

## GEOPARKS MANAGEMENT AND ASSESSMENT

**Zouros N.<sup>1,2</sup> and Valiakos I.<sup>1,2</sup>**

<sup>1</sup> University of the Aegean, Department of Geography, 81100 Mytilene, Greece, nzour@aegean.gr

<sup>2</sup> Natural History Museum of the Lesvos Petrified Forest, 81100 Mytilene, Greece – lesvospf@otenet.gr

### Abstract

*Established in 2000, the European Geoparks Network (EGN), comprising 35 members (November 2009), aims to protect geodiversity, to promote geological heritage to the general public as well as to support sustainable economic development of geopark territories primarily through the development of geological tourism. All requests for recognition as a “European Geopark” must be submitted by the organisation in charge of managing the area. The application dossier includes precise information dealing with identification of the zone, scientific description of the existing geoh heritage, management body, management plan, infrastructure, educational and promotional activities, sustainable development policy instituted and geo-tourism. Membership of the EGN is for a period of four years after which membership is reviewed and assessed. The first revalidation procedure occurred during 2004 and since then has helped to keep all Geopark operations, infrastructure and services at a high quality level. The revalidation process involves a field visit by two independent evaluators nominated by the EGN and UNESCO. Assessment methodology examines the progress in geological heritage protection and promotion as well as the development of sustainable economic activity within each territory. However it also takes into account the Geopark’s degree of active participation in international collaboration and networking.*

**Key words:** *Geoparks management, evaluation assessment methodology, European Geoparks Network.*

### 1. Introduction

Following the 1972 Convention on the Protection of the World Cultural and Natural Heritage and the 1991 Declaration on the rights of the memory of the Earth (Martini 1993), a new initiative was developed in Europe by the active collaboration between territories (through local management bodies), aiming at Earth heritage protection and conservation through a sustainable local development strategy, with the support of the EU. According to the proposed new “concept”, a European Geopark is a territory with a geological heritage of European significance, a sustainable development strategy, a strong management structure and is often supported by a European funding programme to aid further development (Zouros et al. 2003).

Established in 2000, the European Geoparks Network (EGN) aims to protect geodiversity, to promote geological heritage to the general public, as well as to support sustainable economic development of Geopark territories, primarily through the development of geological tourism. The network has drawn together territories from across Europe that share these aims and now work together in an active and dynamic way in order to achieve them. Originally consisting of four territories, the network has grown to include, as of November 2009, 35 territories across 13 European countries (fig 1). Greece is represented by three Geoparks in the European Geoparks Network, the Lesvos Petrified Forest (2000), founding member of EGN, the Psiloritis Geopark in Crete (2001) and the Helmos – Vouraikos

Geopark (2009), which is the youngest member of the EGN ([www.europeangeoparks.org](http://www.europeangeoparks.org)).

In 2001 the European Geoparks Network signed a formal agreement with UNESCO's Division of Earth Sciences, whereby UNESCO gave the network its endorsement. A further agreement was signed with UNESCO in 2004 whereby the EGN was given the responsibility for regulating membership of European Geoparks in the UNESCO Global Geoparks Network (GGN). As a result the EGN acts as the European sector of the GGN. The European Geoparks Network operates through continuous electronic communication, biannual coordination meetings and the establishment of common projects through which territories can exchange ideas, experience and best practices, thereby supporting each other on geotourism development.

UNESCO recommends the creation of similar regional networks, reflecting local conditions, elsewhere in the world. (UNESCO 2008) Today, in addition to the European Geoparks Network, the Asia-Pacific Geoparks Network (A.P.G.G.N.) formed in 2007 is also active and several other regional networks are under consideration in Latin America, North America and Africa (McKeever et al 2009).

The structure of the European Geoparks Network is relatively simple and comprises of an Advisory Committee (11 members including representatives of UNESCO, the International Union of Geological Sciences - IUGS and the World Conservation Union - IUCN) and a Coordination Committee (comprising two representatives from each member). Decisions concerning the network are made only by the Coordination Committee. As part of the Coordination Committee, there is an elected EGN Coordinator and Vice Coordinator to represent the whole Network. They coordinate contacts with other international bodies (E.U., UNESCO, IUGS, IUCN, Council of Europe etc.) and prepare the agenda of the meetings in cooperation with the meeting hosts.

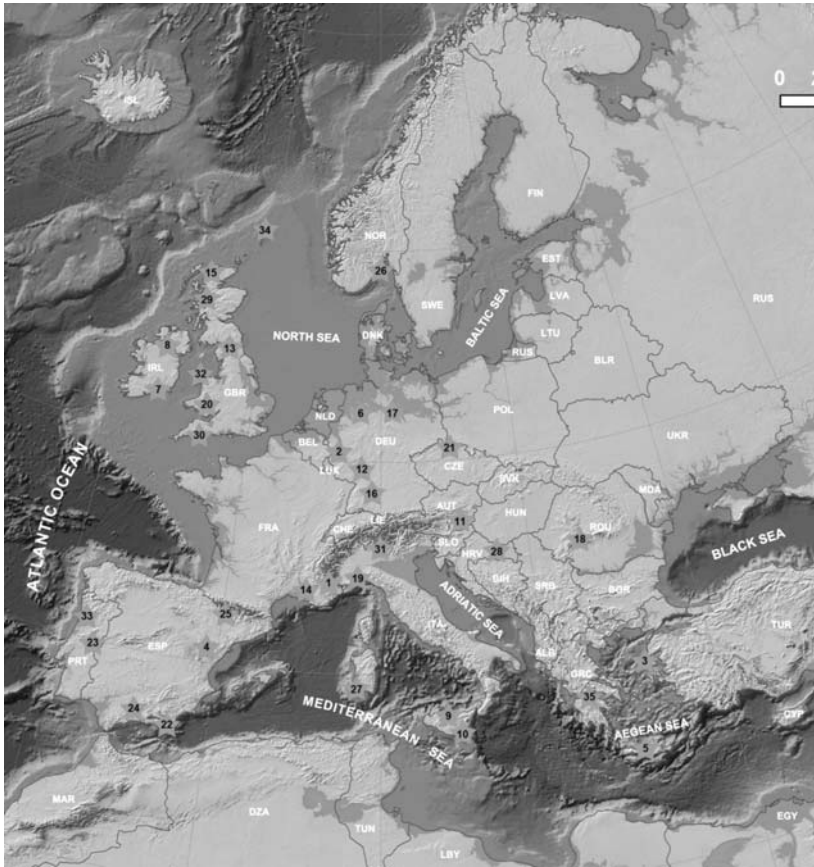
The European Geoparks Network has adopted a common logo which is registered in all European countries. An EGN member has the right to use the European Geopark logo in its communications thereby contributing over time to the creation of a common image of quality, linking the enhancement of European Earth heritage with sustainable development.

Membership in the EGN entitles a Geopark to call itself a European Geopark and to use the logo of the EGN in its promotional material. These logos must only be used on products produced directly by the Geopark management (Zouros 2004, McKeever and Zouros 2005).

## **2. Geopark management**

A European Geopark integrates the range of resources found within its broader region, including geological attractions and geosites, landscapes, wetlands, sites of natural beauty and ecological value, as well as cultural monuments and sites. A Geopark can also include intangible heritage and traditions including gastronomy, crafts and local agricultural products. No distraction or sale of original, ornamental geological material is permitted within a European geopark (Zouros et al 2003).

A broad range of activities combines the main components for the operation of each Geopark, including scientific research, the creation of an inventory and map of geological sites, protection of the geological heritage, the operation of thematic museums and interpretation centers, interpretation and promotion of geological sites, the conservation of fossils, the creation of parks for visitors, the establishment of a network of walking trails linking geological sites to ecotourism infrastructures, the development of environmental education programmes on geological sites, the organization of scientific and cultural events, and the promotion of monumental geological sites. Geoparks also promote themselves as ideal destinations for educational activities (Zouros 2004, McKeever and Zouros 2005, EGN 2009).



**Fig. 1:** Map showing the location of the 35 members of the European Geoparks Network as of September 2009. 1. Réserve Géologique de Haute - Provence–FRANCE, 2. Vulkaneifel European Geopark – GERMANY, 3. Petrified Forest of Lesvos – GREECE, 4. Maestrazgo Cultural Park – SPAIN, 5. Psiloritis Natural Park – GREECE, 6. Terra.Vita Naturpark – GERMANY, 7. Copper Coast Geopark – IRELAND, 8. Marble Arch Caves Geopark IRELAND & N. IRELAND 9. Madonie Geopark –ITALY, 10. Rocca di Cerere Geopark – ITALY, 11. Naturpark Steirische Eisenwurzten – AUSTRIA, 12. Naturpark Bergstrasse Odenwald – GERMANY, 13. North Pennines AONB – UK, 14. Park Naturel Régional du Luberon – FRANCE, 15. North West Highlands – UK, 16. Geopark Swabian Albs – GERMANY, 17. Harz Braunschweiger Land Ostfalen– GERMANY, 18. Hateg Country Dinosaurs Geopark – ROMANIA, 19. Beigua Geopark – ITALY, 20. Fforest Fawr Geopark – UK, 21. Bohemian Paradise Geopark – CZECH REPUBLIC, 22. Cabo de Gata – Nijar Natural Park – SPAIN, 23. Naturtejo Geopark – PORTUGAL, 24. Sierras Subbeticas Natural Park – SPAIN, 25. Sobrarbe Geopark – SPAIN, 26. Gea Norvegica Geopark – NORWAY, 27. Sardenia Geominerario Park – ITALY, 28. Papuk Geopark – CROATIA, 29. Lochaber Geopark – UK, 30. English Riviera Geopark - UK, 31. Adamello-Brenda Geopark – ITALY, 32. Geo Mon Geopark – UK, 33. Arouca Geopark - PORTUGAL, 34. Shetland Geopark –UK 35. Helmos Vouraikos Geopark – GREECE.

Geopark educational activities focus on young people, aiming at the promotion of a common European geological heritage as a key factor for environmental understanding and sensitisation on nature protection. The main target group for Geoparks are schoolchildren and university students. Ages range from 4 years upwards to university level and the interpretation and information material produced is tailored to the needs of each age group.

To achieve all of the above a European Geopark must be managed by a clearly defined structure, organised according to the national legislation of each country and with the ability to enforce the protection, enhancement and sustainable development policies within its territory. Through this management body, a European Geopark can play an active role in the economic development of its region. To achieve this active role, the Geopark needs to reinforce the local identity through enhancement of a strong image linked to the geological heritage and the development of geotourism. The Geopark must work with local enterprises to promote and support the creation of new by-products linked to the geological heritage.

One of the main goals for all European Geoparks is to improve and increase the recognition, protection, conservation and promotion of the geological and geomorphological features they contain. To achieve this, Geoparks are continuously developing, experimenting and enhancing methods for preserving our geological heritage and supporting the development of scientific research in the various disciplines of Earth Sciences (Zouros 2005, 2007 Zouros and Mc Keever 2008).

### **3. Evaluation procedure**

In order to achieve high quality standards in Geoparks operations and the services provided to visitors, the EGN has established an evaluation procedure for all new applicants for membership in the EGN. EGN membership is limited to a period of 4-years after which a revalidation procedure determines the renewal of the membership. The revalidation procedure is similar to the evaluation procedure.

The application dossier must include precise information on the following points:

- Identification of the Geopark.
- Scientific description.
- Arguments justifying nomination as a European Geopark.
- Overall economic situation of the zone.
- Sustainable development policy instituted and importance of geotourism in this context.
- Official application for nomination signed by the competent authority.

All applicants need to provide evidence that their operation respects the provisions of the EGN Charter. According to the EGN Charter “the sites in European Geopark must be linked in a network and benefit from protection and management measures. The European Geopark must be managed by a clearly defined structure able to enforce protection, enhancement and sustainable development policies within its territory. No loss or destruction, directly or via sale, of the geological values of a European Geopark may be tolerated.” (EGN 2009).

The application is followed by the assessment document in the form of a questionnaire which refers to the main elements of Geopark operation. Submitted nominations need to be checked to ensure that all information as per EGN guidelines has been included and reviewed. Then IUGS carries out a desk top evaluation on the value of the geological heritage. Nominations are discussed at the spring meeting of the EGN and calls for evaluation missions are issued at this stage.

Evaluation missions are undertaken by two Geopark experts who are sent to the applicant territory to evaluate the application and to discuss the application with the relevant national and local authorities as well as stakeholders and local communities. Furthermore, the evaluators are also requested to make comments on the integrity and future management of the proposed Geopark. These recommendations have been, in many cases, critical to strengthening the success of applications in the long run. Evaluation missions reports are discussed and decisions made at the autumn meeting of the EGN.

Every four years the EGN membership review takes the form of a revalidation process involving the submission of a revalidation dossier and progress assessment document. An inspection visit is carried out by two evaluators from two different countries from the revalidating Geopark, nominated by the EGN CC and UNESCO.

The revalidation process involves an examination of progress in geological heritage protection and promotion within the Geopark as well as the development of sustainable economic activity within the territory. However it also takes into account the Geopark's degree of active participation in common activities with the network members (Zouros and Mc Keever 2008).

Once the revalidation process is completed, the results are discussed by the CC in the absence of the Geopark under discussion. One of three results are awarded. A "Green Card" renews the membership in the network for a further 4 years period and reflects the fact that the Geopark has been an active member of the network and has made a significant degree of progress in the areas aforementioned. A "Yellow Card" is issued if the CC determines that the results achieved by the Geopark during its four years of membership in the EGN have not been satisfactory or an issue has risen that does not permit the allocation of the green card. The CC will give the Geopark continued membership for a period of time at the discretion of the CC (e.g. up to a maximum of two years) after which a further revalidation process will be undertaken. If sufficient progress has not been made by that time, that Geopark is issued a red card. A "Red Card" is issued if the EGN CC determines that the Geopark has been inactive over the 4 year period and has done little to advance the work and philosophy of the network. A red card means that the Geopark's membership in the EGN has been revoked. Any Geopark that loses its membership in the EGN automatically loses its membership in the UNESCO Global Geoparks Network. Any Geopark that loses its membership in the EGN has the right to re-apply for membership in the normal manner.

## 4. Assessment Methodology

### 4.1 General

A quantitative assessment methodology is performed to assign a numerical value to the main elements in the operation of a Geopark. This evaluation process includes the assessment of five criteria with different weighting. Each criterion includes a series of indicators. The incorporation of each of the above elements in the evaluation process was performed by assigning a numerical value for each indicator.

	<i>Criteria</i>	<i>DWeighting (%)</i>
I.	Geology and Landscape	
	I.1.Territory	5
	I.2. Geoconservation	20
	I.3. Natural and Cultural Heritage	10
II.	Management Structure	25
III.	Interpretation and Environmental Education	15
IV.	Geotourism	15
V.	Sustainable Regional Economic Development	10
Total		100

Criterion 1: Besides the description of the geology and landscape, the description of the natural resources and the cultural heritage of the area is also required, thereby introducing a holistic approach to the Geopark's territorial management. It is divided into three sub-criteria:

- I.1. Description of territorial geological resources, which is based on the following indicators a. the number of geosites, b. geodiversity, c. public interpretation of the Geopark's sites of interest, d. comparison to the geology of existing Geoparks.
- I.2. Protection and conservation of earth heritage sites, which is based on the following indicators: a. inventory and significance of geosites, b. strategy and legislation to protect geological sites and features, c. geosite protection against misuse and damage, d. measures to protect geosites and infrastructure against damage and natural degradation.
- I.3. Recognition of the territorial natural and cultural heritage, which is based on the following indicators: a natural value (aesthetic, biodiversity), b. cultural heritage, c. relation between natural resources and cultural heritage.

Criterion 2: The management structure describes the potential of the managing body to apply its strategy in the territory. The assessment of the management body is based on the following indicators: a. effective organization and budget, b. Management plan, c. Action plan, d. marketing strategy, e. adequate staff, f. monitoring of earth heritage protection and geotourism development, g. scientific support, h. interpretation infrastructure.

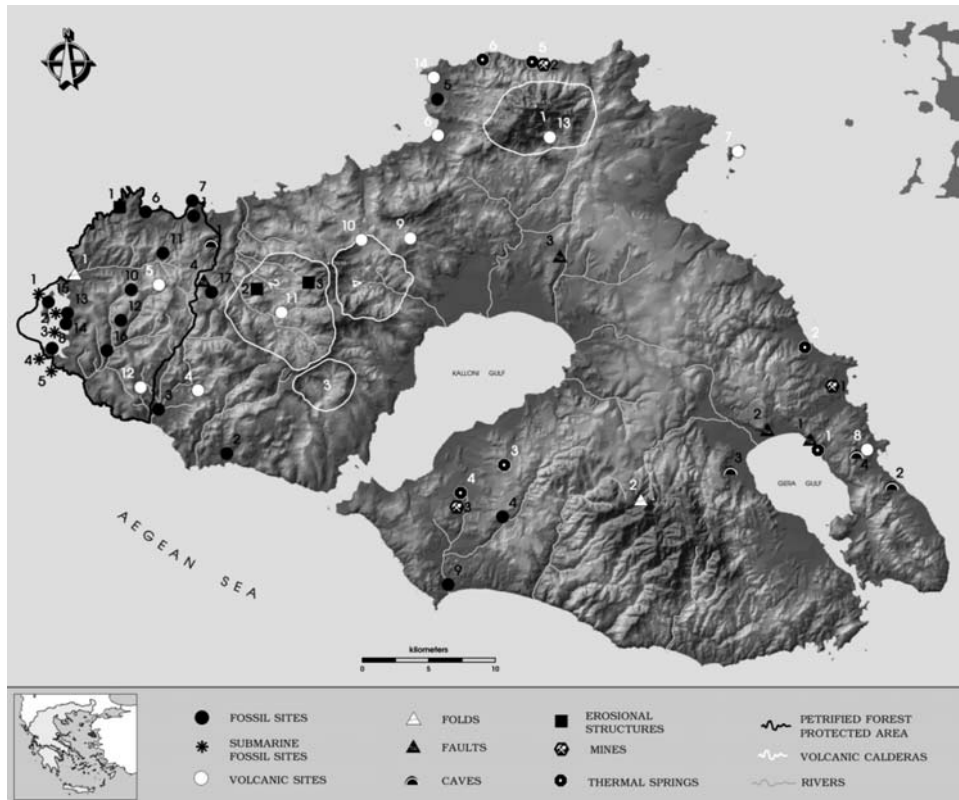
Criterion 3: Interpretation and Environmental Education describe the activities related to the presentation of the natural and cultural characteristics of each Geopark to the general public and raising public awareness, and especially among young students, of the need for the protection and preservation of Europe's natural heritage through guided tours and educational activities in Geoparks. The assessment of the third criterion is based on the following indicators: a. research, information and education scientific activity within the territory, b. environmental education programmes, c. educational materials, d. published information, e. professional marketing, f. material in different languages, g. guided tours, h. vocational training of guides – rangers, i. marketing educational activities, j. media - press – internet.

Criterion 4: Geotourism refers to the existing infrastructure and activities dedicated to public access and interpretation of the Earth heritage for the general public. The assessment of the fourth criterion is based on the following indicators: a. geotourism attractions and visitors centers, b. quality of interpretation for the public, c. public access and facilities, d. guided tours, e. visitor information, f. infrastructure for adventure sports, g. trails, h. visitors' evaluation.

Criterion 5: Sustainable Regional Economic Development refers to the existing links with local enterprises and the contribution of the Geopark to employment and local development. The assessment of the fifth criterion is based on the following indicators: a. regional food and craft product promotion, b. creation and promotion of regional geotourism products, c. promotion of links between the Geopark and local businesses, d. contracts offered to local business, e. networking with local enterprises.

#### **4.2 The Lesvos Petrified Forest Geopark assessment analysis**

The above mentioned assessment methodology has been used to evaluate the operation of the Lesvos Petrified Forest Geopark. The self-evaluation of the management structure and its functionality measured the response of the Lesvos Geopark operation, activities and services to the proposed criteria. A detailed analysis of the scientific, economic and social data was used to examine thoroughly and diachronically all aspects of the management of the Lesvos Geopark as a means for further improvement. There was a complete documentation of the points given, which led to an objective as



**Fig. 2:** Geosites on Lesvos Island.

FOSSIL SITES : 1:Koukla fs ; 2 :Tavari fs ; 3 :Eressos fs ; 4 Rougada f.s.; 5 : Molyvos-Petra f.s.; 6 : Lapsarna f.s.; 7 : Gavathas f.s.; 8 : Sarakina f.s.; 9 : Vatera f.s.; 10 : Akrohiras f.s.; 11 : Mavros Lofos f.s.; 12 :Petrified Forest park; 13: Sigri park; 14: Plaka park; 15: Nissiopi park; 16 : Chamandroula f.s.; 17 :Skaminiouda f.s. SUBMARINE FOSSIL SITES : 1. Nissiopi f.s. ; 2. Ag Georgios f.s. ; 3. Fanes f.s. ; 4. Sarakina west f.s. 5. Sarakina east f.s. VOLCANIC : 1: Lepetymnos Caldera; 2: Vatoussa Caldera; 3: Agra Caldera; 4.Anemotia Caldera ; 5. Ipsilou Dome; 6. Petra Volcanic Neck ; 7: Panagia Columnar Lavas; 8: Alifada Vein; 9: Filia Vein; 10: Anemotia Columnar Lavas; 11: Hidira domes ; 12:Eressos Dome; 13: Pelopi Columnar Lavas; 8: Molyvos Columnar Lavas; FOLDS: 1: Phaneromeni Folds; 2: Olympos Tectonic Window; FAULTS: 1: Gera Gulf Fault; 2: Larsos Fault; 3: Agia Paraskevi Fault; 4. Antissa fault. CAVES: 1Antissa Cave; 2: Taxiathon Cave; 3: Mihos Cave; 4: Alifada Cave. EROSIONAL STRUCTURES: 1: Lapsarna Cliffs; 2: Vatoussa Spheroidal Erosional landforms; 3: Voulgaris Gorge. MINES: 1: Moria Ancient Quarry; 2: N.Lesvos Mines; 3: Magnesite Mines. THERMAL SPRINGS : 1: Gera hot springs; 2: Thermi hot springs; 3: Lisvori hot springs; 4: Polichnitos hot springs; 5: Argenos hot springs; 6: Eftalou hot springs;

possible assessment. The criteria on which the assessment was based were the following.

I. Geology and Landscape: The Lesvos Petrified Forest Geopark includes a core zone (15,000 hectares of the Petrified Forest protected area) and a broad buffer zone (more than 20,000 hectares of the central volcanic terrain). The Petrified Forest, which includes large accumulations of exposed fossilised tree trunks, is a protected natural monument (Presidential Decree 433/1985). The area of the Petrified Forest also belongs to the NATURA 2000 network of protected sites due to its exceptional natural characteristics (fossils, flora and fauna). Based on the results of scientific research, a large number of geosites were identified, assessed, and mapped and a new geosite map of Lesvos was published.

Geosites within the Lesvos Petrified Forest Geopark, apart from the fossil sites, include volcanic geosites, stratigraphic geosites, tectonic geosites - active fault scarps, geothermal fields, karstic geosites and caves, erosional geosites (tafoni) and coastal and fluvial landforms (Zouros 2005). Important cultural monuments lying within the Geopark such as the ancient acropolis of Eressos, the Ipsilou monastery and the Sigri castle are directly related to volcanic geosites. The Lesvos Petrified Forest Geopark applies certain measures for the protection and conservation of the inventory of geosites present in the territory.

II. The management structure: The Lesvos Petrified Forest Geopark is managed by the Natural History Museum of the Lesvos Petrified Forest. The Museum is a legal non-profit entity that belongs to the Greek state and is supervised by the Minister of Culture (N. 2260/1994). The aims of the Museum are the study, research, promotion, exhibition, maintenance, protection and any suitable usage of the Petrified Forest of Lesvos.

The Natural History Museum of the Lesvos Petrified Forest as management body is responsible for the operation and the development of the Geopark. It is well staffed; besides the director, the staff consists of 15 permanent and 25 temporary scientific and technical staff and rangers. Major decisions are allocated to the Board. Its members represent organisations and institutions which are important for the Geopark (such as the different levels of government and different scientific disciplines). Chaired by a president, the Board decides on main strategic issues and projects which are proposed by the Director of the Geopark.

III. Information and Education activities: The Geopark has produced a series of informative scientific and popular publications for visitors such as coffee-table books, field guides, magazines, conference proceedings, brochures, leaflets, posters etc.

Educational activities in the Lesvos Geopark support the development of educational geo-tourism. Environmental education programmes organized for elementary and high school students at the Petrified Forest cover a broad range of activities such as geosite recognition, fossil excavation and conservation, nature observation, bird-watching etc. School visits are organized during spring and autumn, outside the main tourist period, thus contributing to the local economy.

IV. Geotourism: The Lesvos Petrified Forest Geopark has developed a range of tourist infrastructures to serve its visitors. The Natural History Museum of the Lesvos Petrified Forest in Sigri village is at the core of these infrastructures. This state-of-the-art museum has become a key factor in attracting visitors to this part of the island. Within the Petrified Forest's protected area, the main fossil sites are fenced and safeguarded, and five visiting parks have been established, attracting thousands of visitors each year. These include the Petrified Forest Park, the Sigri Park, the Plaka Park, the Nisiopi Park and the Skamiouda Park. Several other areas will become visiting parks during the next years, as the Museum has already begun the necessary procedures. Another main infrastructure is the "Lava Paths" that lead visitors down the ancient paths of the pyroclastic flows from the main volcanoes to the Petrified Forest, equipped with information panels that explain the various geosites. A broad range of activities accomplish the task of attracting and informing visitors. Lectures and multimedia presentations at the Museum, guided tours in the Petrified Forest parks, thematic guided walks, guided trekking and various recreation activities in the vicinity of geosites help raise public awareness about the value of geosites.

V. Sustainable development: The Geopark has created links with local tourist enterprises, restaurants and small hotels in order to provide the necessary infrastructure to meet the needs of the



increasing number of park visitors. In the Geopark, the number of “Bed and Breakfast” accommodations has doubled over the last few years in order to meet the increasing demand. More importantly, visitors have increased the duration of their visit to the Geopark area. As a result the majority of the new enterprises established in western Lesvos are connected with the activities of the Lesvos Geopark. The Geopark also supports the making of local handicrafts such as the production of fossil casts and souvenirs by local enterprises. These items are on sale in the Museum shop along with a variety of other locally made products. Lesvos has a long tradition in pottery and wood carving and the Geopark promotes these products to its visitors. The Lesvos Geopark also collaborates closely with women’s agrotouristic cooperatives and local organic food producers to offer its visitors the opportunity to taste and buy local food products (pasta, organic olive oil, wine, ouzo, liquors, traditional sweets and marmalades etc). The catering for all Geopark events (conferences, meetings etc.) is supplied by the women’s cooperatives which use local traditional recipes. Their products are also sold in the Museum snack-bar. Every summer the Geopark organizes an Agrotouristic festival (attended by 29.000 visitors in 2009), which promotes quality local products, food and drinks prepared by the women’s cooperatives.

Geopark activities are being monitored by an internal evaluation procedure based on the EGN assessment methodology. The results in the different sections of activities of the Lesvos Petrified Forest Geopark are being reported on a regular basis by their supervisors to the director who reports them to the Board. All of the above has led to the conclusion that the continuous monitoring and assessment of the Lesvos Petrified Forest Geopark has led to its effective operation and activities.

The external evaluation conducted in 2007 by two Geopark experts nominated by UNESCO and EGN concluded that the management of the Geopark has a clear and transparent structure and functions very efficiently towards achieving the aims of the Geopark. The high score and the excellent comments by the evaluators that accompanied the report, as well the tangible results of continuous improvements during the last 15 years, are indicators that the management structure of the Lesvos Petrified Forest could work as an example also for other Geoparks in Greece or abroad.

### **4.3 The Lesvos Geopark results**

Apart from the EGN assessment methodology, the Lesvos Petrified Forest Geopark has been evaluated by two independent assessment procedures that tested the quality of the Geopark’s operation in the fields of nature protection, conservation and sustainable development.

The Lesvos Geopark operation results in the field of sustainable tourism were recognized by SKAL International, the largest organization of travel and tourism professionals in the world. To encourage the conservation of the environment and to help promote the development of responsible and sustainable tourism, Skål International initiated an awards program in 2002. While the purpose of these awards was to highlight best practices in ecotourism around the world, they were also created with the aim of acquainting the world with this new concept that puts emphasis on the importance of the interaction of the physical, cultural and social environment, the traveler’s responsibility and the need for active community participation for ecotourism. In 2008 53 entries were received. The applications were evaluated by three independent judges and the scores, given by each separately, were added up to find the winners. The primary criteria for the evaluation was based on points such as contribution to the conservation of nature and cultural heritage, community involvement, educational features, business viability and innovation. The Lesvos Geopark won the SKAL International Ecotourism Award 2008 in the category “general countryside” as the

best ecotourism destination.

Due to the quality of its operations and services, Lesvos and the Petrified Forest were awarded by the European Commission as European Tourist Destination of Excellence.2009. The theme of the EDEN competition for 2009 was "Tourism and Protected Areas". The participating European countries had to choose a destination that respects several general award criteria such as being "non traditional", being based on an area that is part of the Natura 2000 Network or otherwise designated as a "protected area" by national or regional legislation and managing its own tourism offer in such a way as to ensure its social, cultural and environmental sustainability, with the management being a partnership between the authorities responsible for the protected area and all those involved in tourism in and around the area (e.g. tourist service providers, local communities). Both awards guarantee the quality of the Lesvos Geopark's operation and services, thus providing an independent confirmation of the EGN assessment methodology.

## 5. Conclusions

Geopark management requires a solid, efficient, flexible and as autonomous as possible management structure that will be able to decide on the protection, promotion, economic development and progress of the Geopark. Careful long term planning, continuous monitoring and regular evaluation are essential factors for successful results.

Among the 35 members of the European Geoparks Network, several different models of management can be found, depending on the country, the area, the organization in charge etc. Most of those models are very effective and demonstrate excellent results.

The assessment methodology adapted by the European Geoparks Network members provides an excellent tool for setting the general guidelines for successful management. The assessment review of Geoparks is now well underway, and represents a mechanism for encouraging the continuing assessment and upgrading of individual Geoparks. It is notable that many Geoparks are taking advantage of the periodic assessment to try to improve their weak points indicated by the review process. More important perhaps is the fact that some of the delisted Geoparks have returned some years later to present extremely powerful new membership applications.

With the Natural History Museum of the Lesvos Petrified Forest as its management body, the Lesvos Petrified Forest European and Global Geopark can provide an excellent example of how to successfully manage a Geopark and could function as a model for the management structures of potential Geoparks. The assessment methodology developed within the European Geoparks Network has proven to be a useful and excellent tool for monitoring the progress of the Geopark.

## 6. References

- EGN (2009). European Geoparks Magazine No 7. p. 36. Available online at: <http://www.europeangeoparks.org>
- Mc Keever P. and Zouros N. (2005) Geoparks: Celebrating earth heritage, sustaining local communities. *Episodes* vol. 28, No 4, p. 274-278.
- Mac Keever P., Zouros N., Patzak M. (2009) Global Network of National Geoparks. *World Heritage* No 52, 54
- Martini G. (Ed.) (1993) – *Actes du premier symposium international sur la protection au patrimoine géologique* [Proceedings of the First Symposium on Earth Heritage Conservation], Digne, France, 11–

16 June 1991. *Mémoires de la Société géologique de France, numéro spécial* 165, 276 p.

- UNESCO (2008) – Guidelines and Criteria for National Geoparks seeking UNESCO’s assistance to join the Global Geoparks Network, Paris, June 2008. Internal document, 10 p. Available online at: <http://www.unesco.org>
- Zouros N. (2004) – The European Geoparks Network. Geological heritage protection and local development. *Episodes*, 27/3, 165–171.
- Zouros N. (2005) – Assessment, protection and promotion of geomorphological and geological sites in the Aegean area, Greece. *Géomorphologie: relief, processus, environnement*, no 3, 227-234.
- Zouros N. (2007) – Geomorphosite assessment and management in protected areas of Greece. Case study of the Lesvos island coastal geomorphosites. *Geographica Helvetica*, Jg.62, Heft 3/2007, 169-180.
- Zouros N. Martini G. Frey M.L. (2003). *Proceedings of the 2<sup>nd</sup> European Geoparks Network Meeting*, Lesvos 3-7 October 2001, p. 184.
- Zouros N. and Mc Keever P. (2008) European Geoparks: Tools for Earth heritage protection and sustainable local development. in N. Zouros (ed) *European Geoparks, Lesvos Greece*, ISBN 9789607646910 p. 15-30.