

Examining the tourism value of geological landscape features: the case of Terme San Giovanni in the Siena clay lands of Tuscany

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ABSTRACT

The area of the Siena clay lands is famous for its aesthetic value, acknowledged at a national and international level. Though landscapes may have a strong visual attractiveness, other factors are also relevant in determining the extent to which they are appreciated. In this study, we hypothesized that a deeper knowledge of landscape is ever more required by visitors and also by local citizens, therefore a survey was built and submitted to visitors to the San Giovanni spa, located in one of the geologically richest locations. Though wellness and health are the main attraction, this study confirms that "landscape" still plays an important role in tourism attraction, but that visitors are not generally aware of more specific geological features despite proximity and easy accessibility. Nevertheless, increasing awareness of environmental and cultural significance, by "qualifying" these features, would increase the appreciation and would be decisive in capitalizing on this attraction.

Keywords: awareness; faults; CO₂ lake; geotourism value; landscape; nature; survey; thermal tourism

INTRODUCTION

The healthful properties of the thermal water at Terme San Giovanni are well known since ancient Roman times, and natural thermal springs represent a very important resource for both medicinal value and tourism attraction. In recent years, thanks to ongoing social changes and a more stressful lifestyle, the demand for relaxation and recreation opportunities has also increased compared to the need for treatment of physical illnesses. Potentially successful thermal facilities that integrate treatment with wellness are less susceptible to the effects of the recent economic and financial crises. In Tuscany, for instance, many thermal tourism locations are facing a structural economic crisis due to their limited tourism income, while others that

have pointed to "health and wellbeing" have increased their incomes (IRPET, 2014).

Thermal tourism could have a margin for further improvement if, for example, services provided in a spa were augmented by local activities that exploit the informational value of the natural surroundings. In other countries, thermal tourism is increasingly linked to other forms of tourism, such as sport, recreation and culture. For instance in Poland, health spas are located in regions with a diverse offering of natural attractions, usually bordering on national parks and reserves (De Carlo, 2013). In this way they offer the possibility of spending time outdoors and taking benefit from the surrounding environment as well as the spa itself.

One form of tourism that meshes

perfectly with thermal features is geotourism. Hose (1995) first defined geotourism as “the provision of interpretive and service facilities to enable tourists to acquire knowledge and understanding of the geology and geomorphology of a site (including its contribution to the development of the Earth sciences) beyond the level of mere aesthetic appreciation”. Several other definitions followed, though all share a focus on landscape and geology, and on promoting knowledge and conservation of Earth features (Newsome & Dowling, 2010) for future generations (Hose, 2012).

The area of the Siena clay lands is famous for its charming landscape, with gentle clay hills crested by lines of cypresses, patterned by wheat fields, olive orchards and vineyards or Mediterranean woods. The area, however, is also rich in thermal water springs that have been exploited for health and well-being purposes, particularly in the form of spas such as in Rapolano Terme.

Rapolano Terme, located at the North-East border of this area (Martini & Sagri, 1993), on a slope alongside the Chianti Hills and Mount Cetona (Bertini et al., 1991), faces the clay lands and it is rich in natural resources connected to the geology of the area, that strongly mark the economy of the region.

An important geological feature known as Rapolano fault (Bambini et al., 2010) – which interfered during the Pliocene with the formation of the Siena-Radicofani basin (Brogi, 2004; Bambini et al., 2010) – runs north-south and is interrupted by smaller orthogonal faults that generated travertine depositions and thermal water springs during the Late Pleistocene (Brogi, 2004; Brogi et al., 2010).

A natural hot-water spring (located to the south-west from Rapolano Terme) replenishes the San Giovanni spa which, besides the daily entrance, also offers wellbeing and health care packages for visits of varying duration. However, in the same area there are many peculiar features that deserve tourist attention and may offer

an alternative cultural offering to visitors.

The objective of this study was to assess the receptiveness of tourists for a better knowledge of the natural area regarding aspects complementary to the primary reason for their visit to the spa (mostly recreation and wellness). In particular, we investigate 1) visitor interest in landscape aspects; 2) type of tourists and their curiosity for landscape features; 3) their assessment of local services; 4) their assessment of the landscape and geological features in the area around the spa as tourist attraction; and 5) suggestions for improved tourist offerings regarding landscape knowledge and geotourism.

MATERIALS AND METHODS

The area and its natural features

The study was conducted at the San Giovanni spa, close to the village of Rapolano Terme. The spa exploits the thermal water originating from the hydrological water circulation of secondary faults at a temperature of 40°C, often associated with CO₂ emissions (Minissale et al., 2002; Minissale, 2004). A number of significant geological features can be found in the surrounding area (Figs. 1, 2):

- The Campo Muri Archaeological Excavations (AE) bear witness to Etruscan and Roman thermal baths (3rd century B.C.) (Brogi & Capezzuoli, 2009). They were identified in the 1970s, during the first opening of the local quarry at Campo Muri, about 200 m east of San Giovanni spa, and they extend along two sides of the travertine quarry, covering 8000 square meters. At that time, the mineral waters were believed to have holy (evidenced by a votive element identified in Buca delle Fate) as well as therapeutic worth. A large spa pool surrounded by stone terraces, paved with regular overlapping slabs of travertine, was identified as typical of Roman baths. The area was also considered a votive area, since



Fig. 1 Map of the geological features around the spa Terme San Giovanni worthy of tourist promotion and awareness



Fig. 2 Environmental, cultural and geological features that are located in proximity of the San Giovanni spa, in the Siena clay lands. AE) Archeological excavations; Q) Campo Muri quarry; M) Montagnola fissure ridge; B) Bossoleto mofette; G) Geyser – artesian well

many votive statues have been found around. In the woodland next to the archaeological excavations, natural travertine channels that used to discharge the waters from the ancient baths are now covered by vegetation.

- *The travertine quarry of Campo Muri* (Q) is an active quarry that employs residents of the nearby villages. The travertine dates to the Late Pleistocene-Olocene (Carrara et al., 1998) and its extraction dates back to the medieval period. The quarry is visible from the spa and the ancient Etruscan cut, visible from the archaeological excavations, shows the deposition system with angular unconformities and colluvial deposits and paleosols of different periods.
- *The Montagnola active travertine fissure ridge* (M) (Guo & Riding, 1998; Brogi & Capezzuoli, 2009), is about 250 m long and located 50-100 m from the spa. From the geological point of view, the ridge is located on the Eastern side of an alluvial terrace formed during the Pleistocene by the evolution of the Ombrone river. A height difference of about 10 m between the east and west sides likely suggests that Montagnola is the fault line along which the alluvial terrace has been displaced. The fissure on top varies in width from 1-2 mm up to 30 cm and in SE extremity still emits water and forms calcium carbonate deposits. On the smooth parts of the slope, macro and micro-carbonate terraces can be observed. Along the fissure, a transversal cut made for research purposes allows the observation of the travertine stratification and hear the bobbling water underneath.
- *The Bossoleto mofette* (B) is a round-shaped doline (80 meters in diameter and 6 meters in depth) where naturally every night a CO₂ lake is formed. William Jervis was the first to describe the doline in 1868. Its origin is likely due to the rock collapse of the travertine rock by acid water (CO₂ of volcanic origin

reacting with the water table, beside the rain water acidified by atmospheric CO₂). Recent studies have monitored, more or less continuously, the CO₂ concentration inside the doline and proved the formation of a CO₂ lake especially at night time, reaching the concentration of 80% at 1 m from the bottom (vs. 0.04% of ambient concentration) (Kies et al., 2014). During the daytime on sunny days (especially in the summer), thermal convection generated by solar radiation lowers the concentration to levels around 2000 ppm (0.2%). This site is very interesting, being a natural science laboratory for studying the effects and responses of high CO₂ on the ecosystem's abiotic and biotic components (Osborne et al., 1997; Miglietta et al., 1998; Selvi & Bettarini, 1999). The Bossoleto is not accessible to the general public, but guided tours can be organised on demand to the scientific community or in public events like "Settimana del Pianeta Terra".

- *The geyser* (G) located in the spa garden, which is easily accessible by visitors, was generated by an artesian well (20 m deep) drilled in 1950. This provoked the outflow of water and gases: water emerges at temperatures between 38-39°C, with a flow rate of about 1 m³/min (Guerra & Raschi, 2004).

The questionnaire

The questionnaire was 15 minutes long with 13 questions gathered in four parts, as shown in Table 1.

Most of the questions (those relative to personal details, awareness of landscape context, information means used and features noticed around the spa) were multiple choice questions with a possibility to choose one or two options.

Some other questions (e.g. assessment of attractiveness and accessibility, information source; factors important for tourism promotion) asked for the level of agreement

Tab. 1 Structure of the questionnaire

<i>Personal details and staying</i>	Gender (Q1), Age (Q2), Country and Town of provenience (Q3), Interest in geography and earth/landscape knowledge (Q4) Travelling with (Q5), Staying length (Q6), Reason for staying (Q7), Practiced activities (Q8)
<i>Awareness of the landscape context</i>	Landscape forms noticed traveling across the clay lands (Q9), Landscape aspects of interest (Q10)
<i>Assessment of local services and information sources</i>	Roads and public transport (Q11), Information means used (Q12) and assessment (Q13)
<i>Geological features awareness in the area nearby San Giovanni spa</i>	Features noticed around the spa (Q14), Attractiveness and accessibility of the feature (Q15, Q16)
<i>Suggested improvements for the tourist offer</i>	Suggested information means (Q17) What to improve in Terme San Giovanni (Q18)

of respondents to certain items according to a five-point Likert scale (ranging from “Totally agree” to “Totally disagree”).

Sample

The sample was composed of clients of the San Giovanni spa, generally staying for curative or wellness purposes. The hotel accommodates averagely about 80 guests and the volume of daily visitors to the spa is about 50 in the week whilst on weekends typically reaches the double. Clients are in prevalence Italians in the age range between 30 and 60 years. Therefore, it was decided to build a sample as much as proportional to the clients' typology regarding age and length of staying. Due to cost limitations, data collection was during the tourist season of September-October 2015, with submissions made during three week-days and three weekends, mostly at lunch time for not bothering tourists. Author's assistance was provided in filling out the questionnaire, also to make additional interviews.

Statistical analysis

The analysis was carried out using the statistical analysis using Statistica (data analysis software system) version 12

(StatSoft, Inc. 2014). Data from the completed questionnaires were analyzed using descriptive statistics. ANOVA, followed by LSD test for post hoc comparison of means at $P < 0.05$, was applied to observe any difference in responses regarding travel typology (Q5; Q6; Q7), respondents' age groups (Q2) or travel distance (Q3).

Frequencies and percentages were calculated for all multiple choice questions (Q1-Q6; Q8; Q9; Q10; Q13; Q14) and mean scores were calculated for questions with Likert-scale selection modality (Q7; Q11; Q17; Q18), followed by a T-test for independent variables to observe significant differences between the items.

Correlation analysis was also performed between items treated as separate independent variables to find out any relation between age (Q2), travel distance (Q3), traveller typology (Q5), length of stay (Q6) and activities (other than thermal baths) during the visit (Q8), land forms observed travelling across the clay lands (Q9) or between respondent suggestions regarding what they would like to know more about (Q10) and what they have seen around the spa (Q14).

RESULTS

The results of the survey are divided into five parts according to the structure of the questionnaire.

Personal details and visitation

The sample was made up of 50 respondents, whose 45% was made up of daily visitors, and 55% of those of longer staying. Regarding the age, 42% was between 31 and 45 years old, 27% between 46 and 60 and 17% between 61 and 75.

Nearly all were Italian (98%) and the majority of these were female (66%). Most of the visitors were from the central and northern parts of the country, with 17% of respondents coming from towns nearby (less than 50 km), 28% from middle distances (51-100 km), 26% from large distances (101-200 km) and 23% from farther away (over 201 km). Their ages ranged mostly between 30 and 60, with 42% of respondents between 31 and 45 years old, 27% between 46 and 60 and 17% between 61 and 75.

Regarding their interest in the topic of the questionnaire, “Earth knowledge and geography”, a large majority of respondents, 80% of the sample, confirmed having an interest while 20% did not express such interest. The majority indicated that they were traveling with family (58%) or friends (26%), and this correlated with the length of their stay: those with family mostly stayed at the spa for two days ($r^2=0.09$, $P=0.04$) or even up to a week ($r^2=0.17$, $P=0.006$), whereas respondents traveling with friends stayed just for one day ($r^2=0.12$, $P=0.01$).

When asked to rank their reasons for being at the spa in order of importance (Fig. 3), all respondents except for foreigners considered ‘relaxation’ and ‘health’ to be significantly more important than other options ($P<0.001$); both items were highly prioritized regardless of age. Other important reasons given were ‘escaping from the routine of the daily life’ and ‘travelling with friends or family’,

particularly linked to youth (<25 years old) and adults up to 45, especially compared to elders (more than 76 years old) ($P<0.05$).

“Learning new things” and “exploring new places” were considered more important by those coming from farther distances (201-500 km), than by those coming from nearby towns (51-100 km) ($P<0.01$). Italians seemed to reach happiness more than foreigners did ($P<0.01$), whilst “fun”, which is also rather important, was of very little importance for youth (younger than 25) compared to all the other age groups ($P<0.01$).

In order to assess their interest and awareness for landscape in practice, respondents were asked about the kind of activities they engaged in during their staying in the whole area of the Siena clay lands. Most reported (Fig. 4) visiting the nearby towns (58%) and cultural monuments (32%), but many also listed hiking (32%) and excursions to natural sites (28%) – and quite a few spent time in “observation” activities like birdwatching (8%) and nature photography (14%), or nature-based sports like horse riding (4%) or biking (12%).

The percentage of respondents engaging in different activities was not significantly correlated with the length of their stay in the region, with exception of local residents living in Rapolano Terme (corresponding to a length of stay of “other”) – who demonstrated a preference for hiking and biking ($r^2=0.13$, $r^2=0.18$ respectively, $P<0.01$).

Awareness of the landscape context

All respondents were asked if they noticed particular geomorphological and geological features across the area of the clay lands (Fig. 5 A). The great majority affirmed seeing thermal water springs (92%), though significant numbers reported also quarries (50%) and badlands (44%). Other features such as faults and hillocks were seen by only 8% of respondents, and these were mostly visitors who stayed in the area for more than one week) ($r^2=0.3$,

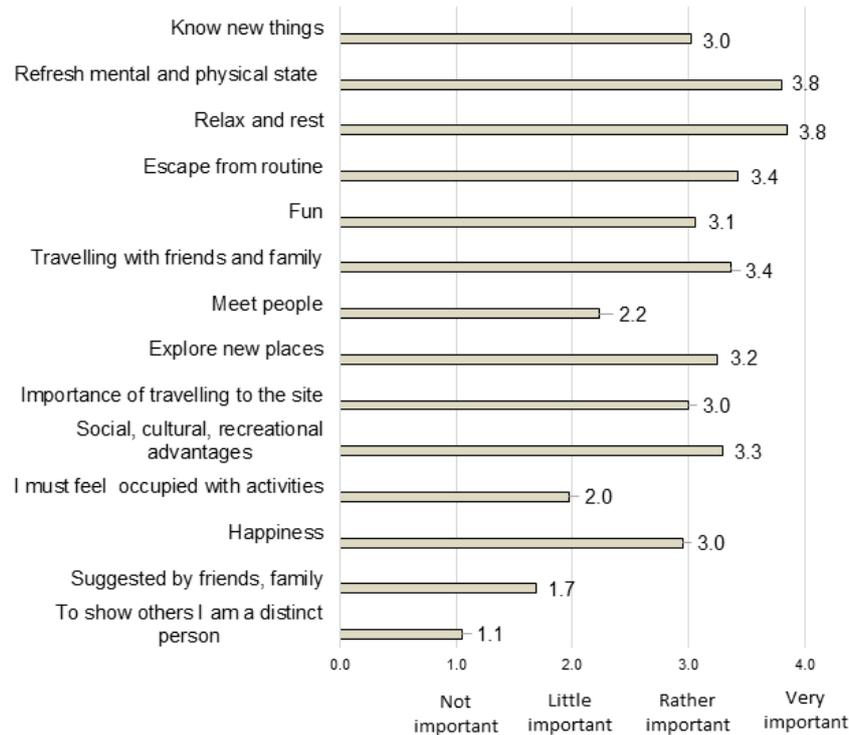


Fig. 3 Relative importance of the suggested reasons for staying at the spa.

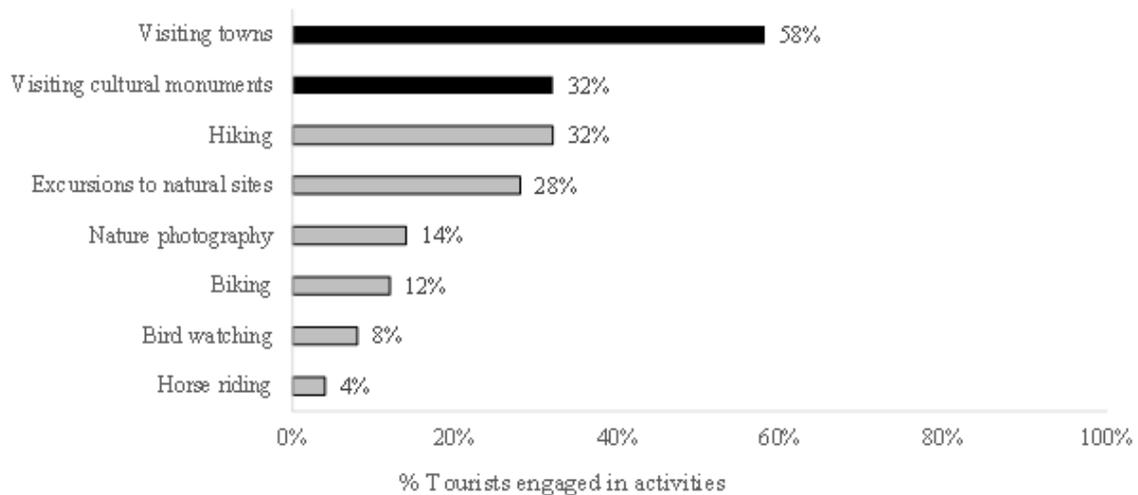


Fig. 4 Activities engaged in by respondents during their stay in the region (percentage reporting "yes" for each item).

P<0.001).

Respondents were also asked about those aspects of the territory which they would appreciate knowing more about (Fig. 5 B). Most of them would like to know more about history (46%) and food (40%), though other topics were of interest as well, including geology and landforms (selected by 34%), specifics and characteristics of

thermal water (30%) and flora and fauna (28%). In contrast, less interest (only by 14%) was given to agriculture – which is, in fact, the primary land use in the area and which strongly affects food-related traditions. Again, respondents staying in the area for at least two days were also those most willing to get further information, especially about thermal waters ($r^2=0.4$,

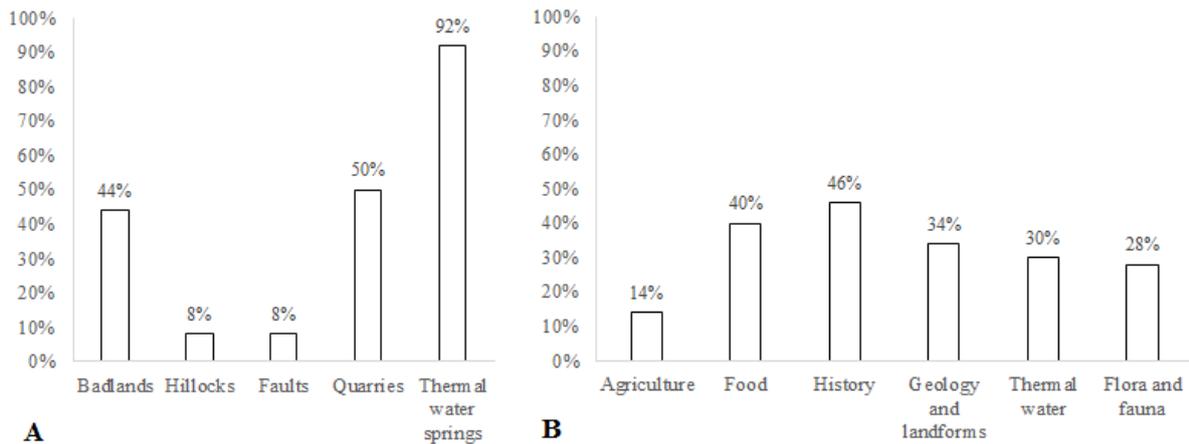


Fig. 5 Land forms seen by the respondents (A) and what they would like to know about the territory (B).

$P < 0.001$) but also about the history of the area ($r^2 = 0.11$, $P = 0.023$). To the extent that landscape features were noticed, they did indeed generate interest in further information ($r^2 = 0.08$, $P = 0.46$ for thermal waters; $r^2 = 0.1$, $P = 0.03$ for hillocks and faults; and $r^2 = 0.14$, $P < 0.009$ for quarries).

Assessment of local services and information sources

In order to verify whether the knowledge of the territory has some connection to the means of transport across the area and information sources, the respondents were asked to assess these means.

About means and ways of transport (Fig. 6), respondents considered hiking and biking routes very important to improve, compared to local transport and roads ($P < 0.001$).

The source of information used by tourists and the quality of this information were also investigated (Fig. 7). Information conveyed by friends and family (word of mouth) and through the internet (25% and 26% respectively) were the main sources of knowledge on the area in general and the spa in particular. Personal experience was also an important source of knowledge for 18% of respondents, while direct forms of information (onsite material, maps, books and magazines or hotel or tourist info points) were less used.

These results are not related to the age of respondents, with exception of the personal

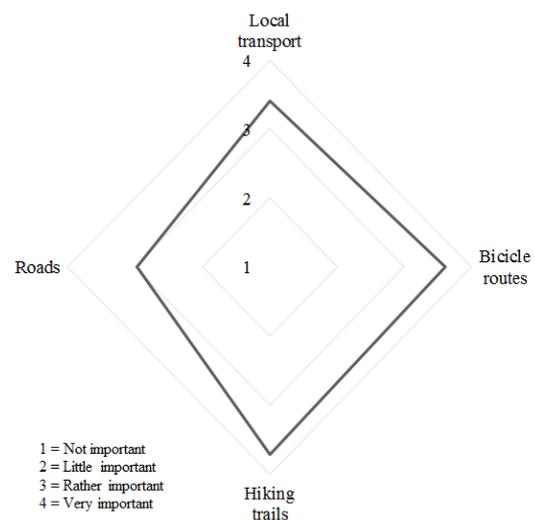


Fig. 6 Level of importance for the improvement of transport means.

experience which is positively correlated to age ($r^2 = 0.297$, $P = 0.04$). Only 44% of respondents evaluated the quality of the information acquired from information points or hotel receptionists. The level of quality, calculated as a weighted average, was mainly quite basic (considered excellent by 17%, brief and concise by 23%, basic by 37% and poor by 23%).

Regarding the services connected to the knowledge of the territory (Fig. 8), informative panels and leaflets in tourist places were valued as important means compared to guided tours ($P = 0.016$) or scenic flights ($P < 0.001$) and apps ($P < 0.01$). Apps and virtual tours were seen as somewhat important, though guided tours

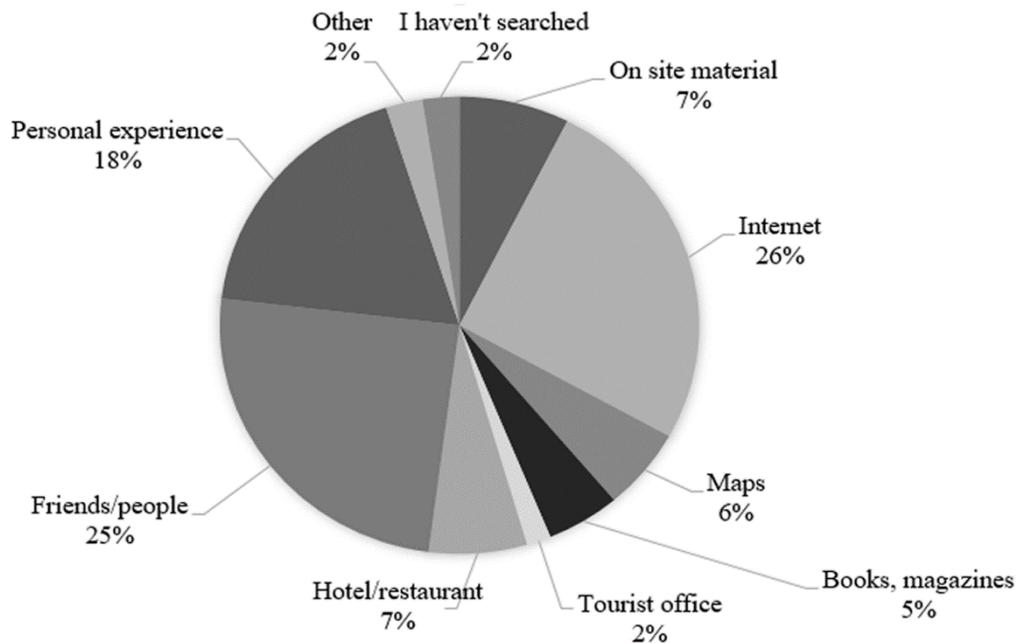


Fig. 7 Distribution of the selection of information sources used by the tourists at the spa.

onsite were appreciated more than virtual ones ($P=0.03$). The types of information preferred were correlated to age – with more adults suggesting panels ($r^2=0.17$, $P=0.028$) and leaflets ($r^2=0.398$, $P=0.0003$) – but also to the length of staying. For instance, people staying for one day and less than a week preferred technological tools like apps and virtual tours ($r^2\sim 0.2$, $P<0.05$).

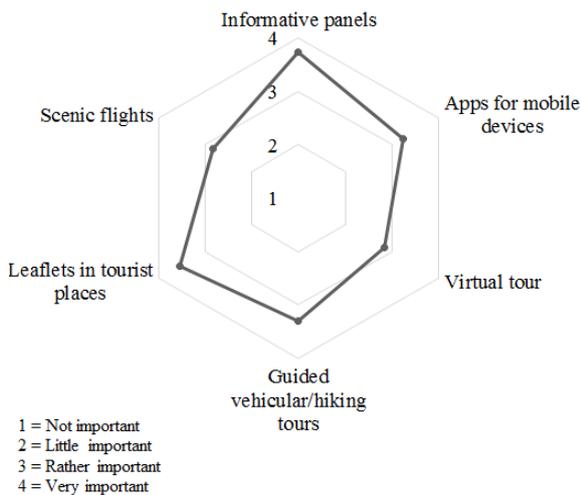


Fig. 8 Level of importance for the improvement of transport means and information means.

Geological features awareness in the area nearby San Giovanni spa

Relating more specifically to the area

around San Giovanni spa, which is especially rich in geological features, respondents were asked if they had noticed 5 key geological or landscape features located within a distance of 100 m from the spa: *Montagnola fissure ridge*, *the Campo Muri quarry*, *the geyser*, *the Campo Muri archaeological excavations* and *the Bossoleto mofette* (Fig. 9).

Surprisingly, 46% of respondents (21/50) reported to have not seen any of the geological features around the spa. Despite their vicinity to the swimming pools (the most frequented place), only 22% declared to note at least one feature, generally the quarry or the geyser. Only 9% of respondents (4) had seen all the features, among which the fissure ridge, the geyser and the quarry are easily visible around the spa. The archaeological excavations, in contrast, were the most unvisited especially compared to the quarry and the geyser ($P<0.001$). There are only a few correlations between length of staying and features noticed around the spa. For shorter staying there is less chance or interest to look around, whilst for longer staying (usually less than a week), the geyser only has the most chance to be seen ($r^2=0.094$, $P<0.034$) (let's remind that the geyser is

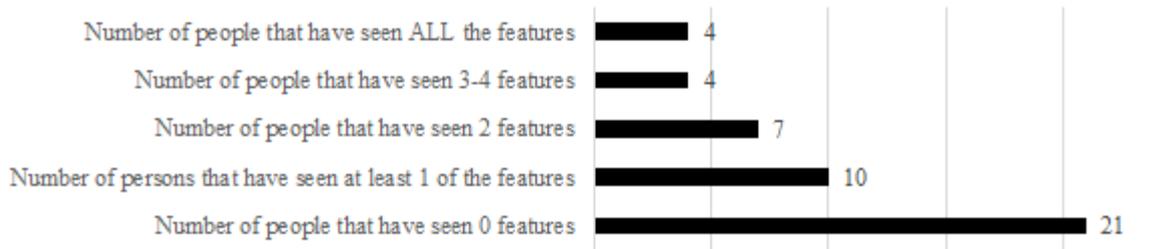


Fig. 9 Number of persons having noticed a certain number of geological and historical features around the spa.

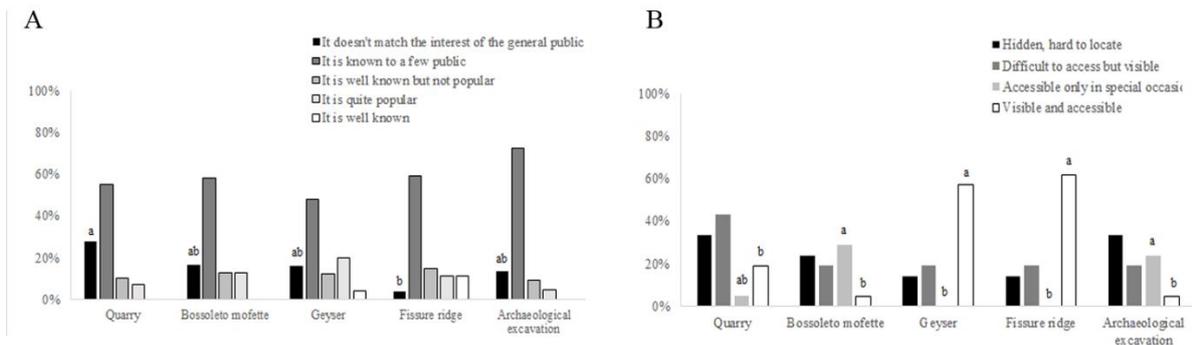


Fig. 10 Interest and accessibility of the geological features around the spa. Letters indicate the significant differences between geological features in each item, identified by the ANOVA followed by LSD test at $P < 0.05$. Items on the top represent the weighted average from selections for each geological feature.

placed in the garden of the spa.

Almost 50% respondents declared to have not idea about the features and not be able to assess their interest toward them, therefore, the following results are based on the remaining sample. Respondents evaluated the popularity and accessibility of each feature to public.

For all of them, the most selected option about popularity was “it is known to a few public” (Fig. 10). Apparently, despite the objective visibility of most of the features, only the travertine quarry did not match the interest of the general public compared to the other elements ($P=0.014$), and the Montagnola fissure ridge and the geyser (by the way easily “visible and accessible”) were considered inconsistently “well known but not popular” and “accessible in special occasions” respectively.

Suggested improvements for tourist offerings

When asked about the most important aspects (among *landscape, information for*

tourists, recreation activities, traditional food, proximity to cities, and local transport) that are needed to attract tourists, we can affirm that just a few aspects are of added importance relative to the others. For instance, landscape is more important than the proximity to cities ($P < 0.05$) or local transport efficiency ($P < 0.01$), and offering recreation activities is also more important than local transport efficiency ($P < 0.05$).

Focusing attention on the information offered for a better knowledge of the territory, the respondents of San Giovanni spa agreed that information panels and leaflets would be very appreciated, especially compared to guided or virtual tours ($P < 0.05$ and $P < 0.001$ respectively).

DISCUSSION AND CONCLUSIONS

The area of the Siena clay lands is famous for its aesthetic value, acknowledged at a national and even international level. Though landscapes may have a strong visual attractiveness, other factors are also

Tab. 2 Importance of information means in the area of the spa. T test for independent samples by suggested items at $P < 0.05$

PANELS	Very important	a
APPS	Somewhat important	ab
VRTUAL TOURS	Somewhat important	b
GUIDED TOURS	Somewhat important	b
LEAFLETS	Very important	a

relevant in determining the extent to which they are appreciated – such as built heritage, other stimuli like sounds and tastes, and contact with people and nature (Carreiro et al., 2015). Despite the prevalence of studies which show rising public awareness of geodiversity stemming from the need for rediscovering a sense of wonder and reconnecting with the landscape (Gordon & Baker, 2015), it appears that in this case people are not particularly aware of Crete Senesi's visible environmental features when they travel in the region. In this study, our premise was that a deeper knowledge of landscape (in its wider meaning) is ever more required by visitors and sometimes also by local citizens. This was reinforced by the survey, in which 80% of visitors expressed interest in earth and geography knowledge.

By gauging the extent to which visitors are aware of – and potentially interested in – the geological features surrounding the San Giovanni spa, we aimed to gain insight into ways of increasing the attractiveness of such geologically rich locations. Our analysis of a sample population of visitors showed firstly that the main purpose for visitation is fairly homogenous, and focused on relaxation, health, and respite from the routine of the daily life. It was clear that most visitors are coming from distant locations (between 200 and 500 km away) and express an interest in learning about environmental features and exploring new places, in addition to enjoying the spa. In fact, a high percentage of visitors took time to visit the main towns or cultural monuments nearby, and many hiked and visited natural sites nearby – most likely in connection to personal hobbies and skills like photography.

Focusing on visitors' recognition of geologically significant features, the survey firstly inquired as to whether the respondent had seen those features which are typical of the Siena clay lands region in general. Excluding thermal water features, which are well known and accessed by nearly all visitors to the spa in the form of the constructed pools, the most widely visible geological features were quarries and badlands (reportedly seen by about half of all respondents). It was found that visitors were not generally aware of more specific geological features like faults and hillocks, which are localized in an area about 20 km from the spa and were reportedly seen by only 8% of respondents, mostly those staying in the area for longer periods of time.

At the same time, some of these features – like the Montagnola fissure ridge – are remarkably unique and immediately accessible from the spa, but remain nearly invisible to most visitors. Survey results showed that the percentage of those who had not noticed the geological features located within several hundred meters of the spa (*montagnola, quarry, geyser, archeological excavations, bossoleto mofette*) was even higher than for those features located at farther distances. In fact, despite their close proximity to the swimming pools, only 22% of respondents reported having seen at least one of these features (mainly the quarry, which is visible at a distance, or the geyser, which is located in the garden of the spa). It is quite clear that the attention of spa visitors is not being adequately drawn to these features, with a lack of visual indications or information panels.

Therefore, many of these features, which

are easily accessible and appear to be of genuine interest for visitors, are not well visited – because satisfying this interest requires informational support that is not being provided. Previous studies have recognized that environmental amenities, whether their value is primarily cultural, traditional or naturalistic, are a determinant force in tourism development (Talandier, 2009; Banski & Wesolowska, 2010; Klepeis et al., 2009; Lokocz et al. 2011). A crucial insight is that even when these natural amenities go relatively unnoticed by the casual observer, they can be "re-qualified" to increase the appreciation of landscapes and to derive eco-tourism value from the inherent environmental qualities of a place (Domon, 2011). Ultimately, the attractiveness of such areas is dependent not only on their visual aesthetics, but on the capacity of tourism service providers to bring their aesthetic and informational value to interested visitors. The fact that many such providers are unaware of the "geo-tourism" potential embodied in such places only underscores the importance of matching the interests and needs of visitors with the tourism services offered, using integrated measures for marketing, product development and conservation purposes (Carneiro et al., 2015).

With respect to the needs of tourists, this study has identified a number of instructive relationships between visitors' priorities and the nature of their visit. For short-term visits, a predominant motivating interest is the history of the place, particularly in terms of food and other cultural aspects which tourists can get a "quick taste" of while visiting the area. Geology and landforms, characteristics of thermal water and flora and fauna are also of importance to many visitors, especially if the duration of their stay is medium- to long-term (several days or more).

The assessment of local services by tourists represents an important source of informational-feedback which can decisively contribute to the improvement of touristic offerings and visitor experience.

For instance, a common sentiment voiced by respondents is that the enhancement of hiking and biking routes should not be under-prioritized compared with motorized transport and roads. Regarding information sources, it is interesting to note how traditional information tools such as on-site informative panels and leaflets are still favoured even when more innovative digital tools like apps and virtual tours are available. Utilizing the potential of various means of communication requires collaborative relationships between tourism service providers and the providers of informational content (including academic and applied research institutions), especially regarding the relation between landscape attributes, their scientific explanation, and their economic valuation.

There is an increasing need among visitors for localized site knowledge, and this represents an implicit awareness of the importance of high-quality information delivery in sustaining local tourism. This study adds to a growing body of empirical findings (Murphy et al., 2007; Sotiradis & van Zyl, 2013) which has demonstrated that along with the internet, word of mouth communication – and therefore personal experience – is still the most common and widely-used source of information. Therefore, a more comprehensive knowledge base, embracing landscape interpretation and science-based information, might be the key to increasing tourists' awareness of a site's natural context.

In conclusion, this study has evidenced that tourists may be familiar with the most popular landscape features in an area, but at the same remain unaware of particularly unique geological elements in the closest proximity of their destination (such as the spa in the case described above). Though wellness and health are the main attraction, there is a significant portion of tourists (especially those coming from far-away locations) that would also be interested in a deeper knowledge of the environmental context and landscape features. This study

confirms that "landscape" still plays an important role in tourism attraction, but that knowledge and awareness of its environmental and cultural significance can be decisive in capitalizing on this attraction. The informational content that is necessary to transfer this knowledge and raise this awareness may be conveyed by increasingly innovative technological tools – but at the same time, a useful role can still be played even by the most traditional forms of communication, as long as they succeed at tapping into the natural curiosity possessed by so many travellers.

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