Between the Enhancement of Heritage and Geotourism: Sustainable Approaches for the Regeneration of Geoparks UNESCO

PVBLICA

ReUSO 2024

Documentazione, restauro e rigenerazione sostenibile del patrimonio costruito

a cura di
Alessio Cardaci, Francesca Picchio, Antonella Versaci

ISBN: 978-88-99586-454

PVBLICA

ReUSO 2024

Documentazione, restauro e rigenerazione sostenibile del patrimonio costruito

a cura di
Alessio Cardaci, Francesca Picchio, Antonella Versaci

ISBN: 978•88•99586•454

Alessio Cardaci, Francesca Picchio, Antonella Versaci (a cura di)
Reuso 2024: Documentazione, restauro e rigenerazione sostenibile del patrimonio costruito

ISBN 978 88 99586 454
Pubblicazione Ottobre 2024

I saggi contenuti in questo volume sono stati sottoposti
a referaggio cieco (*double blind peer review*) da parte di *referee*
facenti parte di un apposito comitato scientifico.

Dipartimento di Ingegneria e Scienze Applicate
Università degli Studi di Bergamo

Dipartimento Ingegneria Civile Architettura DICAr
Università degli Studi di Pavia

Dipartimento di Ingegneria e Architettura
Università degli Studi di Enna "Kore"

PUBLICA
WWW.PUBLICAPRESS.IT

COMITATI

DIREZIONE SCIENTIFICA

Alessio Cardaci – Università degli Studi di Bergamo
Francesca Picchio – Università degli Studi di Pavia
Antonella Versaci – Università degli Studi di Enna 'Kore'

COMITATO D'ONORE

Sergio Cavalieri – Magnifico Rettore Università degli Studi di Bergamo
Elena Carnevali – Sindaco del Comune di Bergamo
Sergio Gandi – Vicesindaco del Comune di Bergamo, delegato alla Cultura e Rapporti con l'Università
Elisabetta Bani – Pro-Rettore Università degli Studi di Bergamo
Giuseppe Franchini –Direttore DISA – Università degli Studi di Bergamo
Andrea Penna – Direttore DICAr – Università degli Studi di Pavia
Francesco Castelli – Direttore DIA – Università degli Studi di Enna "Kore"
Francesca Fatta – Presidente UID – Unione Italiana Disegno
Rossella Salerno – Vicepresidente UID – Unione Italiana Disegno
Fabio Fatiguso – Presidente Ar.Tec. – Società Scientifica di Architettura Tecnica
Renata Picone – Presidente SIRA – Società Italiana per il Restauro dell'Architettura
Maurizio Caperna – Vicepresidente SIRA – Società Italiana per il Restauro dell'Architettura
Elena Svalduz – Presidente AISU – Associazione Italiana di Storia Urbana
Massimiliano Savorra – Vicepresidente AISU – Associazione Italiana di Storia Urbana
Edoardo Currà – Presidente AIPAI – Associazione Italiana per il Patrimonio Archeologico Industriale
Bernardo Naticchia - Presidente ISTeA - Italian Society Science Technology and Engineering of Architecture
Roberta Frigeni – Direttore del Museo delle Storie di Bergamo
Cristiana Iommi – Responsabile Biblioteca Civica Angelo Mai e Archivi storici
Giovanni Carlo Federico Villa – Presidente Ateneo di Scienze Lettere ed Arti
Laura Serra Perani – Vicepresidente Ateneo di Scienze Lettere ed Arti
Maria Mencaroni Zoppetti – Vicepresidente Ateneo di Scienze Lettere ed Arti
Sergio Tosato - Presidente della Fondazione Dalmine
Carolina Lussana - Vice-Presidente della Fondazione Dalmine
Mariangela Carlessi - Presidente della Fondazione 'Giusi Pesenti Calvi'

COMITATO SCIENTIFICO

Andrea Arrighetti – Università degli Studi di Siena
Marcello Balzani – Università degli Studi di Ferrara
Calogero Bellanca – Università degli Studi di Roma 'La Sapienza'
Andrea Belleri – Università degli Studi di Bergamo
Stefano Bertocci – Università degli Studi di Firenze
Daniela Besana – Università degli Studi di Pavia
Matteo Bigongiari – Università degli Studi di Firenze
Vanessa Borges Brasileiro – Universidade Federal de Minas Gerais
Maria Sole Brioschi – Università degli Studi di Bergamo
Susanna Caccia Gherardini – Università degli Studi di Firenze
Alessio Cardaci – Università degli Studi di Bergamo
Santi Cascone – Università degli Studi di Catania
Chiara Circo – Università degli Studi di Catania

Antonio Conte – Università degli Studi della Basilicata
Valentina Cristini – Universitat Politècnica de València
Fauzia Farneti – Università degli Studi di Firenze
Marinella Fossetti – Università degli Studi di Enna ‘Kore’
Emanuele Garda – Università degli Studi di Bergamo
Daniela Giretti – Università degli Studi di Bergamo
Alessandra Ghisalberti – Università degli Studi di Bergamo
Alessandro Greco – Università degli Studi di Pavia
Antonella Guida – Università degli Studi della Basilicata
Mariangela Liuzzo – Università degli Studi di Enna ‘Kore’
Nora Lombardini – Politecnico di Milano
Alessandra Marini – Università degli Studi di Bergamo
Giovanni Minutoli – Università degli Studi di Firenze
Camilla Mileto – Universitat Politècnica de València
Giulio Mirabella Roberti – Università degli Studi di Bergamo
Susana Mora Alonso-Muñoyerro – Universidad Politécnica de Madrid
Marco Morandotti – Università degli Studi di Pavia
Maurizio Oddo – Università degli Studi di Enna ‘Kore’
Luis Palmero Iglesias – Universitat Politècnica de València
Caterina Palestini – Università degli Studi “G. d’Annunzio” Chieti-Pescara
Elisabetta Palumbo – Università degli Studi di Bergamo
Sandro Parrinello – Università degli Studi di Firenze
Francesca Picchio – Università degli Studi di Pavia
Davide Prati – Università degli Studi di Bergamo
Monica Resmini – Università degli Studi di Bergamo
Marco Ricciarini – Università degli Studi di Pavia
Paolo Riva – Università degli Studi di Bergamo
Emanuele Romeo – Politecnico di Torino
Riccardo Rudiero – Politecnico di Torino
Giuseppe Ruscica – Università degli Studi di Bergamo
Massimiliano Savorra – Università degli Studi di Pavia
Barbara Scala – Università degli Studi di Brescia
Marco Tanganelli – Università degli Studi di Firenze
Ilaria Trizio – Istituto per le Tecnologie della Costruzione CNR
Silvio Van Riel – Università degli Studi di Firenze
Fernando Vegas López-Manzanares – Universitat Politècnica de València
Antonella Versaci – Università degli Studi di Enna ‘Kore’
Maria Rosaria Vitale – Università degli Studi di Catania

SEGRETERIA ORGANIZZATIVA

Pietro Azzola– Università degli Studi di Bergamo
Sara Brescia – Università degli Studi di Pavia
Gabriele Daleffe – Università degli Studi di Bergamo
Anna Dell’Amico – Università degli Studi di Pavia
Elisabetta Doria – Università degli Studi di Pavia
Luca Renato Fauzia – Università degli Studi di Enna ‘Kore’
Francesca Galasso – Università degli Studi di Pavia
Silvia La Placa – Università degli Studi di Pavia
Monica Lusoli – Università degli Studi di Firenze
Giulia Porcheddu – Università degli Studi di Pavia
Michele Russo – Università degli Studi di Enna ‘Kore’

COMITATO FONDATORE ASSOCIAZIONE ReUSO

Stefano Bertocci – Università degli Studi di Firenze
Fauzia Farneti – Università degli Studi di Firenze
Giovanni Minutoli – Università degli Studi di Firenze
Susana Mora Alonso-Muñoyerro – Universidad Politécnica de Madrid
Silvio Van Riel – Università degli Studi di Firenze

CON IL SUPPORTO DI

BERGAMO CITTÀ DEI MILLE
COMUNE DI BERGAMO

MUSEO DELLE STORIE

Biblioteca Civica A. Mai
e Archivi storici

CON IL PATROCINIO DI

unione italiana disegno

SIRA

Ar.Tec.
Società Scientifica di Architettura Tecnica

AISU

AIPAI ETS
ASSOCIAZIONE ITALIANA PER IL PATRIMONIO ARCHEOLOGICO INDUSTRIALE

ISTeA
Italian Society of science, Technology and Engineering of Architecture

Fondazione Dalmine

GIUSI PESENTI CALVI
FONDAZIONE ETS

FIEB
FONDAZIONE ISTITUTI EDUCATIVI BERGAMO

ATENEO DI SCIENZE LETTERE ARTI BERGAMO

ORDINE DEGLI INGEGNERI DELLA PROVINCIA DI BERGAMO

ANCE BERGAMO

SPONSOR

GEXCEL
GEOMATICS & EXCELLENCE

MicroGeo

INDICE

SEZIONE 2 - Restauro, riuso, fruizione, valorizzazione: teorie, orientamenti e indirizzi metodologici per la conservazione del patrimonio architettonico, archeologico, paesaggistico e delle componenti materiche e strutturali

SEZIONE 2

Restauro, riuso, fruizione, valorizzazione:
teorie, orientamenti e indirizzi metodologici per la conservazione
del patrimonio architettonico, archeologico, paesaggistico
e delle componenti materiche e strutturali

Alessio Cardaci, Francesca Picchio, Antonella Versaci (a cura di)
Reuso 2024: Documentazione, restauro e rigenerazione sostenibile del patrimonio costruito

ISBN 978 88 99586 454
Pubblicazione Ottobre 2024

XIIth ReUSO Edition
Documentation, Restoration and Reuse of Heritage
29-31 October 2024, Bergamo, Italy

TRA VALORIZZAZIONE DEL PATRIMONIO E GEOTURISMO: APPROCCI SOSTENIBILI PER LA RIGENERAZIONE DEI GEOPARKS UNESCO

BETWEEN THE ENHANCEMENT OF HERITAGE AND GEOTOURISM: SUSTAINABLE APPROACHES FOR THE REGENERATION OF GEOPARKS UNESCO

Alessandra Renzulli - Department of Structural, Geotechnical and Building Engineering, Politecnico di Torino, Turin, Italy, e-mail: alessandra.renzulli@polito.it
Luisa Lombardo - Department of Architecture, University of Palermo, Palermo, Italy, e-mail: luisa.lombardo01@unipa.it

Abstract: The research stems from the desire to understand the importance of natural and cultural heritage within the processes of enhancing and regenerating a territory, highlighting how sustainable tourism can serve as a catalyst for designing, planning, and defining intervention strategies aimed at local development. Within UNESCO heritage sites, these territorial policies are highly focused on, particularly in Geoparks. Arising from grassroots management needs, the heritage of Geoparks is not strictly associated with geological heritage but is valued according to its relationships with natural, cultural, and intangible heritage. To identify the most virtuous and effective management strategies related to tourism, an initial analysis was conducted on European UNESCO Geoparks. Five Geoparks were selected, followed by a comparative assessment with quantitative evaluations of the results obtained. The same approach was applied to understand the dynamics of Geoparks in Italy, specifically analyzing the Madonie Geopark in Sicily and the Sesia Val Grande Park in Piedmont. In comparing them with European countries, the latent potential of Italy's rural built heritage emerged. The discovery of residual quality elements could lead to the implementation of the action plan through the recovery of these architectures for tourism purposes.

Keywords: UNESCO Global Geopark, Tourism, Territorial Management Strategies, Rural Built Heritage, Sustainable Development.

1. Introduction

In a note produced for its roundtable discussion on "Regional Policy and Tourism" the Organization for Economic Co-operation and Development (OECD) highlighted the clear link between tourism and regional development. Tourism, identified as one of the world's major service and growth industries, presents several challenges for economic development and job creation at the national, regional, and local levels [1]. These challenges include supporting tourism as an instrument for territorial development with strategies for sustainable conservation, creating new forms of marketing linked to quality standards for a global market, encouraging new regions to become competitive tourist destinations, revitalizing slowing tourist areas [2], fostering cooperation between regions, and raising awareness of the social impacts of tourism. Since this document was produced in 1999, the European Geoparks Network (EGN), initiated in 2000, has addressed these challenges. European Geoparks, members of a network, actively promote tourism as a driver for economic development and job creation. The research focus is on UNESCO Global Geoparks (UGGp), areas of significant scientific, tourist, and educational importance, de-

Global Wonders: A Collage of UNESCO Geoparks Around the World, A. Renzulli, 2024 (a sinistra).

fined by sustainable area development strategies [3] benefiting from geotourism and geo-conservation. These territories were chosen not only for their valuable geological heritage but also for their fundamental role in promoting knowledge of natural, cultural, and intangible heritage. The transmission of this heritage occurs through strategies and actions aimed at sustainable development, promoting shared understanding of territorial values. By appreciating and enhancing local heritage, recognition as Geoparks stimulates communities to actively engage in the responsible management of natural resources and the creation of sustainable economic and social opportunities. The acquisition of the UNESCO title through a grassroots approach has allowed the interpretation and enhancement of the landscape system to begin on a local scale before integrating internationally. This is evident in the need to aggregate multiple landscapes or sites with common geological characteristics and future objectives, as well as in the relationships established between associations, local and territorial entities, and the community itself. Therefore, these relationships are crucial for raising awareness about territorial care and educating both locals and visitors [4]. Geoparks have developed innovative geotourism products such as time walks, field excursions, and local cultural experiences, combining leisure with education. Over the past decade, Geoparks have advanced holistic nature experiences, promoting geotourism for sustainable development. This special interest tourism, now a global phenomenon, uses unique landscape features to attract visitors, combining adventure with educational insights into geological processes. Through educational initiatives and programs, Geoparks strengthen the bond between humans and nature, raising awareness of the importance of geodiversity heritage and encouraging responsible natural resource management practices while promoting sustainable tourism. Tourism itself becomes a key to revitalization, driving the implementation of local development strategies, transmitting the human-nature connection, and serving as a vehicle for valuing natural-cultural, tangible-intangible heritage. Consequently, the investigation identified exemplary UNESCO Geoparks where territorial regeneration has been most effectively achieved through sustainable tourism.

2. Applied methodology

The analysis follows a multi-scale approach based on three levels: global, European, and Italian. The first level consists of a preliminary survey aimed at identifying the 213 UNESCO Global Geoparks [5]. The second level involved narrowing the scope of the investigation to European boundaries and was divided into four main phases: ‘selection of territories’, ‘classification by geomorphological characteristics’, ‘definition and analysis of the prevailing macro categories’, and ‘selection of case studies’. The ‘selection of territories’ phase included an initial narrowing at the European level, identifying 108 UNESCO Global Geoparks out of the 213 worldwide. Among these, five have transnational boundaries: Karawanken/Karavanke UNESCO Global Geopark between Austria and Slovenia, Schelde Delta UNESCO Global Geopark between Belgium and the Netherlands, Muskauer Faltenbogen/Łuk Mużakowa UNESCO Global Geopark between Germany and Poland, Novohrad-Nógrád UNESCO Global Geopark between Hungary and Slovakia, and Cuilcagh Lakelands UNESCO Global Geopark between Ireland and the UK. After this analysis, the ‘classification by geomorphological characteristics’ phase began, where the territories were divided according to different geomorphological natures into three general macro categories: rural, mountainous, and volcanic. The survey revealed that these categories sometimes appear in combination: rural and volcanic, mountainous and rural, and rural, mountainous, and volcanic. Considering all six macro categories, the ‘definition and analysis of the prevailing macro categories’ phase aimed to understand the percentages of territories associated with each. For greater material availability and ease of analysis, only the primary macro category of each territory was considered, and the category of transnational geoparks was excluded, as they span multiple nations with different regulatory regimes. Finally, the ‘selection of case studies’ phase was conducted on the overall total to identify which territories have implemented the most efficient policies regarding sustainable tourism as a strategy for regeneration/revitalization. The choice fell on five UNESCO Global Geoparks: Geopark Cabo de Gata in Spain, Geopark Vulkaneifel in Germany, Geopark Northwest Highlands in Scotland, Geopark Famenne-Ardenne in Belgium, and Geopark Luberon, Parc Naturel Régional in France.

The third and final level concerned the Italian context to understand whether regeneration policies related to tourism have been as strategic in Italy as abroad. Following the previous methodology, four main phases were defined. The ‘selection of territories’ phase included an initial narrowing at the national level, identifying 11 UNESCO Global Geoparks out of the 108 in Europe. After this analysis, the second phase of ‘classification by geomorphological characteristics’ began, where the territories were divided according to different geomorphological natures into three general macro categories (rural, mountainous, and volcanic) and their combined forms. In the third phase, for greater material availability and ease of analysis, only the primary macro category of each territory was considered, and the volcanic and mountainous, rural and volcanic categories were excluded as they were absent among the identified territories. Finally, for the ‘selection of case studies’, the choice fell on two UNESCO Global Geoparks (UNESCO Global Geopark Madonie in Sicily and UNESCO Global Geopark Sesia Val Grande in Piedmont) located in different regions positioned oppositely for greater differentiation. Following the identification of the seven case studies (five European and two Italian), the UNESCO Global Geoparks were first analyzed individually, and then a comparison was structured based on five interpretative categories defined by the authors: implementation of digital tourism promotion and enhancement tools, creation of tourist itineraries, marketing projects and events, functional building, structural or infrastructural works, and installations on cultural, landscape, and natural sites. The aim was to identify the intervention approaches and effective strategies promoted in the UNESCO Global Geoparks for the regeneration/revitalization of the sites. The parameters were defined on a common basis for all sites and obtained by analyzing the strengths and weaknesses that a park might have concerning the strategies adopted for regeneration. Numerical values were assigned for the evaluation on a scale from 0 to 5: 1 poor, 2 moderately poor, 3 average, 4 good, 5 excellent. Additionally, development strategies, solutions adopted, and results obtained in the post-designation period were identified. The focus was particularly on the theme of tourism, analyzing the impact of visitors, the most used types of tourism, the activities and projects that led to the configuration of itineraries and tourist-informative and technological facilities, and the recovery interventions on built structures that led to the overall enhancement of the Geopark. The intention was to understand how the Geopark relates to the theme of tourism and what solutions were implemented in different territorial contexts.

3. On the global scale

The first level of analysis was conducted on the presence of UNESCO Geoparks across the 7 continents. The quantitative investigation enabled the identification, in numerical terms, of both the nations involved and the various sites designated within them. Out of the total 48 nations and 213 worldwide sites, the highest percentage is found in Europe [6], comprising 27 nations and 108 sites. Following Europe is Asia with 10 involved nations and 84 sites, South America with 7 involved nations and 13 sites, Africa with 2 involved nations and 2 sites, North America with 1 involved nation and 5 sites, and Oceania with 1 involved nation and 1 site, concluding with Antarctica, which does not present any sites. For Russia and Turkey, in assigning sites, their locations were identified as both nations have presence in both the European and Asian territories. Further attention was directed towards Europe due to the presence of 5 transnational geoparks: the Karawanken / Karavanke UNESCO Global Geopark located between Austria and Slovenia, the Schelde Delta UNESCO Global Geopark between Belgium and the Netherlands, the Muskauer Faltenbogen / Łuk Mużakowa UNESCO Global Geopark between Germany and Poland, the Novohrad-Nógrád UNESCO Global Geopark between Hungary and Slovakia, and the Cuilcagh Lakelands UNESCO Global Geopark between Ireland and the United Kingdom of Great Britain and Northern Ireland. For counting purposes, the sites were considered as part of the total for each nation, but in the final count, they were treated as a single geopark. Therefore, 5 sites were subtracted from the calculated total of 113 European sites. An asterisk ‘*’ denotes this type (tab. 1).

4. On the European scale

Following the identification of the 213 sites related to the world heritage, with data updated to 2024, the analysis focused on the 108 European sites. [6] An initial selection was made on the overall total to understand which territories, in the post-nomination period, have implemented more effective intervention approaches, strategies, and policies concerning sustainable tourism for rejuvenation/revitalization. Given their close ties to natural and geomorphological heritage, it was necessary to begin the investigation by identifying the site in relation to one of the macro-categories it belongs to: rural, mountainous, and volcanic. However, since some Geoparks fall into an associated form among the different categories,

three additional macro-categories were initially distinguished: mixed rural and volcanic, mixed mountainous and rural, mixed rural, mountainous, and volcanic. The 108 territories are predominantly rural Geoparks with 50 territories, followed by mountainous ones with 33 territories, volcanic ones with 4 territories, mixed rural and volcanic ones with 4 territories, mixed mountainous and rural ones with 14 territories, and mixed rural, mountainous, and volcanic ones with 3 territories. However, each territory also, in its own definition, highlights the prevalence of one macro-category over the others. The coexistence of different categories underscores the awareness of the plurality and diversity of the parts of the territory with different morphologies and landscape nature. Still, for the sake of facilitating the analysis and due to greater availability of material, only the prevailing macro-categories for each territory were

UNESCO Geoparks	Europe	North America	South America	Africa	Asia	Oceania	Antarctica
47 sites					China		
17 sites	Spain						
11 sites	Italy						
10 sites					Indonesia - Japan		
9 sites	United Kingdom and Northern Ireland* - Greece - France						
8 sites	Germany*						
6 sites	Portugal		Brazil				
5 sites	Finland	Canada			Republic of Korea		
4 sites	Norway						
3 sites	Ireland* - Hungary* - Denmark - Croatia - Austria* Poland				Vietnam		
2 sites	Belgium* - Iceland - Netherlands - Romania - Slovenia*		Mexico		Malaysia - Thailand		
1 site	Cyprus - Czechia - Luxembourg - Serbia - Slovakia* - Sweden - Russian Federation		Chile - Ecuador - Nicaragua - Peru - Uruguay	Tanzania - Morocco	Türkiye - Philippines	New Zealand	
Total	27 nations 108 sites*	1 nation 5 sites	7 nations 13 sites	2 nations 2 sites	10 nations 84 sites	1 nation 1 site	0 nation and site

*The asterisk accounts for the 5 transnational geoparks, calculated in the table as two separate sites located in different countries but considered as a single site for the purpose of overall calculation.

Tab. 1 - Quantitative analysis of UNESCO Geoparks across seven continents.

considered in the selection of case studies (fig. 1). Additionally, transnational Geoparks were excluded from the selection, as they involve multiple nations with different regulatory regimes. The case studies selected for a more in-depth investigation based on the parameters identified previously are: the Cabo de Gata Geopark in Spain, belonging to the rural macro-category; the Vulkaneifel Geopark in Germany, falling under the rural and volcanic macro-category; the Northwest Highlands Geopark in Scotland, categorized as mountainous; the Famenne-Ardenne Geopark in Belgium, pertaining to the rural macro-category; and the Luberon Parc Naturel Regional Geopark in France, classified as mountainous. Therefore, the selected territories consist of 2 predominantly rural, 2 predominantly mountainous, and 1 predominantly volcanic, for better differentiation and case analysis. The analysis proceeded with a focus on the 5 individual sites, evaluating them according to some common parameters defined by the authors and obtained by analyzing the strengths and weaknesses that a park could have regarding the strategies adopted for regeneration. The identified parameters are 5: Development of digital tourism enhancement and promotion tools, Development of tourist routes, Marketing projects and events, Works of architectural, structural, or functional plant nature, Arrangements on cultural, landscape, and naturalistic sites. For each parameter, a value ranging from 0 to 5 was assigned, where 0 is considered as not evaluable, assigned when the geopark does not have sufficient data for adequate evaluation; 1 as poor, when the geopark shows serious deficiencies in management, heritage enhancement, and sustainable tourism strategies; 2 as moderately poor, when the geopark has implemented some initiatives but still has significant gaps in various management and enhancement aspects; 3 as average, the geopark demonstrates acceptable management and enhancement, with good results in some areas but with room for improvement; 4 as good, where the Geopark excels in many areas of management and heritage enhancement, showing an effective implementation of sustainable tourism strategies. 5 as excellent, when the Geopark represents a model of excellence in management, heritage enhancement, and adoption of sustainable tourism practices, achieving high-level results in all evaluated sectors. The aim was to lay the groundwork for a common qualitative comparative analysis, so that effective practices for regeneration/revitalization of territories could be objectively identified, to assess the contribution that sustainable tourism has made to the sites, and how essential the involvement and benefits for local communities have been.
For each Geopark, a brief initial description of the site, activities, and promotion strategies implemented in favor of tourism, impacts on the territory, and finally, a tabulated summary of the qualitative analysis with final scores, and the results obtained following the implementation of management policies applied and improvements to be made are reported. At the end of these examinations, a general conclusion and a comparative analysis of the overall results obtained are provided.

4.1 European case studies

Geoparks represent a model of integrated management of natural and cultural heritage, aimed at promoting sustainable tourism and stimulating local economic development. Below, we will analyze five geoparks, highlighting their main characteristics, criteria of attractiveness, available services, associations promoting geotourism, virtuous activities, and implemented technological solutions.
The Geopark Cabo de Gata is in Andalusia, in southeastern Spain. Characterized by a unique landscape that combines pristine beaches, towering cliffs, and volcanic formations dating back 15 million years, the park offers a wide range of ecosystems, including wetlands, dunes, salt flats, and marine bottoms teeming with life. The main attractions include volcanic geological formations such as calderas, craters, and lava flows, as well as the park's unique biodiversity. The hiking trails (17 in total) allow exploration of various rural and coastal landscapes. The park offers 59 tourist activities, including guided tours, water sports, and educational workshops. There are also seven information points for visitors. Numerous local associations and tourism organizations collaborate to promote geotourism and environmental sustainability. Virtuous activities include educational programs on geology, biodiversity, and environmental sustainability. Implemented technologies include apps for guided routes and tools for astronomical observation, given the reduced light pollution. The local community is actively involved in conservation initiatives and park management, contributing to its tourism promotion and sustainable economic development [7, 8]. The Geopark Vulkaneifel in southwestern Germany is renowned for its unique volcanic landscape, featuring water-filled volcanic craters (maars), volcanic hills, and lava flows. This rich geological area also supports diverse flora and fauna in its forests, meadows, and wetlands. To

promote eco-friendly tourism, the park offers a range of outdoor activities, including extensive hiking and cycling trails. It also emphasizes environmental education through programs for schools and groups, aimed at fostering an appreciation for geology and ecology. Visitor centers and the Geo Museum provide educational resources and insights into the region's volcanic history. The park also includes cultural sites like ancient churches and monasteries, enriching the visitor experience. Overall, Geopark Vulkaneifel combines natural beauty, educational initiatives, and cultural heritage to attract tourists and support local community development sustainably. The Geopark Northwest Highlands is located in the northern region of Scotland. It is known for its spectacular landscapes, including mountains, rugged coastlines, crystal-clear lakes, and glacial valleys, and for rocks dating back over 3 billion years The main attractions are the mountainous and coastal landscapes, the biodiversity with rare species such as the golden eagle, and the hiking trails that span over 1,500 km of terrain. The park offers a wide range of outdoor activities, such as trekking, cycling, kayaking, fishing, and birdwatching. Astronomical observation sessions are another attraction, thanks to the reduced light pollution. Numerous local organizations support geotourism and the conservation of the region's cultural and natural heritage. Activities include environmental and geological education, guided tours to archaeological sites, and the promotion of sustainable tourism. Technologies such as hiker apps and interactive maps enhance the visitor experience. The local community actively participates in promoting cultural traditions and organizing events to highlight the park's heritage [9, 10].

The Geopark Famenne-Ardenne is in the Ardennes region, in southern Belgium, and is famous for its hilly landscapes, river valleys, and limestone caves with stalactites and stalagmites. The main attractions are the limestone caves, historic castles, and local gastronomic products such as cheeses, craft beers, and traditional dishes. The park offers guided tours of the caves and castles, cycling routes, cultural and gastronomic festivals, and glamping activities for a luxury camping experience. Various local associations and tourism entities promote geotourism and the cultural authenticity of the region. Virtuous activities include cultural festivals, gastronomic events, and educational programs on natural and cultural heritage. Technological solutions include interactive guides and tools for virtual visits to the caves. The community is strongly involved in promoting and preserving local traditions, contributing to the sustainable economic development of the park [11, 12].

The Geopark Northwest Highlands is located in the northern region of Scotland. It is known for its spectacular landscapes, including mountains, rugged coastlines, crystal-clear lakes, and glacial valleys, and for rocks dating back over 3 billion years [19,20]. The main attractions are the mountainous and coastal landscapes, the biodiversity with rare species such as the golden eagle, and the hiking trails that span over 1,500 km of terrain. The park offers a wide range of outdoor activities, such as trekking, cycling, kayaking, fishing, and birdwatching. Astronomical observation sessions are another attraction, thanks to the reduced light pollution. Numerous local organizations support geotourism and the conservation of the region's cultural and natural heritage. Activities include environmental and geological education, guided tours to archaeological sites, and the promotion of sustainable tourism. Technologies such as hiker apps and interactive maps enhance the visitor experience. The local community actively participates in promoting cultural traditions and organizing events to highlight the park's heritage [13, 14].

The Luberon Regional Natural Park, located in Provence, southeastern France, is characterized by hills covered with forests, vineyards, lavender fields, and picturesque medieval villages. The main attractions are the natural landscapes, medieval villages, castles, and Provençal cuisine with high-quality local products. The park offers a network of hiking and cycling trails, food and wine tastings, guided tours of historical sites, and cultural activities in the medieval villages. Numerous associations and local entities collaborate to promote geotourism and environmental sustainability. Virtuous activities include promoting local cuisine, cultural events, and educational programs on sustainability. Implemented technologies include apps for hiking trails and digital guides for visitors. The local community is actively involved in park management, promoting the conservation of cultural and natural heritage and the sustainable development of the territory [15, 16].

The table 2 shows that the values attributed to each individual park are extremely high. Various common strategies have been undertaken from a naturalistic perspective, such as the expansion and/or implementation of hiking and cycling trails, the possibility of observing flora, fauna, and stars. However, particular importance has been given to the cultural heritage, not only in terms of the built environment associated with it. The analysis of the case studies has shown how local architectures are presented to visitors sometimes through guided tours, sometimes through the establishment of museums. Although less varied than the natural heritage, this built heritage includes both ruins and new constructions designed to immerse the tourist in a complete experiential process within the territory.

Although these territories are already highly valued, where innovations aimed at improving territorial management, sustainability, and environmental education through tourism are diverse, it is necessary to continue proposing effective strategies for enhancing natural and cultural heritage. This is possible only through a correct understanding of the potential and remaining quality elements of a territory, as demonstrated in the five case studies. The strategies implemented through the promotion of low-impact tourist activities (trekking, birdwatching, and guided tours) can lead to the creation of new ecological transport networks, guaranteed by the implementation of electric buses to reduce the environmental impact generated by visitors. Additionally, conservation and research programs aimed at expanding knowledge of biodiversity can be planned. The preservation of nature and its morphological components is the focus of numerous enhancement strategies and can be pursued through the promotion of projects for the protection of endemic species and critical habitats, including monitoring and scientific studies, as well as ecological restoration initiatives, which involve the recovery of degraded ecosystems through the planting of native species and the removal of invasive species.

It is essential that this environmental education continues to support the ongoing development of new educational centers aimed at raising public awareness of the importance of geodiversity and the conservation of the natural environment. A common outcome is the establishment of educational programs for schools and communities, which involve collaboration between educational institutions and local communities to offer educational programs and workshops on the environment. The involvement of the local community has also allowed for the management of the park through participatory projects and public consultations, as well as increasing sustainable economic development through the promotion of local entrepreneurial initiatives with a focus on complete sustainability.

In line with current issues related to climate change and the Sustainable Development Goals of the 2030

UNESCO Geoparks	Development of tools for enhancement and digital tourism promotion	Creation of tourist itineraries	Marketing projects and events	Construction of functional architectural, structural, or facility works	Outfits on cultural, landscape, and naturalistic sites	Total
Cabo de Gata	4	5	4	4	5	22
Vulkaneifel	4	5	5	5	5	24
Famenne - Ardenne	4	5	5	3	5	22
Geopark Northwest Highlands	4	4	4	3	4	19
Luberon Parc Naturel Regional	4	5	4	4	5	22

Tab. 2 - Qualitative assessment of the regeneration strategies implemented in the five case study.

Fig. 1 - 1 –Spain, 2 – Germany, 3 – Scotland, 4 – Belgium, 5 – France, 6 & 7- Italy (Piedmont & Sicily).

Agenda, new territorial policies aim to develop new strategies to increase the resilience of ecosystems and local communities, particularly concerning measures to reduce the park's carbon emissions through energy efficiency and the use of renewable energy. In this regard, new support tools are necessary for environmental monitoring, such as drones and sensors that monitor the health of ecosystems and instantly detect any threats, as well as providing visitors with an easy-to-read tool, such as smartphone applications and online platforms. These tools can offer information on how to navigate within the park, promote hiking trails, and raise awareness of the importance of conservation and preservation of heritage.

4.2. A focus on Italian cases studies

The "Parco delle Madonie", situated in the heart of central Sicily approximately 70 km from Palermo, represents a protected area of natural interest. Established in 1989, this park extends over an area of over 39,000 hectares, characterized by a varied composition of mountains, forests, rivers, and lakes. Among its main attractions stand out Monte Carbonara, the highest peak of the Madonie at 1,979 meters above sea level and secular beeches forest that hosts a rich biodiversity of flora and fauna. Not to be overlooked are also the medieval villages of Geraci Siculo, Petralia Soprana, and Castelbuono, rich in history and charm among the other 18 villages. This park offers a wide range of activities for visitors eager to explore nature and immerse themselves in local culture. Among the available options are hiking along a network of well-marked trails, trekking on more challenging routes leading to the highest peaks, and mountain biking through dirt trails winding through forests and mountains. Nature lovers will have the opportunity to practice speleology in the numerous caves and grottoes present in the park, as well as to engage in birdwatching to admire the diverse avifauna that inhabits it. For those who prefer more relaxing activities, horseback riding excursions along the park's trails are available, allowing them to appreciate the beauty of the surrounding landscapes. Not only does the Park offer an immersive experience in nature, but it is also renowned for its rich culinary tradition. The local cuisine offers a wide range of typical products, including ricotta, pecorino cheese, honey, and olive oil, which will delight even the most discerning palates. [17, 18]

Turning to the Geopark UNESCO Sesia Val Grande, located in northern Piedmont between the provinces of Vercelli and Biella, another wonder of Italian nature is discovered. Founded in 2022, this geopark extends over a vast area of over 78,000 hectares, characterized by a variety of landscapes including mountains, rivers, lakes, and forests. Among the main attractions of the Geopark UNESCO Sesia Val Grande are the majestic Monte Rosa, the second highest mountain in the Alps, and the Parco Nazionale della Val Grande, the first Italian national park. Furthermore, the park hosts the Riserva Naturale Speciale del Monte Mars, a protected area that preserves a rich biodiversity of flora and fauna, and the picturesque Lago Maggiore with its islands and breathtaking landscapes. Not to be missed are also the Sacro Monte di Oropa, an important Marian sanctuary located on a hill, and the medieval village of Varallo Sesia, with its well-preserved historic center. Like the Parco delle Madonie, the Geopark UNESCO Sesia Val Grande offers a wide range of activities for visitors. Among these are hiking along panoramic trails, trekking on more challenging routes, and mountain biking through forests and mountains. Nature lovers can explore the caves and grottoes of the park, indulge in birdwatching to observe the numerous species of birds present, and enjoy skiing on the slopes during the winter season. Additionally, it will be possible to practice rafting and canoeing along the rivers that traverse the geopark's territory. These

two splendid parks offer visitors a unique opportunity to immerse themselves in nature and discover the cultural and landscape richness of Italy. [19, 20] From the results of the conducted analysis in tab. 3, following the previous methodology applied for the other parks it emerges that the two geoparks in Italy have obtained significantly lower scores compared to the case studies located in Europe. This allowed to identify the potential areas that could be enhanced and to outline possible approaches.

The comparison revealed that built heritage has not received particular attention, when, instead, it is a component that absolutely favors these parks over the others considered. In the case of the Madonie Park, villages and rural architectures are abandoned, while for the Sesia Val Grande, reference is made to the rich built heritage linked to the Walser culture, still preserved; significant opportunities for the recovery and enhancement of villages and communities together. These medieval villages hold rich historical and cultural heritage, which can be leveraged for tourism development by promoting their historic architecture, traditional crafts, and local traditions. Sustainable tourism practices prioritizing environmental conservation and community engagement can benefit local communities, collaborating also with entities and promote the development of eco-friendly tourism initiatives, including responsible outdoor activities and agritourism ventures showcasing slow food and hospitality. Community-based tourism initiatives can empower residents to actively participate and give work. Through cooperative networks, villagers can become ambassadors for their communities, sharing their knowledge and traditions with visitors while preserving their way of life and building stock. By harnessing the strengths of villages and communities, these parks can create sustainable development pathways that enhance both cultural and natural assets, thriving as vibrant hubs of heritage tourism while safeguarding resources for future generations.

UNESCO Geoparks	Development of tools for enhancement and digital tourism promotion	Creation of tourist itineraries	Marketing projects and events	Construction of functional architectural, structural, or facility works	Outfits on cultural, landscape, and naturalistic sites	Total
Madonie	2	3	2	1	2	10
Sesia Val Grande	2	2	2	1	2	9

Tab. 3 - Qualitative assessment of the regeneration strategies implemented in Italian case study.

5. Conclusion

In the comparison among the whole case studies, it has emerged that all Geoparks share the UNESCO designation, along with a geological, natural, and cultural component closely linked to the local community and the territory it pertains to. However, it is particularly evident that in Italian cases, there is also a strong connection with the entire built heritage, which is currently not fully exploited. It is believed that regeneration/revaluation strategies should pay greater attention to this type of heritage, to integrate the shortcomings identified in the comparison.

Tourism could provide valuable insights for identifying new projects: while other European parks, with their significant heritage mainly linked to geological and natural features, are able to implement effective management strategies that foster growth and provide employment, thus enhancing their international attractiveness, the Italian cases, under the same criteria, do not demonstrate a complete recognition and subsequent valorization of the existing heritage. The built heritage could be reconsidered as an additional quality element, through the attribution of new functions related to tourism. In this way, it would be possible to enhance the hospitality of the territory, which is already open to this type of issues (as in the

case of European parks). The aim of the research is to highlight these latent potentials in order to bring them to light and gain recognition from the local community and associations operating in the same territory, so that, through a grassroots approach, interventions can be made to improve their attractiveness, as seen in the case of UNESCO recognition. The use of these local resources could involve the recovery of local architectures that are currently in an advanced state of degradation/abandonment: ranging from villages to rural architectures.
The idea would be to use these assets to promote the growth of tourist services on par with other parks. The issue of hospitality is crucial in the Italian case, as the territories are unable to meet the demand compared to the required supply (unlike what happens in Europe). By integrating these considerations, the guidelines for the recovery and enhancement of parks can be further enriched, ensuring greater involvement of local communities, more effective use of available resources, and sustainable tourism growth respecting the environment and cultural traditions.

Bibliography

[1] Molinelli G, Benvenuti M, Di Benedetto G. UNESCO Global Geoparks: A Powerful Tool for Sustainable Development and Geotourism Promotion. Sustainability 2023;15 (1):1-18.
[2] Newsome D, Dowling R. Handbook of Geotourism. Massachusetts: Edward Elgar Publishing, 2020.
[3] Németh K, Rashad MHM. Challenges of Geoconservation and Geotourism in a Changing Environment. In: Eder W, Bobrowsky PT, Martínez-Frías J, editors. Geoheritage, Geoparks and Geotourism. Conservation and Management Series. Springer Publishing: 2023.
[4] Dowling RK, Newsome D. Geotourism. Elsevier, 2005.
[5] UNESCO, UNESCO Global Geoparks: Guidelines and Criteria for Designation. Last consultation 07/06.2024. https://www.unesco.org/en/iggp/geoparks/proposals
[6] UNESCO. Geoparks. UNESCO. Last consultation 07/06.2024. https://www.unesco.org/en/iggp/geoparks?hub=67817
[7] Pérez-Calderón E, Prieto-Ballester JM, Miguel-Barrado V. Perceived Rural Development in UNESCO Global Geoparks in Spain. In Land 2022;11(7):1086. DOI: 10.3390/land11071086
[8] Gómez-García D, Martín-Bueso M. The Role of Geoparks in Promoting Local Culture and Heritage: A Case Study of Cabo de Gata Geopark, Spain. Journal of Heritage Tourism 2022;17(6):854-872.
[9] Höck J, Behr U. The Vulkaneifel Geopark, Germany: A Model for Geoconservation and Sustainable Tourism Development. Geoheritage 2015;7(2):145-154.
[10] Döring M, Frevert T. The Economic Impact of Geotourism in the Vulkaneifel Geopark, Germany. Tourism Economics 2015;21(4):785-800.
[11] Tsien HH, Sun Q. The Famenne-Ardenne Geopark: A geotourism destination with a global perspective. Tourism Geographies 2018;20(3):432-449.
[12] Bernier H, Boulvain D. The Famenne-Ardenne Geopark: A geological and cultural heritage asset in Belgium. Géochronique 2018;146:4-11.
[13] Barbier F, Bertrand J. Le Luberon: Un espace naturel et culturel à valoriser. Revue des Régions Européennes 2004;314:101-112.
[14] Clark MS. The geomorphology of the North West Highlands Geopark. Scottish Geographical Magazine 2004;120(4):213-225.
[15] Milne C. The North West Highlands Geopark: A visitor attraction with a difference. Tourism Management 2004;25(3):307-318.
[16] Clauzon G, Métral J. Le Géoparc du Luberon: Un outil de développement durable. Développement durable et territoires 2004;2:127-138.
[17] Cacciatore G, Di Vincenzo G. The Madonie Mountains Geopark (Sicily, Italy): A geotourism case study. Journal of Sustainable Tourism 2012;20:115-135.
[18] Anselmo V. Madonie a piedi: 24 itinerari escursionistici nelle «Alpi di Sicilia». Youcanprint Editor, 2016.
[19] Guerini M, Mantovani A, Khoso RB, Viani C, Giardino M. Geodiversity and Geoheritage data from Alagna Valsesia, Sesia Val Grande UGGp (NW-Italy). Zenodo 2024;19. DOI: 10.5281/zenodo.10636049
[20] Guerini M, Khoso RB, Negri A, Mantovani A, Storta E. Integrating Cultural Sites into the Sesia Val Grande UNESCO Global Geopark (North-West Italy): Methodologies for Monitoring and Enhancing Cultural Heritage. Heritage 2023;6(9):6132-6152. DOI: 10.3390/heritage6090322