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MONITORING OF MEDITERRANEAN COASTAL AREAS
problems and measurements techniques

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Giovanni Fattori "Lungomare di Antignano" (1894)
Museo Civico G. Fattori, Livorno

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SOCIO-ECONOMIC ANALYSIS AND STAKEHOLDERS INVOLVEMENT: THE CASE OF THE 'BUE MARINO CAVES' TOURIST VALORIZATION

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Abstract – The authors are involved in the research project “*Sustainable Exploitation of karst areas: study and conservation of biodiversity in the caves of Sardinia (KARSTBIOSAR)*”, funded by the Region of Sardinia with LR 7/2007. The aims of this paper is to show the progress of the project, focusing on the case study of the ‘Bue Marino’ Caves (Fig.1).

The area has been chosen mainly because it is characterized by a very vulnerable natural system for its high and fragile biodiversity joined to a heavy tourist pressure. More than annual 60000 visitors coming from all over the world, are distributed in a relatively short tourist season from April to October. During the winter time, the access to the Caves is impossible for the high level of the sea-waters. The Stakeholder Analysis is an useful tool to enucleate the complicated and multi-faced relations between local communities and policy-makers, also in order to reconcile private and public goals, helping local communities to better understand their actual goals and the political institutions to identify supporters and opponents to eventual and alternative protectionist/exploiting policies. We will identify the network of interests surrounding the ‘Bue Marino’ Caves, by analyzing: (1) the social network of interests and actors; (2) the key patterns of the interaction among the actors; (3) the values, interests, aptitudes and aspirations of stakeholders; (4) the reasons for opposition/support to the management patterns of the Caves; (5) the role of the public institutions in the governance process. Following an already tested method, we discuss the availability of quantitative and qualitative data, these latter regarding the stakeholders’ perceptions about the necessity of managing biodiversity of the Caves, balancing relevant socio-economic and environmental goals. We report some results about the cooperative involvement that has already been established between researches and some of the key stakeholders during several preceding meetings. The free commitment of participants during meetings and interviews shows us the possibility to further enhance the sharing of common ideas about the socio-economic convenience of improving a well defined managing policy, oriented to the reconciliation of environmental protection and tourism exploitation. The results of the field research will usefully support the development of a ‘common pool of knowledge’ that both institutions and private actors can use in identifying a model for selecting a shared environmental policy, thus having more chances of successful policy choices.

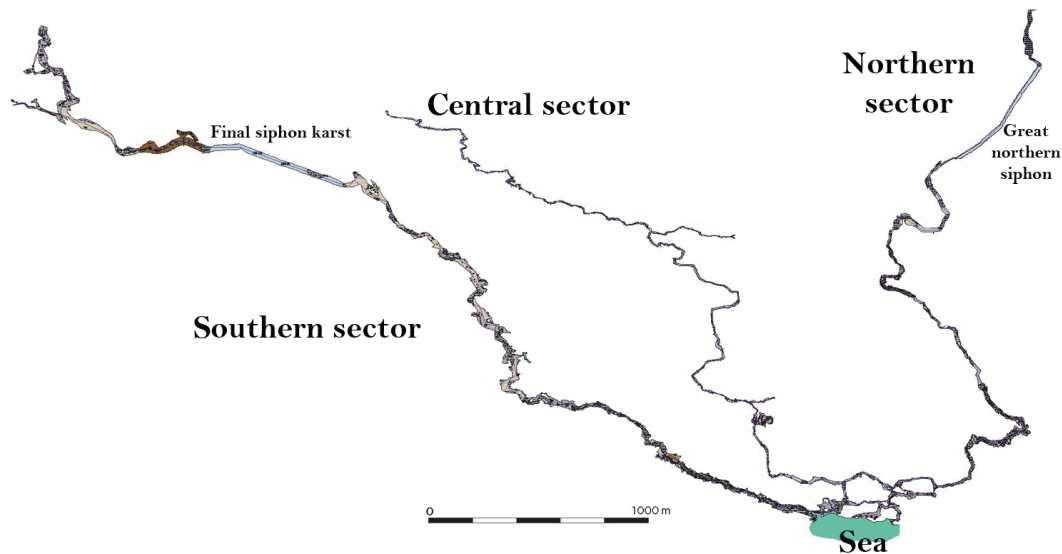


Figure 1 – The Bue Marino Cave - [Source: modified by Leo Fancello and Daniel Hutňan].

1. Introduction

Sustainability is on the international agenda even in the travel and tourism sector, which is becoming a world wide prominent economic activity. The rapid increase of the tourism industry has been caused by the general rise both in living standards and wealth of people. The importance of tourism is not just about the money visitors spend on travel, accommodations, leisure activities or buying souvenirs, however the overall industry stimulates the participation and collaboration of local communities, national and local governments, local suppliers, businesses and tourists, throughout a more or less extended and complicated network of relations. Sustainable (tourism) development embraces economy, society and nature and is the overall context for this study.

In recent years, increasing attention has been paid to political actions aiming at programming the tourist valorization of natural resources and public interventions that are established as a result of a common knowledge, shared by local populations and implemented in policies of environmental managing. The involvement of local actors in policymaking is a research topic of increasing interest and the specific matter of the present paper.

Social inclusion in decision-making has become a central element in the preparation of EU rural development policies but even in every planning process aimed at local territorial resources valorization. The authors are involved in the research project ‘Sustainable Exploitation of karst areas: study and conservation of biodiversity in the caves of Sardinia (KARSTBIOSAR)’, funded by the Region of Sardinia with RL n. 7/2007.

The touristic use of natural resources is of high interest both by for private enterprises (which objectives are usually identified by market goals) and residents and environmentalists (who are more often interested in ‘non-market’ goals and in the conservation of natural resources). Market and non-market goals can be considered contrasting, often expressed by harsh confrontations between enterprises, residents and other social actors. Furthermore, the network of interests of economic, environmental and sociological nature, is always very

complicated due to the intertwining relations between society and nature even in a singular site specific case as the study of Bue Marino Caves in Sardinia, Italy.

The present paper aims at giving some intermediate results, actually a second step report, after the first one presented a year ago [11]. The research is still under way with the goal to detect at least 30-40 questionnaires, and today we have the possibility to expose the results of near the third part of the total scheduled number.

The research question we have particularly investigated in this paper is what is the involvement of stakeholders in the policy of managing and promoting the tourist use of the Bue Marino caves.

The paper is organized as follows. Paragraph 2 gives the background theory literature, regarding the social networks and economics (subparagraph 2.1) and the use of the Stakeholder Analysis (subparagraph 2.2), paragraph 3 reports the overall geographic situation (subparagraph 3.1) and the administrative framework and services to access the tourist use of the site (subparagraph 3.2). In paragraph 4 we expose the methodology and in 5 we give results. Paragraph 6 is dedicated to discussion of results and concluding considerations.

2. Theory Literature

2.1. Social networks and economics

Social sciences are concerned how singular individuals can combine to consolidate functioning societies and in economics and geography functioning societies matter. Social network theory can give feasible models for interpreting specific and micro aspects of social functioning and spatial interpretations as well, helping to explain social phenomena in a vast range of topics, from corporate profitability to policymaking, governance and spatial diffusion of development. Furthermore, social network theory is feasible to deeply interpret social relationships in local communities, allowing the investigation on micro choices, behaviors and citizens' participation which determines collective results [1]. Scholars [6], in defining theory on network distinguish two kinds, a theory of the networks, which considers the antecedents of network phenomena, and a network theory, which, on its turn, considers the consequences of network phenomena. The first considers arguments that determine the network phenomena, the second being a theory of the advantages of social capital, considering the consequences of the network phenomena. In the 'theory of networks', societies are depicted as 'systems of relationships' within which actors play roles relative to one another [22], with a sound relational perspective in economic sociology named *embeddedness*, i.e. economic transactions among actors are influenced by actual social relations among the same set of actors [19]. The behavior of people, can depart from market, political expectations and other type of ties (i.e. friendship, kinship) [7].

In the Italian scholarly debate on local development, is noteworthy the importance given to 'territorial' intermediate economic actors, from local productive systems to system-areas, and from *milieux innovateurs* to networks of enterprises and network-enterprise within a socio-economic approach [14]. The territory is a transformed space, organized by social actions (production and consumption) and thus is both the product of social strategies and the 'theatrical set' and object of designed strategies [26] [3]. Visible features of the territory are not the mere results of several microeconomic decisions but actually the product of evolutionary processes which are *self-triggered* and *oriented*, that in

their turn are capable of conditioning microeconomic choices [4]. The need to understand the continuing interlocking of actions and feedbacks have suggested to adopt the local systems as the minimum survey units for the social and economic research [5]. In this framework, *embeddedness* can be defined as a process by which entrepreneurs become part of local social structures and that is a necessary mechanism for entrepreneurs to understand local rules, access local resources and create value [18]. A sort of a ‘district approach’ has been anticipated, within the agricultural economics, by the agricultural economist Arrigo Serpieri who defined the ‘agrarian zone’ as the territorial unit within which the territorial production is almost homogeneous and to be studied in an unitarian way, as land serves as the seat of agricultural, pastoral and forestal production, but is also the seat of any other human activity. ‘The land transformations, producing a specific land tenure, have non purely agricultural production targets, but also other production and civilization targets’ [25]. Thus, the analysis of *embedded* social networks can be a sound basis for interpreting the involvement of local actors in the effectiveness of any proposed development policy.

2.2. Stakeholder Analysis

Local actors are to be considered as stakeholders in front of any actual/potential change of public policies. Their acceptance/refuse of policies is determinant for policymakers if they want to introduce effective public interventions and governance of social goals. Freeman [17] proposed a theoretical statement for Stakeholder Analysis (SA) that has even practical feasibility, telling how the characteristics of stakeholders, being them individuals, groups and even organizations, influence the policymaking process in reality. A systematic tool [24], with clearly defined steps and applications for scanning the current and future organizational environment, is available, feasible, and tested to detect local issues in environmental topics [2]. Stakeholder analysis can identify key-actors and understand their behavior, intentions, interrelations, agendas, interests, and the influence or resources they have brought, or could bring, to bear on decision-making processes [8]. As a cross-sectional view of an evolving social picture, the utility of stakeholder analysis for predicting and managing the future is time-limited and it should be complemented by other policy analysis approaches [9]. Nevertheless, a participatory, multi-stakeholder approach can help research and policymakers to assess diversity of interests and positions, ‘not only to further democratic principles but also to increase the practical likelihood that the proposed actions and plans will be accepted, implemented and effective’ [13].

3. The Bue marino caves

3.1. Geographical characteristics of the site

The area surrounding the town of Dorgali is dominated by the limestone rocks of the Mesozoic. They mark the landscape with spectacular and rugged landforms, characterized by grand and impressive plateaus limited by deep escarpments which lead quickly to the valley floor. The town is located at the base of a calcareous slope that, for tectonic tilting towards the East, is a massive cliff about 30 kilometers long, near to the transition between the Mesozoic limestone formation and the underlying Paleozoic basement composed of metamorphic often deeply altered rocks.

Another geological feature that distinguishes this municipality is the presence of basaltic flows of the Pliocene, as large areas of this region are marked by a landscape or sub-horizontal tabular made by lava flows. These volcanic events are largely diffused in the area surrounding the *Monte Bardia* which overlooks the town of Dorgali.

The coast is determined by a long cliff only locally interrupted by short stretches of beach, sandy or pebbly, at the mouths of the rivers that run through the Mesozoic limestones with deep canyons and gorge, known in this area as *codule*. The lava flow, coming from the town of Dorgali, dips along the coast of Orosei determining the existence of two small beaches, named *Osalla* and *Cartoe*, located on the sides of the casting that forms a promontory on the coastline.

The location of the village was dictated by the particular hydrogeological conditions of the region: there were easy to pick up waters and more sand-clay soils suitable for agriculture than the residual limestone ones, best known in the literature [10] as *Terre Rosse*.

The main river of this area is the River Cedrino, which runs for most of its final stretch, along a deep canyon carved on volcanic superimposed lava strata that have affected this region for over a million years.

Furthermore, the big presence of limestone has favored the diffusion of an underground water flow, feeding numerous rivers that characterize the impressive cave systems, such as the *Grotta del Bue Marino*.

The Bue Marino caves, located between *Cala Gonone* and *Cala Luna*, lay within the territory of Dorgali, and over 50 years has been visited by tens of thousands tourists and many speleologists, attracted by the beauty and geological complexity of its large galleries.

The cavity, whose development is currently more than 20 km, can be reached by boat or by walk, along an easy footpath starting from *Cala Fuili*, a small beach located at the end of the coastal road south of *Cala Gonone*. The footpath runs along the edge of the coastal cliffs, surrounded by the Mediterranean maquis vegetation. At the end of the path, a wall boardwalk links the entrances of the caves, that are closed by a gate.

The caves were already known in ancient times, probably when the sea was lower than the current level, so as to allow convenient access from the ground. This is witnessed by rock carvings discovered in a concretionary cast in front of the sea entrance, and some other archaeological traces found in an inner room (about 3200 BC) [12].

The caves became famous because were the refuge, until the mid-seventies, of the *Foca Monaca* (*Monachus monachus*) (Fig. 2), in the Sardinian language *Boe Marinu* (in Italian *Bue Marino*), now extinct at all.

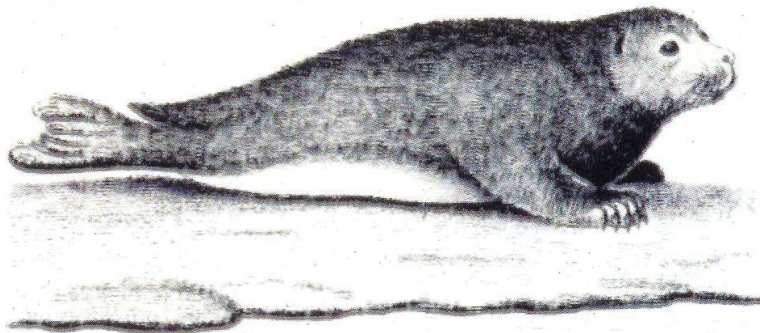


Figure 2 – Picture of the monk seal - Source: [15].

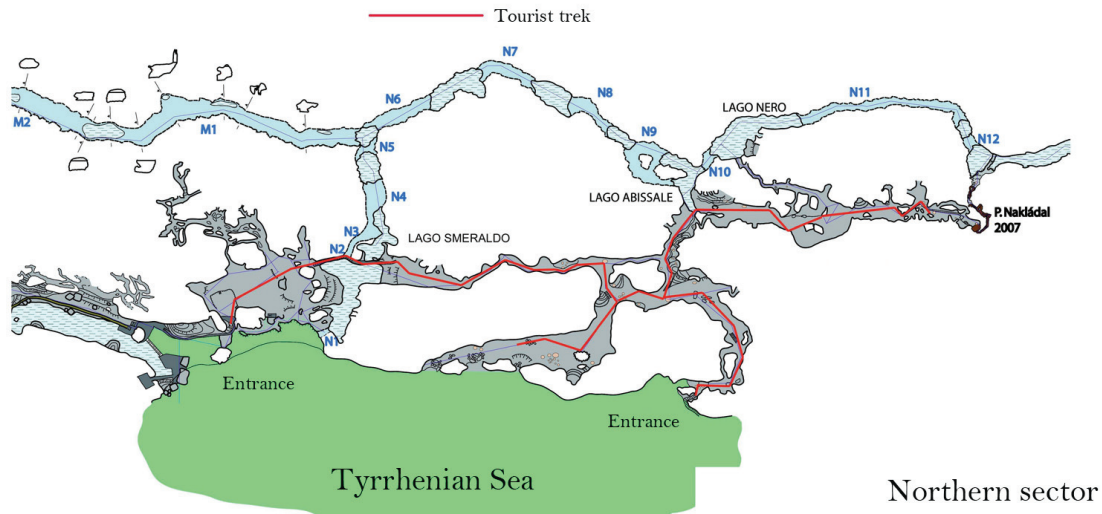


Figure 3 – The North Branch. Source - Survey: *Gruppo Ricerche Ambientali- Dorgali. Gruppo Speleologico Sassarese 1987-2007. Czech Speleological Society 1989-2007.* Length of the cave: 17.340 m (31.12.2007). Graphics: Anna Hutňanová, Daniel Hutňan. Completion by Leo Fancello and Daniel Hutňan. Modified.

The mammal survived the last glacial period but not the man, because shepherds and hunters, equipped with pruning hooks and guns, killed the seals while sleeping on the beaches of the Gulf. They kept skins and lamp oil for selling. On their turn, the fishermen killed seals to protect their nets and fishes. To these troubles, after the sixties, tourists added their disruptive presence. In the Bue Marino caves, the last sighting of a seal was in 1975.

The Bue Marino cave schematically composed of three different branches apparently not communicating. They are joined by the sea, concurring with two tall and spectacular portals. The North Branch (Fig. 3) is characterized by large fossil galleries (about 1400 meters long), the walls of which show visible signs of a preceding higher sea level. Along these galleries you can find three lakes: Lake Emerald, Lake Abyssal and the Black Lake. In the early nineties an extraordinary complex of galleries was discovered, largely flooded, and over 7 km long composed of 42 traps and as many lakes, crossed by an underground river. Overall, the development of the North Branch is about 9000 meters.

The Middle Branch is 4.5 km long and has magnificent underwater pipelines with at least 38 traps. It has been explored in the 70s for the first 500 meters, and the explorations are still in progress.

The South Branch (Fig. 4) is activated only during heavy rainfall, acting as an overflow of the karst complex, where the water table is located approximately 9 m below. In periods of low water, the sea penetrates into the cavity for the first 600 meters, up to a barrier, sometimes crossed by a cascade of water coming from inland lakes, which determines the boundary between the salt and sweet waters. The rooms are everywhere characterized by the presence of large galleries, the floor is usually made of long white sand beaches, interspersed with clear lakes of fresh water. You can divide this branch of the caves into three parts: the Tourist Branch, the branch of Speleological Galleries and the post siphon Branch. The overall development of the South Branch is approximately 7000 meters.

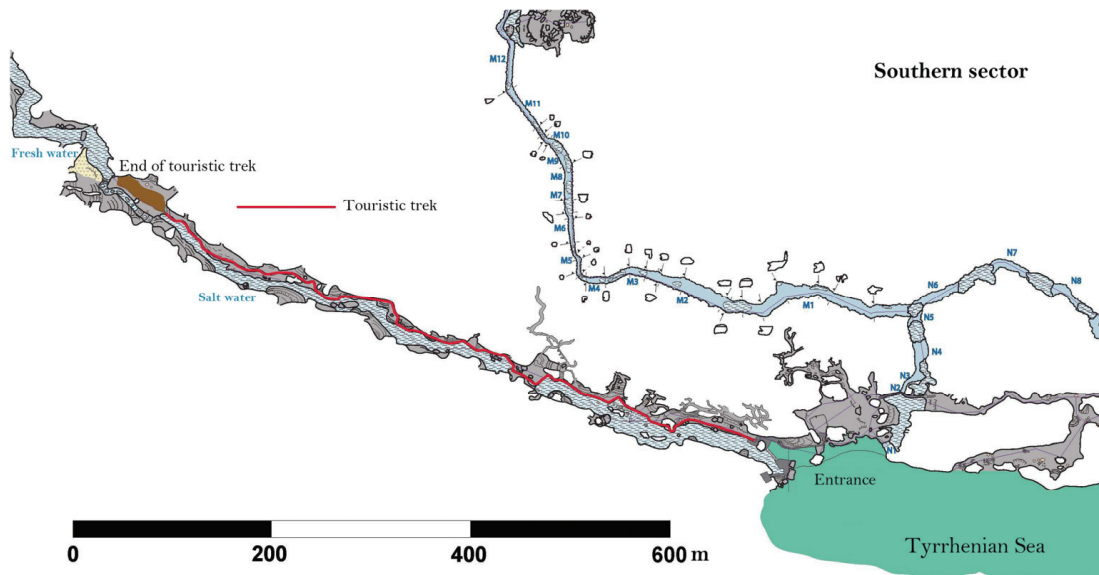


Figure 4 – The South Branch. Source - Survey: *Gruppo Ricerche Ambientali- Dorgali. Gruppo Speleologico Sassarese 1987-2007. Czech Speleological Society 1989-2007*. Length of the cave: 17.340 m (31.12.2007). Graphics: Anna Hutňanová, Daniel Hutňan. Completion by Leo Fancello and Daniel Hutňan. Modified.

The southern branch was opened at the end of the seventies, for about 700 meters, equipped with walkways and electric lighting [15] [16].

3.2. The administrative framework and services to access the tourist use of the site

The tourist development of Cala Gonone, a tourist seaside destination in the Municipality of Dorgali in Sardinia, started between the fifties and sixties of the past century, when some first visitors came and saw the caves of the ‘Bue Marino’. The very first tourist initiative is due to a colony of fishermen coming from the isle of Ponza, in the southern Italian region of Campania, and settled in Cala Gonone by the starting of the century, using fishing boats to carry tourists to the caves. Some significative development flourished after the promoting initiative of the *Pro Loco*, that managed the access to the caves, using tourist guides since the seventies. The pure agri-pastoral and handicraft local economy began to differentiate implementing tourism activities. Since 1960 the Bue Marino, Cala Luna and Miramare hotels have been built and the fishermen stopped their original activity. In 1954, the northern branch of the caves was equipped for tourists, transported by boats of fishermen original of Ponza who then lived and worked in Cala Gonone. The lighting was provided by gas lamps and acetylene and the service was led by fishermen or guaranteed by the shepherds.

After this, the local community of Sardinian residents finally got the wind of the bargain and buying a boat for tourism purpose and started the Maritime Transportation Consortium. Due to overfishing activities and environmental neglect, the seal extinguished, becoming only a toponym of the memory of the marine mammal.

Today, the visit of the caves is limited to only a part, namely the North Branch, which was the very first visited caves since the eighties, illuminated by gas lighting. Afterward also the South Branch has been implemented for tourism. Until this date, the *Pro Loco* earned entirely all the revenues. In 1989, the Municipality administration decided to directly manage the tourist fruition of the caves in favor of the entire community, selecting annually a private contractor by a public auction.

The current manager of the caves is the *Atlantikà* company, that usually gains the lower bid auction. The Municipality gives a monetary payment and requests some services (seasonal calendar, daily opening, trained guides) back. All revenues pertain to the Municipality and ticketing is located in the port and at the entrance of the caves by the Maritime Transportation Consortium.

Beside the service furnished by *Atlantikà*, tourist can reach the caves by their own boat or renting private rubber dinghies, which are managed by several companies that obtain grant of activities by the Italian State marine property. They actually 'keep busy' the sea front in the port of Cala Gonone with wooden hut for ticket selling service.

In 2013, around 60 000 people visited the caves, and in particular its south branch, with peaks ranging between 200 and 500 people per day between July and August, and only 15 people per day in the low season. The trend of admissions shows a considerable decrease in little more than a decade (in 2000 amounted up to 100 000 visitors). The tourists are mostly Italians in the peak season (July and August), French, German, Swiss and Austrian in March, April, May, June, September, October and November. The cost of the ticket is 10 Euros for the North branch and 8 € for the South branch to which you add up the cost of 5 euro ferry.

4. Methodology

Considering the theory literature, in order to answer the research question we made in the introduction, we carried out a field survey by making face-to-face interviews to key-stakeholders selected from the overall list of stakeholders already stated [11]. The interviews have been performed following a mix procedure combining the guidelines stated by Schmeer [24] for making a Stakeholder Analysis (SA) and the key-informant technique [20] [21] during the period June 2013 - July 2014.

The SA is a method of investigation that, through the systematic collection of qualitative informations and their interpretation, allows researches and policymakers to understand which are the interests that must be taken into account in the design of a policy, program or any other action, identifying the key players and the actual social interactions. The SA allows us to understand the values, interests, aptitudes and aspirations of stakeholders even favoring a more transparent and coherent dialogue between the parties. In this sense, can be crucial in conflict resolution, as it provides a platform on which the concerned parties can identify and express their interests converging and/or diverging in order to build a shared vision between the parties and find a compromise, thus reducing the risk of failure facilitating the work of policy building [23].

5. Results: the key actors and the network of relations and interests

Until today, we can state and describe the main actors which constitute the social network of local interests linked to the managing of the Bue Marino Caves, excluding the tourist demand side. We can put the key-actors involved in the Bue Marino caves as follows:

- the Mayor of the Municipality of Dorgali;
- the Environment and Territorial Marketing Alderman of Dorgali;
- the Mayors of neighboring villages surrounding the Orosei Gulf;
- the Office of Italian State marine property in Cala Gonone;
- the Coast Guard of the Cala Gonone Port Authority;
- the Unions of hotels and accommodations in Cala Gonone and neighboring tourist destinations;
- the cooperative company that currently manages the boat transportation and visit to the caves;
- the private boat rentals of dinghies;
- the private owners of hotels and other tourist accommodations;
- the handicraft, agricultural, and pastoral companies in the surroundings.

We can briefly describe the surveyed situation as follows. The local community is a ‘small world’ within which everyone knows everyone and potentially can interact with everyone. The caves of the Bue Marino is generally considered an important asset for the local economy, and even a real landmark that distinguishes the image of Cala Gonone in a very effective way. The local community is well aware of the importance of a better use of the caves as a tourist resource and—at the same time—of a necessary more sustainable and proper managing. The problem of a tourist overpressure is in the mind of public administrators who try to contrast the private pressure on the natural resource coming from private companies and tourists, but they consider the necessity to increase the tourist revenue for the local residents. The private and public interests are fabricated in a very particular systems of alliances. The public officers of the Municipality declared to be very concerned with the necessity to assure a sustainable tourist use of the caves, acting as an actual ‘tourist operator’ often accused by other private operators to perform an approximate managing and not to invest enough money—earned by the exploitation of the natural resource—in the tourist promotion.

Public and private goals and interests often diverge. One point of fragility and actual and potential conflicts is due to the different powers exerted by different public administrations on territorial assets and natural resources. The Municipality of Dorgali annually auctions the right to manage the caves to a private company, while the Italian State marine property office can authorize private companies to rent boats and dinghies, used to access many coves of the gulf and the caves as well. Thus the Mayor and the Environment and Territorial Marketing Alderman believe the density of boat rental companies too high and not well placed in the port front, but having no administrative power to control their number and excessive density.

In particular the Environment and Territorial Marketing Alderman declared: ‘In the peak season we can see over than 300 rubber dinghies in the gulf, carrying lots of people without an effective control and no possibility to limit potential excesses. We have to exert only a moral suasion’.

Even the boat rental companies believe licenses are too many, facing an excessive market competition, but being unable to collectively manage their activities and deal with the public administrations. They are more loyal and committed to the Office of the Italian State marine property, from which they receive their job licenses, than to the Municipality to which they (indirectly) pay taxes. With no doubt this is a fragile point in the governance system and actual origin of social conflicts.

The local community has a clear perception of the necessity to manage the Bue Marino in a broader system of tourist destinations located in the Orosei Gulf and in the inner closer rural areas. From a couple of years the Municipality organizes an annual event located in the caves, including music performances, local typical food and craft products promotion, trying to involve as much people and tourist companies as possible, from the village of Cala Gonone and closer areas as well. The success of this event is believed positive and to be repeated for the future.

6. Discussion and concluding considerations

The purpose of this paper is to identify and provide a brief summary of the first results about the application of a Stakeholder Analysis (SA) in view of assessing and possibly improving the managing and promoting policies of the tourist use of Bue Marino caves. The use of the SA allowed us to detect the features of the social network of interests surrounding the Bue Marino caves and the perception of local actors about the current management of the tourist use of the natural resource. The followed method is actually a mix between a formally organized SA and a face-to-face interview qualitative method and allowed us to assess the position of each stakeholder regarding the perception of the importance of the Caves in the territorial economy and what aspects of the managing and developing policies must be improved or ex novo introduced.

For the case study, we have selected the main stakeholders' categories in order to select the key-stakeholders as stated in section 5. Then a specific and already proved questionnaire has been used for surveying the network of actors that supervise the government, organization and upgrading of the caves. In particular, we have interviewed the Mayor, the Environment Alderman and the President of the *Pro Loco* of the town of Dorgali, then the President of the 'Gennargentu Association', who runs the North Branch, a representative of the *Atlantikà*, the company which runs the South Branch of the caves, an operator representing the Consortium of private boat rentals of dinghies, a representative of the Ogliastro Maritime Cruise Consortium, a hotel and restaurant owner, a representative of farmers, two non-resident tourists and one resident in Sardinia tourist.

The results we obtained at the current step of the research are feasible for assessing:

- the level of knowledge of the natural resource and problems of management and use by the local community;
- the position of the stakeholders in respect of the management of the caves;
- the main alliances between stakeholders;
- the main reasons for socio-economic conflicts.

These results are also feasible for the future enhancement of the broader research we are conducting about the sustainable tourist use of the Bue Marino caves. In particular

we can state the correct feasibility of the method and questionnaire we are using, in view of describing the entire network of socio-economic interest surrounding the caves.

A fundamental point, strongly confirmed till now, is the current unsatisfactory pattern of auctioning the right to rent boats and dinghies. The density of boats is largely perceived as too high, originating an uncontrolled over pressure on the natural resources. Nevertheless, the prevailing opinion is that the tourism induced by the Bue Marino caves has positively contributed to the economic development of the local economy and social improvement of the community.

Future development of the research will aim to further clarify the power and leadership of each actor, the ability to mobilize resources and map the position of the diverse stakeholders with respect to the use and management of the Bue Marino caves. The complete map of power and leadership will allow us to assess how the use of informations derived from the research can be exploited within the territory and what tools can be used to improve the performance of tourism development of the Bue Marino caves. The results can be used in future comparison to other case studies located in similar/different geographical locations.

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