## **ENVIRONMENTAL EDUCATION AND LANDSCAPE LEISURE.** GEOTOURIST MAP AND GEOMORPHOSITES IN THE PICOS DE EUROPA NATIONAL PARK

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Abstract: Picos de Europa National Park is the oldest and most extensive National Park in Spain, a symbol of conservationism and management of Iberian nature. The present day use is defined by abandoned ancient traditional structures, summer livestock and mainly tourism in and around the National Park, and over the last forty years the visitors of the National Park has grown until 2 million per year. The context of the map it framed in the next questions, which places are most frequented by visitors?, what places are the most interesting to visitors?, what are visitors looking for?, and who visits the National park? The main type of visitors are mountaineers (1,5%), hikers (5), active tourists (10%), recreational tourists (66%) and students (16%). Hikers and active tourist represent the 18% of visitors to the National Park, over 120,000 visitors per year. They are, joint the monitors and teachers guiding students groups, the main objective of documents and geotouristic maps. The map has five levels of reading (planimetry, altimetry, geomorphology, human uses and tourist routes), the elements are represented by areas, patterns and symbols in colours, and the selected significant elements represent the topography, geomorphological features (glacial, karst, nivation, landslide) and human remains (mining, grazing) and routes between geomorphosites and more representative scenic view points. The interpretative geotouristic maps are useful tools to develop an approach to tourist activity and for interpret nature and landscapes from direct knowledge of the field but also they are a powerful tool for environmental education in National Parks and Natural Protected Areas.

Key words: Geotourist maps, Environmental education, Natural Protected Areas, Geomorphosites, Picos de Europa

### **INTRODUCTION**

Nowadays, Mountain Natural Protected Areas receive a wide range of visitors, from tourists, hikers, mountaineers to birdwatchers. All enter the mountains by paths or tracks to reach huts, scenic views, summits or walls with different aims, sport, relaxation or

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adventure. Most admire and enjoy the landscape without understanding the elements or the landscape itself. Active tourism, involving visiting mountains, engaging in sports, exploring nature or viewing the landscape, is the main economic activity in and around these Natural Protected Areas. Such activities in Natural Protected Areas (N.P.A.) are referred to as Geotourism. When people walk, hike or climb mountains in N.P.A.s, the landscape and geofeatures are considered as important elements to enjoy, aesthetic views, the broader landscape, steep faces or paths crossing gorges, slopes or crests. Geotourism contents are an important component of the open-air activities in nature, just as are knowledge of artistic style or historical framework in visiting cathedrals, castles or art museums in Cultural tourism. Basic research and practical applications can help the individual to connect with, enjoy and conserve cultural and natural values of Natural Protected Areas and to help maintain and develop local communities by means of geoconservation and geotourism initiatives (Dowling and Newsome 2010; Farsani et al., 2011). Many countries currently follow an active strategy with laws, socio-economic or protective plans in which geodiversity action plans, such as those of the UK, the geopark networks, in Europe currently made up of 36 geoparks with development and tourist plans (Zouros and Mckeever, 2009), Australia and others, have a relevant role in the ways described. But in the same sense work must be done on Natural Protected Areas, and especially on National Parks, in which landscape and abiotic values have become very important factors for conservation measures over the last hundred years or so. Different tools and initiatives can be used in the field and among visitors in order to promote the interpretation and enjoyment of abiotic and landscape values, and making leaflets and other literature available to visitors is one of the cheapest and easiest ways of doing so.

# THE GEOTOURISM EXPERIENCE IN N.P.A.S – LEISURE, KNOW-LEDGE AND CONSERVATION

The definition of Geotourism includes the interactive interpretation of abiotic characteristics of a site or landscape. This mainly includes the abiotic feature related to the organization of the landscape, but the human uses related to the exploitation of mineral resources, the alteration of geoheritage and the genesis of anthropic landforms must also be considered. Geotourism is used in two distinct senses, from the broadest context as geographical tourism or nature interpretative tourism, including natural, socioeconomic and cultural considerations (Stueve et al., 2002, National Geographic Society, 2005), to the previous and most limited definitions which merely imply the geological and geomorphologic features (Hose, 1996, 2006; Joyce, 2007; Newsome and Dowling, 2006; Dowling and Newsome, 2010), which is geological tourism. All authors in both lines point to the need to consider the landscape, historical, cultural and natural contexts, with openair activities (walking, hiking) and the visit to geoparks and geosites in each context (Gray, 2004; Farsani et al., 2011), transcending the more restricted definitions. This is the same consideration as Geomorphosites as a compendium of scenic, natural and cultural values (Panizza, 2001, Panizza and Piacente, 2003; Reynard, 2009). Thus, a broad range of subjects are implied within geotourism and interpretative activities, e.g. interpretative walks or scenic views with landscape contents in which human and natural elements are difficult to separate. The main elements involved in geotourism in mountain Natural **Protected Areas are:** 

- Geomorphology: earth surface landforms, processes and geomorphosites.

- Geology: rocks, minerals, fossils, structures, palaeontology, geosites.

- Hydrology: lakes, glaciers, rivers.

- Human use: traditional (terraces, water management), mining, cultural values.

- Landscape: natural and human features, cultural values, history.

The experience of geotourism must be based on different sources of knowledge oriented towards reaching a basic comprehension of the abiotic environment during the

stay or during activities there. Of course, the biological environment completes the understanding of landscapes and life in Natural Protected Areas, but we consider that biological features and biodiversity are the subject of priority attention by managers while abiotic features and geodiversity do not receive the same consideration in management and environmental education. The natural diversity of N.P.A.s, the sum of Biodiversity and Geodiversity, is not attended to because more attention is required for abiotic elements of natural diversity (Gray, 2004; González-Trueba, 2007a; Serrano and Ruiz, 2007; 2009). The knowledge and enjoyment of geodiversity and abiotic elements in nature, especially in National Parks, is based on three points:

- Direct contact with nature: This is the most important and main objective in geotourism and must be developed through slow procedures such as walking or hiking as far from mechanical engines as possible. This means that visitors and hosts need at least a wealth of knowledge, an adequate cultural level and an attitude towards nature, territory and geoconservation.

- Tools prior to experience: Different types of lectures to attend, or books, booklets, brochures, guidebooks or maps to consult before travelling or making visits. In this sense Interpretive Centres have an important role in introducing tourists and visitors to the nature of N.P.A.s. Interpretative Centres are now the first contact with the reading of the landscape, but when the time spent visiting interpretative Centre is too long, the true contact with nature and the experience that the geotourist seeks is delayed.

- Field tools to guide and advise the geotourist: Documents such as local guides, posters and panels are the most common tools in this field. Several experiences have been made in Europe, where a wide range of didactical and outreach tools are offered to visitors and tourists (Pereira et al., 2009). Maps and leaflets showing and explaining the location and characteristics of landscapes and abiotic features are one of the most useful tools in this respect. Maps and explanatory brochures of geosites and geomorphosites are useful to local guides, instructors and tourists, cheap and easy to transport, and report the essential qualities of the territory by the spatial representation of abiotical features. Panels are not recommended because they are too much expensive, easily broken and cause a high impact on landscape.

To interpret the various elements that make up geotourism documents and tools are needed for visitors, environmental educators and tourism workers, all of them concerned with geoconservation. Pralong (2009) has point to the necessity of didactic goods and services adapted to the different kinds of visitors, differentiating between three basic visitors: specialists; people genuinely motivated; and occasional tourists. The latter includes the majority of visitors. In mountains areas, nevertheless, the second and third types are very heterogeneous and people genuinely motivated (hikers, mountaineers, amateur naturalists) are more common than they are in other areas. Moreover, interpretative practices in the mountains need appropriate tools that allow workers and visitors to interpret the basic keys of the territory they want to know and teach.

### Geotourist maps, geomorphosite selection and presentation in NPAs

An attempt must be made in outreach and didactic documents to explain the basic abiotic keys of the territory oriented to achieving a high level in the development of leisure, culture and education in open-air activities in NPAs. Maps containing abiotic information are not a new tool in nature outreach of National Parks. Two steps should be observed in the publishing of maps and documents:

1) During the 80s and 90s of the twentieth century maps and guides with geological or glaciological information were developed and published in American and European Natural Protected Areas (e.g. USA National Parks, French and Swiss Regional and National Parks, British, German, Italian or Spanish Natural Protected Areas). But the published maps were mainly geological maps with tourist information (80s-90s)

and geological guides with a high level and content, both scientific maps and guides published about NPAs intended for scientists, managers, teachers or visitors with a very high level of interest.

2) Interest in abiotic elements and the landscape together led to the development of Interpretative Centres in Natural Protected Areas and involved the development of thematic maps and guides (palaeontological, geological, glaciological) intended for visitors and tourists, and information on geology, geomorphology, topography, trails, culture, huts and tourism was included on the same map. This is useful as a topographical guide to exploring paths and places, and as an abiotic nature guide, centred mainly on geomorphological or geological features (e.g. Smiraglia, 1995). The geotourist map was born.

Maps with abiotic and tourist information have different scales and focuses, such as road maps with symbols representing geomorphosites, palaeontological sites, panoramic and landscape views or topographical maps indicating walking routes, representing sites and drawing landforms, lithologies, structures and geosite maps. Different proposals have led to maps being drawn up with topographical and tourist information on natural elements (such as the Geotourist mapguide of the National Geographic Society), maps with tourist information only or specialised maps with simplified geological or geomorphological information (Szarvas, 2010). The Geotourist map has been defined as a map that is used to communicate with a public of non-specialist and that visualises geoscientific information as well as tourist information" (Regolini-Bissig, 2010, p.3). But maps intended for geotourists are of a very different class and have also been given different names, such as, for example, Tourist-Environmental map (Barozzini et al., 2004; Castaldini et al., 2005a), Exploring the landscape (Goodenough et al., 2004), Geomorphological-Tourist map (Angelini et al., 2004), Geotourist map (Castaldini et al., 2005b; 2009), Geological Tourist map (Sapp et al., 2006) or Geo-Hiking map (Coratza et al., 2008). All of these can be assumed to be similar to Geotourist maps, a useful and portable document intended to help understand the landscape. Nevertheless, they are very different documents. Regolini-Bissig (2010) has differentiated between five types of geotourist maps defined by scientific content: index maps, tourist maps, two types of geoscientific maps and interpretative maps. The latter is the most appropriate tool for education and recreation because the map focuses on the communication of geoscientific themes for understanding geomorphological or geological phenomena, origin and evolution, but where the tourist information is of secondary importance.

The common aims of all Geotourist maps (Castaldini et al., 2005a; 2009; Coratza and Regolini-Bissig, 2009; Regolini-Bissig, 2010) are: to help understand landscapes and abiotic elements to non-specialists and to improve knowledge of landscapes or geosites visited. Finally, the geo-tourist map replaces aggressive elements in the field (panels, posters, signs and small buildings) which are expensive to set up and conserve, and it permits the private (hikers, tourists, mountaineers) and collective (teachers, rangers, mountain and tourist guides) use of maps.

The basic principles of geotourist maps (Castaldini et al., 2005a, 2009; Carton et al., 2005; Coratza and Regolini-Bissig, 2009; Regolini-Bissig, 2010) are to emphasize only the recognizable landscape features and to be simple, clear and handy in the field. Both principles are synthesized to provide a useful map for visitors and the general public to discover and understand abiotic elements, but always maintaining scientific rigour as a document of scientific diffusion and knowledge. The map must be useful for environmental education and also to promote the enjoyment and conservation of the areas mapped with responsible use and behaviour. Geoconservation must be a key objective in the preparation of detailed geotourist maps with routes or interpretative trails.

The detailed geotouristic map of Natural Protected Areas in mountain areas includes information in two areas. First, the representation of landforms and geological elements in the general context of the protected area and detailed maps of **298** 

geomorphosites are oriented to a deeper understanding of the more interesting areas visited by hikers. Basic guidelines for geotourist map design have been proposed, including considerations for users, themes, level of information, scales, dimensionality and design (Regolini-Bissig, 2010). All of these are very useful for application to geosites or geomorphosites, but when working in wide areas, including landscapes and geomorphosites linked by pedestrian trails, other considerations must be included. These are the most common surface features among geomorphosites on different levels of information, interconnection between landforms and processes, or a general view including common features of the network of geomorphosites.

The second area is in information for hikers: trails linking geomorphosites, hut sites, springs or features with natural and cultural values (mines, historical routes). Tourist information is a secondary goal of the map and these must be expressed in simplified form.

Geotourist maps are a cultural tool designed to encourage visitors to understand landscape abiotic elements and to improve the social value of Natural Parks. Trails are proposed and features are explained as a complement to biological observation (mammals, birds, trees or forests) by itineraries and sightseeing to representative geomorphosites. The map guides hikers by previously existing trails, among geomorphosites and the most representative scenic viewing points.

# A GEOTOURIST MAP FOR THE EASTERN MASSIF OF THE PICOS DE EUROPA NATIONAL PARK (SPAIN)

The Picos de Europa is a calcareous high mountain massif characterised by karstic and glacial features, divided in three main massifs, Central, higher (2648 m), Western and Eastern (figure 1).



Figure 1. Location map and limits of the Picos de Europa National Park

The domain of successive thrust faults of north dip involves a hard morphological dissymmetry. Wall and escarpments are dominant on the south side while less abrupt

relief is found to the north, where Quaternary glaciers have been more important and glacial landforms are dominant (González Trueba, 2007a; 2007b). The Picos de Europa National Park receives over 2 million visitors per year (table 1), although only a reduced number goes to the forest and the high mountain.

Data Source: On 11, On 11 OK, ASTON					
<b>Declaration Date:</b>			1995	64.660 Has	
		First declarati	on: 1918	10.000 Has	
Visitors per year 2009	1,858,671				
Provinces:	Astı	ırias	Cantabria	León	
Main Gates	Cabrales	Covadonga Lakes	Fuente De	Valdeón	
Nº Visitors (2009)	319.368	717.475	676.535	112.292	
% visitors (2009)	17.1%	39.5%	37.2%	6.2%	
% Visitors by mechanical	Funicular	Bus: 14%	Cable Car: 44%		
engine (2009)	Railway: 3,5%				

Table 1. Picos de Europa National Park (43°5'- 43°15' N; 4°35- 5°5' W)Data source: OAPN, CANTUR, ASTUR

The Picos de Europa is a Atlantic mountain range in which annual precipitation as snow and rain surpasses 2500 mm/yr. It is a holokarst and nivokarst environment where the deepest caves in Europe are located. The glacial features (glacial cirques, glaciokarstic depressions, troughs and moraines from the Pleistocene age to the Little Ice Age) and icepatch remains from the Little Ice Age characterize the high mountain environments. It is a Glacio-karstic landscape.

A small area of the present day National Park was declared in 1918. It is the oldest National Park in Spain, an important milestone in conservationism in Spain. The reason behind the original declaration was the landscape, religious and historical values, centred on lakes and peaks, the religious and the patriotic significance of the Covadonga area. In 1995 the National Park was extended from 10,000 Ha to 64,660 Ha, including the Central and Eastern massifs. It is the most extensive National Park in Spain, a symbol of conservationism and management of Iberian nature. The present day human landscape is defined by abandoned ancient traditional structures, summer livestock and mainly tourism in and around the National Park.

Over the last forty years the national park has grown slowly in number of visitors, with low periods (1997/98; 2001/2002; 2005/2008) and increases, visits oscillating between 1,5 and 2 million per year (figure 2).



Figure 2. Number of visitors to the Picos de Europa National Park

The context of the map it is very important for its design. We need to know the potential users and interesting features for the interpretation of landscape and landforms.

For the study and selection of routes and geomorphosites represented on the map we have formulated several questions on Geomorphosites assessment

- Which places are most frequented by visitors (figure 3)? We must know the gates, itineraries and places and landscapes of interest to visitors, and frequentation of places and trails. Figure 4 shows the most frequented areas and itineraries.



Figure 3. Most frequented places and gates to access to the National Park.

- What places are the most interesting to visitors? (figure 4). Includes types and activities of visitors.



Figure 4. Geomorphosites and places of interest to visitors

- What are visitors looking for? The general idea of the map and leaflets is not to attract visitors to geomorphosites, but so that visitors can understand the landscape where they are located. The map explains the places where visitors walk or landscapes where they perform activities as well as the geomorphosites located on the trails and itineraries. In the Picos de Europa National Park 46 geomorphosites have been selected, although only 22 are located in the most visited areas. From these the most interesting geomorphosites must be selected according to their added and use value, and not their scientific value. Geomorphosites of high scientific value or high sensibility, such as caves for example, are not featured on the maps and leaflets because they must be devoted to the conservation. Others, with high use values, include explanations of the main abiotic characteristics of the landscape. The geomorphosites are located in the Eastern massif (González-Trueba and Serrano, 2010).

- Who visits the National park? We are interested in what kind of visitor is to be found walking or hiking along National Park trails. This is an important factor in the aims of the geotourist map. Pralong (2009) pointed to the need to produce didactic goods and services for each different target group, and differentiated between specialists, visitors genuinely motivated and occasional visitors. Each target group has a differential demand for activities and documents oriented to his level of interest, preferences or the activity developed in the natural sites. According to their main reason for visiting the Picos de Europa National Park, the General Secretariat of Tourism has established five kinds of visitor:

1) Mountaineers: They move within the massif in search of walls or the highest summits to climb. They represent  $\sim 13,500$  mountaineers per year, 1.5% of visitors to the National Park. It is a small number, but they are often interested in landscape and abiotic values (rocks, minerals, landforms or processes).

2) Hikers: They spend time observing nature (bird, flora, forest, landscape, landforms), and combine sport and knowledge of the environment in the National Park and its surroundings, thus raising the tourist experience. They represent  $\sim 40,500$ tourists per year moving mainly in the high and medium mountain, but not inside and on the top of massifs. They make up 5% of visitors to the National Park, a relatively small number, but they are important for geotourism activities because they are motivated visitors interested in natural, cultural and heritage values.

3) Active Tourists: Their main activities are related to cultural and historical values, but they are sensitive to the landscape and nature of the Picos de Europa and surroundings. They include several types of geotourism, such as ecotourism and casual nature tourists. There are  $\sim 81,000$  active tourists per year, representing 10% of visitors to the National park.

4) Recreational tourists seek leisure and recreation in a natural environment, looking for excitement, aesthetic landscapes, sightseeing and new places to visit. They only need new places or excitement for a short time, arriving by road, funicular railway or cable car with short walks to admire the landscape and visiting the places where there are tourist products and services. Lakes (Covadonga), villages (Covadonga, Bulnes) or viewpoints (Fuente De) are the most frequented places in the National Park for this type of tourist. There are 540,000 of such tourists per year, 66% of the visitors to the National Park. It is a important number for the tourism industry in the villages in and around the National Park, with gastronomy, rural markets and parties, farming, health (spas) and cultural or artistic visits (middle ages monasteries and churches, rural palaces, and so on). They are not potential users of geotouristic documents, maps included.

5) Students: Study trips and environmental education are important activities in the National Park with a strong tradition of visitors from UK together with those of different Spanish regions. They study fauna and flora, but also geography and geology at several educational levels, from primary studies to university. Visits of students in groups 302

reach ~ 135,000 per year, 16% of total visitors. It is a considerable number and because they are guided by teachers and monitors they need documents for abiotic nature, Geotourist maps and Geomorphosites.

Recreational tourists are the main economic activity in and around the national park and the local government strives to get tourist to spend over several hours or whole days in the National park. These initiatives must be made together with others that support the individual and collective experience, knowledge of nature and mainly conservation. Educational support is the best way, and appropriate documents may be prepared with this aim in mind. Hikers and mountaineers practise their activities in the National Park and support is needed for the knowledge of natural and cultural environments where activities take place. Active tourists are the target of geoconservation and environmental education, joint guides, monitors and teachers, and interpretative documents such as geotourist maps are most useful. The National Park must work on conservation and improvement of the ecosystem and landscape, including geodiversity, in the places where these activities are practised and develop educational activities with young people and adults. This is the best target for working with interpretative documents as geotourist maps. Tourist types 2 and 3 represent only 18% of visitors to the National park, but come to over 120,000 visitors per year. They move inside the National Park and are the main potential users of geotourist maps, in which education and knowledge are more effective.

### THE MAP: METHODOLOGY.

The methodology to draw up the map is based on the selection of key elements from a prior geological and geomorphological map, the simplification of reading levels and the spatial representation of significant elements, according to the usual geotourist maps (Castaldini et al., 2005, 2009; Coratza and Regolini-Bissig, 2009; Regolini-Bissig, 2010). Appropriate pathways to interpret relief as a key aspect of the landscape of high mountains are included in the map.



#### MANCONDIÚ PEAK ROUTE:

Itinerary: Jito de Escarandi – Canal de la Jazuca – Muro del Mancondiú – Pica del Mancondiú (2.000 m) – Canal de la Jazuca – Jito de Escarandi.

Time: 1/2 to 1 day.

Altitude difference: 675 m.

**Difficulty**: mediun. moderate altitude difference, good ways (except in the final part).

**Start Point:** Jito de Escarandi (1.322 m).

**End Point:** Jito de Escarandi (1.322 m).

Figure 5. Example of an Interpretative detailed map of the Macondiú Peak and itinerary

The proposed map in the Picos de Europa is a 1:25,000 scale map representing the topography, geomorphological features (glacial, karst, nivation, landslide) and human

remains (mining, grazing), the most significant for shaping the high mountain landscape. The map has five levels of reading (planimetry, altimetry, geomorphology, human uses and tourist routes) and the elements are represented by areas, patterns and symbols in colours. The map contains routes that allow the interpretation of all key elements and is accompanied by a location map, a geological sketch and a brief text describing the pathways. The map includes:

- Abiotic features: Geomorphological and geological information including landforms and geological elements in context, and must be complemented with detailed maps and figures of geomorphosites (figures 5, 6 and 7), the more interesting areas visited by hikers, students and active tourists.

- Hiker and tourist information: The map contains information on trails linking geomorphosites, hut sites, springs, cultural and natural features (mines, historical routes) (figures 5 and 6).



Figure 6. Example of an interpretative detailed map of the Acero Peak area. Itinerary in red.

Once the best places of geomorphological values have been selected, we make the assessment of geosites (González Trueba and Serrano, 2010) to make the geotourist map and geomorphosite explanations on the map or in the leaflets. On the exposed methological framework (figure 8) we have work only on Geomorphosites inventory in this work because geomorphosites and geomorphological landscapes are the most expressive and useful tools for education and leisure in mountain areas. The **304** 

geomorphosite assessment can be made using different methodologies applied at several places in Europe (Pralong, 2005; Reynard, 2004; 2009; Serrano and González Trueba, 2005; Bruschi and Cendrero, 2005), but when applied to geotourism it is more important to consider mainly the added and use values (Pralong, 2005) rather than scientific values (figure 8).



Figure 7. Mining features (orange) and morphology in the Ándara area



Figure 8. Methodological framework for geotourist map making

Following the method applied in the Picos de Europa (Serrano and González Trueba, 2005; González Trueba, 2007; González Trueba and Serrano, 2010) we have focussed efforts on the added and use value contents on the assessment card. In this case

the educational (educational resources and educational levels) and tourist (real tourist content and potential tourist content) added values have special importance together with use values such as accessibility, fragility, vulnerability, risk of degradation and state of conservation and limits of acceptable change (Serrano and González Trueba, 2005). The map attempts to show the basic characteristics of geomorphosites by interpretative documents of landscapes and panoramic points; places of interest for landscape and landform systems interpretation, such as morphostructural (figure 9), morainic complexes (figure 10), slopes; and sites where abiotic elements can be studied in detail, such as karst landforms, moraines, deposits or processes.



Figure 9. Morphostructural interpretative sketch of the Morra de Lechugales Group



Figure 10. Picture and interpretative sketch of Las Salgardas frontal morainic complex

The resulting document is a useful tool to develop an approach to tourist activity and for support in the field. It is aimed at local guides, monitors and tourists-hikers wanting to interpret nature from direct knowledge of the field. The geotourist map represents the context and the itineraries linking geomorphosites facilitate knowledge of details for the understanding of landscape. The map guides the hikers by already existing trails between geomorphosites and more representative scenic view points (figures 5 and 6).

### CONCLUSION

Interpretative geotourist maps can be a powerful tool for environmental education in National Parks and Natural Protected Areas, especially when made available to students and for selected targets of visitors. 20% of visitors to the Picos de Europa National Park can be considered potential users of interpretative documents, in particular the interpretative geotourist maps. This potential is high because there are over 120,000 such visitors per year, consisting of mountaineers, hikers and active tourist visitor kinds, and students.

Interpretative geotourism maps can be a useful tool for leisure and educational activities leading to abiotical nature interpretation, knowledge and leisure to not genuinely motivated visitors. It has an important function as a participating document in the valuation by visitors and local communities of abiotic elements of landscapes and geodiversity, and conservation of Natural Protected Areas as a tool for scientific outreach and geoconservation.

Finally, an effort must be made to create attractive and efficient geotourism maps in their design, interpretative and scientific outreach contents, and useful information. So, they are a very useful tool for educational and geoconservation advances.

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