TERRITORY OF RESEARCH ON SETTLEMENTS AND ENVIRONMENT
INTERNATIONAL JOURNAL OF URBAN PLANNING
20

Inclusive coastal landscapes

green and blue infrastructure for the urban-land interface 2

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II
CENTRO INTERDIPARTIMENTALE L.U.P.T.

Federico II University Press
fedOA Press

Vol.11 n.1 (JUNE 2018)
e-ISSN 2281-4574

sommario

Inclusive coastal landscapes: green and blue infrastructure design for the urban-land interface 2

Table of contents/*Sommario*

TERRITORIO DELLA RICERCA SU INSEDIAMENTI E AMBIENTE
INTERNATIONAL JOURNAL OF URBAN PLANNING

Federico II University Press
fedOA Press

TRIA 20 (1/2018) 119-140/ e-ISSN 2281-4574
DOI 10.6092/2281-4574/5822

abstract

Natural and man-made landscape in the Phlegraean Fields: linking identity and potentials for sustainable development.

Paolo Camilletti, Gianluca Lanzi

Abstract

This paper aims to highlight the peculiar relationships between natural and anthropic factors which modified the landscape of the Phlegraean Fields from the early Greek and Roman settlements until the current time. The dynamism of such landscape is mainly due to the volcanism, of which bradyseism is the most famous phenomenon occurred. In addition, the sea and more generally water have played a remarkable role in shaping such territory. The Mediterranean identity strongly characterises this coastal area, which has attracted aristocrats, artists, scientists, and tourists.
The research focuses on three municipalities: Pozzuoli, Bacoli, and Monte di Procida. Their analyses show many similarities in environmental, cultural, landscape and urban

The island of Nisida in the foreground and the Phlegraean Fields in the background

features. Finally, an overview of the strengths and weaknesses of the study area provides basis of a Phlegraean green-blue infrastructure as means to reconnect cultural heritage and landscape, and to support its sustainable development.

Key Words
Coastal landscape, volcanism, cultural heritage, green-blue infrastructure

Paesaggi naturali ed antropici nei Campi Flegrei: relazioni tra identità e potenzialità per lo sviluppo sostenibile

Questo contributo si propone di evidenziare le relazioni peculiari tra fattori naturali e antropici che hanno modificato il paesaggio dei Campi Flegrei a partire dai primi insediamenti greci e romani fino all'epoca attuale. Il dinamismo di questo paesaggio è dovuto principalmente al vulcanesimo, di cui il bradisismo è il più noto fenomeno ivi manifestatosi. Inoltre, il mare e, più in generale, l'acqua hanno avuto un ruolo notevole nel plasmare tale territorio. L'identità mediterranea caratterizza fortemente questa zona costiera, che nel tempo ha attirato nobili, artisti, scienziati e turisti.
La ricerca si concentra su tre comuni: Pozzuoli, Bacoli e Monte di Procida. Le loro analisi mostrano molte similitudini in termini ambientali, culturali, paesaggistici e urbani. Infine, una panoramica dei punti di forza e di debolezza dell'area di studio fornisce la base per il disegno di un'infrastruttura verde-blu flegrea intesa come mezzo per riconnettere il patrimonio culturale con il paesaggio e per incentivare il suo sviluppo sostenibile.

Parole Chiave
Paesaggi costieri, vulcanismo, patrimonio culturale, infrastrutture blu e verdi

Attribuzioni:
i paragrafi 1 e 2 sono stati elaborati congiuntamente dai due autori; il paragrafo 3 da Gianluca Lanzi e i paragrafi 4-5-6 da Paolo Camilletti.

Natural and man-made landscape in the Phlegraean Fields: linking identity and potentials for sustainable development

Paolo Camilletti , Gianluca Lanzi

1. Introduction to the study area and aims

The Phlegraean Fields represent a dynamic landscape characterised by interaction between natural phenomena and anthropic factors[1]. Such interaction, however, has showed juxtaposition and heavy alteration in the recent decades instead of sustainable development and respect of landscape identity that is linked to the volcanism and the historical component. Therefore, the current image denotes the subordination of natural and historical components to the anthropic transformations. This paper aims to give an overview of the potentials and risks of the Phlegraean Fields, and to outline some strategies to highlight their multifaceted identity.

At present, the ecosystem is highly degraded and fragmented, and it requires effective tools and actions to recover. There would be a great benefit not only from ecological networks in a narrow sense, but also from innovative tools such as green infrastructures, conceived to implement ecosystem services and biodiversity[2]. Green-blue infrastructures can link urban to peri-urban and extra-urban areas, according to the National Strategy of Biodiversity (2010)[3], in a way to develop a multifunctional network that comprises conservation of existing natural areas, enhancement of habitats connection, cultural heritage promotion, and hydraulic risk management.

Archaeology is an essential discipline to comprehend the identity of the Phlegraean Fields. The archaeological interest for this territory sensibly increased in the Renaissance. At that time, architects used to visit the Phlegraean area to study the constructive techniques of the Romans, whose ruins did not show as many alterations as the ones occurred in Rome during the Late Antiquity and the Middle Ages, but only a process of natural ageing and the consequences of volcanic phenomena.

The Phlegraean Fields are well known for their peculiar land morphology, mainly shaped by the intense volcanism. It has created several landmarks and it is still active in secondary events such as Pozzuoli's Solfatara and the springs of Agnano's Baths. Mythology tells that the Giants fought against Jupiter to overthrow him. When Mount Nuovo erupted (1538), this phenomenon had wide resonance, as to make the historian Giovanni Tarcagnota (1566) define "burning land" this area - coherently with the Greek etymology (φλεγρατος). Volcanism remains the primary touristic attraction and scientific focus of this area. In fact, the protected areas of the Phlegraean landscape still witness their geological origins, and monitoring of volcanic events includes surveys and analyses of long-term processes. Recently, national and international media have highlighted the study of activity and evolution of the greater volcano area between the Promontory of

Posillipo and Cape Miseno. It measures 12 kilometres in diameter, thus it is the widest of Europe and the second biggest of the world after Yellowstone Park's one in the United States of America. According to the scientists, its temperature fluctuations, changes of quality and quantity of fumarole gas emissions, and frost heaves provide evidence of the increasing magmatic pressure.

2. Elements of landscape evolution and history of the Phlegraean territory.

The coast of Campania Region, from the mouth of the river Garigliano to the harbour of Sapri, has a variety of suggestive and complex places, mainly not easily accessible, partly used for incoherent or improper activities, albeit they comprise areas of remarkable landscape quality and outstanding beauty, archaeological parks and monuments of worldwide importance.

In particular, the coastal landscape of Campania is characterised by the natural and cultural site of the Phlegraean Fields which, together with the Vesuvius, have always attracted Italian and foreign poets, writers, artists, and travellers. Such hilly and fertile territory extends from the ancient riverbed of Sebedo to Cape Miseno and Cuma. The Phlegraean Fields form a specific district of the Metropolitan Area of Naples (fig. 1), around the Gulf of Pozzuoli, clearly noticeable because of its volcanic ring-shaped elevations. The surface area is approximately 110 square kilometres, and it includes several municipalities: the northwestern part of Napoli (Fuorigrotta, Bagnoli, Posillipo, Soccavo, Pianura), Pozzuoli, Bacoli, Quarto, Monte di Procida; their population has reached about 390000 people (2011 Census). In addition, the islands of Procida, Vivara and Ischia share part of their geological and geomorphological characteristics, and they strongly interact with the Phlegraean mainland[4].

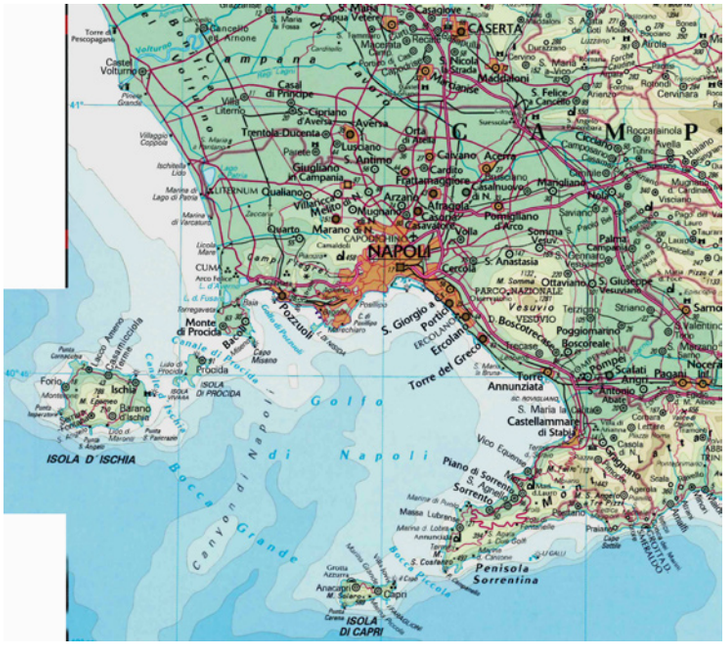

Fig. 1 - Physical-political map of the Metropolitan Area of Naples. From Landini P. (2006), Atlante Geografico Italia, Touring Ed. , Milano, p.63

Under the layers of pozzolana (from Puteoli-Pozzuoli) or in outcrops, the Neapolitan Yellow Tuff witnesses the origins and evolution of the Phlegraean area. It wholly belongs to the volcanic complex Campi Flegrei-Procida-Ischia, shaped by a single eruptive phase within a giant caldera dated more than 35000 years ago, followed by the proper Neapolitan Yellow Tuff eruption around 12000 years ago. In a relatively small area, eruptions and bradyseism – the latter still occurring in the 1970s-80s – together with soil erosion have designed a various landscape with hills, craters, lakes, inlets, promontories. The landmarks are generally linked to the volcanism. There are four main craters - Astroni, Monte Barbaro, Agnano, Solfatara (still active) – and the lakes of Fusaro, Avernus, Lucrinus, Miseno, Grande at Agnano[5]; two of these lakes, Fusaro and Miseno, are also interested by sea water penetration. Hence, the overall image of the Phlegrean Fields has

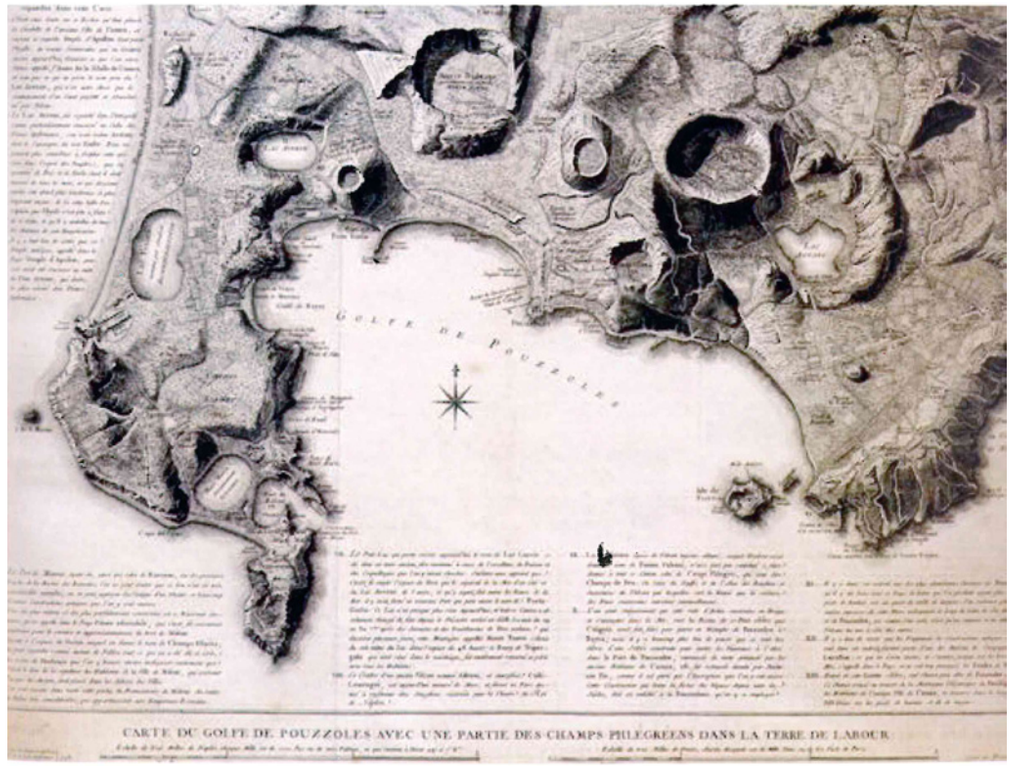

Fig. 2 - Carte du golfe de Pouzzoles avec une partie des Champes Phlegreens dasn la Terre de Labour / Levée sur les lieux et dessinée par Mrs. de la Vega...[en] 1778 ; Gravée par Perrier [en] 1780 ; Ecrite par Droüet [en] 1780. From Picone L. (2009), La costa sul Golfo di Napoli-The coast of the Bay of Naples, Massa Editore, Napoli, p.53

been effectively conveyed by Vito Cardone's definition of a "landscape of holes" (fig. 2). The climate reflects the typical Mediterranean characteristics: mild winter, warm summer, rainfall peaks in spring and autumn, rare snowfalls, summer drought usually between early June and mid-August. There are some microclimate variations which can be explained by natural factors – altitude, exposure, proximity to sea or lakes, springs – or anthropic – i.e. urban heat islands. Locally, the phytoclimate has been mainly influenced by the combination of geological and climate features, although phytosociological observations have shown a considerable interference of anthropic activities in such environment[6].

According to the Italian landscape typology by Sestini (1961), the whole promontory and the islands of Procida and Ischia are part of the landscape type n.61 "Campania's volcanos" as well as the Vesuvian area, grouped in the landscapes of the Tyrrhenian anti-Apennine (fig. 3). The use soil capacity denotes high fertility due to its geological origins, with andisols and permeable structure rich in skeleton, locally with tuff outcrops known as Neapolitan yellow tuff, a sandstone which has been used in building construction for centuries given its durability[7]. Such geological characteristics have determined a potential natural vegetation oriented to neutro-acidophile species. Despite the low level above the sea and the proximity to the coast, it is possible to observe some peculiarities of the study area, which clearly belongs to the biogeography of the Mediterranean region. Pavari's classification of Italian phytoclimates (1916) shows that the *Lauretum* include the whole

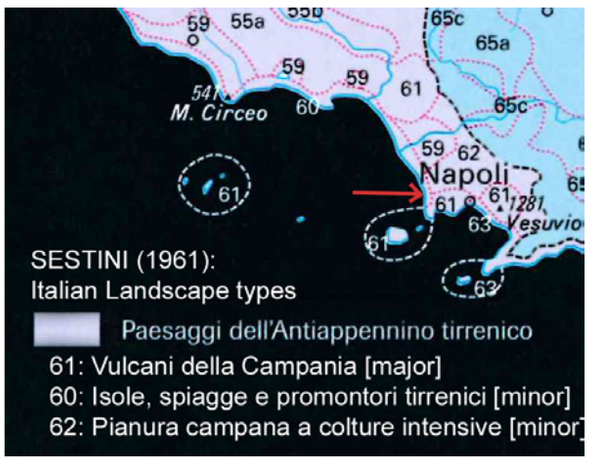

Fig. 3 - Landscape types according to Sestini's classification (1961). From Landini P. (2006), Atlante Geografico Italia, Touring Ed. , Milano, p.28

promontory, but two zones can be distinguished:
1) *Lauretum* warm: along the coast, the higher temperatures allow the growth of Mediterraean scrub with potential for evergreen sclerophylle such as *Arbutus unedo, Ceratonia siliqua, Erica arborea, Myrtus communis, Pistacia lentiscus, Pyrus pyraster, Quercus ilex*; locally, on rocks and slopes, the scrub is replaced by the garigue plant community;
2) *Lauretum* cold: inland – i.e. in the Natural Reserve of the Crater Astroni - the microclimate is influenced by the altitude (max. height reaches 458 metres above the sea), the lakes and their surrounding wet areas, thus favourable for heliophile species, such as *Castanea sativa, Crataegus monogyna, Fraxinus ornus, Quercus frainetto, Quercus petraea, Quercus pubescens, Quercus robur, Ulmus minor*.
The analyses of the regional and sectoral plans show the naturalistic value and potential of the study area, despite the heavy urbanisation after the Second World War. The PTR (Regional Territorial Plan) of Campania (2008) classifies the various landscape systems[8] and units (fig. 4), and synthetically defines the Phlegraean Fields and its islands as "high naturalistic-landscape potential area with strong anthropic pressure". The 2009-13 PFG (General Forestry Plan) has introduced specific prescriptions for woodlands and naturalistic sites. Regarding the protected areas on the mainland and the islands (fig. 5), three SPA (Special Protection Areas) and several SCI (Site of Community Importance) witness the environmental relevance of this territory[9]. The institution of the Regional Park of Phlegraean Fields (1993, operational since 2003) has supported the environmental protection by introducing three restrictive zones (type A Integral protected area, type B General protected areas and General marine protected area), plus a forth Controlled area for oriented transformation and urban requalification (type C).
Approximately, some 50% of the Phlegraean territory is occupied by natural areas – lakes, solfataras, woods, coastal slopes covered by Mediterranean scrub and garigue – and cultivated areas, thus the population density is rather high in the settlements, especially along the coastal line. Some of the socio-economic dynamics of this area are similar to the greater city of Naples. At the same time, it is possible to state that this territory represents a significant part of the north-western development line[10] along the coast. Inland territory, with the exception of protected areas, shows the coexistence of contemporary urban developments, small rural settlements and agricultural areas. Vines and fruits are the two main cultivations – the latter even in mixed cultivations. Moreover, there are kitchen-orchard gardens and residual cereal crop fields. The quality of agricultural production,

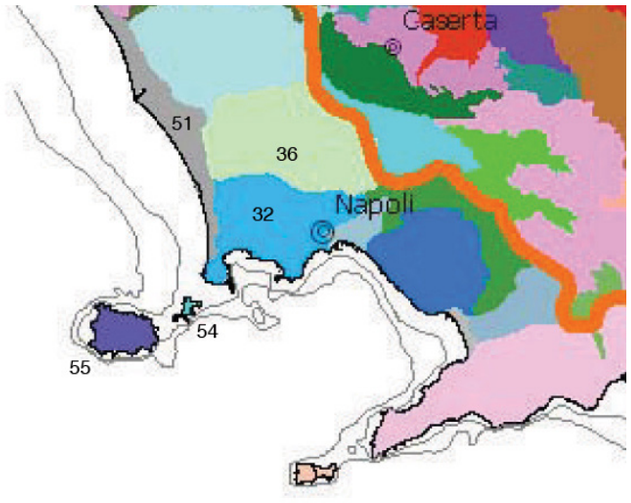

Fig. 4 - Landscape systems and units - n.32 "Campi Flegrei" (blue-azzurre); n.36 "Pianura Flegrea" (light green); n.51 "Pianura costiera del Volturno e del litolare Flegreo" (grey); n.54 "Isola di Procida" (mid blue); n.55 "Isola di Ischia" (violet). From PTR (2009), Region Campania

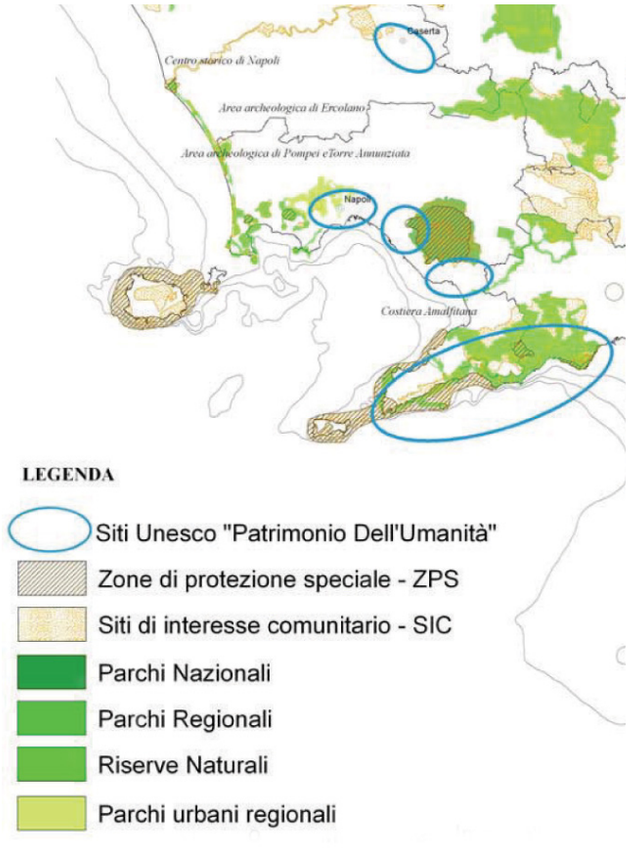

Fig. 5 - Protected areas – Nature 2000. From PTR (2009), Region Campania

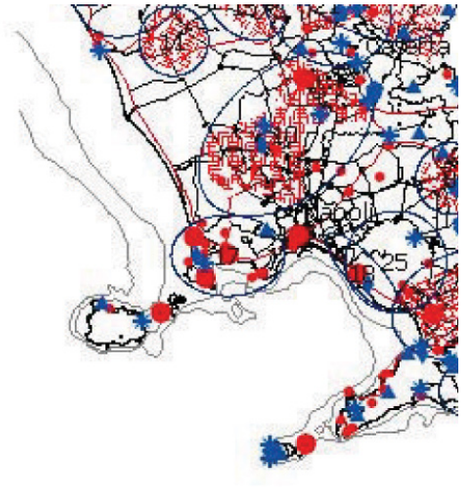

Fig. 6 - Cultural heritage and archaeological areas. From PTR (2009), Region Campania

very much appreciated in the past, has reached outstanding ranking regarding the DOP vine classification[11]. As a landscape feature, the traditional hydraulic systems and cultivation techniques are still visible in the terraced vineyards and orchard-gardens. The technique of terracing fields has been acknowledged as a traditional tool of domesticating landscapes for agricultural usages. It used to be realised through manual modelling, following the contours, digging upstream and moving topsoil down to the walls made of stones carefully chosen and placed to support the long and narrow steps.

The perception of the Phlegraean landscape has always shown the dualism of natural and anthropic actions through time. Yet Homer and Virgil told the Phlegraean myths, the historical relevance of this territory firstly lies in the Greek colonisation – the so-called Magna Grecia - significantly the foundation of Cuma in the 8th century B.C. and afterwards Neapolis (Neaples). Puteoli's (today, Pozzuoli's) port became one of the main sea infrastructure when the Romans dominated the Mediterranean. The whole area also benefitted from the proximity to Neapolis (Naples). The architectural legacy of the Greek colonies and the Roman Empire (fig. 6) survived to the barbaric invasions only as ruins, whilst land abandonment resulted in the increase of coastal marshes and the reversion to woodland on hilly areas.

It was only from the 15th century on that Pozzuoli, Baia and Cuma have been systematically described in major compendia on the history of the Italian peninsula, such as Flavio Biondo's *Italia illustrata* (1453). In 1579, Marco Cartaro was commissioned by the viceroy to map the whole area from Posillipo hill to the Acropolis of Cuma, included the countryside of Patria lake. Cartaro's map equally emphasised the natural components (lakes, hills, coasts) and the artificial ones (monuments and villas), with a careful representation of cultivated fields, roads, paths, distribution of vegetation. Further cartography was periodically released and enabled the readout of the geomorphological structure as designed by volcanism (fig. 7). Between the 13th and the 19th century, the wide artistic production of engravings, prints, paintings, gouaches, has

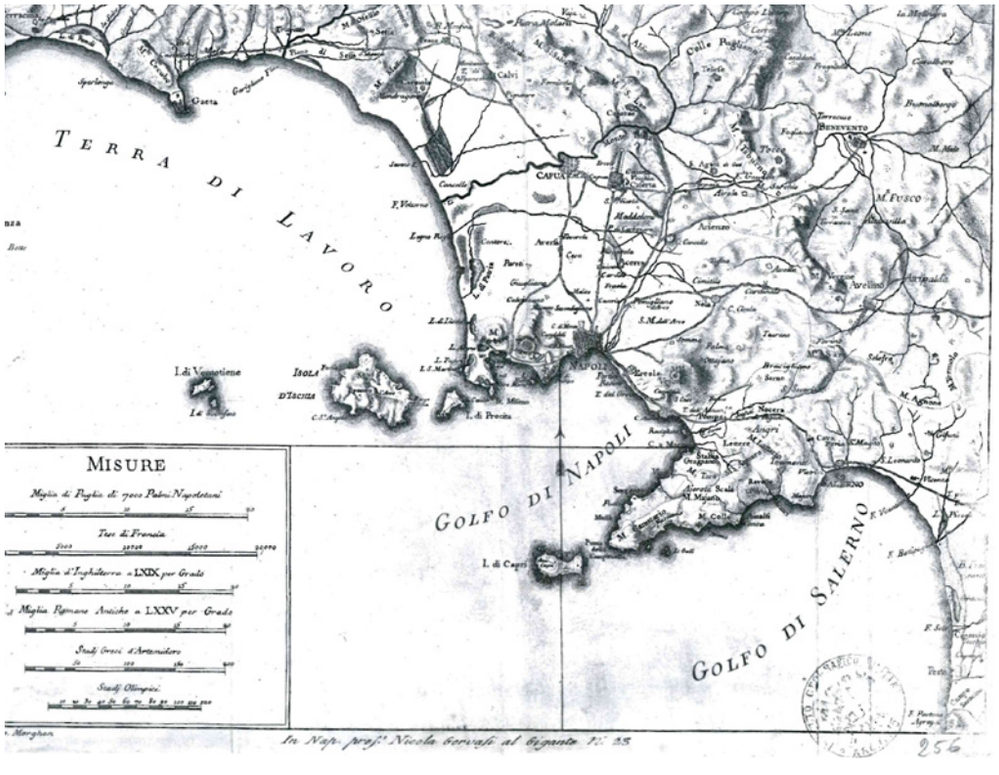

Fig. 7 - Pianta litorale e sue adiacenze dai confini del Regno di Napoli fin a Pesto (18th century, Francesco Forte's private collection). From Forte F. (2005), Il caso Capaccio-Paestum. Inu Edizioni, Roma, fig. 21a, p.65

Fig. 8 - Vue du Naples prise de Pausillipe (Hamilton W., Campi Phlegraei, Napoli 1766-1779, tav. I). From Musi A. (2010), Regno di Napoli, Omnia Arte, Napoli, p.267

confirmed the influence of the Phlegraean landscape and heritage on artists and society more generally (fig. 8). During his Grand Tour, visiting this land in 1787 Goethe stated "Here one is amazed by the events of history and nature".

Indeed, the image of the Phlegraean Fields is rich in symbolism. Water, for instance, is one of the most recurrent and fascinating elements in their landscape – sea, lakes, spas, sulphurous springs, and artificial works such as aqueducts – and since ancient times it symbolises life, purity, truth and wisdom. The Roman Aqua Augusta or Serino Aqueduct, built around 10 A.D., served even the Phlegraean settlements and some villas[12]. In the 18-19th century, the lakes and the surrounding countryside were also frequented for hunting, as witnessed by pictures, engravings, and chronicles (fig. 9).

The same emotion felt by the French architect Eugène Viollet-le-Duc whilst travelling

Fig. 9 - King Ferdinand IV of Bourbon hunting at the Lake Fusaro; the Casina Vanvitelliana is on the right (Ferdinando a caccia di folaghe al Fusaro, by Hackert, oil on canvas). From Musi A. (2010), Regno di Napoli, Omnia Arte, Napoli, p.244

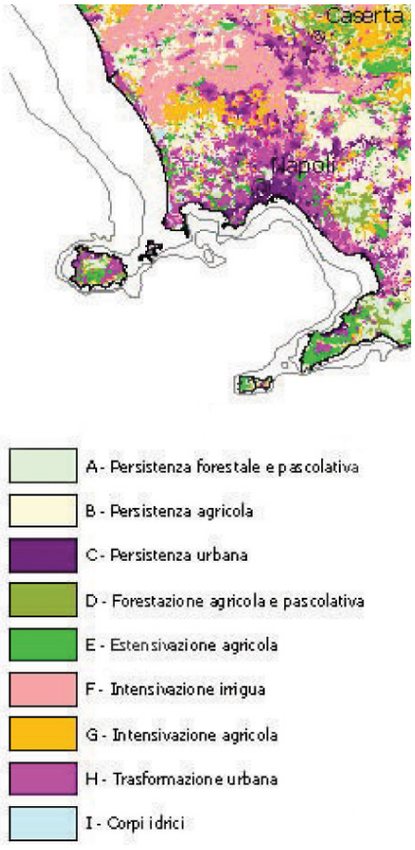

Fig. 10 - Land use dynamics. From PTR (2009), Region Campania

on the roads of Pozzuoli in 1837 may still explain the interest for the study area. At that time, they were lined by Mediterranean and subtropical plants, such as pines, palms and aloes, often planted to embellish gardens of country houses of outstanding architectural quality, immersed in a landscape which appeared suspended between wildness, rurality, and vestige of the past.

It would be sensible to pose a question on which of those hallmarks are still contributing to qualify the Phlegraean landscape. Urban sprawl has changed the physiognomy of the settlements and the territory itself (figures 10 and 11). Data on the land use prove that the two halves of the 20th century were characterised by different phenomena. Between 1900 and 1954, woodland surface decreased of 30% and some 10% of lake shores were lost in favour of crops, but only 7.5% of agricultural land was urbanised; pasture ceased. Later, in the period 1954-1998 urban surface quintuplicated, partly due to unplanned or unauthorized new developments; agricultural land drastically decreased and uncultivated areas were nearly eight times more[13]. However, it must be noted that the since the 1990s some natural areas of the territory were protected by law (Regional Park of Phlegraean Fields). The recent two decades have shown the slowdown of population trends and other kinds of urban transformation, such as disuse of factories, revitalisation of historic centres, yet far from activating "sustainable urban metabolism". Population density has reached about 3450 inhabitants/km² in the small municipality of Monte di Procida, similar to the figures of Naples' western quarters, whereas Pozzuoli and Bacoli are still below 1950 inhabitants/km². Infrastructures sensibly increased in the 20th century, not only with new road development, but also with the railway lines Cumana, Circumflegrea, and Villa Literno-Napoli Gianturco (Metro line 2). Such connections enable strong metropolitan correlations with Naples and – to a minor extent – with the farther Domitian coast to the north.

Despite the chaotic urban sprawl, which may threaten the very existence of the

Fig. 11 - Aerial view of the Phlegraean area and its railway connections. From Google Map consultation (2018).

environmental and cultural heritage, it is still possible to observe volcanic and water landscapes of outstanding beauty, glimpses of sunsets on tufa cliffs, sudden finds of huge Roman cisterns and other monuments, orchards and vines, woods and Mediterranean scrub. Within such landscape complexity, the present study will focus on the three most representative Phlegraean municipalities: Pozzuoli, Bacoli, and Monte di Procida. The three main archaeological settlements of Cuma, Puteoli-Pozzuoli, and Baia-Bacoli-Miseno are comprised in the mentioned municipalities, but not necessarily each cultural park is fully comprised in one territory. Such circumstance, together with the overall geomorphological features, contribute to envisage an overall district concept of the area rather than individual development proposals.

3. Pozzuoli

The current municipality of Pozzuoli includes part of the first territories of Campania Felix, the Roman region whose settlements - originally dated to the Iron Age - were colonised by the Euboeans from Chalcis in the 8th century B.C. . The Greek colonisation of the Mount Cuma led to the foundation of Kyme (Cuma), through the development of the acropolis and the typical facilities of the Greek polis, such as spas, agora, capitolium, temples, northern and southern chora, and necropolis. Afterwards, the Romans renamed the main town Puteoli because of the abundance of sulphurous spas.

Pozzuoli has two coastlines: the western Domitian-Phlegraean shore and the southern bay of the homonymous gulf extended from the island of Nisida to Cape Miseno, where the Romans built Portus Iulius. It took a strategic role when the Roman Empire expanded to the Eastern Mediterranean and provided itself with such impressive port to store foodstuffs[14].

The geomorphology of this area is characterised by craters and volcanic edifices. Some of them are invaluable for the environmental heritage: the Natural Reserve of Astroni; Mount Cigliano near the Roman consular road Via Campana; Mount Olibano with its active crater called Solfatara; Mount Gauro with its three peaks of Mount Barbaro southward, Mount St. Angelo westward and Mount Corvara northward including the crater Campiglione (750 metres in diameter) which is the proper volcanic caldera; finally, Mount Nuovo since the 16th century has represented another geological emergence, as its eruption was the only one not dated to early Phlegraean volcanism. Bradyseism has arisen throughout the centuries, mainly with negative phases (soil lowering) until the 11th century A.D. and positive afterwards. Outstanding phenomena occurred around 1538 causing Mount Nuovo's emergence, and the cycles of 1970-72 and 1983-84. The recent bradyseismic activity influenced the urbanisation of Pozzuoli. New developments had to be built to provide housing to displaced population from evacuated neighbourhoods, but it resulted in further soil consume[15]. Nonetheless, its demography represented itself the main cause of urban sprawl due the uninterrupted growth rates in the 20th century, absolutely challenging if comparing 29690 registered inhabitants in 1936 to 78754 in

2001.

The municipal district of Pozzuoli comprises the lakes of Lucrinus and Avernus. The coastal Lucrine Lake is much smaller than its Roman extension, when it was linked to the sea through a long canal. On the top of its isthmus the Romans built the Via Herculea that is currently 3.50-4.00 metres below the sea level. A dam protected Portus Iulius, but the silting process made the port useless especially for military purposes. The wide volcanic lake of Avernus extends 0.55 km^2 and its depth is about 35 m. The lack of birdlife - most likely due to the recurring fumes of carbonic acid or hydrogen sulphide - may have determined the name Avernus. It also inspired myths, writers and poets, and a spas-temple consecrated to Apollo which was reduced to ruins by the 16th century bradyseism[16].

Pozzuoli has a remarkable historic heritage. Of the old Roman town, there are alignments of the urban grid designed by roads such as Via Domitiana and Via Campana[17], fabrics, harbour facilities and other monuments or open spaces. Among these facilities, it is worthy to mention: the Flavian Amphitheatre, third-largest after the Colosseum and S. Maria Capua Vetere's Amphitheatre; the Macellum, which served as market square next to the harbour, also known as Temple of Serapis; the Capitolium or Temple of Augustus, whose archaeological remains were incorporated in the late Baroque Cathedral; the necropolis along the Via Campana; the Baths of Neptune, an ensemble of spas facilities built in the 2nd century A.D. along the slopes of the hill; the Piscina Cardito, comprised of two cisterns to store water both for drinking and naumachiae. In the Modern centuries, the historic centre has also preserved the Mediaeval structure on the promontory: the Rione Terra is a clear example of palimpsest (fig. 12).

To sum up, the current image of Pozzuoli is still influenced by its strategic location.

Fig. 12 - Pozzuoli - De Musset M.P. (1820), Voyages pittoresque en Italie – Partie mèridionale et en Sicilie, Paris, at the National Library of Naples. From Musi A. (2010), Regno di Napoli, Omnia Arte, Napoli, p.272

Together with Napoli, its port links the mainland to the islands of Procida and Ischia. Despite the 20th century developments, its heritage is well preserved and includes part of the archaeological area of Cuma and the historic centre of Rione Terra inhabited since Roman times, as well as the protected areas and the lakes.

4. Bacoli

South of Pozzuoli, the municipality of Bacoli extends with similar characteristics, albeit with much smaller surface and population. It has developed since the Roman times between the western Domitian-Phlegraean coastline and the Gulf of Pozzuoli to the east, particularly on the hill, sharing geomorphological features and geological origins as well as the archaeological heritage with Pozzuoli. The territory of Bacoli was shaped not merely by the craters of Pennata, Baia, Miseno, but also by tuff erosion due to the interaction of wind and sea, which has gifted spectacular cliffs and the Islet of Punta Pennata (fig. 13). The ancient Roman town of Bauli was a well-known and high class resort which exploited the two coastal volcanic lakes of Fusaro and Miseno, the sea and the lush vegetation. Moreover, it was a strategic base for the navy and it was part of the ambitious plan of the Emperor Nero, whose Navigabilis Fossa would have connected Puteoli to Rome[18].
The Lake Fusaro is the widest coastal lake of the Phlegraean Fields (97 hectares). Its

Fig. 13 - Panoramic view with Punta Pennata. From Picone L. (2009), La costa sul Golfo di Napoli-The coast of the Bay of Naples, Massa Editore, Napoli, p.18

Fig. 14 - The Casina Vanvitelliana at the Lake Fusaro. From Picone L. (2009), La costa sul Golfo di Napoli-The coast of the Bay of Naples, Massa Editore, Napoli, p.22

ancient name Acherusia Palus conveyed the main geographic feature: a lagoon with brackish water, where fresh spring water mixes with salty water penetrating from the sea. Despite the cyclical soil movements and the engineering work in the history, the lake is divided by a thin coastal strip covered by dune and wetland vegetation, connected to the sea through three mouths. Its ecosystem is protected by habitat directives. It has always been exploited for fishing – also for oyster and mussel farming - and recreational activities. Paget (1968) has pointed out the possible location of Cuma's harbor by the Lake Fusaro, which was not far from the acropolis. The architectural heritage includes the Casina Vanvitelliana, a fine example of late Baroque-Rococo hunting lodge designed by the architect Carlo Vanvitelli and built in 1782, with a peculiar composition of spaces and facilities[19]. Since its construction under the Bourbon King Ferdinand IV, the Casina was painted several times and today it can be still considered a key element of the landscape (fig. 14).

The Lake Miseno[20] has a smaller surface than the Lake Fusaro, but almost identical characteristics and issues. Its coastal strip is interrupted by two mouths, but in the recent years it has been interested by water pollution. During the Roman Empire, the utilitarian function was predominant, particularly as a military port for the huge fleet (some 10000 soldiers). It consisted of two areas: in the internal one, which was the lake itself and its shores, there were shipyards, stores, quarters, and the military school; the external roadstead areas served for 250 vessels[21].

In all likelihood, the ancient Bauli extended even beyond the current shoreline, as proved by the evidence of ruins in the nearer seabeds, such as roads, buildings' basements, marble and mosaic decorations. In the 9th century A.D. the negative bradyseism caused the submersion of the Phlegraean coasts and their settlements. The Romans built aristocratic villas and monuments on the hills, whose ruins are partly preserved: Agrippina's Sepulchre, Cento Camerelle[22], Cornelia's Villa, to name some. It is worthy

to visit the Archaeological Park Thermae of Baia, a complex of buildings and facilities built on the slope of a hill (fig. 15). Also, A remarkable collection of antiquities is kept at the Archaeological Museum of the Phlegraean Fields, located in the Aragonese Castle of Baia, a monumental 16th century fortress that strategically overlooks the Gulf of Pozzuoli and the islands.

Perhaps the most famous archaeological attraction of Bacoli is the Piscina Mirabilis, an architectural and hydraulic engineering masterpiece of the Augustan age, when the Serino aqueduct was built too. It is well preserved, currently without water, thus the visitors can admire a sort of "basilical" structure. This cistern was dug in the tuff hill and it consists of a main rectangular room of 72 metres in length and 25 metres wide, with 4 rows of 12 cruciform pillars each that are 15 metres high and support barrel vaults. It could store up to 12600 litres of fresh water, which was essential for the fleet and the trade. The idea – at a smaller scale – was commonly applied for domestic water supply in all Roman territories, especially in islands (i.e. Ponza, Ischia, etc.).

The whole scenery, however, is dominated by Cape Miseno (164 m amsl), the promontory which marks the morphological limits of the Gulf of Pozzuoli. It is of primary relevance for passive and active views which, in addition to the climate and the landscape quality,

Fig. 15 - The Archaeological Park Thermae of Baia. From Picone L. (2009), La costa sul Golfo di Napoli-The coast of the Bay of Naples, Massa Editore, Napoli, p.16

attracted the aristocracy that built several country villas on top of the hill, close to the light. Cape Miseno has always been a reference point for mariners sailing the Neapolitan coasts.

The development of Bacoli in the 20th century witnessed not only the densification of urbanised areas, but also a worrying urban sprawl and uncontrolled speculation for touristic purposes[23]. The population has more doubled between 1936 (10438 people) and the end of the century, but later it stopped and it currently counts approximately 26500 residents. The housing demand was partly met by planned interventions, but unauthorised developments or extensions of existing buildings were rather usual in the decades 1960s-1990s. Therefore, unbuilt areas can be found in natural reserves, the promontories, and those parts of the countryside not reached by roads or limited by steep terrain.

5. Monte di Procida

With reference to the territorial surface and the population (less than 13000 residents), Monte di Procida is the smallest Phlegraean municipality. It is their south-western tip, and the Channel of Procida separates such promontory from the homonymous island. Actually, this municipality took its name from the island in the 17th century as a consequence of its recolonization by the Procidani and the administrative union until recent times[24].

At the time of the Magna Grecia, in this territory there was a little village under the control of Cuma. Afterwards, the settlement was part of the colony of Misenum and consequently called Mount Misenum. The fall of the Roman Empire, the Barbaric and Saracen invasions caused the overall decline of the Phlegraean area, and Mount Misenum was abandoned as well. During the recolonization, the farmers of Procida settled in the three rural villages – Cappella, Monte and Case Vecchie – served by as many streets – via Torregaveta, via Panoramica, via Cappella[25]. The decoding of such process has been made more and more difficult by the progressive and intense urbanisation. The old settlements merged in a “continuum” of detached and semi-detached houses, small hotels and other touristic facilities, and a network of narrow secondary roads often lacking in pavements, trees and street furniture.

One of the strengths of Monte di Procida comes from the combination of orography and location. From its terraces, it is possible to read the overall structure of the Phlegraean Fields in relation to the northern and southern coasts and the islands[26]. Furthermore, such landscape views and the geological evidence show the exceptional role of volcanism and sea in shaping this territory, including the small Islet of San Martino which was once joined to the promontory.

The port, currently protected by breakwaters, is the closest point in mainland to reach the island of Procida and, subsequently, Ischia. In the past, such geographical feature was particularly significant, as mentioned before. However, the orography and location did not allow its development by comparison to the nearby port of Pozzuoli. In fact, its

small surface and difficult access to the main territorial infrastructures have limited its role to passenger transport to and from Procida, and to pleasure craft.
The territory of Monte di Procida has probably reached the highest man-made level of transformation of the Phlegraean Fields. The cliffs seem to be the last components of the landscape keeping some wilderness, but they are endangered by soil erosion and scrub degradation. New developments for housing are definitely not sustainable, and forbidden by landscape protection plans. By safeguarding naturalistic aspects and the few cultivated fields, with appropriate planning and design interventions, it would be still possible to enhance the outstanding landscape value.

6. Conclusions: observations on designing the Phlegraean green-blue infrastructure.

The environmental and cultural heritage of the Phlegraean Fields represents a unique chance to promote a distinct socio-economic development of the northern metropolitan area of Naples. The key point is the interpretation of the identity of the place, not well known or promoted for its outstanding values, maybe underestimated by touristic routes in Naples, too often perceived as place for passing through – and reach the gulf islands, for instance – rather than for visiting. The beaches suddenly become crowded in summer, because of mass tourism. At the same time, the local population need to be aware of values, and to adopt good practices within a more collaborative idea of community life, identity and respect.
It can be observed that, despite the urbanisation occurred in the decades 1940s-1990s, the characterising elements of natural and cultural heritage have been preserved. The territorial vocation should be supported by services and compatible land uses, as to allow the development of sustainable sea tourism, archaeological sites, spas, farming. The protected areas, traditionally known for didactic and scientific purposes, might be further enhanced for trekking and hiking.
The landscape protection actions should aim to preserve active and passive views, and to improve the quality of the landscape by focusing on:

- traditional cultivation techniques in agrarian landscapes, i.e. vines and fruits trees, kitchen gardens on steps;
- enhancement of gardening and food production, even at smaller scales, in urban and peri-urban contexts;
- environmental policies to ensure water quality of the lakes and the sea, which is a prerequisite for fishing and shellfish farming, as well as to safeguard marine flora and acceptable levels for bathing;
- conservation policies in naturalistic and archaeological areas, including the requalification of surrounding areas;
- improvement of roads and paths as linear landscape signs, especially those built on historic routes and/or panoramic terraces;

- monitoring and limiting soil consumption, trying to implement soil permeability, and preventing soil erosion;
- requalification of existing residential settlements – historic centres and outskirts - and reuse of abandoned industrial areas;
- open spaces redevelopment and care, with regards to materials, features, plants, and anti-vandalism strategies.

The introduction of green-blue infrastructures can be challenging for the local authorities because of the old conception of urban and regional plans. Nevertheless, planning and designing sustainable infrastructures cast light on the strengths and help rescuing neglected areas. In order to achieve this result, it is of primary importance to coordinate local and sectoral authorities to elaborate plans and programmes on shared ecological and management objectives. The Phlegraean green-blue infrastructure can be conceived to foster:

- multifunctional and high quality landscapes, characterised by the mix of environmental conservation of hotspots and volcanic areas, traditional agriculture, organic gardening, open spaces and public grounds design, coastal landscapes (natural and man-made), urban forestry as proposed in the National Strategy of Urban Green (2018);
- historic centres, monuments, and archaeological sites as built components of the spread cultural heritage circuit;
- roads and paths care, tree rows maintenance and new planting, info-points and touristic routes, panoramic points;
- progressive reduction of conventional and polluting transports, through the elaboration of sustainable transport plans based on interchange, public transport, slow mobility;
- health and zero-km policies, such as locally grown organic food and slow food circuits, fitness trails, sport parks, community grounds for gardening;
- innovative concept of tourism, which needs to broaden and diversify its offer in order to widen the touristic season from summer to the whole-year round, by integrating cultural and environmental attractions with the conventional fruition of coasts and beaches;.
- marketing actions of branding to support the whole process of territorial identification of the Phlegraean Fields district.

In conclusion, sectoral approaches and separated plans or interventions by each Phlegraean municipality may not be as effective as an overarching and coordinated action. A holistic approach to the integrated development requires a wider range of professionals. Their expertise should include sociology, economics, cultural ethnology, in addition to the more conventional sciences of territory – planning, landscape architecture, agrarian sciences, history and archaeology.

ENDNOTES

1 According to the European Landscape Convention (Florence, 2000): "Landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. The Phlegraean Fields on one hand denote the exceptionally powerful volcanic events as landscape generators, on the other hand anthropic settlements from the Roman Age on, whose archaeological remains coexist with historical architectural heritage and contemporary developments. Some human settlements – i.e. Pozzuoli – have been partly abandoned or damaged by seismic activities due to the volcanic nature of such site.

2 More information regarding the benefits of green infrastructures in the Italian context can be read in official documents released by the Ministry for the Environment. In particular, see: Le infrastrutture verdi e i servizi ecosistemici in Italia come strumento per le politiche ambientali e la green economy: potenzialità, criticità e proposte, Report Ministero dell'Ambiente, 2013, pp.6-10

3 The Italian Ministry for the Environment has adopted the "Strategia Nazionale per la Biodiversità" in 2010, revised in 2016, with aims and guidelines. In the more recent "Strategia Nazionale per il Verde Urbano" (2018), the role of green infrastructures is highlighted to meet sustainable development standards.

4 It can be noted that there have been strong spatial, geological, historical, cultural and socio-economic relationships between the islands of Procida, Vivara, Ischia and the Phleagraean Fields. Furthermore, even the islands of the Pontine archipelago (Ponza, Ventotene and minor ones) have shared many of those features. Giuseppe Galasso, in his contribution *Il paesaggio disegnato dalla storia* (2000), described this relationships between the islands and the mainland of the Tyrrhenian coast of Italy as "intimate" (see Il Paesaggio Italiano, Touring ed., pp.43-44).

5 The geomorphological aspects are analysed in Pagliuca E. (2003), Paesaggi virtuali della metropoli campagna, in Il ruolo delle aree metropolitane costiere nel Mediterraneo, edited by Francesco Forte, Alinea, Firenze, pp. 107-110, 121-124.

6 By comparison between late 18th and early 21st century floristic surveys, a depletion of native flora with some 40% species loss has been observed in the Phlegraean area. Farming and selective woodland exploitation occurred in the 19th and early 20th centuries. The main human transformations occurred in the 20th century, due to urban sprawl and industrial settlements. Specific data can be found in Motti R., Maisto A., Migliozzi A. and S. Mazzoleni (2004), Le trasformazioni agrarie del paesaggio agricolo e forestale dei Campi Flegrei nel XX secolo, Informatore Botanico Italiano, 36 (2), pp.578-582.

7 The geographical and sectoral aspects of the study are taken from Landini P. (2006), Atlante Geografico Italia, Touring Ed. , Milano, pp.28-34; Marcarini A. (2000), *Paesaggi italiani*, in Il Paesaggio Italiano, Touring Ed. , Milano, p.270; Forte F. and F. Varone (2003), *Metropoli e metropolitanità*, in Il ruolo delle aree metropolitane costiere nel Mediterraneo, edited by Francesco Forte, Alinea, Firenze, pp.10-15, 27-34.

8 According to the 2008 PTR's Map of Systems of Rural and Open Territory, such areas belong to:
- macro-system of Volcanic elements (major part), system of Continental volcanic elements, unit n.32 "Campi Flegrei";
- macro-system of Plane areas (minor part), distinguished in: system of Piedmont terraced areas, unit n.36 "Pianura Flegrea"; system of Coastal planes, unit n.51 "Pianura costiera del Volturno e del litolare Flegreo".
Finally, the islands are comprised in the macro-system Islands of the Gulf of Naples, system of Volcanic islands, units n.54 "Isola di Procida" and n.55 "Isola di Ischia".

9 The ZPS-SPA are: Seabeds of the islands; Island of Vivara; Lake of Averno. The SIC-SCI are: Wetlands of Crater Agnano; Cape Miseno; Camaldoli Hill (Neaples); River mouth of Licola; Central parts of the island of Ischia– Pinewoods of Ischia, Cliffs of Ischia, Stations of *Cyperus* of Ischia; Seabeds of the islands; Island of Vivara; Islet of S. Martino and surrounding areas; Lake of Averno; Lake Fusaro; Lake Lucrinus; Lake Miseno; Mount Barbaro (Pozzuoli) and Campiglione Crater; Mount Nuovo; Harbour Paone at Nisida; Stations of *Cyanidium caldarium* (Pozzuoli). From the Piano Forestale Regionale 2009-2013, Regione Campania, pp.31-35.

10 An overview of the process of metropolitan development in the decades 1950s-2000s can be read in Ferraioli P. (2003), *Il processo di metropolizzazione in Campania*, in Il ruolo delle aree metropolitane costiere nel Mediterraneo, edited by Francesco Forte, Alinea, Firenze, pp.53-73, 78-83.

11 The Ministerial Decree of 03 October 1994 and subsequent modifications and integrations officially recognised the following Phlegraean types of wine, mainly from local and old vine varieties: Bianco, Rosso, Falanghina, Piedirosso or Pér e palummo rosso, Piedirosso or Pér e palummo rosso riserva, Piedirosso or Pér e palummo rosato, Piedirosso passito, Falanghina passito, Falanghina spumante.

12 The Serino Aqueduct served eight main towns - Nola, Acerra, Atella, Napoli, Pozzuoli, Baia, Cuma and Miseno. The main axis of its water network started from the spring close to Mount Terminio in Irpinia and reached Piscina Mirabilis at Miseno after some 100 kilometres. There were some secondary axes as well, which served Cuma and other remarkable towns.

13 Land use shows that, on one hand, the farm mosaic (Corine class 2) decreased from 72.1% (1900) to 38.5% (1998); on the other hand, urban use (Corine class 1) increased from 1.8% (1900) to 7.2% (1954) and finally 35.5% (1998). Overall, agrosilvicultural (crop + farming + woodland) occupied 93.4% in 1900, 90.2%

in 1954, 51.7% in 1998. Uncultivated areas, which represented only 2.1% in 1900 and 1.3% in 1954 because of farming pressure, reached 10.2% in 1998. From Motti R., Maisto A., Migliozzi A. and S. Mazzoleni (2004), Le trasformazioni agrarie del paesaggio agricolo e forestale dei Campi Flegrei nel XX secolo, Informatore Botanico Italiano, 36 (2), pp.579-581

14 In 529-528 B.C., on the cape currently known Rione Terra that was part of the territory under the control of Cuma, Samos' exiles banished by tyrant Polycrates founded another Greek colony called Dikaiarchèia (literally, "town of the righteous government"), subsequently Fistelia inhabited by the Samnites, eventually Puteoli under the Romans. Puteoli's port became one of the most important slipways of the Mediterranean Sea both from the trade and military viewpoints. In fact, Portus Iulius had a costal pier 372 metres in length and built on arches positioned on fifteen quadrangular pylons. It was protected by a long dam, on which passed Via Herculea or Herculanea, from Point Epitaffio to Point Caruso, including the access to the navigable canal linking to the Lake Lucrinus. Today, the ruins occupy 10 hectares at a depth of about 2.50-5.00 metres.

15 Regarding the 16th century bradyseism of Mount Nuovo, the explosive mouth was close to the edges of the Lake Miseno. As a consequence of such volcanic event, the lake was almost completely drained. In 1970, the Rione Terra was evacuated and it led to the construction of the quarter Toiano for displaced citizens. As a consequence of the 1980s bradyseism, the new development of Monterusciello was the last major expansion of Pozzuoli. References: Motti R., Maisto A., Migliozzi A. and S. Mazzoleni (2004), Le trasformazioni agrarie del paesaggio agricolo e forestale dei Campi Flegrei nel XX secolo, Informatore Botanico Italiano, 36 (2), pp.582-583; Moccia F. and B. Scalera (2017), "UIA and the MAC project: green city and multi-ethical connections for Monteruscello neighbourhood. Pozzuoli case study", Tria, 18, 01/2017, Naples, pp.178-181

16 The Romans heavily transformed the shores of the Lake Avernus under the supervision of Marco Vipsanio Agrippa. His project included a canal network and a tunnel that linked such lake to the Lake Lucrinus and then to the sea, whilst on the opposite side the Cocceius Tunnel connected Portus Iulius to Cuma. Furthermore, the Lake Avernus was thought to be the entrance to the Hades underworld, as Virgil wrote in Aeneid. An architectural ensemble with baths, dedicated to Apollo, was built on a side of the lake; the dome of the temple recalled the lines of the Pantheon in Rome.

17 With reference to the old grid of Roman roads, it can be stated that those routes are still partly preserved and/or reused in Pozzuoli. Firstly, the consular Via Campana began at the Flavian Amphitheatre and joined the Via Appia, and its route literally cut one of the oldest Phlegraean craters later renamed Montagna Spaccata ("split mountain"). Moreover, the Via Domitiana linked Sinuessa along the Appia to the colonies of Vulturnum and Liternum and finally Puteoli, where it joined the Via Antiniana to Naples: therefore, such route became the coastal connection between the Gulf of Naples and the north-western settlements. For further reading about the territory of Pozzuoli and its relationships with the coastal structure and the old routes, see: Scalera B. (2009), Pozzuoli e il suo fronte mare, in La costa sul Golfo di Napoli-The coast of the Bay of Naples, edited by Luigi Picone, Massa Editore, Napoli; Freda G. (2009), Attraverso le strade della storia e del mito, in Fraticelli V., Mariniello A. F., Picone L., Piemontese A. and Scarano R. Bacoli e Monte di Procida, edited by Luigi Picone, Massa Editore, Napoli, pp.52-59

18 In 69 A.D. the Emperor Nero made an attempt to build a waterway connecting Puteoli (Pozzuoli) to Rome. Such plan aimed to overcome the difficulties to provide the Eternal City with food supplies in the winter time - even worse after the 64 D.C. fire. The initial part of the canal would have linked the lakes Avernus and Baianus (the latter not any more existing) following the direction east-west. The route would have been 160 miles in length (236,5 km), probably circumnavigating the promontories of Formia, Itri and Terracina, eventually reaching the River Tiber between Ostia and Rome. For further reading: Arata F. P. (2014), La navigabilis fossa di Nerone, in Mélanges de l'École française de Rome – Antiquité, 126 (2014), 1

19 The Casina Vanvitelliana is linked to the lake shore through a wood bridge. The two-storey building has three intersected octagonal volumes with a central pagoda and wide windows. It hosted royal families of various dynasties and countries, but it has also witnessed revolutions and cultural events.

20 According to Virgil's Aeneid (6th book), the name Miseno comes from the Troyan soldier and trumpeteer Misenus, Aeolus' son, who drowned and was buried by Aeneas under a huge mound named Cape Miseno.

21 From Marcarini A. (2014), "La Piscina Mirabilis" in Tesoro Italia. Il patrimonio negato, edited by Anna Ferrari-Bravo, Touring Ed. , Milano, pp.204, 206

22 The Cento Camerelle ("One hundred rooms") are another fabric with a system of cisterns, located in the upper part of Bauli. Distributed on the upper and lower floors, they were excavated in the tuff rock as well as similar cisterns. They are also called Carceri di Nerone ("Nero's prisons") as traditionally – but not surely - thought to be the place where Nero made his mother Agrippina be murdered. For further reading on the Piscina Mirabilis, see: Marcarini A. (2014), "La Piscina Mirabilis" in Tesoro Italia. Il patrimonio negato, edited by Anna Ferrari-Bravo, Touring Ed., Milano, pp.204, 206

23 Permanence and evolution of the settlement of Baia have been analysed by Piemontese A. (2009), "Gli aspetti strutturali e formali del paesaggio", in Fraticelli V., Mariniello A. F., Picone L., Piemontese A. and R. Scarano, Bacoli e Monte di Procida, edited by Luigi Picone, Massa Editore, Napoli, pp.86-101

24 Monte di Procida regained its administrative independence from Procida in 1907. Nonetheless, the new municipality kept the name that had been already used for a long time.

25 The ongoing development of the PUC-Urban Plan of Monte di Procida has enabled to outline the main structural and landscape resources of its territory. For further reading: Piscopo C. and P. Scala (2012), Building the landscapes of Monte di Procida, IJPP - Italian Journal of Planning Practice, Vol. II, issue 1 – 2012, pp.77-80

26 The reconnection of coastal landscapes between Acquamorta and Torre Fumo to the upper quarters of Monte di Procida should be one of the priorities to enahnce aesthetic and functional aspects. For further reading, see: Fraticelli V. (2009), Criteri metodologici per la riqualificazione del litorale da Torre Fumo al Porto Turistico, in Fraticelli V., Mariniello A. F., Picone L., Piemontese A. and Scarano R. Bacoli e Monte di Procida, edited by Luigi Picone, Massa Editore, Napoli, pp.116-123

References

- Agnoletti, M. (2014), ed. by, Paesaggi rurali storici/Historical rural landscapes, Touring Ed., Milano
- Arata F. P. (2014), La navigabilis fossa di Nerone, in Mélanges de l'École française de Rome – Antiquité, 126 (2014), 1
- Austin G. (2014), Green Infrastructure for Landscape Planning: Integrating Human and Natural Systems, Routledge, London
- AA.VV. (2000), Il Paesaggio Italiano, Touring Ed. , Milano
- Barberi F., Cassano E., La Torre P. and A. Sbrana (1991), Structural evolution of Campi Flegrei caldera in light of volcanological and geophysical data, Journal of Volcanology and Geothermal Research, 48, 1–2/August 1991, pp. 33-49
- Cardone V. and L. Papa (1993), L'identità dei Campi Flegrei, Cuen, Napoli
- Dinetti M. (2000), Infrastrutture ecologiche, Il Verde Editoriale, Milano
- Forte F. (2003), ed. by, Il ruolo delle aree metropolitane costiere nel Mediterraneo, edited by Francesco Forte, Alinea, Firenze
- Forte F. (2006), Politiche urbane, Napoli: storie, bisogni, opportunità, INU Edizioni, Roma
- Fraticelli V., Mariniello A. F., Picone L., Piemontese A. and Scarano R. (2009), Bacoli e Monte di Procida, edited by Luigi Picone, Massa Editore, Napoli
- Landini P. (2006), Atlante Geografico Italia, Touring Ed. , Milano
- Marcarini A. (2014), "La Piscina Mirabilis" in Tesoro Italia. Il patrimonio negato, edited by Anna Ferrari-Bravo, Touring Ed. , Milano, pp.204-207
- Miano P., Izzo F. and L. Pagano (2017), ed. by, I Campi Flegrei. L'architettura per i paesaggi archeologici, Quodlibet, Macerata
- Motti R., Maisto A., Migliozzi A. and S. Mazzoleni (2004), Le trasformazioni agrarie del paesaggio agricolo e forestale dei Campi Flegrei nel XX secolo, Informatore Botanico Italiano, 36 (2), pp.577-583
- Moccia F. and B. Scalera (2017), "UIA and the MAC project: green city and multi-ethical connections for Monteruscello neighbourhood. Pozzuoli case study", Tria, 18, 01/2017, Naples, pp.173-186
- Musi A. (2010), Regno di Napoli, Omnia Arte, Napoli
- Norberg-Schulz C. (1979), Genius Loci, Electa, Milano
- Paget R.F. (1968), The ancient Ports of Cumae, The Journal of Roman Studies, 58, Parts 1-2, pp.152-169
- Picone L. (2009), La costa sul Golfo di Napoli-The coast of the Bay of Naples, Massa Editore, Napoli
- Piscopo C. and P. Scala (2012), Building the landscapes of Monte di Procida, IJPP - Italian Journal of Planning Practice, Vol. II, issue 1 – 2012, pp.71-92
- Sereni E. (1961), Storia del paesaggio agrario italiano, Laterza, Bari
- Sirpettino M. (1999), I Campi Flegrei. Guida storica, Edizioni Scientifiche Italiane, Napoli

Paolo Camilletti
Department of Architecture, University of Naples "Federico II"
paolo.camilletti@unina.it

Architect and landscape architect, European PhD in garden history and design at the Polytechnic of Turin, term-lecturer at the University Federico II of Naples. He pursued an artistic education, and got a piano degree at the Conservatory of Perugia. After his MSc degree in architecture at La Sapienza in Rome, he attended two Masters in garden management and landscape design at the Universities of Tuscia and Turin respectively. As a scholar of the Rotary Foundation, he did research at the University of Reading (UK) under the supervision of Richard Bisgrove. Research consultant of APGI, landscape conservation manager in various municipalities in Lazio Region, he is President 2017-20 of AICu (Italian Association of Curators of parks, gardens, and botanical gardens); life member of the RHS, and member of AIAPP-IFLA.

Gianluca Lanzi
Department of Architecture, University of Naples "Federico II"
gianluca.lanzi@unina.it

Architect, Ph.D in "Evaluation methods for the integrated conservation of the urban and environmental architectural heritage", is architect and expert in geographical information systems. He received his post graduate master's degree in "Planning and Urban Design in the Government of Territorial Transformations" at University Federico II of Naples. He is referee and member of editorial board of the urban planning journal TRIA (Territory of Research on Settlements and Environment) published open access by FedOA (Federico II OpenAccess). His main interests are the economic evaluation of plans and programs.