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ORIGINAL ARTICLE

Geotourism as a Development Tool of the Geo-mining Park in Sardinia

Nađa Beretić[1] · Zoran Đukanović[2] · Arnaldo Cecchini[1]

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Abstract

Theory and practice about geoparks and the geotourism concept consider not only the geological heritage, but also its relationship to all other aspects of the natural, cultural and intangible heritage as a cornerstone of sustainability and well-being. In doing so, geotourism could be a powerful tool for the preservation and development of the heritage. The Geo-mining Park in Sardinia marks centuries of geological, mining and historical and environmental heritage. The recognition of the Sardinian Geopark by UNESCO in 1997 as innovative, and as a heritage of great importance, created administrative and legislative opportunities. However, the territory lacks a territorial development strategy and administration structure for managing the heritage. With the indirect pressure from the tourism industry the region faces, over the next few decades, a deep social-economic crisis and neglect of the landscapes and settlements. This paper aims to examine geotourism as sustainable strategic approach and territorial planning tool that based on multi-source networking and, that benefits both, development of the local community and preservation of the Geo-mining Park in Sardinia.

Keywords Geo-mining Park · Geotourism · Sardinia · Heritage · Urban planning

Introduction

Sardinian landscapes, environmental and social condition have been always shaped by mining activities. Mineral extraction in Sardinia dates back to the origins of the Nuragic civilisation and Obsidian extraction around six millennia before Christ (Parco Geominerario della Sardegna 2012). The era of mining extraction in Sardinia starts from the 1720s when mining became an official regional development strategy (Sella 1871/1999). Large-scale territorial specialisation in mining activities and the modern age of the mining industry dates from the eighteenth century (Perelli et al. 2011). The period of the most intense mining finished in the late 1960s. The collapse of this long-term and powerful economic engine resulted in high levels of depopulation and the neglect of the landscapes. The Sardinian Geopark was recognised by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1997 as innovative and as a heritage of great importance. However, its foundation and recognition by regional decree came only seven years later, in 2006. Administrative and legislative opportunities at the regional, national and international level resulting from the UNESCO heritage status are developing slowly and without much interaction with local life and the people who inhabit the areas. Currently, the top-down, unidirectional administrative approach in dealing with the heritage is proceeding with minimal efficiency. Nowadays, the Sardinian Geo-mining Park is characterised by severe depopulation, a lack of planning and management and beautiful landscapes scarred by the dilapidated remnants of the ex-mining infrastructure.

Both for the protection and development of the natural and cultural heritage, UNESCO defines science, education and tourism as development fields to celebrate the heritage. Tourism is a strong branch of the economy in Sardinia and given the powers of its impact, it requires proper territorial

✉ Nađa Beretić
senseinadja@gmail.com

Zoran Đukanović
duke@arh.bg.ac.rs

Arnaldo Cecchini
abcecchini@gmail.com

[1] Department of Architecture, Design and Urbanism, University of Sassari, Piazza Duomo 6, 07041 Alghero, SS, Italy

[2] Faculty of Architecture, University of Belgrade, Bulevar kralja Aleksandra 73/II, Beograd 11000, Serbia

planning and instruments to ensure the protection and development of the regional heritage and well-being of local communities.

This paper examines geotourism as a possible development tool of the Geo-mining Park in Sardinia. Geotourism can foster the local economy and celebrate the heritage and local life during the whole year, unlike the present seasonal development of tourism in Sardinia.[1] This research questions geotourism as a sustainable strategic approach and territorial planning tool that benefits local communities whilst acting as a parallel approach to the preservation and development of Geo-mining Park in Sardinia.

The geopark and geotourism concept is considered as a cornerstone of sustainability and well-being both for the geological heritage and in relation to all other aspects of the natural, cultural and intangible heritage. A European Geopark is "…a territory which combines the protection and promotion of geological heritage with sustainable local development." (Zouros 2006:16). By voicing the words of the local community and by empowering cross-sectoral collaboration, geotourism fosters local economies and celebrates local life. Thus, in this paper, the introduction of natural and cultural resources of the geo-mining park is followed by a discussion of the local human resources. This research is pragmatically oriented and it determines the potential resources and stakeholders corresponding to the Sardinian Geopark and geotourism. Accordingly, we proposed a categorisation with the description of jurisdiction. The proposed steps are based on the UNESCO World Heritage Sustainable Tourism Online Toolkit. The proposal is not a fixed framework, rather a planning tool in anticipation of the application of the development tool. In conclusion, the discussion highlights geotourism as a development tool that should combine the local and regional, natural and cultural heritage with, in the first place, local people. Likewise, given the heterogeneity of the Sardinian Geo-mining Park, this paper presents an approach based on the quality that could ensure social, economic and environmental sustainability and well-being of the local community and everyday life.

Methodology

This pragmatically oriented research starts with the determination of the problem and its specificities. Such an approach is appropriate for the elaboration of a case study and "transformative paradigm theory" (Creswell 2014). It allows us to use mixed methods in research: close-ended measures and open-ended observations (Creswell ibid). The mixed method procedures included the following: qualitative and quantitative data collection and analysis of both forms of data. They also included two forms of data that are integrated, merged, connected and embedded. Intentionally, quantitative data are collected before qualitative, but the process was rather iterative, and the higher value is given to the qualitative data. Urban research must consider people, place and well-being and for such research "You could not help but be part of the moment and the place." (Friedman 2015: 81). Picturing the state of the art of the Sardinian Geo-mining Park, an analysis of the social, economic, political, environmental and cultural context, constitutional and governance patterns has been carried out. We executed it by linking the patterns of the changes into practice, rather than interpreting the spatial information. Furthermore, after analysing the nature of the case (through theoretical and empirical research), particular attention is devoted to investigating the potentials and local capacities of the geo-mining park for geotourism. Semi-structured interviews have also been realised with the aim of evaluating both, the perception of the people, places where they live, and people involved in the development processes of the Sardinian Geo-mining Park. The chosen sample included representatives from all sectors: civic, private and public, also ensuring the diversity of backgrounds and roles among respondents (as the representatives from all eight areas of the geo-mining park, from local to regional representatives). The chosen orientation gives both, practical advantage and scientific limits. The scientific limits reflect the lack of data about tourism (even though the information from the regional to a local level exist, regulatory limits of the geopark do not overlap with the municipal borders). Other obstacles include false or outdated information (e.g. some of the museums or geopark locations are listed as open and functional, but they are not). This "in situ" research also includes verification of some desk analysis and visual recording.

Trends and Potentials for the Tourism Sector in the Geo-mining Park of Sardinia

Despite numerous global economic crises, since the beginning of twenty-first-century tourism has proved to be a resilient sector and one that recovers efficiently. Tourism employs nine % of the world's GDP (direct, indirect and included[2]), it gives a job to every eleventh person. Furthermore, it generates six % of the world's exports and 30% of services export (United Nations World Tourism Organization—UNWTO

[1] Calculations from the National Institute of Statistics Italy (ISTAT 2016) show that tourism flows in Sardinia are concentrated in the summer months, from June to September. These tourism flows in Sardinia have always followed the same dynamics (not only in 2016).

[2] Direct impact increases turnover in an enterprise. Indirect impact increases turnover of supplies of goods or services to tourism business. Included impact captures the economic activity generated by the employment and wage income effect, directly or indirectly connected to the National economy (Saasrinen and Kauppila 2002).

2016). Europe has led the growth of international tourist arrivals by five % in 2015 and continues to have a positive outlook in 2016 from + three and a half % to + four and a half % (UNWTO 2016). Statistics on competitiveness about world travel and tourism shows that in the top 10 visited countries, six of them are in Europe. Italy occupies the eighth place in total list, the first place with numerous World Heritage Sites, the second place with respect to its natural tourism[3] (World Economic Forum 2015). Reflecting national trends, the tourism industry also grows strongly in Sardinia. Comparative analyses of economic activity in Sardinia illustrate the growth of services from the 1950s (the tourism industry is the most prominent service activity) and currently dominates the agriculture and construction industries (Paci 2010 Fig. 1). Arrivals in Sardinia for 2015 grew four % in comparison with the year before, continuing the growing trend from 2004 (National Institute of Statistics Italy—ISTAT 2016). Peoples' movement and travelling around the World became routine. The trend in ranking arrivals based on the tourism industry is considered as a measurement of prestige among countries. Alongside arrivals, tourism presence is another important aspect of the tourism industry that should be considered seriously. Moreover, tourism presence is crucial for the sustainability of heritage, because of its direct implication on local people and everyday life.

Tourism could generate conflicts between tourists and the "indigenous" populations (Colomb and Novy 2016). We can divide the population of a city or a territory into several groups, in a continuum from pure tourists and pure residents (Cecchini and Cannaos 2010). If we classify the population according to their activities, we can build the following scheme (Table 1):

This scheme could be useful for the purpose of analysing the actual and potential situation of the different populations of a territory (also with possibilities for new citizenships and types of migratory populations).

All the population typologies are potential, and not all are present in the different sites of the Geo-mining Park in Sardinia, in which conversely, the depopulation is high in all senses, reflecting poor local human resources and having a negative trend of growth (Fig. 6).

Mass tourism operates globally, whilst heritage tourism is growing. Both forms of tourism exploit the same resources (cultural and natural heritage), but they do not always cooperate (Jurėnienė 2016). Tourism is global in its scope and influence, displaying various paradoxes, creating pressures, tensions and benefits, extending across the world and communities affected by tourism: "national capital, multi-national organisations, and liberal movements of people, and ideas" (UNESCO 2006: 9). It becomes particularly complicated and sensitive when dealing with aspects of 'culture,' both, tangible and intangible (Jurėnienė 2016). Unlike other industries, tourism depends on natural, regional and local resources and, furthermore, it depends on the culture (Ecological Tourism in Europe—ETE et al. 2004). Thus, nature and culture are becoming part of the tourism industry, meritorious and responsible for the engagement, development and tourism management. Being a service industry, tourism and fluctuations in quality depend strongly on human resources at all levels (ETE et al. 2004). Doubtless, the economy will grow by increasing the quality of tourism. We could only hope that this is going to be a local economy. Local income has two crucial branches in sustainable development, and they both come from tourism activities. The first one is local territorial resources and the second one is local human resources. Both of them contribute to the prevention of licentious tourism which has an adverse effect on a place and local culture. The local community must be recognised, involved and supported as an equal stakeholder in planning activities, to ensure sustainable tourism. Only in this way, will sustainable tourism enhance the well-being of the community and support the protection of natural and cultural heritage. The product quality enrichment and tourist satisfaction are of secondary importance.

Tourism in Sardinia is as an important branch of the economy and it must not be neglected as an inevitable circumstance, potential commodification[4] factor and development feature. On the other hand, the Sardinian mining landscape provides an opportunity for combining scientific research with tourism and in investigating and promoting the territories significant heritage (according to the UNESCO requirements). Sustainable tourism is defined as a strategic development horizon for all Geoparks (UNESCO 2016). Thus, sustainable geotourism and heritage tourism are development potentials of the Geo-mining Park in Sardinia, but it is crucial to manage them, to strengthen the local life and celebrate local culture as a heritage.

The Geo-mining Park and Approaches to Geotourism

UNESCO defines geopark as "a nationally protected area containing a number of geological heritage sites of particular importance, rarity or aesthetic appeal. These Earth heritage sites are part of an integrated concept of protection, education and sustainable development." (UNESCO 2006: 2). Conservation, education and

[3] Italy is highly ranked with numerous World Heritage sites and natural tourism, but on the other side, it shows meager results as the business environment, and it is less price competitive (World Economic Forum 2015).

[4] Commodification and bureaucracy convert abstract into concrete space and, by doing so, commodification demonstrates the transformation of exchange value into use. This conception of commodification is given according to Lefebvre (1974/1991).

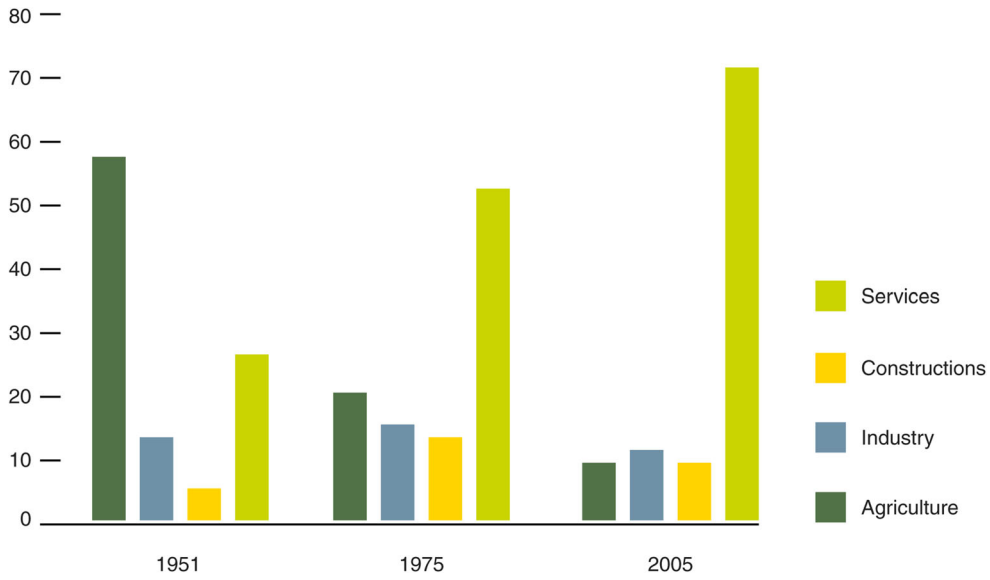


Fig. 1 Comparative analysis of economic activity by % composition of working units; growth and domination of the tourism sector in Sardinia from the 1950s (data obtained from Paci 2010)

tourism are three overlapping domains of the geopark concept for achieving these goals. Geoparks are not only geology-oriented but enhance all other aspects of natural and cultural heritage about key issues facing society (UNESCO 2016). In this context, European Geoparks aim to foster regional development. Regional development encourages economically disadvantaged communities to improve their economic, social, cultural and environmental well-being by realising the full potential of a region's resources and its inhabitants (European Geoparks online n.d.). Hence, UNESCO highlights the bottom-up approach and local community: "UNESCO Global Geoparks give local people a sense of pride in their region and strengthen their identification with the area" (UNESCO 2016: 1).

The Global Geoparks Network (GGN) was established in 2004 as a dynamic network, to exchange the ideas, practice and joint projects among the partners (UNESCO 2016). To this extent, all geoparks have national legislative recognition, and the management body includes all relevant local and regional participants and authorities (UNESCO ibid). During the general assembly in October 1997 (Paris), UNESCO recognised the Geo-mining, Historical and Environmental Park of Sardinia (*Parco Geominerario*, *Stirco e Ambientale della Sardegna*). The Sardinian case is not the only geopark in Italy recognised by UNESCO (Fig. 2a), but it is the very first

Table 1 Classification of the population according to their activities (Cecchini and Cannaos 2010)

Living (L)	Working (W)	Consuming (C)	Having fun (F)	Populations
S	S	S	S	Traditional residents
S	S	S	N	Young residents
S	S	N	S	Commercial residents
S	S	N	N	Post-modern residents
S	N	S	S	Traditional commuters
S	N	S	N	Young commuters
S	N	N	S	Commercial commuters
S	N	N	N	Postmodern commuters
N	S	S	S	Businessmen and tourist
N	S	S	N	Traditional businessmen
N	S	N	S	Tourist businessmen
N	S	N	N	BusinessmenGoal oriented
N	N	S	S	Traditional tourists
N	N	S	N	Commercial city users
N	N	N	S	Traditional city users
N	N	N	N	Virtual users

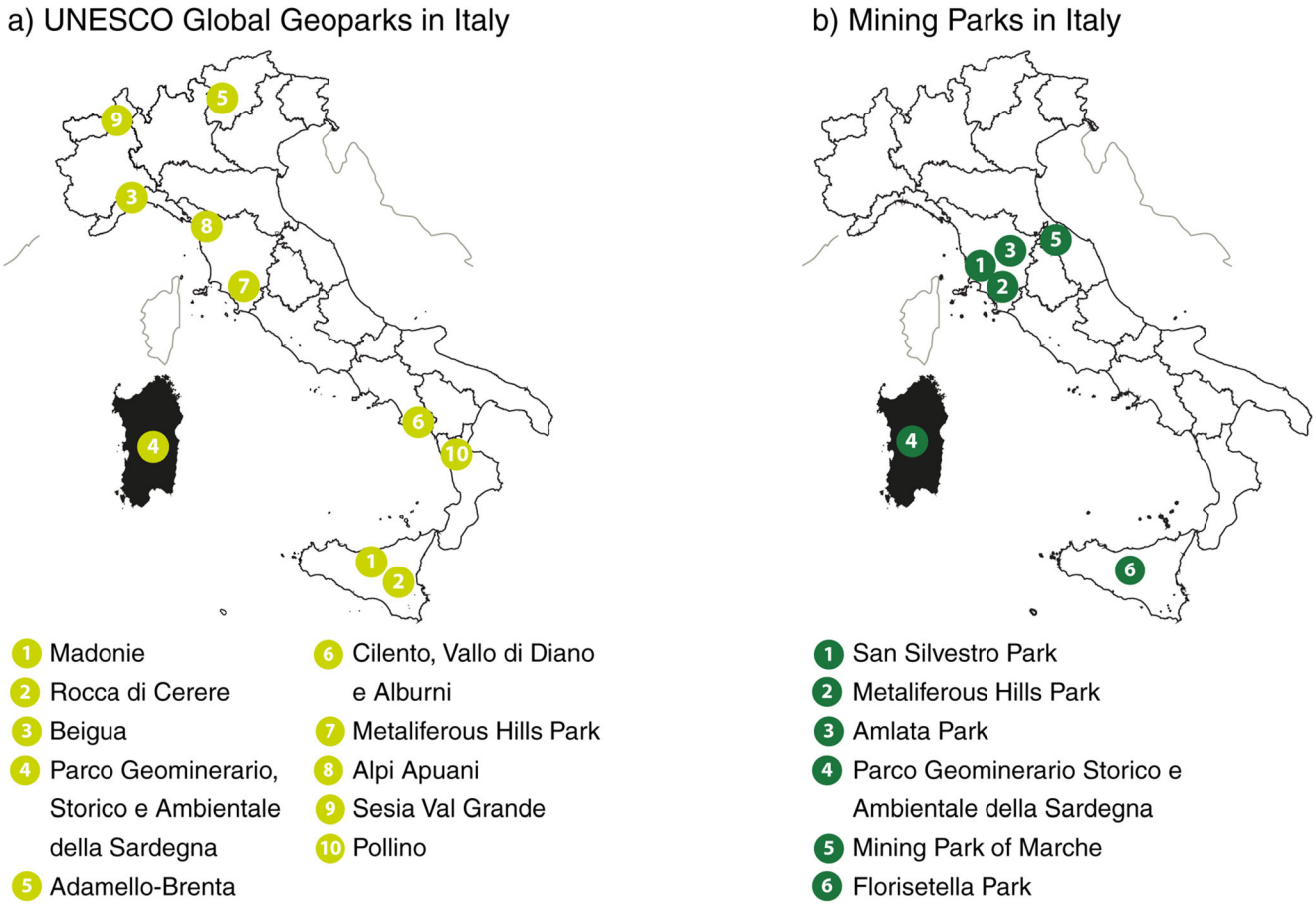


Fig. 2 Ten geoparks in Italy being part of GGN (**a**) and Six Mining Parks in Italy (**b**). The Sardinian case is both, Geo-mining Park (source: author)

geopark ever identified. The Sardinian example is the prime "geosite-geopark" at the global level (European Geoparks online n.d.), the pioneer of the idea.

Even though the Sardinian Geopark has a valuable geological heritage and environment, it is essentially recognised as an industrial heritage, created by the mining history and culture.[5] Industrial heritage, as a subcategory of cultural heritage sites, emerged in the 1950s and the first laws about mining industrial heritage appeared in the 1970s. The term "mining landscape" or "mining region" appeared not before 1997 (parallel to the idea of geoparks), defining mining landscape or region as a wholeness (not as a single object or infrastructure as it has been previously considered). This understanding of a mining heritage as a superposed natural and mining (cultural) heritage is recognised within Italy and Europe, but is not recognised globally. The term Mining Park is particularly used for the mining heritage in Italy. Italy has six Mining Parks (Fig. 2b), but only two of these, *Colline metalifere* (Tuscany) and *Parco Geominerario della Sardegna* (Sardinia) are polythematic geo-mining parks.[6] The uniqueness of the Sardinian case even in the Italian context is distinguished by its official recognition on a global level and the large time span of its mining culture.

Geotourism Perspectives for the Geo-mining Park in Sardinia

The study of geoparks is derived from Earth sciences as a new and rapidly emerging multidisciplinary field of enquiry (Henriques et al. 2011). This young and complex scientific field notes the high variance in the use of the term.[7] All geoparks involve conservation, education (of the broader public about geological, environmental and cultural issues), tourism and geotourism (as a responsible and sustainable development strategy).

[5] By a number of decommissioned mines in Italy (427 in total and 200 of them are completely abandoned), Sardinia Region takes the second place. Sicily occupies first place with 765 inactive mines (most of them are abandoned). Tuscany has 416, Piemonte 375 and Lombardia 294. The rest of the regions have a fewer number of decommissioned mines (APAT 2009).

[6] Another four are not exclusively Mining Parks, but natural heritage is not dominant and directly spatially superposed as in the case of Sardinia and Tuscany.

[7] Whilst researching the literature, it is possible to find reference to geoparks within a number of categories: Earth heritage, geoheritage, geoconservation and similar categories.

Geological tourism, geotourism "specifically focuses on landscape and geology" (Newsome and Dowling 2010: 3). It is an alternative tourism strategy to the mass tourism development of a destination (Hose 2006) and a way to achieve sustainable development in rural areas (Ólafsdóttir and Dowling 2014). Hose (2011) argues for alternatives to mass tourism: "responsible," "sustainable," "alternative," "nature-based," "niche tourism," "heritage tourism," "educational travel" and boundary "ecotourism." The substantial shift that Hose's perspective gave is the recognition of "approach" to tourism, rather than defining "form" or "type" of tourism, as an alternative to the earlier traditional view (Newsome et al. 2013). The term is also confusingly used in tourism geography literature, and it is essential that the term should be clearly defined and characterised to avoid universal meaning (Hose 2006, 2011; Newsome and Dowling 2010; Newsome et al. 2013). Geotourism could benefit the geoparks' preservation and the sustainable development of communities living in heritage site areas. On the local level, the interpretation should accomplish three goals: "assisting visitors to appreciate site significance, aiding in site management and promoting understanding of the site agency's policies" (Hose 2006: 224). On the territorial level, geotourism is committed to geoconservation and long-term sustainability (Newsome et al. 2013; Ólafsdóttir and Dowling 2014). Geotourism should act as economically viable and socially and ethically responsible towards the local community (Newsome et al. 2013). The employment of local resources reflects economic viability. The threat that can appear by "branding" a geopark and become a "front for governments wanting to commercialize a country's geological assets through the legitimisation of tourism" (Newsome and Dowling 2006: 253).

The Geo-mining Park in Sardinia: a Case Study

Building upon previous consideration about challenges and tensions inherent in geotourism as a development tool for the Sardinian Geo-mining Park, this section discusses the case-specific issues.

Background Context of the Geo-mining Park in Sardinia

Eight thousand years of mining extraction in Sardinia was made possible by the geological and mineral resources of the Sardinian Geo-mining Park. These extractive works made profound socio-cultural and economic changes to the island, leaving behind an important heritage. Occupying the area of approximately 15% of the total island's territory (3770 km^2), the Sardinian Geo-mining Park is recognised as one of the largest and most heterogeneous parks in Italy. The geo-mining park comprises eight geographical areas spread across the island (Fig. 3) and "383 sites perceived as relevant local heritage resources both by local communities and decision makers" (Perelli et al. 2011: 207). Seemingly, it is the most participative project in the island given that about 35% of the total inhabitants of the region live within its boundaries and that approximately 81 municipalities are involved in its management (Perelli et al. ibid). Despite that, this massive participation existed in theory, whilst the daily life testified the opposite (from the very first moment of recognition to the present). The consensus of the municipalities is based on recognition only by local officials whilst the citizens have never truly been involved in the decision-making process about the heritage.

The Sardinian Geo-mining Park was initially recognised by UNESCO in 1997 and ratified in the following year at a special ceremony attended by the highest authorities of the Italian government (Ministry of Environment), members of the European Geoparks Network and the National Commission of UNESCO in Italy, as well as the supporters of the park. These included the Autonomous Region of Sardinia and Sardinian Mining Authority (Ente Minarario Sardo—EMSA), the University of Cagliari and the University of Sassari. The areas of international importance and patrimony are recognised in the regional constitutional paper (also known as the *Carta di Cagliari*). Accordingly, a set of principles were laid out focusing on the protection of the technical-scientific heritage, historical and cultural landscape and environment related to human events that have interests in the geology and mineral resources of Sardinia (Carta di Cagliari 1998). The paper also clarified the aims, objectives and overall role of the Sardinian Geo-mining Park. It stresses both, recognition of the universal values of the geological mining area and its planning as well as the coordination of scientific research and educational tourism involving sustainable community development. To this extent, the park management authority was granted administrative and legislative freedom at regional, national and international levels to pursue the development and implementation of projects based on local communities' interests. A board of trustees manages the geo-mining park which consists of the following: representatives of the 81 communities (with a 51% share); the regional government of Sardinia (with a 15% share), the Province (10%); Environmental Ministry for Cultural Heritage (15%), University of Cagliari and Sassari (four %) and finally, cultural and environmental associations with a five % stake (Mezzolani and Simoncini 2007).

Despite its ratification as UNESCO's pioneer example of the geopark concept, the Sardinian Geo-mining Park faced varying obstacles from the beginning of the development process. The process of institutionalisation started with a low effectiveness, marked by a time gap of seven years. The regional decree defining administrative and legal issues was instigated in 2006. This time gap continued with a further

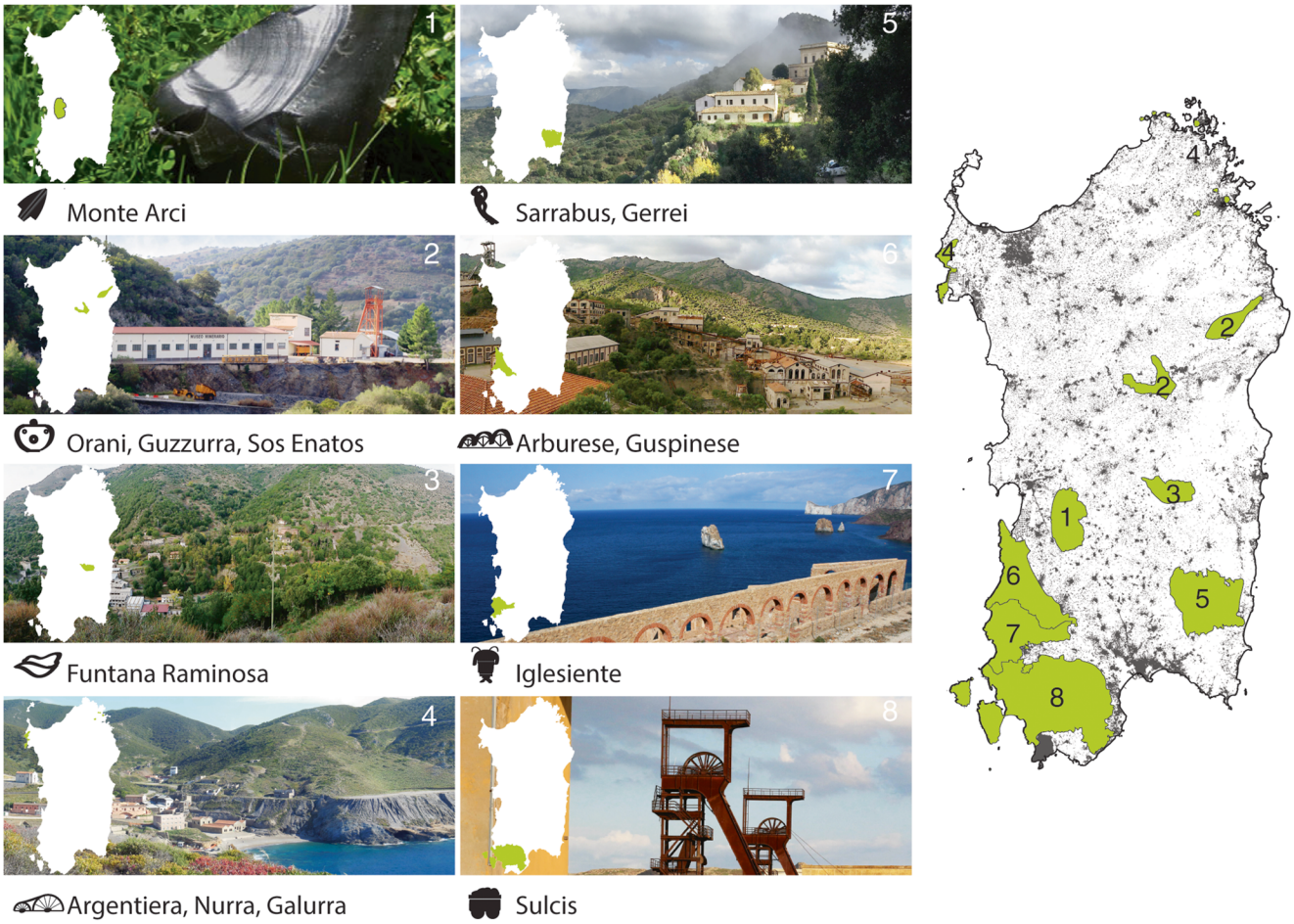
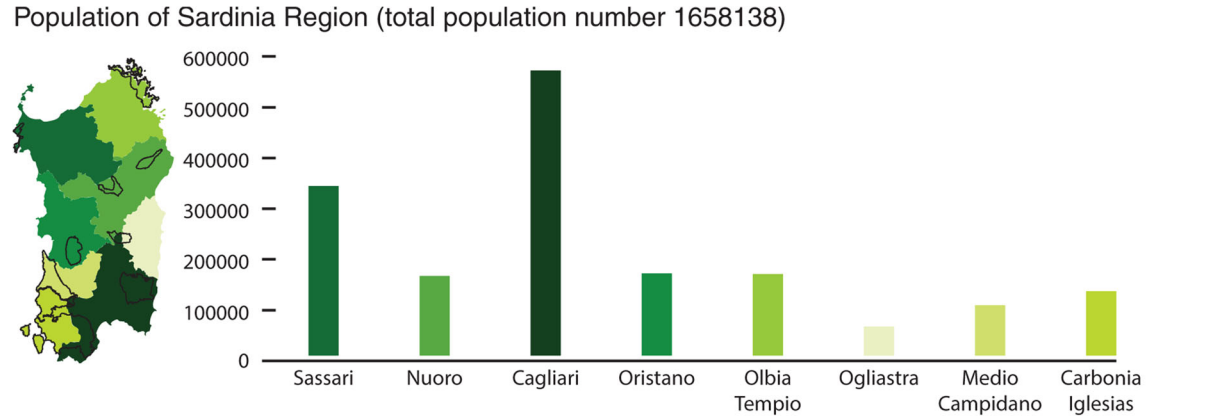


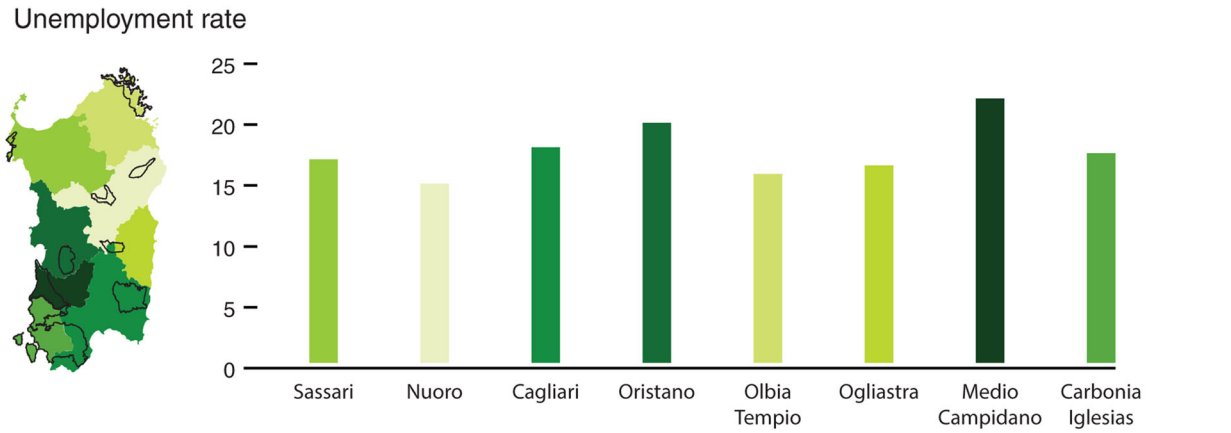
Fig. 3 Sardinian Geo-mining Park (source: authors)

series of time lapses and obstacles related to management. Finally, the development of the government body was not followed by the full implementation of actions resulting in an undeveloped mining landscape. Because of the socio-economic crisis, geo-mining park areas are among the less developed areas in Sardinia. The crisis is represented in the provincial distribution of the population, a growing trend in unemployment distribution and occupational data about the economic activities in Sardinia Region (Fig. 4). The figure shows that the provinces, where the most prominent part of the geopark is situated, are the least populated. At the same time, they have the most negative trend in immigration and unemployment. In these provinces, the prevalent economic activities are represented mainly by the service and petro-chemical industries and by agriculture.

Mining activity in Sardinia has been the most relevant contributor to the territorial economy for decades (in some areas for centuries), and finished in the 1960s with the closure of mines. Mining extraction in Sardinia was the mono-functional economic activity of the area. Socio-economic contextual dynamics were formed and ruled by the economic activity. The crash of economic engine of the territory was substituted by the top-down institutionalisation of the heritage of the geo-mining park. Thus, the needs of people and everyday life were never addressed, resulting in a series of crises and the peoples' detachment and loss of a sense of place. The peoples' detachment represents a crucial factor in anticipating the future concerning the heritage. According to the "production of space" theory, "Social space is (social) product" (Lefebvre 1974/1991: 26). Furthermore, urbanised space as an artwork is a creative product and context for everyday life activities of its inhabitants (an oeuvre; Lefebvre 1974/1991). We are arguing that less than 20 years after the institutionalisation, the geo-mining park remained semi-perceived, pseudo-conceived and mostly lived[8] (Beretić 2014). The semi-perceived nature of the heritage represents disorder in the landscape matrix. The pseudo-conceived character of the heritage lacks a plan about the visioning, envisioning and imagination. Mostly, live realities of the Sardinian mining landscape are in direct relation to the findings of "detachment"

[8] According to Lefebvre's theory, the triad of spatial production consists of spatial emanations of perceived, conceived and lived space (Lefebvre 1974/1991, p. 46).


Population of Sardinia Region (total population number 1658138)
600000
500000
400000
300000
200000
100000
0
Sassari
Nuoro
Cagliari
Oristano
Olbia Tempio
Ogliastra
Medio Campidano
Carbonia Iglesias


Unemployment rate
25
20
15
10
5
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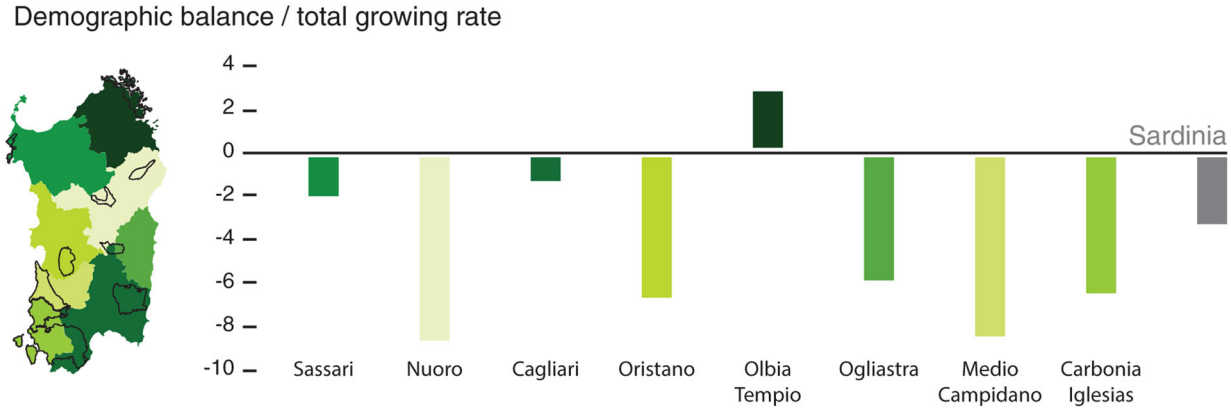
Sassari
Nuoro
Cagliari
Oristano
Olbia Tempio
Ogliastra
Medio Campidano
Carbonia Iglesias


Demographic balance / total growing rate
4
2
0
-2
-4
-6
-8
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Sardinia
Sassari
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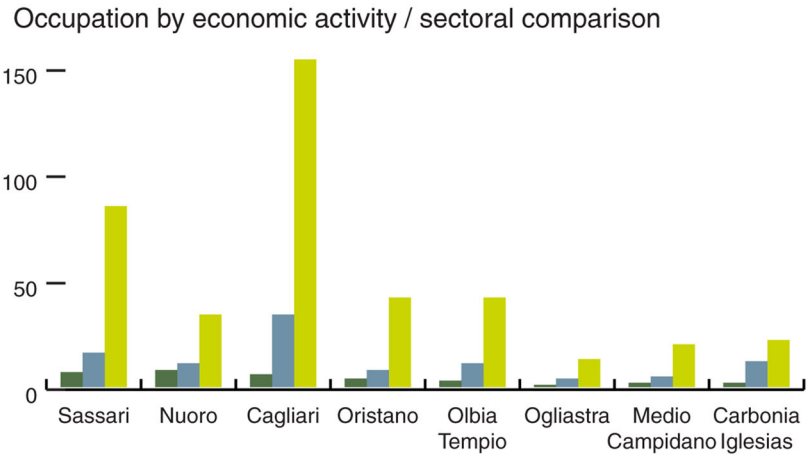
Ogliastra
Medio Campidano
Carbonia Iglesias


Occupation by economic activity / sectoral comparison
150
100
50
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Sassari
Nuoro
Cagliari
Oristano
Olbia Tempio
Ogliastra
Medio Campidano
Carbonia Iglesias

◀ **Fig. 4** Provincial distribution of the population in the Sardinia Region in relation to the geo-mining park areas (The database is provided by ISTAT 2015, whilst the occupational data about the economic activities are obtained from RAS 2014 online. The calculations on data are made by the authors)

people and place. It is directly dependant on the particular location and, due to abandonment, absence of everyday life.Firstly, to conceive the future Sardinian Geo-mining Park developmental tool, we would have to cease the current practice of excluding people from the decision-making process. Secondly, the past experiences demonstrate the fundamental role of diversification in various economic activities and economic resources. Thus, the future development of the Sardinian Geo-mining Park has to include both, a local-based participative planning approach and multi-resource-based geotourism. It includes and benefits firstly the local communities and subsequently the territory.

State of the Tourism Sector in Sardinia and Within the Geo-mining Park

This section concentrates on the geotourism concept as a development tool and regional tourism trends relevant to the Sardinian Geo-mining Park. Initially, the section argues that visitors are concentrated on other natural and cultural resources than the geo-mining park such as regional natural parks or the coastal system. The next section discusses the seasonal character of tourism and its conflicting relationship with everyday life. Lastly, it explains the absence of the cross-sectoral collaboration in the tourism industry and the underdevelopment of the civic sector.

The tourism industry in Sardinia concentrates primarily on the coastline. The coastline attracts tourists by the extraordinary beauty of the natural recourses, characterised by a variety of geo-morphological splendours which are hard to find elsewhere. In addition to natural resources, the Sardinian coastline is rich in cultural resources. The archaeological heritage is abundant, representing traces of the Nuraghe culture, and Romanesque and Pisan-Romanesque-architecture. Primarily, the motives for travelling to these locations are relaxation, pleasure, recreation, or rest, visiting family or friends and for religious reasons/pilgrimages. Another significant motive for travelling is for working purposes. This motive implies travelling out of the municipality in which people live and which involves at least one overnight stay in the visited place. Even though they are not strongly influenced by tourism, most of the mining sites are located in the coastal area. Tourism was never economically beneficial to the geo-mining park, but it has always been intended for use as a developmental tool. Somehow, existing coastal tourism and stamp of UNESCO heritage imply that tourism has the potential to benefit the future of heritage areas. At the beginning of the developmental process, the geo-mining park is expected to attract 24% of the visitors in Sardinia. 75 percent of these visitors to the geo-mining park should have been the tourists who are already visited the south-west part of Sardinia (Mezzolani and Simoncini 2007). The numbers envisioned during the foundation process of the geo-mining park are never achieved. Currently, the geo-mining park attracts approximately two and a half % of the total tourism arrivals in Sardinia and about 50% of these concentrate on municipalities in the coastal area. Municipalities have leisure resources and they are not strictly connected to the mining heritage (calculated for Sulcis-Iglesiente area 2008 and 2009 from data ISTAT). Instead of serving as the nucleus to diversify the tourism offer, a mix of natural and cultural recourses continues to attract the visitors without incorporating the geo-mining park. On the other hand, the geo-mining park's offer must promote the local qualities, but on-site interpretation and communication about the heritage values are missing in Sardinian case.[9]

Seasonal tourism in Sardinia stimulates the touristic settlements designed in detail; out of context hyper gesticulated spaces, timeless, and withdrawn from "everyday life." "Holiday landscapes" often become a projection of desires, an invention of dreams and mask the real conditions of urban life. Occasionally, the landscape turns to "brand-scape" (Maciocco 2007), when marketing-oriented techniques guide the design of the spaces for tourism, to increase the value perceived by the user. Although tourist fluxes and activities are seasonal, they can overwhelm the life of the local inhabitants and their experience of the cities during the whole year. Absolute values about the presence show that the number of people during the season increases about three times (calculated from source: National Institute of Statistics Italy 2016). The season's duration is from June to September. Tourists flux calculations include both types of movements, travelling (long stay with a reservation to stay) and excursions (short stay, sometimes without reservation to stay). The key issue and main struggle that the Sardinian Geo-mining Park needs to face are the local human resources, the experience of place and temporality. Here, we should implement geotourism as a sustainable development tool based on a local community. To have an everyday experience local-based strategic approach, everyday activities need to be constant, not only seasonal. All effects of activities planned to revive the heritage must not overshadow "ordinary life," they should produce well-being for all and celebrate the heritage and the local life. The quality of tourist experience directly and/or indirectly shapes the experience of the inhabitants, thus it comes in second place.

"Tourism is a service industry which means that it depends strongly on human resources at all levels (regional, national,

[9] Frequently, basic indicators to the sites are missing, e. g. paths and roads. Another problem represents an interpretational obstacle such as geoformation process.

international)" (ETE 2004: 3) and the fluctuation in tourism quality depends on the human sector. In the case of the Sardinian Geo-mining Park, social capital is low. The social capital comprises the public, private and civic sector. The public sector dominates the management and decision-making process about the heritage, but its operational capacity is low. The private sector did not demonstrate an investment interest in areas of the geo-mining park. The civic sector is excluded from the decision-making process, and it is also low in capacity. The social capital of the civic sector is fragmented, including mostly walking/hiking associations, cultural associations, agriculture and gastronomy associations or other voluntary activities. Listed associations are hierarchically ordered, by the number of registered associations and their activities realised during the year (data obtained from National Institute of Statistics Italy 2015). The highest number of activities is excursions, daily activities or, occasionally, weekend events. Events that last for more than two days are even rarer and if present, they are music or film festivals. Cross-sectoral collaboration is almost completely absent,[10] and if it exists, it is not a full collaboration (events are not planned together among diverse stakeholders who would contribute to the common long-term benefits). Management, economic development and the success of a geopark "can only be achieved through strong local involvement" (Farsani et al. 2011: 70). Thus, geotourism should not be seasonal and has to strengthen the civic sector and the capacity cross-sectoral collaboration.

Territorial Geotourism Development Planning Approach: Geo-mining Park in Sardinia

Social capacity, culture, economic growth and the environment are the cornerstones for well-being and sustainability. Balancing resources, blueprint and process, geotourism could benefit as a tool to celebrate the heritage and foster the local economy during the whole year, ensuring the well-being of the local inhabitants and the Geo-mining Park in Sardinia.

The techno-economic feasibility study (Sardinian Mining Authority—EMSA 2002) of the Sardinian Geo-mining Park highlighted the need for "innovative co-planning" as an obstacle from the very beginning. Given its status as a complex, and relatively new institution that has to do with very few stakeholders who cannot recognise the common interest, the management authority of the geo-mining park was not able to coordinate, harmoniously, projects of different sizes (EMSA ibid).

[10] Occasionally, excursion on mining route finishes at a village where degustation of local gastronomy takes place. We recognise these examples of local practices as a possibility to upgrade the capacity of cross-sectoral collaboration.

Planning politics about sustainable tourism are territorial, and they depend on the long-term provision and evaluation of compatible resources and social systems. Interrelationships within a social system are created in-between local populations and tourists (Cecchini 2016). The territorial sustainability of geotourism as a developmental tool faces the same issues. The conception of sustained development favourable to the local everyday life and beneficial to conservation and education within the geo-mining park in Sardinia through geotourism needs to establish a territorial relationship system based on local environmental and human resources. Environmental resources require compatibility and diversification that are fundamental to a multi-functional geotourism economy. Human resources have to be strengthened, favouring a bottom-up approach instead of the present top-down institutional practice. Furthermore, cross-sectoral collaboration and cooperation have to be supported and intensified.

Mapping the Heterogeneity: Mining Landscape and Geopark in Sardinia

Compatibility and diversification of environmental resources challenge the heterogeneity of geotourism and strategic priorities. There are high varieties of resources, which characterise the Sardinian Geo-mining Park, e. g. mining engendering techniques, geological, historical, archaeological and other factors. This heterogeneity of resources adds value to a qualitative character of the geo-mining park. Although the mining landscape and the Geopark have compatible objectives, their spatial distribution is different. The European Route of Industrial Heritage (ERIH) defines heritage networking principles whilst confronting resources that are not superimposed. It recognises anchor points as significant heritage sites, and the routes follow (ERIH n.d.). These principles indicate that characterising the heritage places where mining and

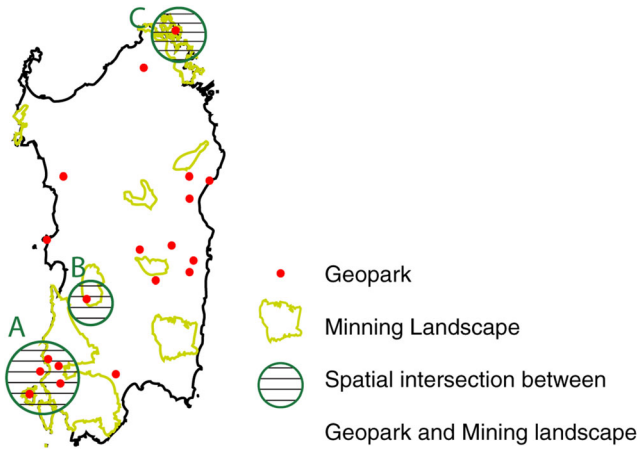


Fig. 5 Distribution and the physical intersection between mining and geological heritage as primary potentials to fund the future development strategy of Geo-mining Park in Sardinia (source: authors)

geological heritage interests intersect are the strategic priorities of geotourism development (Fig. 5). Firstly, intersections are physical, relevant to the economic exploitation of infrastructural connections and time. Secondly, intersections are qualitative assets of the heritages' thematic diversity. The possibilities of thematic diversity depend on the natural and cultural composition of the landscape and the socio-economic conditions that shapes it. These two elements are the critical points that unify the concepts of the geopark and mining landscape. The Sardinian case recognised eight areas of mining landscapes and nineteen Geopark sites. Three physical intercessions exist. Qualitative assets are suggested for further research, but even in the early phase of the drafting, the intersections contain elementary contextual differences. Case A has the highest number of intersections and represents the core of the natural and cultural resources of the Sardinian Geo-mining Park. Case B has more natural than cultural characters, but is of very high historical importance to the geo-mining park. Case C is the least important mining landscape within the territory of geo-mining park. It represents a collection of dispersed heritage sites rather than a mining territory. On the other hand, the demographic and socio-economic condition of case C is an exception in the geo-mining park. It is a unique Sardinian Province with an increasing demographic rate and small unemployment rate. Also, case C is the area with the most intense tourism when compared with the other two cases. Whilst being the least important area in heritage character, area C has the highest level of general public interest for the area. Therefore, in comparison with other areas of the geo-mining park, case C has the highest potential for intense future development. The state of the art allows for the development of the existent systems and infrastructures (physical and human capacity) whilst sharing an interest with the heritage area and/or topic. However, all three cases (A, B and C) should have a designated strategic development approach.

Regional Potentials of Shared Interest Concerning Geotourism

Figure six shows the distribution of Sardinian regional natural resources within the Geo-mining park. The intersections of particular areas between the Geopark and natural parks, coastal system, protected systems of flora and fauna and areas of general public interest are possible starting points for networking and collaboration.

This approach could bring multiple benefits to the geo-mining park and its communities. Firstly, sharing interests in the area and sharing or integrating activities could multiply the social and economic benefits to places by encouraging the reduction in the offer of a seasonal commodified product. The secondary review carried out in this study shows minimal examples of collaborative and cross-sectional activities. More research should be carried out aiming to identify further activities funded in local everyday life that can act as benchmark examples for future geotourism development. Secondly, such an approach could stimulate community' engagement with a sense of belonging to the geo-mining park and geotourism-related initiatives.

Geotourism as a Development Planning Tool Has to Support Bottom-up Initiatives Next to Top-down Practices by Strengthening Social Capacity and Cross-sectoral Collaboration

Findings also suggest that there is a need to reexamine the functioning of the geo-mining park management authority and participation in the development and implementation of an effective geotourism strategy.

Planning and management of World Heritage Sites strongly influence the anticipation of the future. Driven by the necessity to support sustainable tourism development and concerned stakeholders, UNESCO created the World Heritage Sustainable Tourism Online Toolkit (UNESCO n.d.). This innovative approach represents an intention to focus sustainable tourism development strategies on destination rather than heritage (UNESCO 2015). Shifting the focus on particular places (destination) run by local communities rather than having a heritage in some communities requires vast institutional support from UNESCO towards the full participation, spatial production and everyday life performances. UNESCO suggest four steps to make the basic foundations for the management of World Heritage destinations: understanding (key terms of reference), strategy (based on and made with the stakeholders), governance (different from World Heritage site management, it must be extremely open, inclusive and interactive) and engagement (based on local economic opportunities—talking and listening, voicing the words of the local community). These steps are necessary for the identification of the most suitable solutions and effective destination management. In the Sardinian Geopark case, only the first step is partially completed. Existent organisational and programming structures mostly include public sector representation but involve minimal participation from the private sector. From the civic sector, some associations are contributing, but mostly without a long-term strategy and without cross-sector networking even though social capital (local and territorial stakeholders) and environmental resources exist (Beretić et al. 2015). Jessop et al. (2008) call this approach a "strategic-relational approach" and it "must be viewed as mutually constitutive and relationally intertwined with dimensions of socio-spatial relations" (Jessop et al. 2008: 389). Sustainable territorial planning should anticipate and propose the strategy rooted in local communities that contribute to shared well-being by considering four dimensions: territories, places, scales and networks. The success of geotourism in the geo-mining park

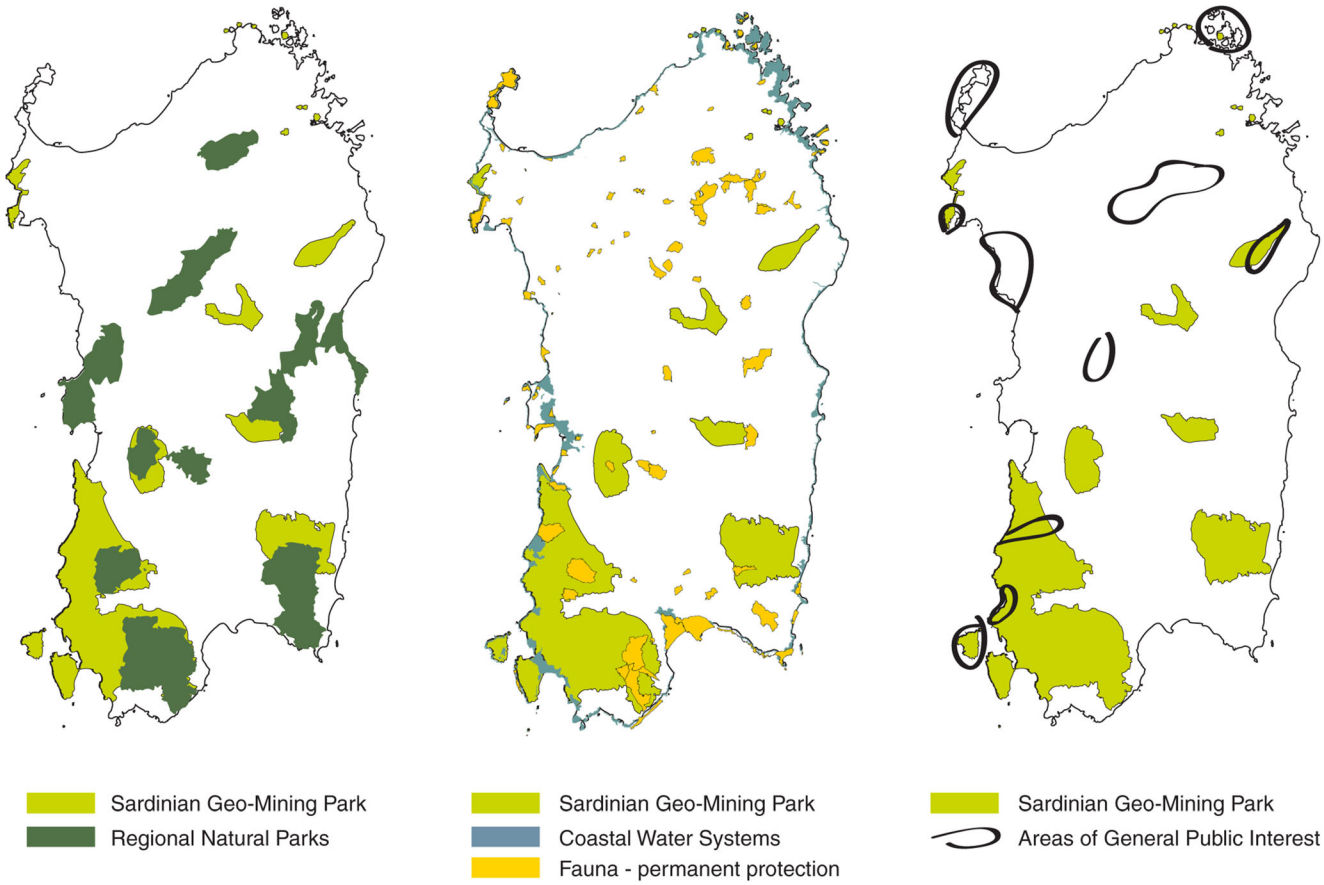


Fig. 6 Sardinian Geo-mining park and other natural and cultural resources in Sardinia Island (source: authors from "Geoardegna" GIS database online)

depends on the active involvement of local communities in the strategic development to ensure local-embedded activities.

Discussion and Conclusion

Whilst not being a new phenomenon, tourism is now a critical sector in Sardinia's economy and in this respect, much research is still needed to understand the impacts it can have on the everyday life of the island's communities (Cecchini and Cannaos 2010). As the case presented here shows, much research is still needed to design, plan, coordinate and implement tourism strategies that can bring about effective and sustainable socio-cultural and economic changes.

This paper presents the case of the Sardinian Geo-mining Park examining its development possibilities by using the concept of geotourism, a type of tourism and an approach to local economic development that celebrates local heritage and local life during the entire year (Newsome et al. 2013). About 10 years after the institutionalisation, the Geopark remains semi-perceived, pseudo-conceived and mostly lived, lacking effective management strategies to stimulate local sustainable development (Beretić 2014). The documentary review analysis carried out in this study shows that geotourism has had little impact on the socio-cultural and economic well-being and environmental protection of the geo-mining park areas since its institutionalisation. Much of Sardinian tourism is still concentrated in the summer months and focused on the sea and coastal landscapes. Mining sites are mostly located along coastal areas, but only sporadically influenced by tourism, contributing about two and a half % of the total visits to Sardinia. Furthermore, many sites perceived as relevant local heritage resources (Perelli et al. 2011) are without a coordination plan and vision to demonstrate heterogeneity as the qualitative advantage of the geo-mining park. The documentary analysis highlights internal stakeholders' conflicts and diverging community priorities as key issues affecting the territorial development strategy. These issues, however, are further compounded by a lack of coordinated research in terms of sites' distribution and territorial co-planning, challenging the successful programming and implementation of development strategies. Despite these difficulties, the research noted how several small-scale civic and private sector initiatives and practices have started to emerge, ranging from local walking/hiking associations; to cultural associations offering daily excursions and guided tours during the summer season. However, the need remains to investigate further the potential for cross-sector collaboration in geotourism development as

well as exploring the potential relationships geotourism can have with another form of tourism in the attraction of visitors throughout the year. Effective strategic geotourism planning and development in the Sardinian Geo-mining Park should thus also focus on reducing a seasonal and commodified heritage tourism offer which inevitably converts "landscape in brand-scape" emphasising the link between the landscape and every life practices (Hose 2006; Maciocco 2007; Newsome et al. 2013).

UNESCO highlights the importance of bottom-up approaches and local communities as cornerstones for a Geoparks' development: "UNESCO Global Geoparks give local people a sense of pride in their region and strengthen their identification with the area" (UNESCO 2016: 1). In this context, geotourism, as an effective development strategy for the Sardinian mining Geopark, also requires a review of the current in-place management structure. The analysis highlights how, despite in principle participation, there is very little representation from the private and civic sector. The research recommends strengthening the issues concerning social capacity and local activities in the territory of Sardinian Geo-mining Park. Thus, the study suggests that any future geotourism strategy should also be based on better integrating stakeholders into the management structure, as well as identifying each stakeholders' roles and capabilities to contribute to future strategy. Local people, engagement and pride, are the best strategies for long-term sustainability and thus in this context geotourism, as a possible strategy for revival of the Sardinian Geo-mining Park and community well-being, can only work effectively if embedded in the fabric of local communities; by empowering the cross-sectoral collaboration of stakeholders in the balancing of resources, blueprint and processes of natural, cultural and intangible heritage development for geotourism.

Last but Not Least: Geotourism as a Tool for the Preservation and Development of the Geo-mining Heritage in Sardinia

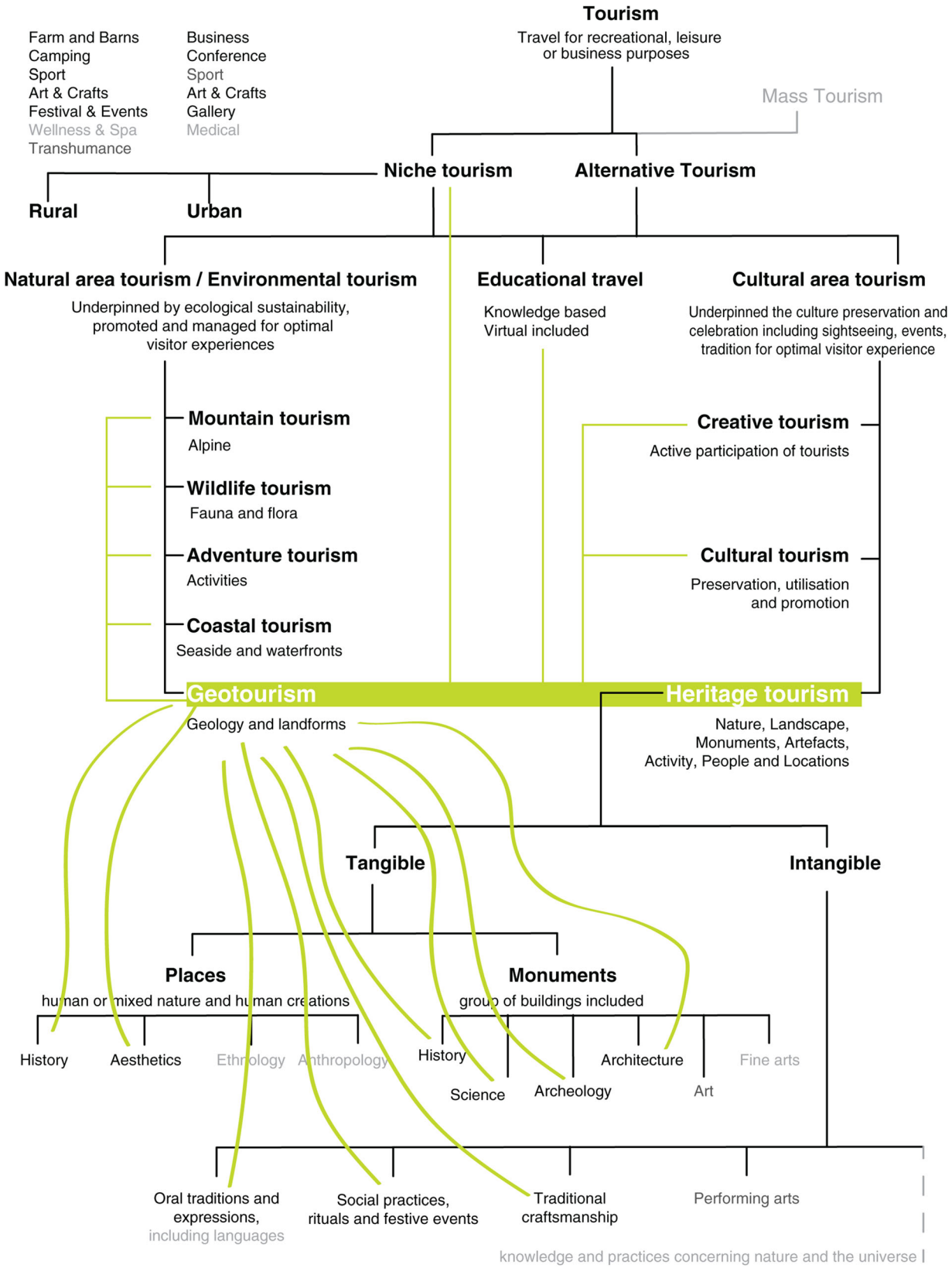
This study contributes to the further understanding of geotourism as a strategy for sustainable development of the geo-mining parks as heritage sites and communities. As the literature highlighted, the concepts of the geopark and geotourism are still in their infancy, are relatively new and, that much more research is needed to explore their potential for the protection and valorisation of unique areas and a local community's well-being (Dowling and Newsome 2006; Hose 2011; Newsome et al. 2013). With its commitments to the local people and geoconservation (long-term ecological, social and economic sustainability and visitors' education), geotourism is a beneficial approach to territorial development of the Sardinian Geo-mining Park.

The paper provides an insight into the assessment and principles involved in selecting the significant features of heritage for strategical development, rather than as an evaluation tool. The orientation of outcome is appropriate for the development stage of the Sardinian case. Assessment of territorial sustainability about geotourism and heritage development has to conceive compatible spatial-environmental resources (natural and cultural) and social systems between local populations and tourists that are beneficial to the heritage and everyday life of the local community. Thus, territorial continuity of compatible and shared development interest in the environmental and human resources has to scale from local to regional networking, cooperation and cross-sectoral collaboration. Hence, the integral strategic approach requires an interface between heterogeneous geo-mining heritage and other regional, natural and cultural resources with shared interest. A multiple resource-based strategic approach minimises the probability of failure by avoiding monofunctional economies and maximising the diversity of participants and systems involved with the heritage. The research emphasises the urgency for strategic priorities and unique governance of the territorial harmony at different scales for the Sardinian Geo-mining Park as a regional heritage, involving both, natural and cultural heritage and other regional resources of shared developmental interest.

This paper presents the case of the Geo-mining Park in Sardinia and its heterogeneous natural and cultural resources. The distribution of complex resources results in three spatial units (cases A, B, C, figure five) with different development potentials and realities. But all of them have the highest variety of heritage resources in comparison with the complex variability of the Sardinian Geo-mining Park. However, the research does not suggest these three cases as an absolute priority for the strategic development of a complex regional system of heritage. Rather, it defines these cases and their general condition within the criteria of spatial distribution and heritage variability.

Through simulation of the "gamma diversity" from landscape sciences, with the higher value of heterogeneity (local multi-resources that compose the "local" unit), comes the highest number of total merged heterogeneous resources (complex of geo-mining park and other natural and cultural resources). Following the "gamma diversity" principle, one sustainable development scenario for the Sardinian Geo-mining Park depends on the interface of geo-mining heritage and other natural and cultural resources of the Island. Figure seven summarises the examination of geotourism as a potential sustainable tool for preservation and development of the Geo-mining heritage in Sardinia.[11] In particular, in the case

[11] The figure is referent to the UNESCO's classification of cultural heritage and partially inspired by the research of Hose, Newsome, Moore, and Dowling about alternative tourism.


Tourism
Travel for recreational, leisure or business purposes
Mass Tourism
Farm and Barns
Camping
Sport
Art & Crafts
Festival & Events
Wellness & Spa
Transhumance
Business
Conference
Sport
Art & Crafts
Gallery
Medical
Niche tourism
Alternative Tourism
Rural
Urban
Natural area tourism / Environmental tourism
Underpinned by ecological sustainability, promoted and managed for optimal visitor experiences
Educational travel
Knowledge based
Virtual included
Cultural area tourism
Underpinned the culture preservation and celebration including sightseeing, events, tradition for optimal visitor experience
Mountain tourism
Alpine
Wildlife tourism
Fauna and flora
Adventure tourism
Activities
Coastal tourism
Seaside and waterfronts
Creative tourism
Active participation of tourists
Cultural tourism
Preservation, utilisation and promotion
Geotourism
Geology and landforms
Heritage tourism
Nature, Landscape, Monuments, Artefacts, Activity, People and Locations
Tangible
Intangible
Places
human or mixed nature and human creations
Monuments
group of buildings included
History
Aesthetics
Ethnology
Anthropology
History
Science
Archeology
Architecture
Art
Fine arts
Oral traditions and expressions, including languages
Social practices, rituals and festive events
Traditional craftsmanship
Performing arts
knowledge and practices concerning nature and the universe

◀ **Fig. 7** Geotourism and heritage tourism approaches that may be considered for Sardinian geo-mining park (source: authors)

of the Sardinian Geo-mining Park, geotourism has to establish the strongest relationships firstly with heritage tourism and the tangible and intangible heritage, and then with other approaches to tourism. Surely, it also has to relate to the correct approach to natural area tourism. Three shades of grey regarding subcategories of tourism approaches correspond to the level of compatibility; where the darkest colour (black) is the most compatible for the Sardinian case. The figure illustrates conceivable relationships between geotourism as a heritage tourism option and multiple tourism approaches, suggesting both possibilities and challenges in developing multiple resource-based tourism strategies. It provides a spectrum of the development options which geotourism could generate stating both, heritage types and regional resources in the interface. Hence, the territorial planning approach to geotourism contributes to the protection and development of the Geo-mining Park in Sardinia by building up spatial and thematic relationships that should benefit the local community. Moreover, the multiple resource-based territorial planning development approaches are applicable to other heritage sites.

The role of the geopark and socio-economic impacts of geotourism is fundamental for improving the local living conditions, stimulating economic growth and engaging the local communities in the geo-mining park and in geotourism development strategies. (Farsani et al. 2011). This study shows that strategic planning through community involvement and cross-sectoral collaboration may be the key to the development of a sustainable geotourism strategy in Sardinia. However, this planning should also be supported by dedicated stakeholders' management principles and the integration of local practices as well as sound visitors' research profiling. These are vital to ensure that any future strategy is sustainable. Whilst relevant to the Sardinian Geo-mining Park case, it is suggested that the findings presented in this study could inform similar studies aimed at appreciating the challenges and opportunities in geotourism as a territorial planning development tool for multiple resource-based strategies in other geo-mining parks and heritage sites.

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