

Alternative Tourism at Natura 2000 areas, as a Proposal for Ecological Restoration, Protection, Conservation, and Sustainable Development. The Case Study of Zakynthos and Strofades

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Abstract—The current study took place at Natura 2000 areas in Ionian Islands, specifically at Zakynthos and Strofades. Both islands have a significant natural and cultural heritage and constitute part of the Natura 2000 Network. Zakynthos is protected for its biodiversity and its landscape and the Strofades islands belong to the National Marine Park of Zakynthos. The forest character of both areas constitutes a common base for a proposal for their alternative and sustainable development. Because of recurrent fires, the currently occurring degradation of woodland area at the west coast of Zakynthos demonstrates the importance of supporting and promoting natural and cultural heritage of the area, so as to ensure its protection and conservation, as well as its sustainable environmental and socio-economic development. Regarding Strofades, it constitutes a significant sequestered ecosystem, an important habitat for different species, hosting the only forest in Greece with *Juniperus phoenicea*. The present study mapped and recorded the environmental and cultural characteristics of Zakynthos and Strofades (ecosystems, biodiversity, landscape, soundscape, culture), to propose a compiled model for an alternative sustainable development.

Index Terms— awareness, ecotourism, protected areas, sustainable development, Strofades, Zakynthos.

I. INTRODUCTION

ECOTOURISM is an alternative form of tourism that relates to touristic activities in nature, connected with the natural and cultural resources of the area. It is a kind of touristic activity that combines the protection of the natural and cultural environment with the citizens' active stance and participation. The adoption of environmentally friendly attitudes can simply reduce the environmental impact, whereas activities focusing on promoting and highlighting the wealth of each area can play a key role, contributing to the area's

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economy, society and environment [1, 2, 3]. Ecotourism can be combined with other forms of tourism in the same area, such as educational tourism, environmental tourism, agrotourism, gastronomic tourism, religious tourism, and scientific tourism [4].

Amongst a plethora of definitions of ecotourism (including those offered by Wallace and Pierce [5]; Wearing and Neil [6]; Bjork [7]; Weaver [3]; EplerWood [8]; Fennell [9]; Ceballos-Lascurain [10], we quote the IUCN definition [10], according to which: ecotourism is the environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features—both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations (p. 20). Moreover, ecotourism reinforces the view that nature belongs to all, as its design includes infrastructure to facilitate the visitation by people with disabilities.

Ecotourism is based on three major pillars: a) protecting and promoting the natural environment, b) respecting the local community and its cultural heritage, and c) educating both visitors and local communities [11]. It initiated in the developing world, mainly aiming at protecting ecosystems and biodiversity, while also creating developmental opportunities for local communities, reinforcing their income. Although it seems to rely on eco-centric principles, it is actually a form of touristic development that enables visitors to experience, interpret and enjoy nature, learn about the environment and biodiversity and interact with local communities [6, 12].

II. SUSTAINABLE DEVELOPMENT OF ECOTOURISM SITES

Mass tourism has increased in recent years, particularly in areas of natural and cultural wealth, leading to environmental degradation and threatening biodiversity [13]. The degradation of natural and cultural resources may result in the direct or indirect economic decline of affected areas, the destruction or change of use of forest ecosystems, the drainage of wetlands, the destruction of natural habitats, and the extinction of rare or endemic species of fauna and flora. Furthermore, this environmental impact can adversely affect the attractiveness of the area, thus negatively affecting its sustainability.

The definition of "sustainable development" prevailed internationally in 1992, after the United Nations World Summit on the Environment in Rio de Janeiro, Brazil. As

defined by the World Commission on Environment and Development, of the United Nations (WCED), the term refers to "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs". One decade later, at 2002, the European Union and the World Summit for the Environment of the United Nations in Johannesburg established the three pillars of sustainable development (economy-society-environment), and determined the rational management of natural and cultural resources as essential to achieving sustainable development.

Sustainable development directly relates to protecting and promoting natural and cultural wealth. It creates opportunities for economic growth, respecting nature, culture and local traditions, and thus improving the living standards of local communities. The International Ecotourism Society (TIES, 2006) defines ecotourism as the "responsible travel to natural areas that conserves the environment and improves the well-being of local people" [10]. The IUCN definition of ecotourism seen above [14], indicates that ecotourism involves the integration of many factors including tourists, residents, and managers. Moreover, in such areas local populations can enjoy a symbiotic relationship with tourism [15].

Ecotourism is an important tool for the protection and conservation of natural and cultural resources and the sustainable development of sensitive areas [4]. Sustainable development is often associated with the sustainable management of agriculture and forestry, sustainable tourism and sustainable economic development or an area.

The areas of the case study, Zakynthos and Strofades, are environmentally and culturally sensitive. This paper investigates how ecotourism can positively influence ecological protection and restoration necessary in environmentally degraded areas.

The west and northwest coasts of Zakynthos (GR221001) and the Strofades islands (GR221003) belong to the Natura 2000 network and could be ideal case studies for ecological restoration, through ecotourism development.

The objectives of this study are: a) to facilitate the protection, conservation and ecological restoration of natural and cultural environment, b) to enhance the environmental education and awareness of the local community, both in terms of environmental and ecosystem services, and regarding sustainable development and c) to empower the local community financially.

III. STUDY AREA

Zakynthos is located in the south of the Ionian Sea and covers an area of 406 sq. km. The largest part of the island is mountainous, covered by low Mediterranean vegetation and *Pinus halepensis* forest, while the valley is fertile and very productive. The western coast is steep and impressive, with many caves that serve as shelter for several species of marine fauna and avifauna. The island is very important from an ecological perspective, due to the various habitats and its particular geomorphology, which have resulted from intense seismic activity.

Zakynthos has three Natura 2000 areas: the west and

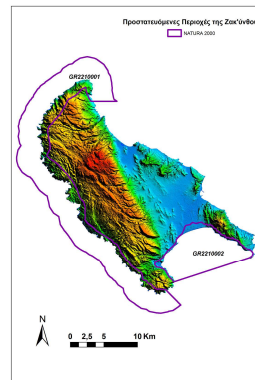


Fig. 1. Map of Zakynthos

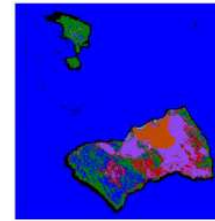


Fig. 2. Map of Strofades islands

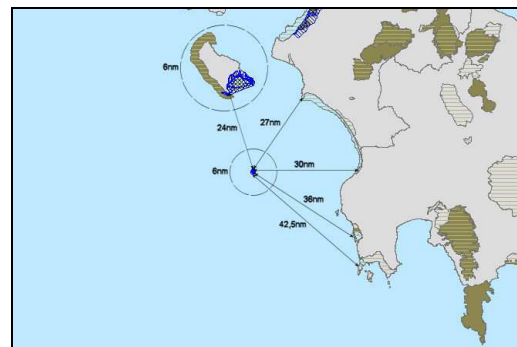


Fig. 3. Map of Zakynthos and Strofades

northwest coast of Zakynthos (GR221001), the Laganas Bay (GR221002) and the Strofades islands (GR221003). Moreover, the National Marine Park of Zakynthos (NMPZ) is of particular importance. NMPZ includes land and marine areas and constitutes an important habitat for the *Caretta caretta* sea turtle. In the territory of the park other species can also be found, such as the *Monachus monachus* seal, endemic species of plants and species of sea birds. The NMPZ and the Natura 2000 northwest area offer special opportunities for alternative tourism development.

The mountainous area of Zakynthos island is ideal for ecotourism, as it has significant natural and cultural resources, and landscapes with a unique combination of mountains and coastal areas. It is an "ecological laboratory", with very important and sensitive ecosystems. Fourteen traditional villages span in the mountainous area, with an important cultural heritage.

Apart from the nesting areas, the NMPZ encompasses the wetland of Keri Lake and the two small islands of Strofadia, which are located 50 km south from the island of Zakynthos. The larger of the two islands is called Stamfani and covers an area of 1,5 km², located about 50 km south from Zakynthos and 49 km west of the Peloponnese (mainland Greece; Fig. 2).

Strofades islands are considered as oceanic type islands, of great ecological and environmental value: a) For migratory birds from Africa to the countries of northern Europe, Strofades is the first station for resting and feeding, after "travelling" over the Mediterranean base. b) One of the most important colonies of the species *Calonectris diomedea* in

Mediterranean base (about 6000 to 9000) nests in the rocky coasts [17]. c) The unique forest of *J. phoenicea* grows in the terrestrial part. d) The island is associated with the religious and cultural heritage of the Ionian region, as it is the location where monk St. Dionysios, protector of Zakynthos, lived and was buried, whereas on the north coast of the island of Stamfani, the Castle-monastery has been dedicated to the Saviour Christ since 1241, and there are also 23 stone wells, which are historical and cultural monuments. The climate is clearly Mediterranean, with two different seasons: The rainy season (October to March) and the dry season (April to September). Stamfani Island (37°15' N, 21° 00' E) at the Strofades islands group (south Ionian Sea, Greece; represents a Natura 2000 site (Natura 2000) and constitutes Part of the National Marine Park of Zakynthos in the Ionian Sea.

IV. METHODOLOGY

The present paper was conducted in continuation of a series of studies in Natura 2000 areas, and the northwest coast of Zakynthos (GR221001). The studies were carried out under the Interreg Greece-Italy European program 2007-2013, "Strategic plans for restoration protection & ecotourism promotion in Natura 2000 sites which were devastated by natural disasters", aimed at environmental protection and enhancement, and ecotourism development. They include: a) recording and GIS mapping of natural resources and biodiversity of the Natura 2000 area (GR221001) and of mountainous Zakynthos, b) recording and mapping the cultural wealth of the region, c) recording biodiversity sounds and soundscapes, so as to promote and protect them, and d) preparing a proposal of alternative development.

The developed methodology includes three stages: The first relates to research on biodiversity and natural and cultural resources. In this work, an element of vital importance is the use of Geographical Information System (GIS) for mapping, and also using the Global Positioning System (GPS) for the precise registration of terrestrial dimension of network [19]. The second stage concerns the eco-agrotourism network, which is associated with an evaluation of different corridors. The third stage concerns the organization and planning of environmental routes, using satellite pictures and maps of biodiversity and natural and cultural resources. Using specialized equipment, we recorded the soundscapes, as well as the distinctive or characteristic sounds of the area under study, so as to provide an experiential profile of the area and its particular characteristics. The classification of sounds in biological, anthropogenic, and geomorphological, and the recording and composition of audiovisual material, enabled us to produce material adapted for people with disabilities [20]. The recording of audiovisual material follows regional seasonality and reflects the variation of ecological characteristics (biodiversity, species, climatic characteristics, etc.).

V. RESULTS AND DISCUSSION

Using the recordings of the natural environment and

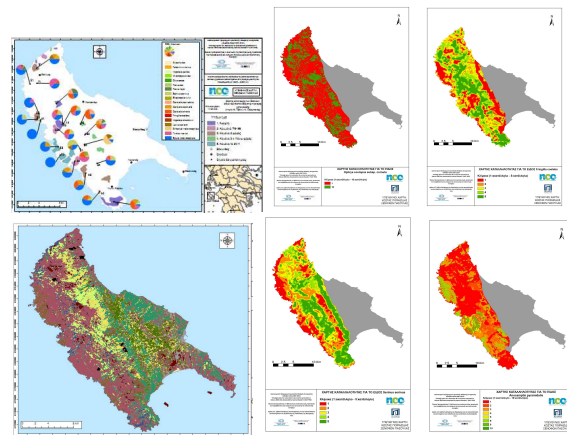


Fig. 4. Biodiversity maps of Zakynthos.



Fig. 5. Route for people with disabilities.

biodiversity in the region of Zakynthos, we created maps of the species and the suitability for species of flora, fauna, birds, bats, etc., (fig. 4), as well as maps of the cultural wealth of the region [21].

Based on the natural and cultural wealth of the mountain areas, we proposed the creation of routes for the development of ecotourism in the region [22], while through the Interreg program we proposed the creation of special routes for people with disabilities (fig 5).

The present study also took into account the results of a survey conducted in Zakynthos, in the period July - August 2014. 250 questionnaires were completed by five (5) groups of participants (50 per group): a) entrepreneurs, b) residents of mountainous areas, c) residents of the lowland zone, d) local residents within and outside the NMPZ, and e) visitors of the site. The survey revealed a low educational level, and a general lack of knowledge on environmental and sustainable development issues. When asked if environmental protection is a top priority, residents of mountainous areas maintain a neutral stance, unlike residents of the lowland zone or living near NMPZ. Additionally, from their responses to the question whether they know what is a PA and what its role is, it can be seen that the residents of mountainous areas constituted the group who knew less on the issue, compared to the other participant groups. The lack of knowledge undermines the importance of the environment, as the inhabitants of the mountainous area believe that economic growth is more important than protecting the environment, a view that changes as we approach the NMPZ, where people believe that protecting the environment is more important than economic growth. Regarding the visitors, the results are impressive; participants stated that they were satisfied, that they would

accept restrictions on their stay in a protected area, and that they could contribute financially to the effective protection of the area.

Furthermore, according to the data collected on the Strofades island of Stamfani in spring and summer of 2014, the island is an ideal venue for conducting research and promoting its unique biodiversity through environmental awareness. Therefore, it is suggested that we should calculate the island's carrying capacity, so as to promote its unique natural and cultural wealth, since it is a small area, with rare ecological, religious and cultural characteristics. Apart from the monastery of Christ the Savior (religious tourism), the creation of a botanical path, in an undisturbed Mediterranean ecosystem, could be an important incentive for Greek and foreign visitors. Under certain conditions, bird-watching is also an activity which could be brought to the island, as it is located on a migration corridor, and offers the main resting and feeding area for many species of migratory birds. We also propose that a study be conducted on underwater routes, since Strofades are oceanic islands with rich marine biodiversity. Lastly, the recording of landscapes and soundscapes of the region could also enable people with disabilities to visit the area, either virtually, in specially designed facilities, or with a site tour on accessible routes. The experiential aspect plays an important role in nurturing a creative relationship with the other people and the world. We have already started to collect the material, and audiovisual seasonal routes are to be created within the interdisciplinary field of acoustic ecology [23, 24, 25, 26].

Ecotourism offers a new developmental model, by promoting what is original and old and connecting it to what is new, through environmental protection. It offers new, alternative opportunities to local rural communities, which might otherwise be taking the path of migration to large urban centers. [19]. Furthermore, ecotourism shall play an important role in increasing tourism, in light of the changed trends and habits of a large part of tourists, who seek new destinations, in societies that respect natural environment, history and culture. Societies which show respect for natural and cultural environment and follow the principles of sustainable development will have the opportunity not only for economic recovery, but also for ecological restoration. Visitors to protected areas are increasing, and their satisfaction relates to the quality of the natural environment and the cultural wealth of the regions they visit.

In conclusion, based on this research work, it seems that the promotion of natural and cultural wealth can lead to economic improvement of degraded areas, contributing to environmental awareness on the one hand and to the protection, conservation and restoration of the environment on the other.

In many areas, the beginning of ecotourism development was also accompanied by environmental protection and restoration. The residents understood that natural and cultural wealth is a significant asset for their region and an important pillar of development, which means that they have to warrant its protection. Many studies with examples of areas are mentioned in the publication "Le guide des destinations

indigenes" [21]. This guide book describes how tourism funds ambitious projects in Environmental Restoration and how the economic benefits of tourism can help a local community to develop a better appreciation of the multiple values of conservation and restoration, since tourists are eager to support such efforts, e.g. with direct financial contributions or eco-volunteering.

In the area under study, we could follow the same model of sustainable development for the protection, conservation and restoration of the natural and cultural wealth of the Ionian islands.

VI. CONCLUSION

The Strofades islands have a unique character and value on an environmental and cultural level. The islands' ecosystems, species, genetic characteristics, constitute an important biodiversity, which has to be recorded, in line with research priorities. The protection, conservation and management of Strofades has become a priority; research on different levels and topics should continue, combined with a modern adaptive management process, where nature and human presence coexist in balance. The islands' landscape, soundscape and ecosystems could constitute a model case study for ecotourism. The current research is planned to be continued and extend in more and different scientific areas in collaboration with the National Marine Park, the Metropolis of Zakynthos Island, experts and Universities.

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REFERENCES

- [1] M. B. Orams, "Towards a more desirable form of ecotourism," *Tourism Management*, vol. 16, no. 1, pp. 3–8, 1995.
- [2] R. Buckley, "Neat trends: Current issues in nature, eco- and adventure tourism," *International Journal of Tourism Research*, vol. 2, pp. 437–444, 2000.
- [3] D. B. Weaver, "Ecotourism as mass tourism: Contradiction or reality?," *Cornell Hotel and Restaurant Administration Quarterly*, vol. 42, no. 2, pp. 104–112, 2001.
- [4] Z. Mieczkowski, *Environmental issues of tourism and recreation*. Lanham: University Press of America, 1995.
- [5] G. N. Wallace and S. M. Pierce, "An evaluation of ecotourism in Amazonas, Brazil," *Annals of Tourism Research*, vol. 23, no. 4, pp. 843–873, 1996.
- [6] S. Wearing and J. Neil, *Ecotourism: Impacts, potentials and possibilities*. Oxford: Butterworth Heinemann, 1999.
- [7] P. Bjork, "Ecotourism from a conceptual perspective, an extended definition of a unique tourism form," *International Journal of Tourism Research*, vol. 2, pp. 189–202, 2000.
- [8] M. E. Epler Wood, *Ecotourism: Principles, practices & policies for sustainability*, UNEP-TIES, United Nations Publication, 2002.
- [9] D. A. Fennell, *Ecotourism programme planning*. Oxon: CABI Publishing, 2002.

- [10] H. Ceballos-Lascurain, *Tourism, ecotourism and protected areas: The state of nature-based tourism around the world and guidelines for its development*. Gland, Switzerland, and Cambridge, UK: IUCN, 1996.
- [11] M. Honey, "Foreword" in *Le guide des destinations indigènes*. Montpellier, France: Indigène éditions, 2006.
- [12] S. Wearing and M. McDonald, "The development of community-based tourism: Re-thinking the relationship between tour operators and development agents as intermediaries in rural and isolated area communities," *Journal of Sustainable Tourism*, vol. 10, no. 3, pp. 191–206, 2002.
- [13] C. Christ, O. Hillel, S. Matus and J. Sweeting, *Tourism and biodiversity: Mapping tourism's global footprint*. Washington, DC: Conservation International, 2003.
- [14] H. Ceballos-Lascurain, "Introduction", in K. Lindberg, M. E. Wood and D. Engeldrum (Eds.), *Ecotourism: A guide for planners and managers*. North Bennington: The Ecotourism Society, 1998, pp. 7–10.
- [15] S. Ross and G. Wall, "Ecotourism: Towards congruence between theory and practice," *Tourism Management*, vol. 20, no. 1, pp. 123–132, 1999.
- [16] D. Diamantis, "Environmental auditing: A tool in ecotourism development," *Eco-Management and Auditing*, vol. 5, pp. 15–21, 1998.
- [17] G. Karris, E. Thanou, S. Xyroychakis, D. Voulgaris, S. Sfenthourakis, and S. Giokas. "Sex Determination of Scopoli's Shearwater (*Calonectris diomedea*) Juveniles: A Combined Molecular and Morphometric Approach", *BioOne Research Evolved*, 2013.
- [18] A. Lange and C. Gilbert, "Using GPS for GIS data capture". In P. Goodchild, M. Maquire and D. Rhind, *Geographical Information System* (vol I). New York: John Wiley & Sons, 1999.
- [19] G. Bruner Lash, "Sustaining our spirit: Ecotourism on privately owned rural lands and protected areas", Ph.D. dissertation, University of Georgia, Athens, GA, 2003.
- [20] Ch. Minotou, "Protected Areas and People with Disabilities – Special Environmental Education" [in Greek], Ph.D. dissertation, University of Ioannina, Greece, 2012.
- [21] S. Blangy, *Le Guide des Destinations Indigènes*. France: Indigène Editions, 2006.
- [22] A. Martinis, K. Kabassi, E. Skotti, G. Karris and E. Charou, "Environmental Routes Setting Methodology: The case of Corfu and Paxi Islands", in *International Conference of Tourism Development and Management (ICTDM 2009). Tourism in a Changing World: Prospects and Challenges*, Kos Island, Greece 11-14 September 2009, 309-312.
- [23] L. Vygotsky, *Mind and society* [translated in Greek]. Athens, Greece: Gutenberg, 1997.
- [24] H. James and C. Carney Strange, *Creating Campus learning environments that work*. The Jossey Bass Higher and Adult Education Series ERIC Number EDA 62059, 2001.
- [25] D. Matless, "Sonic Geography in a Nature Region," *Social and cultural geography*, vol. 6, pp. 745-766, 2005.
- [26] N. Scheper-Hughes, "The primacy of the ethical: proposition for a militant anthropology," *Current Anthropology*, vol. 36, no. 3, pp. 409-440, 1995.