to coastal areas. Also, by its nature it has an entertaining and educational purpose, in contrast to mass tourism which focuses on entertainment. R2 points out as an advantage the “highlighting of the hidden nature-loving treasures of the Cretan hinterland, far and beyond the well-known resorts. If the sun and the sea are the main motives of the tourist flow to Crete, then to them is added the easily accessible wealth that is composed of the individual values of the two geoparks of the island, both natural and cultural. A wealth that is addressed to a growing worldwide stream of demanding and experienced travelers”. Nevertheless, he does not believe that geotourism can contribute to the expansion of the tourist season due to practical and climatic factors.

Regarding the characteristics and motivations of the visitors of the two geoparks, participants agree that the ages of geotourists are varied, as they include children, students, middle-aged and elderly people. Most believe that it is too early to draw conclusions, since geotourism in Crete is in its infancy. R2, R6 and R8 who organize excursions to the two geoparks, claim that geotourists and ecotourists are travelers with ecological consciousness, love for nature, spiritual cultivation, trend for adventure, high income, lovers of the Cretan landscape. They are characterized by very good physical condition, while the nationalities include locals, French, Germans, British, Swiss, Austrians, Americans and Canadians. Their motives are educational, nature-loving, recreational, scientific (archaeologists, geologists), although there is a lack of statistical data regarding the alternative forms of tourism in the island. There are many individual visitors, while although there are no travel agents with exclusive involvement in geotourism, there are at least five who organize excursions and tours in the two geoparks. There are also organized excursions from schools, universities, groups and clubs. R10 points out that individual visitors are often the most informed about geoparks. R1, R5, R7 and R9 consider that the response is small in relation to the quality of the tourism product and the “good job” that has been done by the development companies and the Natural History Museum of Crete to date. In addition, R2 noted that geotourists are mostly individuals and rarely in organized groups, and that if there was adequate infrastructure in the wider area of the geoparks, this new product might be able to compete with countries more experienced in geotourism such as Costa Rica, Ecuador, Spain etc.

Subsequently, all respondents agreed that geotourism can contribute to the sustainable development of Crete, especially the geopark areas, under certain conditions. R3 claims that “geotourism in combination with other forms of alternative tourism can play a decisive if not dominant role in the sustainable development of these areas. On the one hand, it relies on the sustainable management of environmental and cultural wealth; On the other hand, it relies on and supports local products and production. The geoparks develop and support local networks of producers and service providers and with their joint actions around the world promote the special characteristics and products of their regions, thus strengthening first geotourism and then the local economy of their regions”. R8 expresses the hope that geotourism will also offer extra income to young people who choose to stay in their place of origin. It also raises the issue of not changing the culture, customs and people of the geopark areas. Geotourism is a unique development opportunity, R10 emphasizes, while R4 reminds that the sustainable development of local communities is the main goal, as long as host communities take advantage of the opportunity and invest with a holistic approach and planning. R2 argues that the viability of geoparks will occur through local visitors. It is impossible to find a sufficient flow of international geotourists to Crete. The activation of the local community and the direction of the economic benefits to the locals themselves, will serve the goal of sustainable development in the two geoparks, R1 emphasizes.

All participants emphasize the need to combine geotourism with other alternative forms of tourism. R10 points out the existence of the famous Toplou Monastery within the Sitia geopark, so it can be combined with religious tourism, and the images described by Vitsentzos Kornaros – a famous poet born in the area – in his famous 17th century novel “*Erotokritos*” related to the landscapes of the geopark, therefore literary tourism. Other participants additionally mention ecotourism, voluntourism,

speleological, gastronomic, sports, cycling, and adventure tourism. "I have always believed and still believe that there is no barrier between the thematic forms of tourism. That is, the person interested in visiting geoparks, may be interested in getting to know the agricultural production, the archeological sites, the monuments of an area. It is most likely that in practice it is usually combined with ecotourism, because often the areas of special geological interest are also environmentally protected, but also because in the geoparks themselves there is often unique flora and fauna and remarkable natural landscapes. Therefore, the two forms are tangent" (R1).

Among other important criteria for the integration of geoparks in the Global and European Geopark Networks, is the participation of the local community in their management. Participants were therefore asked if there was a corresponding interest from locals and if the management bodies show the appropriate extroversion by encouraging their participation. R3 emphasizes that the involvement of the local community is necessary both in the decisions for the geoparks and in the development of synergies and collaborations with the informal or formal management bodies, due to the bottom-up approach that characterizes a geopark and sustainable development. So the geoparks act as carriers – umbrellas of various activities and initiatives which are developed by local communities, under powerful tools of promotion and support. R2 finds a heartbreaking non-response of the locals to recent calls in information days for the two geoparks in Sitia and Psiloritis. In the same direction, R9 does not consider the interest from the locals satisfactory, so maybe the institutions should try to involve the local community more. Similarly, R8 states "...there is, I believe, an established and classical approach they take in local communities, which is characterized by a lack of imagination, creativity and immediacy and which does not help the locals, especially the young people, to understand how important it is to have an area protected by an organization with global prestige and recognition and what will be the benefits of all this, which often does not have to be financial!". R6 emphasizes the need for more information, seminars, actions, because people are wary and do not know what a geopark is and what its possibilities are.

Regarding the promotion of the two geoparks, most participants agreed that geoparks are well-advertised. More specifically, R3 stated that geoparks should promote and support their areas through actions they develop or in cooperation with other geoparks or with national and local bodies. From the beginning, the geoparks were developed as networks based on cooperation, mutual support and promotion. Thus, at European level, geoparks invest significant resources in maintaining a common website, as well as social media pages, publishing the magazine of European geoparks three times a year, publishing a newsletter every four months, participating together for many years in tourism exhibitions around the world. Every year during the last week of May and the first of June, the Week of Geoparks is organized in all European geoparks with a variety of information and promotion activities. At the same time, all UNESCO World Geoparks have to promote the other geoparks of the network through various means, so today one can find the geoparks of Psiloritis and Sitia displayed in the largest museums of Beijing and other cities. At the same time, the Forum of Greek UNESCO Geoparks cooperates with the Ministry of Tourism, which organized actions for the promotion of geoparks in the Czech Republic and Poland, and respectively actions were planned, which were suspended due to a pandemic of COVID-19. Contrariwise, R1 states that geoparks are not adequately advertised and that the way of their dissemination should be expanded, through a targeted marketing plan that will indicate the most appropriate means. R2, R8 and R9 argue that the advertising and promotion that takes place to date is not effective and is mainly occasional. The geotourism of Crete does not exist in any brochure of the big tour operators. In particular, R8 emphasizes the complete lack of advertising even in the local community and that the occasional reference of geoparks in some articles may not be enough to keep in the minds of the people.

Geoparks and geotourism is a relatively new product for Greece, therefore face several problems and obstacles. Admittedly, there is no proper political will to enhance geotourism and alternative tourism in general, intensively and with a strategic plan. "Any funding is simply wasted on showcase

projects to show that we support this type of development, with no real result. A negative example is the subsidies given over time by national and European programmes for investments in agritourism. Thousands of small or medium-sized units were built, but in no case did they harmonize with the philosophy of this type of tourism and were converted into private villas or expensive chalets with jacuzzis and swimming pools”, R4 claims. R10 mentions the bureaucracy and multiplicity that complicate funding procedures. On the other hand, R5 identifies problems in infrastructure and in the provision of quality services, such as road network, transport, health structures and the pollution of the environment by human activities. R1 focuses on actions such as marketing, digital applications and organizing local community participation. R3 points out that geoparks – like all those focusing on alternative tourism – face significant problems, most of which are institutional. For example, geotourism has recently been recognized as part of thematic tourism by Greek law and in relation to other forms of tourism lacks support. In addition, most Greek geoparks operate without institutionalized management bodies based on Law 3937/2011, with the result that they are not staffed effectively and without receiving the necessary support in order to implement their policies. Also, in Greece there are obstacles to the wider tourist-development environment, e.g. the definition of agritourism is unclear and the recent law on multi-functional farms is not yet ‘functional’ enough to help small geopark producers sell their produce. Even due to the dominance of mass tourism in Crete, finding resources to support geotourism is very difficult. Another not insignificant problem is the development of alternative tourism actions and products by individuals or entities that have nothing to do with alternative tourism, either compete unfairly without control over real alternative tourism products, or create attitudes, practices and results that offend and discredit alternative tourism. Also, many times such initiatives can degrade or even destroy the natural and cultural wealth on which they are supposed to be based. In addition, it rings the alarm bells in terms of mentality in decision-making centers, where based on easy profit and immediate ROI – the impact of mass tourism – they create unfair competition. R2, R6 and R8 refer to the absence of local participation in institutions’ calls-for-actions, the lack of education and interest from individuals, associations and local authorities, inability to maintain the paths, etc.

So, what are the critical factors for the further development of geotourism in Crete? Improvement of infrastructure, financing, more effort in informing the locals, synergies with educational institutions, are some of these factors. In addition, R2 focuses on the utilization of the brand name ‘geopark’ under the umbrella of UNESCO by the residents. R6 considers it crucial to design organized packages and promote them in schools, individuals, universities, travel agencies, etc. and to host journalists and travel agents and guide them to the geoparks, in order to “get to know them and suggest them to the outside world”. R8 suggests to management bodies to learn from the experiences of other organized and successful alternative tourism cooperation networks. At the same time, R9 considers the marking of geological monuments, paths, placement of information and direction signs, as well as the creation of small leisure infrastructures, in places of special geological interest, as a critical factor. R3 argues that “at the local level, geotourism needs more and practical support from the Region of Crete, the Municipalities and the local authorities so that its reciprocal benefits can be directed directly to its recipients, i.e. the local community. This can be done through the various funding programmes and development tools that they plan and manage, through their further promotion and advertising, but also through the support of the geoparks at institutional and political level”. Moreover, R4 suggests that a change in the philosophy of development policy should be made by the central and regional administration, which presupposes a change of ideological approach, while local societies should understand that development and environmental protection are interrelated concepts. R8 emphasizes the importance of utilizing our natural heritage and changing our way of life that must turn to responsible and alternative tourism, which respects and protects the environment. R10 states that the arduous process of evaluating geoparks by such an important organization requires the cooperation of volunteers, managers, services and citizens, and their sustainable operation will create new businesses and growth.

DISCUSSION

The dominance of mass tourism in Crete so far has created many negative impacts and geotourism, along with other alternative forms of tourism, can contribute to the partial solution of these problems. Crete has the unique advantage of having two geoparks in its region, which after remarkable efforts were included in the Global Network of UNESCO Geoparks. These geoparks are an integral part of the natural heritage of Crete and can be the basis for the development of geotourism on the island, which can contribute to the protection of the geological environment, the promotion of geoheritage, the environmental education and the sustainable development of local communities. However, this does not seem to have happened yet to the extent that would be desirable and expected. Geotourism in Crete seems to still be in its infancy, as at the moment only a few, mainly individual tourists visit the two geoparks, along with some groups of students. No major travel agent or tour operator proposes Crete as a geotourist destination. These few visitors are of different age groups, have a high income and education, come mainly from Europe, USA and Canada, and their motives are educational (students), nature-loving, recreational, scientific (archaeologists, geologists). Moreover, they are characterized by their very good physical condition, they are lovers of the Cretan landscape, and travelers with ecological consciousness, love for nature, spiritual cultivation, trend for adventure, high income. These diverse socio-demographic characteristics of the visitors seem to be expected if we consider that various scholars (Gordon 2018; Telbisz et al. 2023) claim that geotourism caters to a variety of visitor interests and motivations, as it satisfies both authentic geotourists and other visitors who lack specialized knowledge of geodiversity. Furthermore, geotourists' experiences may be multiple and different (Aquino et al. 2018).

Although it is probably too early to talk about the development of geotourism in Crete, the prospects seem to be positive. However, in order to achieve this, the various problems and pathogenesis faced by the two geoparks must first be addressed. Such problems include the lack of an appropriate legislative framework for geotourism and alternative forms of tourism in general, bureaucracy and multiplicity that complicate funding procedures, problems in infrastructure and in the provision of quality services, lack of support from the Greek state, management problems, understaffing problems, lack of interest and support from local communities. Similar problems have been recognized by previous researchers (Neches, Erdeli 2015; Nemanja 2011). For example, P. McKeever et al. (2006) argue that there are serious obstacles to the development of geotourism, such as inappropriate planning policy, lack of understanding, training and incentive, and short-term thinking. K. Matshusa and L. Leonard (2023) also refer to the absence of governance plans for the development of geotourism and management of geoheritage sites. C. Fassoulas and Z. Skoula (2006) agree that geodiversity in Greece is poorly recognized and protected by the national legislation. They suggest that the only possibility for the conservation of the geosites under the given status is to reveal the economic value that these could have for the local communities. The involvement of the locals also is necessary (Farsani et al. 2014; Pramanik, Rahman 2023; Trišić et al. 2023) both in the decisions for the geoparks and in the development of synergies and collaborations with the informal or formal management bodies, due to the bottom-up approach that must characterize the development and management of a geopark. It is commonly accepted that the success of geoparks – and consequently of geotourism – depends to a large extent on the interest and participation of the local communities (Kim, Kim 2024; Ólafsdóttir, Tverijonaite 2018). Consequently, informing and educating local people is considered very important so that they start to benefit from the operation of this new product in their area. UNESCO claims that the geoparks included in its Global Geoparks Network are “established through a bottom-up process involving all relevant local and regional stakeholders and authorities in the area (e.g. land owners, community groups, tourism providers, indigenous people, and local organizations)”⁹. Experience in

⁹ <https://en.unesco.org/global-geoparks> (accessed: 12.01.2024).

other destinations has shown that non-formal learning activities can play a crucial role in raising locals' awareness on the value of geoheritage and geosites (Coratza et al. 2023).

Undoubtedly geotourism can be a powerful and effective tool for achieving sustainable development, however its management requires special attention since there are not a few cases where management mistakes have led to the threat or destruction of geoheritage resources (Newsome et al. 2012). All the above problems must be tackled effectively in order for geoparks to contribute significantly to the sustainable development of the island, for geotourism to develop and for Crete to be able to compete in this area with well-established countries such as Costa Rica, Ecuador and Spain. A number of available studies (Herrera-Franco et al. 2021; Hose 2007; Quesada-Román, Pérez-Umaña 2020; Mero et al. 2018) show that these countries have successfully developed geotourism for years, taking advantage of their geological heritage. In addition, in recent years there is a number of emerging countries and destinations promoting their geoheritage and geodiversity (Cai et al. 2023; Chakrabarty, Mandal 2018; Chauhan et al. 2023; Dollma 2019; Gamkrelidze et al. 2021; Kubalíková 2019; Nemanja 2011; Novarlia 2023; Paungya et al. 2020; Petrović et al. 2023; Purdie et al. 2020; Sengupta et al. 2023; Štrba et al. 2020; Tomić et al. 2020), so the competition in the field of geotourism is expected to intensify even more. In any case, the management bodies of the two geoparks in Crete can be exemplified by other geoparks both in Greece and abroad, which have been described in the literature as cases of good practices (Frey 2021; Mastika et al. 2023).

The two geoparks of Crete should focus on the educational role which by definition they should pursue. A key objective of UNESCO Global Geoparks is to develop and operate educational programs and activities, both formal and informal, to adults and children, to spread awareness of their geological heritage and its links to other aspects of their natural, cultural and intangible heritages¹⁰. Moreover, the educational role of geoparks is in line with the Agenda 2030 for Sustainable Development and its 17 Sustainable Development Goals (SDGs), in particular SDG 4 “Quality Education” (Silva, Sa 2018). Participants recognize that one of the key pillars in the operation of the two geoparks is geo-education. However, the managers of the two geoparks in Crete should be inspired by good practices from other geoparks either in Greece (e.g. Lesvos island) or internationally (e.g. Fangshan China) in order to design and offer educational activities, seminars, programs and field course in collaboration with educational institutions (Wang, Zouros 2021).

Further networking, cooperation, mutual support and promotion with other geoparks inside and outside Greece, governmental support through funding and shaping the necessary legal framework, greater information and involvement of local communities, synergies with educational institutes and other public and private bodies, combination of geotourism with other forms of alternative tourism (e.g. ecotourism, cultural tourism, religious tourism, voluntourism, gastronomic tourism, adventure tourism, photographic tourism etc.) are some of the measures that can provide the impetus to the further development of geoparks and geotourism in Crete. These forms of tourism have also been proposed by other authors in the past (Buckley 2003; Dowling, Newsome 2006; Valachis 2021), considering that they are harmoniously combined with geotourism, while they also provide significant benefits to destinations that strongly experience the negative effects of mass tourism, such as Crete and other destinations in the Mediterranean and elsewhere. Such benefits have been described by previous researchers and include the decline of unemployment and emigration in rural areas through engaging the local communities in geopark activities (Rocha, da Silva 2014), a source of economic revenue and community wellbeing (Dowling, Pforr 2021), an extension of the tourist season (McKeever et al. 2006), while examples of other geotourism destinations have proven that geoheritage can be an effective place branding tool (Van Geert 2019). Digital and mobile applications have also proven in other cases of geoparks to be extremely useful in promoting them to both a general and a more specialized audience (Filocamo et al. 2020; Pica et al. 2018; Rozenkiewicz et al. 2020). In

¹⁰ <https://www.globalgeoparksnetwork.org/mission> (accessed: 12.11.2024).

our case, newly developed digital tools seem to have doubled the ‘visibility’ of the Psiloritis Geopark during the COVID-19 pandemic (Fassoulas et al. 2022).

Furthermore, the recognition of the two geoparks by UNESCO and their inclusion in the Global Geoparks Network are the main axes for the further development of geotourism. Various researchers (Al Mohaya, Elassal 2023; Pásková 2022) point out the benefits of the certification of geoparks and their inclusion in the UNESCO Global Network, suggesting that this process allows for the implementation of various sustainability management concepts and their various combinations, while increasing geoparks’ tourist attractiveness. Although the two parks first met the criteria to be classified as geoparks and then to enter the Global Geoparks Network, their continuous presence on the network requires a lot of effort and endurance from all involved, management, locals, tourism entrepreneurs and of course by the state itself. Besides, every four years UNESCO thoroughly re-examine the functioning and quality of each geopark it has included in its list, through a revalidation process¹¹.

CONCLUSION

Serious issues that have emerged worldwide such as climate change, energy supply crisis, immigration due to war or natural disasters, cost-of-living crisis, and more recently the COVID-19 pandemic, form a new framework for discussion and push us to act collectively and rethink the way we plan the tourism development of a destination. Designing any development effort with sustainability at its core seems to be a one-way street right now. Geotourism is an alternative form of tourism that has attracted global interest in recent years as it is considered that it can contribute significantly to the sustainable development of destinations, through the protection and promotion of the natural environment and heritage, and the strengthening of local communities. In addition, as a form of nature-based tourism it fully responds to the changes in the behavior of tourists in the post-COVID-19 era, who now seem to be turning to more autonomous trips close to nature (Trihas et al. 2023). This study, focusing on the case of Crete, highlighted the importance and the role that geoparks can play in the sustainable tourism development of a destination. Geotourism presents a sustainable development opportunity for Crete, based on its rich and diverse geological assets and landscapes. The research findings also led to some interesting managerial implications. In this context, this paper contributes to the growing body of knowledge on geoparks and geotourism.

This research has one basic limitation. The survey was carried out on a small number of key informants related in some way to the two geoparks of Crete. However, any attempt for tourism development in the context of sustainability must also take into account the perceptions of other stakeholders, such as residents and visitors/tourists to a destination. Consequently, future research could focus on investigating the perceptions of other stakeholders on the contribution of geotourism to sustainable tourism development. In particular, as sustainable tourism development must be planned with a bottom-up approach (Zouganeli et al. 2012), the perceptions of the residents of Crete are considered very important. In addition, one more survey could be done among the tourists and visitors of Crete, mainly among those who visited the two geoparks in order to examine their characteristics, motivations, perceptions and level of satisfaction based on their prior expectations. The geotourism development itself would not be possible without the interest of visitors (Štrba et al. 2018) in the two geoparks. Similar surveys could also be conducted in other geoparks in Greece to compare the results and seek good practices.

¹¹ <https://en.unesco.org/global-geoparks> (accessed: 12.01.2024).

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