Athens Journal of Architecture 2022, 8: 1-33
https://doi.org/10.30958/aja.X-Y-Z

From the Landscape of Contrasts to the Landscape of Invisible Cities: A Strategic Landscape Design for the Revitalization of the Ancient Greek Colony of Megara Hyblaea in Sicily

By Simona Calvagna[*], *Pietro Maria Militello*[±], *Fabio Agatino Reale*[°], *Gianluca Rodonò*[•] *& Andrea Tornabene*[♦]

The present research aims at revitalising the archaeological park of Megara Hyblaea through innovative strategies developed within the PON project "An early warning system for cultural heritage/e-WAS". In this project Sicilian research institutions, universities and companies pursue the common goal of developing new technologies for the protection, enhancement and strategic management of the historical and cultural heritage. The ancient Greek colony of Megara Hyblaea is immersed in an industrial landscape that stretches along the coast of eastern Sicily from Augusta to Syracuse. The sense of the original place has been obliterated by an indiscriminate occupation of the land by industries which have left, here and there, an archipelago of "patrimonial wrecks", which are equally close to the smelly chimneys and the horizon of the sea. This landscape of contrasts, dominated by petrochemical industries, has over time hindered a cultural tourism appropriate to the representativeness and importance of the asset, despite the efforts made by the authorities responsible for its protection. The paper demonstrates the need for a holistic approach to the revitalisation project of the archaeological site: the strategic design, understood as the story of the overlapping of "invisible cities", aims to reorganise and re-conquer places through a new narrative coherent with hidden values, going as far as the experimentation of innovative technologies for the creation of facilities for the enjoyment of the park.

Introduction

The work illustrated in this contribution is part of the Research Project called *eWAS - An Early Warning System for Cultural Heritage*. It is a project financed by the Italian Ministry of Education, University and Research, whose aim is the experimentation of new technologies for the protection, conservation, management and safety of cultural heritage.

As part of a wide range of objectives, the eWAS project includes the design and prototyping of facilities for archaeological sites. To this end, the ancient Greek colony of Megara Hyblaea was chosen as a test site for the realisation of a

[*]Professor, Dicar - University of Catania, Italy.
[±]Assistant Professor, Disum - University of Catania, Italy.
[°]Research Fellow, Dicar - University of Catania, Italy.
[•]Researcher, Dicar - University of Catania, Italy.
[♦]Research Fellow, Dicar - University of Catania, Italy.

responsive cover in composite material and an innovative visitors pavilion with low environmental impact. Megara represents a case of great importance in the archaeological panorama of the whole of Magna Graecia, as it provides overlapping and clearly legible archaeological evidence of the first colonial settlement dating back to the end of the 8th century BC, the archaic phase of the city, and the subsequent Hellenistic phase of the 4th century BC. Nevertheless, the site is subject to important weaknesses. Situated on the eastern coast of Sicily (Figure 1) and literally besieged by the Syracuse petrochemical complex, the site is now an enclave in the industrial landscape, excluded from the main communication axes and tourist circuits.

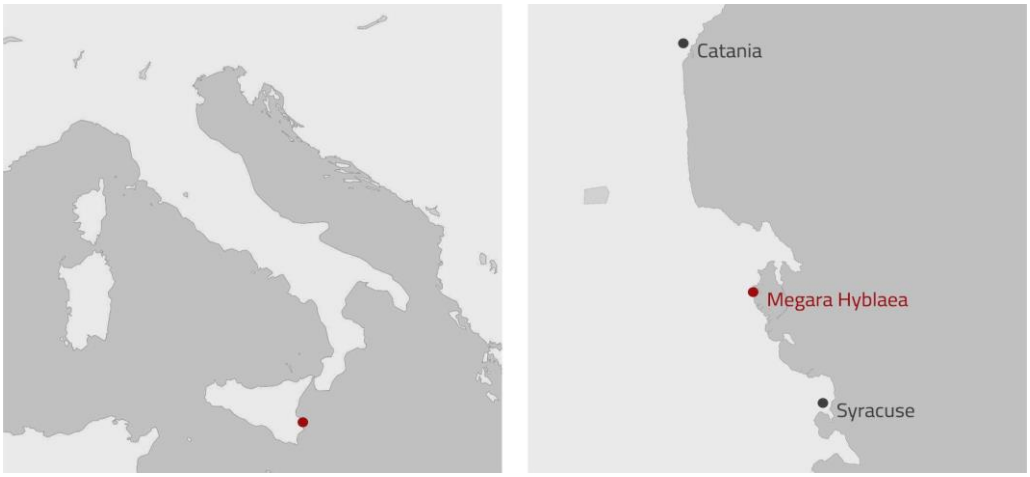

Figure 1. *Location of the Experimental Site*

On the other hand, the location of the archaeological site holds great potential from a landscape point of view, being situated on a plateau overlooking the sea and open to the coastal landscape of the Gulf of Augusta. The ancient city, therefore, with its values and threats, represents an ideal terrain for the experimentation of innovative protection and fruition support structures.

The design research concerned not only the technological aspects of the facilities, but also the framing of the architectural interventions in a strategy of global revitalisation of the archaeological site. The project was therefore approached with an interdisciplinary and inter-scalar, landscape-oriented approach, with the intention of promoting a reinterpretation of the landscape of the Gulf of Augusta that can restore centrality to the identity features of the cultural and natural heritage, triggering new relationships between places, heritage and communities.

In this text, after a brief state of the art on the concepts of landscape, territory and heritage, on the one hand the relationship between archaeological heritage and architectural design are focused on; on the other hand, an examination is made of the consolidated technological solutions in architectural constructions within archaeological sites.

The literature considered constitutes the critical design framework for the case study. The paper then focuses on the description of the methodology adopted and its implementation in the revitalisation project of the archaeological site of Megara Hyblaea. In this way, the paper aims to contribute to a wider debate on landscape

and architectural design within archaeological sites, highlighting the relevance of the landscape approach in enhancing archaeological heritage.

Landscape, Territory and Heritage

The signing of the *European Landscape Convention* (ELC) in Florence in 2000 marked a turning point in the understanding of landscape. No longer confined to aesthetic-contemplative or ecological-environmental interpretations, the landscape is described as a mosaic of historical, cultural, ecological, social and economic values, as a context of life, expression of local identities and diversity. Its character is at once dynamic, relational and participatory.[1] Moreover, "acknowledging that the landscape is an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday areas",[2] the ELC attributes equal dignity to all landscapes and involves the populations in their conservation and enhancement. Landscapes are cultural entities, resulting from the relationships between communities and places;[3] if, in addition, they are conceived as resources (physical or immaterial) invested by a system of historical, cultural and identity values of places, they become *common goods.*[4] This approach to landscape resonates with the research of the Italian *Scuola Territorialista*[5] which, by considering the territory as the historical product of long-term co-evolutionary processes between human settlement (culture) and the environment (nature), recognises the existence of a "territorial heritage".[6] The principles underlying the Faro Convention (2005),[7] which emphasises the link between cultural heritage and democracy and encourages the recognition of the value of cultural heritage in the meanings and uses attributed to it by people, belong to the same cultural posture.

1. S. Calvagna, "Verso la definizione di un Paesaggio Vulcanico Urbano sull'Etna. Dalla città di Catania all'area metropolitana," in M. Arena and A. Villari (ed.) *PAESAGGIO 150: Sguardi sul Paesaggio Italiano tra Conservazione, Trasformazione e Progetto in 150 Anni di Storia* (Roma: Aracne, 2012), 236.

2. ELC, Preamble. Retrieved from: https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/176. [Accessed May 2021.]

3. G. Fairclough, "Essentially Cultural: Perspectives on Landscape from Europe," *Landscape Journal* 35, no. 2 (2016): 149-166.

4. P. Donadieu, *Paysages en commun: Pour une éthique des mondes vécus* (Valenciennes: Presse Universitaire de Valenciennes, 2014), 24; J. D. Gerber and G. Hess, "From Landscape Resources to Landscape Commons: Focusing on the Non-Utility Values of Landscape," *International Journal of the Commons* 11, no. 2 (2017): 708-732.

5. Born in the early 1990s in Italy by teachers and researchers of urban planning and sociology: A. Magnaghi (Università di Firenze), G. Ferraresi (Politecnico di Milano), A. Peano (Politecnico di Torino), E. Trevisiol (IUAV), A. Tarozzi (Università di Bologna), E. Scandurra (Università di Roma 'La Sapienza'), A. Giangrande (Università Roma Tre), D. Borri (Università di Bari) e B. Rossi Doria (Università di Palermo).

6. A. Magnaghi, *Il progetto locale: verso la coscienza di luogo* (Torino: Bollati Boringhieri, 2010).

7. Faro Convention. Retrieved from: https://www.coe.int/en/web/venice/faro-convention [Accessed May 2021.]

The historical-evolutionary and local-centred perspective of the *territorialist* approach to bioregional spatial planning is now put in tension with the paradigm of "ecosystem services",[8] whose relevance has grown exponentially since the end of last century, due to changing environmental conditions.

The imbalance between human settlement and the environment and the impressive degradation of the *territorial commons* are rooted precisely in the interruption of those co-evolutionary processes emphasised by the territorialist approach. The laceration of the interaction and mutual transformation between man and the environment by the industrial and post-industrial civilisation of machines is at the origin of the current environmental crisis. The need to overcome the Manichaean opposition between uncontrolled exploitation and crystallisation of the environment in 'protected reserves' of cultural and natural assets, in favour of a planning vision in which the collectively patrimonialised territorial palimpsest produces ecosystem services capable of improving people's quality of life – and not limited to a numerical and quantitative assessment of natural resources with the risk of their commodification –[9] now seems evident. In pursuing a "return to the territory",[10] far from being a vain and nostalgic attempt to restore the original state, but rather aimed at establishing new and more efficient balances,[11] the proactive vision of the landscape promoted by ELC integrates with the logic of *re-territorialisation* mentioned above. Overcoming the nature/culture dualism, the landscape should be approached not so much as an object *on which* to act (generally in the end, in the name of an ideology of the picturesque), but rather as a *milieu* of human existence *with which* to act, in search of a confrontation with society and its spaces, of which the landscape is expression.[12] The landscape project, Pierre Donadieu observes, adapting to the period of irreversible transitions we are living through, is based on new paradigms: the aforementioned ecosystem services, the multisensory emotions, the projects over time and the places of memory.[13] Experience and time are project materials: the site is not a *tabula rasa* but «a place where the chosen form and values evoke the local history» and a *milieu* in which continuous ecological processes (R.T.T. Forman) occur. "The project guides the process but not decides the end states" and is focused on the experience of users, which are "sentient beings to their environment with their five senses".[14]

8. D. Poli, "Tracciare la rotta per iscrivere i servizi ecosistemici nella pianificazione bioregionale," in D. Poli (ed.) *I Servizi Ecosistemici nella Pianificazione Bioregionale* (Firenze: Firenze University Press, 2020), 129-135.

9. A. Franchina, "Servizi ecosistemici in chiave progettuale e proattiva," in D. Poli (ed.) *I Servizi Ecosistemici nella Pianificazione Bioregionale* (Firenze: Firenze University Press, 2020), 59-64.

10. A. Magnaghi, "Mettere in comune il patrimonio territoriale: dalla partecipazione all'autogoverno," *Glocale. Rivista Molisana di Storia e Scienze Sociali*, no. 9/10 (2015).

11. Ibid, 52.

12. J. M. Besse, *La nécessité du paysage* (Marseille: Éditions Parenthèse, 2018), 111.

13. Donadieu, "Landscape Architecture to Morrow: a Democracy of Landscape Commons?", in *Tasting the Landscape: 53rd IFLA World Congress*. Torino, April 20-22, 2016) (Firenze: Edifir, 2016), 36-37.

14. Ibid, 36.

The Archaeological Heritage between Memory and Identity – The Ruins Project

An important role in relation to the landscapes of places of memory is certainly played by archaeological areas. Archaeology, in fact, as the physical materialisation of memory, is an important factor in the creation of identity, referring to a temporal and geographical extension which intersects different regions, cultures and events on a wide scale and activates a plurality of belongings.[15] The problem of the transformation of the archaeological landscape can be approached from two perspectives, that of memory and that of identity. Their integration leads to an approach that is not "from the traces" but "on the traces", i.e., instead of "discovering the ruins" (the task of the archaeologist), it enhances them and makes them readable.

Architectural design therefore interprets the concept of ruin differently from archaeology. While for archaeology the ruin, even after discovery and related study, remains a "document" or "find" to be attested chronologically and included in the framework of a wider scientific knowledge, for architecture the ruin is revealed as the primary image of the architectural form. The memory contained in the ruins expresses the existence of "a pure, undated time, absent from this world of images, simulacra and reconstructions of ours".[16] Moreover, it can be observed that "ruins have a 'physical' nature, as materials subject to degradation and transformation, and a 'mental' nature, as bearers of ideas, values and cultures linked to a given environment and a given historical period".[17] According to Georg Simmel, this degradation confers great fascination on the ruin, since it makes man's work perceived as a product of nature:[18] in this sense, the ruin mitigates his severity by becoming absorbed into the natural environment. The ruins are therefore presented as "semiophoric objects" (bearers of meanings): they do not have an intrinsic and univocal communicative capacity but represent the result of dynamic parameters such as space, time, energy and information. The attribution of meaning to the ruin must take place following a cognitive process that does not close it off in the interpretation of "an oppressive and paralysing legacy" but considers it "a wealth for the present that is projected into the future; a cognitive process that therefore builds around the ruin a 'monumental' character that distinguishes it from the idea of 'rubble', placing it halfway between *project* and *memory*".[19]

The attribution of meaning to archaeological settlements and the definition of a contemporary role for ruins have varied over centuries depending on the

15. L. Basso Peressut, "Archeologia/Archeologie: identità e rappresentazioni museografiche", in S. Canepa, V. Minucciani and M. Vaudetti (ed.) *The Archaeological Musealization* (Torino: Umberto Allemandi & C., 2012).

16. M. Augé, *Rovine e macerie: Il senso del tempo* (Torino: Bollati Boringhieri, 2004), 135.

17. V. P. Bagnato, *Nuovi interventi sul patrimonio archeologico: Un contributo alla definizione di un'etica del paesaggio* (Barcelona, 2013), 51.

18. G. Simmel, "Die Ruine," in *Philosophische Kultur: Gesammelte Essays* (Leipzig: Klinkhardt, 1911).

19. Bagnato, *Nuovi interventi sul patrimonio archeologico: Un contributo alla definizione di un'etica del paesaggio*, 2013, 53.

relationship between archaeology and architecture. While in the nineteenth century the two disciplines were presented as clearly distinct – the former being concerned with archaeological sites and the latter with modern cities – since the 1970s a rapprochement between the two subjects can be observed.

Thus, the conservative or transformative approach to the valorisation of archaeological sites has been debated. In recent decades, there has been a renewed focus on the context: the increasing need to musealise archaeological sites and to provide them with new buildings for accommodation and exhibition purposes has generated a more "contextualist" attitude, seeking "integration" between the environmental and archaeological context through the dialogue of forms and materials. The ancient-modern dichotomy was also overcome by contrasting the idea of "archaeological find" with that of "architectural fragment"; [20] the idea of the ruin has merged with that of the architectural object, making the fragment independent of its unique relationship with the past, and also becoming an architectural element that generates new forms and new meanings.

What happens "is not the transfer of the ancient object to the present time, but the codification of an idea of architecture in 'archaeological' terms; it is not the ruin that becomes modern, but the new that becomes archaeology, in a timeless dimension".[21]

Sustainable Technologies for Archaeology

The design approach for interventions in archaeological contexts is usually directed to the preservation and conservation of the findings as priority focus. For this reason, design research efforts are mainly focused on roofing structures or protective shelters for artefacts that are more subject to the degradation of the material. The numerous design workshops on this subject, which aim to bring together a multidisciplinary approach, demonstrate the complexity and importance of this research topic.[22] In addition to the approach often measured to the idea of building in an already built environment, which in this case has great testimonial value, the attempt to use non-invasive technologies is a constant element (minimal foundations, light and reversible structures, large free spans, compatible materials). As a result, the use of experimental technological solutions is often undertaken for innovation with respect to construction practice. The high value and uniqueness of the findings also means that particular attention must be paid to the choice of envelope materials so that no unfavorable thermo-hygrometric conditions are

20. F. Purini, "Il frammento come realtà operante," *Firenze Architettura*, no. 1 (2006): 2-9.

21. Bagnato, *Nuovi interventi sul patrimonio archeologico: Un contributo alla definizione di un'etica del paesaggio*, 2013, 31.

22. M. Vanore (Ed.), *Archaeology's Places And Contemporary Uses* (Venezia: IUAV, 2010); G. Parrello et al., "Architecture for Archeology: Identifying New Modular and Flexible Types of Shelter Adaptable to the Diverse Needs of Archaeological Sites," in *XII International Forum Le Vie dei Mercanti Aversa*. Capri 12, 13, 14 June 2014.

created that could lead to alteration of the protected material.[23] The technological innovation that today seems to respond most to the demands of sustainability (economic, environmental and cultural sustainability) concerns the use of so-called *textile materials* or *fabric structures.*[24] These are preferred to the use of glass or plexiglass because their degree of transparency can be calibrated in relation to specific needs. In fact, they are made with a polymeric matrix with a natural or artificial textile reinforcement. Their transparency could be changed in relation to the choice of a specific fabric wave.

However, design interventions for archaeological area should also encourage the use and communication of the findings,[25] as well as aiming to safeguard the materials. This because knowledge and use certainly play a driving role in the process of safeguarding. In order to achieve these further aims, roofing structures can play a prominent role, but a series of service facilities and an overall design of the use system should certainly be flanked. These facilities must also employ technological solutions that guarantee minimum impact on the ground and the possibility of being easily dismantled and reassembled. To guarantee this performance it is necessary to use technologies with a high level of environmental sustainability, using recycled or recyclable materials. The Atelier Peter Zumthor project in Sauda, Norway, is emblematic in this sense. The design of the service facilities in the industrial archaeology mining park consists of a series of small volumes with minimal impact on the land thanks to the presence of a wooden frame. The frame rests on the rocky ground below with specially shaped metal load distribution plates, without creating any alterations. Given the difficult accessibility of the site and the need not to affect the context, the volumes were entirely prefabricated in the nearby town of Sauda and transported to the site.

The Crossing-Scales Project between Landscape, Archaeology, Architecture and Technology

The project has been framed in a wide-ranging and inter-scalar strategic landscape design. The aim was at the reorganisation and reconquest of places by means of a new narrative innervated by the system of local values, going as far as the experimentation of innovative construction technologies in harmony with the archaeological landscape. The project is intended as a story that brings together the site's future in *federating themes*: by encouraging a process of territorial government that includes the transmission of heritage, it aims to help people rediscover the pleasure of living together in a specific place.

The landscape posture of the archaeological area project is based on the

23. Ç. F. Yaka and B. İpekoğlu, "Impact of Transparency in the Design of Protective Structures for Conservation of Archaeological Remains," *Journal of Cultural Heritage* 14S (2013): e21-e24.

24. A. Zanelli, "Architectural Fabric Structures in Refurbishment of Archaeological and Cultural Heritage Areas," in J. I. Llorens (ed.) *Fabric Structures in Architecture* (Cambridge: Woodhead Publishing Limited, 2015), 481-527.

25. P. M. Militello, "Archaeologists and Archaeological Cover," in M. Vanore (ed.) *Archaeology's Places and Contemporary Uses* (Venezia: IUAV, 2010), 49-65.

following principles:

- Places of memory extend to the whole territory and are not limited to the archaeological site itself; if the landscape is everywhere, even in everyday places, the archaeological site must enter into dialogue with landscape of surroundings, even when it is a degraded landscape.
- Landscape is a *relational entity*; therefore, the project tends to build networks of physical and immaterial relations and to interlace the heritage stratifications (of which the archaeological site is part) with the territorial and ecological ones.
- In order to implement the two principles described above, the project must therefore *cross the scales*[26] as to be able to grasp the systemic dimension of the landscape: the traces of archaeological site acquire meaning by resonating both with the landscape and with the intervention on architectural scale, in a reciprocal and continuous exchange.
- The landscape project has a strong heritage connotation: the landscape is itself heritage, because it has a cultural dimension, and at the same time it contains heritage, because it represents as a whole the framework on which local identities are based.
- The project for the revitalisation of the site is dynamic: it is not limited to the control of the result, of the configuration of a final crystallised layout, but intends to manage the process, on several time scales.
- Being based on the relationships between communities and places, landscape design is a sensitive process, which takes into account multisensory emotions: the approach to the archaeological site tends therefore not to be limited to visual aspects, but uses the synesthetic experience to favour the appropriation of places by the users.

In order to initiate a re-weaving of the network of physical and immaterial relations between archaeological heritage, place and community, the design process was intertwined with a dialogue with stakeholders. It was considered necessary to understand to what extent the local community identifies with its territorial heritage,[27] as to identify a shared hypothesis of general interest to be pursued. The idea of an archaeological park emerged as a space of integration between archaeology and nature and between the different historical stratifications. From a strictly planning point of view, the project imagined the future of the site not from the point of view of protection, but of guided co-evolution of the processes in place.

26. M. Corajoud, "*Le projet de paysage: lettre aux étudiants*," in J. L. Brisson (ed.) *Le Jardinier, l'Artiste et l'Ingénieur* (Lagrasse: Éditions Verdier, 2000), 37-50.

27. Magnaghi, *Il progetto locale: verso la coscienza di luogo*, 2010.

The Experiential Pavilion Project: The Intersection of Two Processes

Extrinsic Method: From Landscape to Architecture

The archaeological site has been interpreted as an "open-air" exhibition place, in which ruins remain where they were found, "musealizing" the archaeological area itself. Architectural interventions are therefore conceived in relation to topographical aspects (relationship between ruins and landscape) and visual aspects (relationship between the aesthetics of the ruins and the morphology of the landscape), and not only to the control of the architectural elements themselves.

Through architecture, the ruin becomes not only a precious trace of the past, but a trace open to new possible configurations and new meanings. Architecture claims its right to coexist alongside archaeology and, while working with an analogical approach, acquires conceptual and material autonomy and recognisability.

The design experimentation embraces the coastal strip between Augusta and Thapsos and is developed on three scales of observation: territorial (masterplan), intermediate (archaeological park) and architectural (exhibition pavilion). Two alternative hypotheses for the arrangement of the facilities within the area of the excavations have been developed, based on two different concepts: a more radical one, which gathers the visitor support facilities around a strong sign, a linear metal structure containing seats, shelters, pavilions, raised terraces and belvederes; another solution, instead, emphasises the sedimentation of the places, making the single facilities emerge in strategic points, near the remains of the most relevant monuments along the main routes of the ancient city. The latter solution was considered the most suitable for the pursuit of the objectives of the e-WAS project because is able to enhance the immersive approach advocated by the archaeologists of the Ecole Francaise de Rome (EFR) and is also more compatible with the time and resources available. Therefore, it was developed up to the prototyping of some elements. The first solution, on the other hand, is reported in the discussion of this paper as useful working material to outline an alternative path emerged from the same strategic design, confirming its fertility.

Intrinsic Method: From Detail (Technology) to Architecture

The e-WAS project envisages the definition of innovative technologies for the construction of equipment to support visits to archaeological sites whose performance meets the requirements of sustainability in the broadest sense of the term. In order to be sustainable, an intervention in an archaeological area must not only be economically and environmentally sustainable, but must also meet the requirements of minimal impact on the context in which it is built, be light and completely reversible. This translates into building objects that must meet a number of requirements:

- Ease of transport and assembly of components, as archaeological sites are often difficult to access by vehicle.
- Unobtrusive surface foundations, so as not to alter the site.

- Easy reconfiguration in the event of a change in visitor routes for further study, excavation or restoration campaigns.
- Energy self-sufficiency, due to lack of connection to the electricity grid in the most isolated sites.

The research therefore envisaged the definition of a basic component, a prefabricated panel in wood and cardboard, light and easy to assemble, which constituted, with its possible variations, the alphabet with which to construct the words of the project.

The Case Study of Megara Hyblaea, a Heritage Hidden among Contrasts

The coastal area of the province of Syracuse is profoundly marked by human activity, which has irrevocably altered the original layout of the area, creating a complex palimpsest of physical and temporal stratifications of archaeological, urban and industrial elements (Figure 2). From a geomorphological point of view, the surrounding sequence of limestone hills, the Climiti mountains, are an identifying feature of the entire local context. A sequence of natural 'caves' carves these mountains down to the sea, housing a rich spontaneous vegetation alternating with ancient 'gardens' of citrus fruits set below a drier landscape of fallow land or pastureland.

The favourable natural conditions – conformation of the gulf, ease of landing and abundance of water – have allowed man to settle here since prehistoric times, building up a rich and stratified historical and archaeological heritage (Stentinello, Megara Hyblaea, Thapsos, etc.). The same resources that led to intense and 'refined' anthropisation in ancient times, have led to the current problematic concentration of settlements and uses. The heavy transformation of the territory began in 1949 with the establishment of the first mineral oil refinery south of Augusta. The progressive flourishing of highly polluting industries, power stations, purifiers, incinerators and refineries disrupted more than 20 kilometres of coastal territory. This abrupt transition from a backward agricultural society to forced industrialisation profoundly changed the physical image and identity of the area. In less than twenty years the beautiful south-eastern coast of Sicily was defaced and altered. It cannot be ruled out that there was also the destruction of what was still buried and unknown at that time. Today it is possible to recognise that the industrial policy has partially failed and has not succeeded in achieving the aspired self-propulsive development of the territory. The consequences of the petrochemical revolution on the health of inhabitants and workers are dramatic, and they are accompanied by irreparable environmental damage, air, water and soil pollution.

Having escaped the threat of being obliterated by the construction of the Petrochemical Pole thanks to the significant intervention of the Superintendency in the early 1960s, the archaeological site of Megara Hyblaea is now partially hidden among the industrial installations. The site preserves the vestiges of the ancient city born during the massive Greek colonisation that involved Magna Graecia and the eastern coast of Sicily from the 8th century BC. Megara Hyblaea was founded

in the second half of the 8th century BC.[28] For its first 245 years, in the so-called Archaic phase, the city was one of the richest and most flourishing centres in Sicily. During the 6th century BC. Megara allied itself with neighbouring Syracuse and was completely destroyed between 482 and 483 by Gelon the Syracusan. In 415 BC the city was reduced to a Syracusan stronghold until 340 BC and was subsequently repopulated by Timoleon, but never reached the size and splendour of the city of the Archaic period.

Figure 2. *Aerial View of the Archaeological Site of Megara Hyblaea*
Source: Photo by L. Valenti.

The Hellenistic phase began here: in the 3rd century Megara Hyblaea played an important role in the Second Punic War against the Roman Empire, which determined its ruinous fate: shortly afterwards, it was besieged and destroyed by the Roman consul Marcellus. A small settlement was established on the ruins of the city and remained there throughout the 2nd and 1st centuries BC, followed by a further period of abandonment. It was only in the 4th century AD that a small village arose, which used the remains of the ancient city, especially the fortifications, as a stone quarry.

The excavation area today occupies a limestone plateau overlooking the Gulf of Augusta. The area of the settlement, characterised by a very regular division of

28. A. Tullio (Ed.), *Itinerari archeologici in Sicilia* (Palermo: Dario Flaccovio Editore, 2002), 222-224; M. Gras, "La colonizzazione greca e la Sicilia, Megara Hyblaea e la nascita dell'urbanistica in Sicilia orientale," in *La colonizzazione Greca e la Sicilia, Megara Hyblaea e la Nascita dell'urbanistica in Sicilia Orientale* (Palermo: Ed. Regione Siciliana, 2006); G. Vallet, F. Villard and P. Auberson, *Megara Hyblaea 3: guida agli scavi* (Roma: École Français de Rome, 1983).

plots of land, is completely flat, without an acropolis, and surrounded by imposing walls: it is about 1 km wide (east/west) and about 800 m long (north/south). The full realisation of the urban space was reached in the second half of the 7th century BC, with a clear distinction between private spaces (plots of land with associated dwellings) and public spaces (roads, religious and civic buildings and areas). The agora, the civic place par excellence in the Greek city, was already in the urban layout of the 8th century BC, identified as a large trapezoidal open space of about 2370 m^2 between the dwellings. After Gelon's destruction in 483 BC, following the repopulation by Timoleon after being abandoned for about a century, the streets, the agora and the city walls were restored in a smaller size, but the regularity that characterised the archaic city was lacking.

Figure 3. *Georges Vallet and the First Excavations of Megara Hyblaea*
Source: Archive of N. Privitera.

As the city has not been extensively occupied after 483 BC, part of its archaic levels can be clearly traced below ground level and is therefore of great importance in the panorama of archaeological studies of Greek Sicily. Megara, abandoned and forgotten for centuries, began to arouse interest in 1864 with the visit of Julius Schubring.[29] It was only a few years later, at the end of the 19th century, that Francesco Saverio Cavallari and Paolo Orsi inaugurated an archaeological survey of the area. Studies of the site were then continued by François Villard and Georges Vallet, young members of the EFR, who in 1949 led the first French archaeological mission to Megara Hyblaea (Figure 3), with the aim of refining the chronology of Corinthian pottery. In more recent times, research on the site has been continued by several members of the EFR (including Mireille Cébeillac, Michel Gras, Henri Tréziny, Jean-Christophe Sourisseau, Claude Pouzadoux and Laurence Mercuri), who have been working in the area since

29. Gras, H. Tréziny, "Mégara Hyblaea: le domande e le risposte," in *Alle Origini della Magna Grecia, Mobilità, Migrazioni, Fondazioni* (Taranto: Ed. Istituto per la Storia e l'archeologia della Magna Grecia, 2012), 1133-1143.

2012, making it a reference point for colonial archaeology.

From the Landscape of Contrasts to the Landscape of *Invisible Cities*

The construction of the cognitive framework, carried out by means of a technical-spatial immersive analysis, covered a wider study area than the one involved in the eWAS project, including the entire coastal strip of the Gulf of Augusta. The first step was the dialogue with the stakeholders, implemented with a qualitative survey. After identifying the subjects to be involved among the economic, cultural and political actors of the territorial context, interviews were administered remotely, between March and May 2020, due to the lockdown imposed to contain the spread of Covid-19 pandemic. The interviews were conducted as conversations, following specific drafts according to the category of interlocutors and leaving the interviewees as free as possible to express themselves.

Interpretative Report of Interview Results

The dialogue phase made it possible to understand the stakeholders' representations of places and the perspectives they imagined. Ideas were collected around three general themes: the perception of the area over time; the potential and weaknesses of the area; the visions for the future suggesting project strategies.

Figure 4. *Restitution of the "Visual Scale" of the Landscape of the Gulf of Augusta Dominated by Industries. Graphic Elaboration of Photograms Taken Crossing the Industrial Area*
Source: Own elaboration.

The interviews revealed that the presence of industry inevitably dominates the visual perception of this area (Figure 4). The landscape of the Gulf of Augusta is often described in terms of "contrast" between the modern world, represented by

industries, and the historical-archaeological and naturalistic aspects present in the area and perceived only on the "tactile" scale of the landscape (Figure 5), i.e., *from inside*.[30]

The interviewees recognised, each in their own way, the beauty and the potential, albeit under-exploited, of the site of Megara Hyblaea and the surrounding area. They also recognised the ecological-environmental resources – including mountains, rivers, salt pans and the wealth of their fauna – that enrich the historical and archaeological traces of this complex territory.

However, the interviewees identified several critical issues that limit the potential of the site. It was found that the site is mainly visited by school children from neighbouring areas because it is not included in the tourist circuit. Many tourists visit the section dedicated to Megara at the Paolo Orsi museum in Syracuse without ever reaching the archaeological site, as there are many difficulties in accessing it (uneven road surfaces, lack of signposting and the absence of a public transport network). In addition, the site is very difficult to visit: information panels are few and old, there is a lack of well-defined paths and weeds, which are not regularly cut, invade the excavation areas, making it difficult to read the archaeological layout. Added to this is, there is the negative visual and environmental impact of the surrounding refineries.

Figure 5. *Restitution of the "Tactile Scale" of the Landscape of the Gulf of Augusta. From Left to Right: Saline di Priolo Nature Reserve, Excavations of Megara Hyblaea, Marina di Priolo*
Source: Archive of authors.

The interviewees then expressed their vision and ideas regarding the future of the Megara Hyblaea site, suggesting strategies and actions for its redevelopment: from the opening of the antiquarium and the realisation of service facilities (such

30. B. Lassus, "L'obligation de l'invention: du paysage aux ambiances successives," in A. Roger (ed.) *La Théorie du Paysage en France (1974-1994)* (Seyssel: Ed. Champ Vallon, 1995), 424-428.

as cafeteria, shade canopies, picnic areas) to the use of innovative technologies, such as augmented reality. Furthermore, in imagining a new future for Megara Hyblaea, many interviewees see collaboration with surrounding industries as crucial for the protection, redevelopment and promotion of the site, along with the involvement of educational institutions and cultural associations operating in the area. The promotion of the site of Megara cannot be separated from its reconnection with the neighbouring areas, the enhancement of the road and public transport network, and the activation of soft mobility routes. Some interviewees suggested the creation of itineraries connecting the numerous historical and cultural sites present along the entire coastal stretch between Syracuse and Augusta. In this way the archaeological site (Figure 6), rethought as a landscape park immersed in a network of naturalistic and cultural value, would become an attraction node while providing the community with leisure spaces and ecosystem services. Finally, everyone sees the reconversion and/or progressive dismantling of the refineries as the only solution to make the area more sustainable, in order to safeguard the health of people and the environment and protect historical and cultural resources.

Figure 6. *View from the Agora of Megara Hyblaea in a Westerly Direction*
Source: Photo by I. Pillitu.

From the "Landscape Atlases" to the "Landscapes of Cities"

Taking its cue from the methodologies developed in Europe for the study of landscapes according to the principles of ELC (in particular the French *Atlas* and the Catalan *Catálogos*),[31] the landscape of the Gulf of Augusta is described in

31. https://objectif-paysages.developpement-durable.gouv.fr; http:// www.catpaisatge.net [Accessed May 2021.]

terms of its identity by means of *Landscape Atlases.* Composed of cartographic tables or graphic suggestions, the *Atlases* represent the components of the landscape by aggregating them into thematic systems of "characters":

- *Territorial characters*: territorialising elements, i.e., all the anthropic features that testify to land use.
- *Ecological-environmental characters*: geomorphology and the ecosystem singularities.
- *Heritage features*: historical and cultural heritage elements defining the identity of the landscape.
- *Sensory, social and symbolic characters*: linked to the intangible dimension of the landscape, represented by means of an evocative collage of the social representations of the communities that live in and/or pass through these landscapes (Figure 7).

Figure 7. *Collage of Sensory, Social and Symbolic Features*
Source: Own elaboration.

The subsequent interpretative reading has returned the sedimentation of the different layers of identity, considering them as complex systems indicated by the term "city", so as to connect the terminological origin of the word to the concept to

which these levels of interpretation metaphorically refer. From the Greek *polis*, the city in fact indicates the "settlement of a community of individuals and families held together by multiple ties".[32]

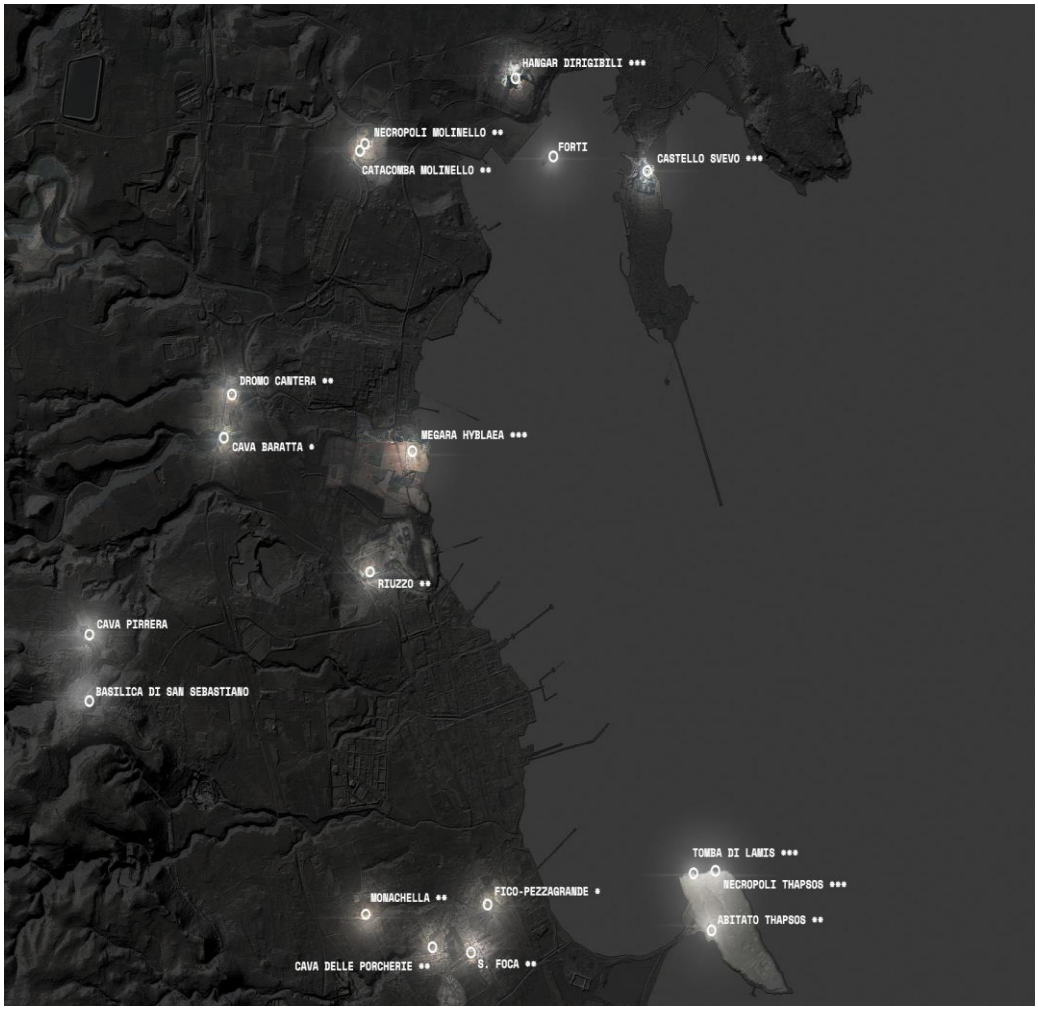

Figure 8. *The 'Invisible Cities' Map*
Source: Own elaboration.

At the base of these overlapping layers a "natural matrix" has been identified, understood as the mineral and biotic support consisting of the geomorphological substrate, the former salt marshes, quarries and watercourses and agricultural crops.

Three *cities* were then identified:

- The "city of steel": it is the emblem of a dreamed progress that has crumbled over time, a portion of space that is both frightening and fascinating, the symbol of an industrialisation that produces scenarios of pollution and artificial contrasts between rusty metal sheets and smoking

32. Retrieved from: www.treccani.it. [Accessed May 2021.]

chimneys.

- The "inhabited city": it is the city of people, of daily life, of the history of the individual intertwined in the unfolding of time with other existences, which reveals its intangible past in the patterns of its streets, in the lights of the street lamps, in the windows of the houses that contain life.
- The "invisible cities": they speak of those places that the eye cannot see, heritage of the past, remote areas almost forgotten and brought back to light, which come to life today through the voices of those who reinterpret them (Figure 8).

The different cities are brought together in the *Landscape Map*, a graphic synthesis of the relationships between them (Figure 9).

Figure 9. *The Landscape Map*
Source: Own elaboration.

The Masterplan. A Territorial Strategic Design

The design questions emerged from two SWOT analyses, carried out (one on a territorial scale and one on a local scale) critically reflecting on what emerged from field surveys, dialogues with stakeholders and photographic, cartographic and archive research. The SWOT analysis returned the image of a territory marked

by complex contradictions. The system of natural and environmental assets – the *natural matrix* – is discontinuous and interrupted by infrastructures and industrial settlements; the system of diffuse cultural assets – the *invisible cities* – consisting of numerous archaeological sites and isolated assets, is severely underused due to difficult access and poor social appropriation; the urban centres – the *inhabited city* – lack facilities and leisure areas; finally, the industrial areas – the *steel city* – constitute impassable enclaves, which are less and less capable of ensuring the well-being of the inhabitants of the area.

The need has emerged to reinterpret widespread cultural and landscape resources as a system and to consolidate their identity value in the collective memory. So, the Masterplan has the primary objective of strengthening the characters of traditional local landscape connected to nature, traditional rural landscape and historical assets through the implementation of four main strategies.

The first strategy aims at linking heritage and landscape. The creation of a network among the available territorial resources (Figure 10) is possible through the definition of itineraries connecting destinations able to make attractive the high number of assets that alone do not have sufficient attractiveness. The potential catchment area has been identified as mainly linked to proximity, cultural and sports-naturalistic tourism. The system effect is realised in the organisation of itineraries, in the integration of the offer and in the multifunctional use of facilities, with, in particular:

- The setting up of a network of paths for soft mobility allowing access to naturalistic, heritage and touristic areas.
- The construction of "gateway" facilities that allow, in addition to a comfortable stop and information points, the interchange of vehicle.
- The strengthening of public transport systems by converting the existing railway line into a surface metro, increasing its frequency and creating new tourist stops, and by creating a system of small moorings along the coastline.

The second strategy is to enhance the historical and cultural heritage. The Masterplan proposes redevelopment and enhancement measures, the inclusion of new facilities and functions, and active management involving the promotion of events, shows and exhibitions. The tourist accommodation system is increased promoting the recovery of widespread heritage of the old abandoned farms.

The third strategy aims to restore and enhance the environmental network (Figure 10). Agriculture is a primary activity in the production sector, but it also fulfils more complex functions such as landscape protection, sustainable resource management, preservation of biodiversity, and support for economic and social vitality. The redevelopment of the traditional agricultural landscape is proposed through agreements and conventions for the revitalisation of uncultivated or abandoned land. Traditional crops are to be combined with non-food crops that can absorb and degrade pollutants dispersed in the land near areas that have been heavily affected by the presence of industrial plants. The necessary reconnection of the ecological network takes advantage of residual and marginal areas, such as

road and railway buffer strips or wooded riverbeds. Along the coastal strip, the redevelopment of wetlands (former Regina and Punta Cugno salt pans), streams and canals is promoted.

Finally, the fourth strategy consists in planning the transformation of industrial plants. In a long-term vision, an evolutionary process that involves the partial and progressive abandonment of part of the industrial activities currently present in the area is imagined. This possibility opens up new and unpredictable opportunities for structuring spaces and functions. The resolution of conflicts of use along the coastal strip can allow the development of a range of leisure time facilities which can include, as evidence of the disused activities, the preservation of part of the imposing and suggestive set of warehouses and cisterns, metal structures, chimneys and smokestacks, converted to accommodate new functions for production or cultural, educational and recreational uses. It is possible to imagine a revitalisation of the production sector through the insertion of high-technology and low-impact products to replace the activities affected by the processes of dismantling.

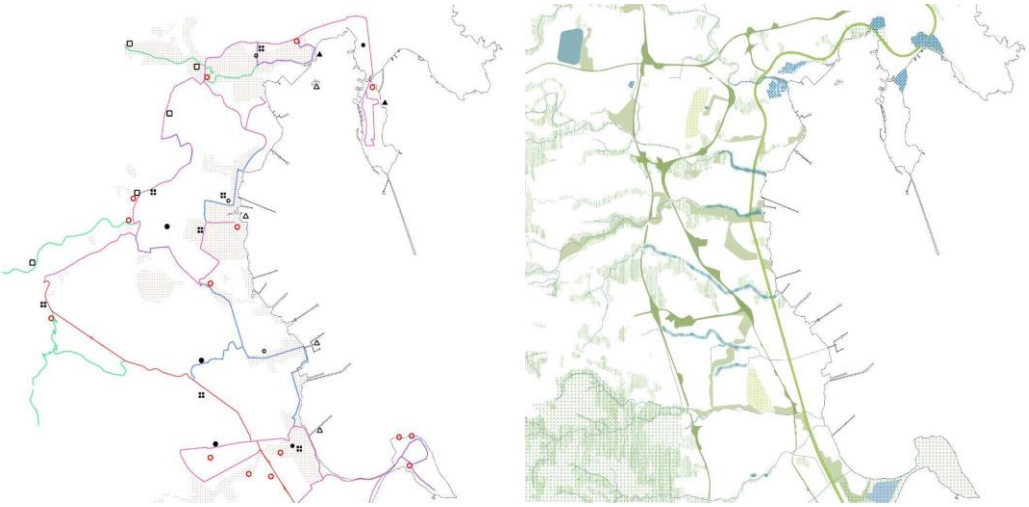

Figure 10. *The Network of Naturalistic-Cultural Routes and the Ecological-Environmental Network*
Source: Own elaboration.

The Intermediate Scale Project of the Archaeological Park and *Traces*

The lack of an overall vision of the potential of the archaeological park of Megara Hyblaea has led in the past to the realisation of punctual interventions, which were insufficient to guarantee the inclusion of the site in the broader tourist circuits (Figure 11). To achieve this aim, the revitalisation project aims to improve the accessibility of the park and its integration within the territorial dynamics, and finally to facilitate the comprehensibility of the excavations and their stratigraphy too. Therefore, the project is intended as a tool to tell the story of the area of the excavations, today difficult to interpret and read due to the presence of only the remains of the foundations and the lack of elevated structures. To this end, the proposed intervention starts from a new system of routes. By following the traces

of the archaic urban road system, the new routes become the instrument to bring out the urban structure of the city and to accommodate punctual interventions within the area of the excavations, mini-architectures and responsive roofs.[33] In addition, the new paths allow a more functional circulation and the reorganisation of the accesses to the park. Besides the introduction of new elements (paths and facilities), the project includes the re-functionalization of the complex of buildings inside the park (the Cantera lighthouse, the Antiquarium and the Baglio). A guesthouse for the archaeological mission, exhibition spaces for the archaeological remains coming from Megara Hyblaea and now housed in the Paolo Orsi Museum in Syracuse, and services (café and toilets) will be provided. Finally, the project aims to restore agricultural functions to the western part of the archaeological park, expanding an existing citrus grove to progressively regenerate the traditional agricultural landscape, creating a "park within a park".

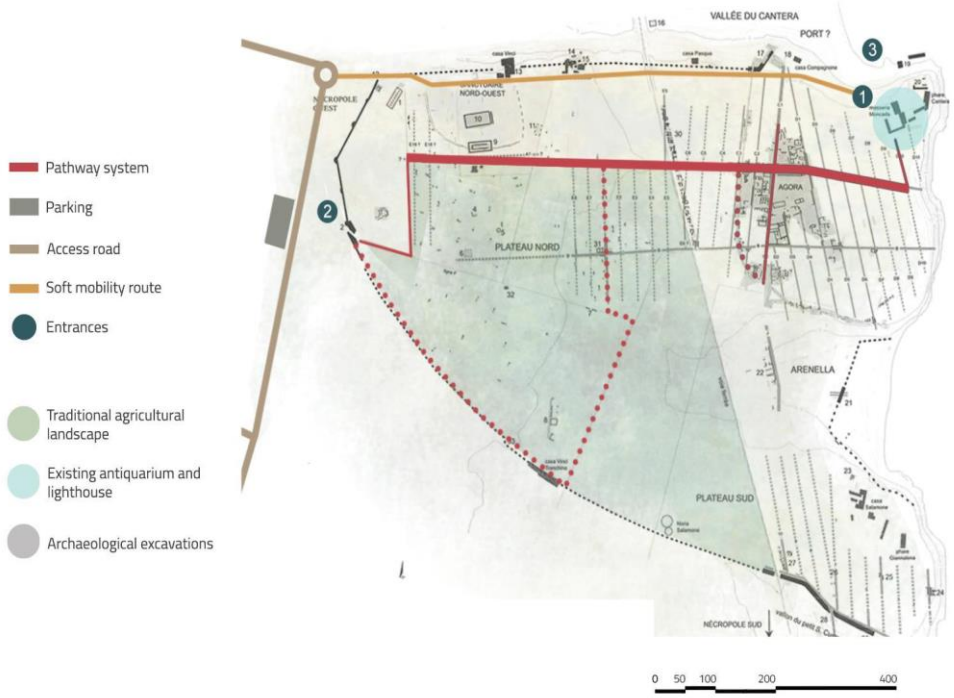

Figure 11. *General Planimetry of the Archaeological Park*
Source: Own elaboration.

A new system of entrances enhances the historical accesses to the city and solve the weaknesses emerged during the analysis phase in relation to the accessibility of the site. The opening of the new access in the western part of the park will allow the construction of a parking area suitable for tourist bus. The existing access road, which is undersized for vehicular traffic, is converted into a soft mobility path for cyclists and pedestrians. The opening of a new landing place

33. The eWAS project also includes the prototyping of responsive roofs to protect the most degradation-prone areas of finds. The responsiveness allows the control of the comfort levels of visitors under the shelter.

on the coast also makes it possible to connect the park by sea with other points of interest in the Gulf of Augusta, such as the Forts, the Thapsos site and the tourist port of Augusta.

Figure 12. *Planimetry of the Excavation Area*
Source: Own elaboration.

As suggested by the archaeologists M. Gras and H. Tréziny,[34] a primary route axis – a thick red line in the plan – is inserted, which crosses the park along the west-east axis, following the same route as the main road of the archaic polis (axis A). Walking this route, the visitor is able to cross the northern plateau in its entirety, passing over the railway trench by means of an elevated walkway, to reach the western entrance of the Hellenistic city walls and finally the Agora. This primary axis is connected to three other main routes in a north-south direction that contribute to structuring mobility within the park (Figure 12). The primary axis is created by means of a wooden footbridge slightly raised above the ground level, which visually marks the route. This axis is intersected perpendicularly, at the Agora, by a main north-south route that follows the archaic road axis C1. To allow access to the internal areas of the excavations, at different altitudes, a system of secondary routes has also been inserted, consisting of raised walkways, which also follow the course of the road network of ancient Megara. In this case, too, a

34. Gras and Tréziny, "Megara Hyblaea tra presente e futuro," in *Selinunte: Restauri dell'Antico* (Roma: De Luca Editori D'Arte, 2016).

functional necessity becomes a design pretext for revealing the traces of the past and making them legible to the visitor, marking the ancient road axes both materially and visually and thus the structure of the urban fabric. One of these footbridges gives the visitor an idea of the original size of the archaic agora, one of the largest in that historical period, which is difficult to perceive because of the successive stratifications that have confused the traces.

The Architectural Scale Project of *Traces*: The Experiential Pavilion EP

Moving down to the architectural scale, the project defines the devices that enrich the visitor experience through information content, visitor support equipment and sensory experiences. The latter are conceived as suggestions (visual, olfactory, sound or tactile) linked to natural elements – such as water, which recalls the ancient presence of thermal baths, springs and the relationship with the sea – and to the activities of the settlers' daily life – arts and crafts, vegetable gardens and recreational gardens –.

The inclusion of architectural elements within the archaeological site cannot, however, be separated from a profound reflection on the relationship between the new and the ruins.

In this regard, the words of Salvatore Settis come to our aid:

> According to Western tradition, ruins signal both an absence and a presence: they show, or rather are, an intersection between the visible and the invisible. What is invisible (or absent) is highlighted by the fragmentation of the ruins, by their "useless" and sometimes incomprehensible character, by their loss of functionality (or at least of their original functionality). But their obstinate visible presence testifies, well beyond the loss of their use value, to the duration, and indeed the eternity, of the ruins, their victory over the irreparable passage of time.[35]

Architectural objects have been conceived as mini-architectures that allow a deeper reading of the remains. They take the form of projections of the *traces of the past* capable of revealing the absence of what is no longer there. The new devices are thus generated from the projections of the planimetric footprints of the most representative buildings along the main routes. The mini-architectures are thus *traces* that can take on different configurations depending on their position and function: seating, shelters, information totems, privileged observation points and pavilions housing exhibition or service (Figure 13).

Among the mini-architectures identified in the plan of the excavation area, the *Experience Pavilion* (EP) was chosen as a pilot project because of its strategic position within the excavation area, barycentric and tangent to the Agora. The project has been developed up to the executive level, making full-scale mock-ups, preparatory to the construction of the prototype in situ. The planimetric imprint of EP is generated by the projections of two of the most representative monuments of

35. S. Settis, *Futuro del "Classico"* (Torino: Einaudi, 2004). Translation from Italian by authors.

archaic Megara: the *South Temple* with its central colonnade, datable to around the end of the 7th century BC, and the *Pritaneo*, a public building of the 6th century B.C. probably intended for the banquets of the city's magistrates. The projections generate a system of two opposing elements in relation to the route: the first, with a triangular plan, is the projection of the remains of the south temple, while the second, with a rectangular plan, is the projection of the remains of Pritaneo (Figure 14).

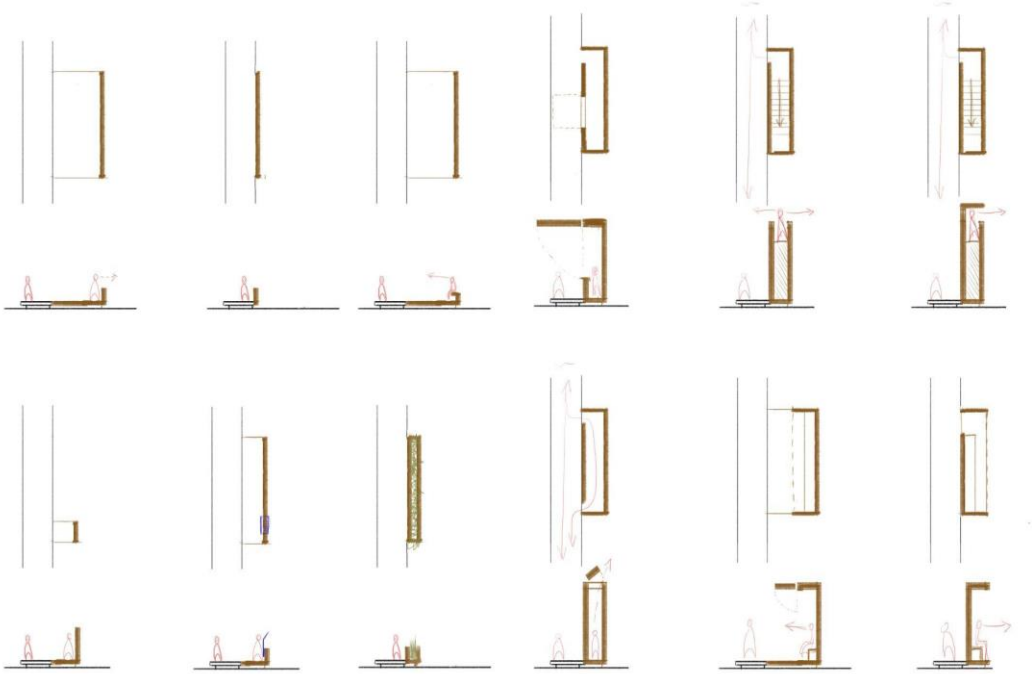

Figure 13. *Possible Track Configurations*
Source: Own elaboration.

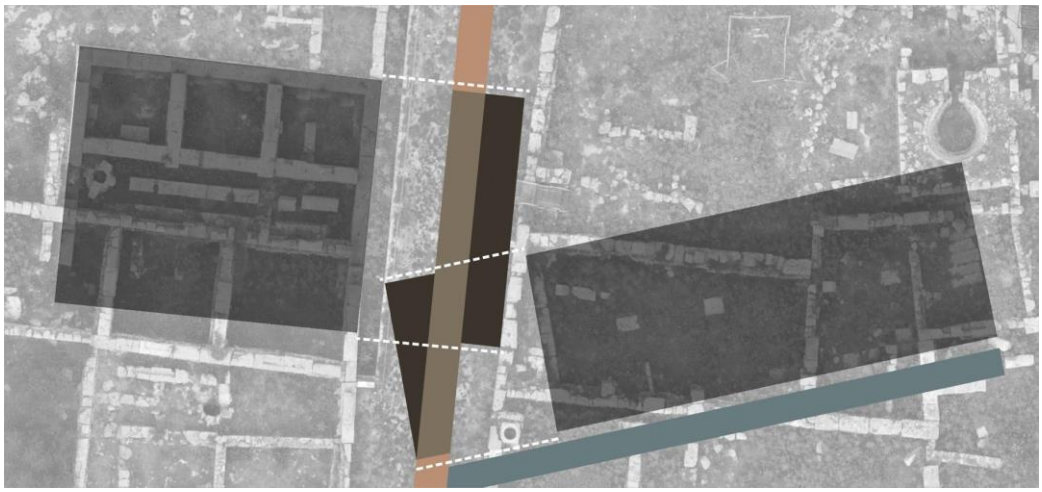

Figure 14. *Plan Genesis of the Experience Pavilion*
Source: Own elaboration.

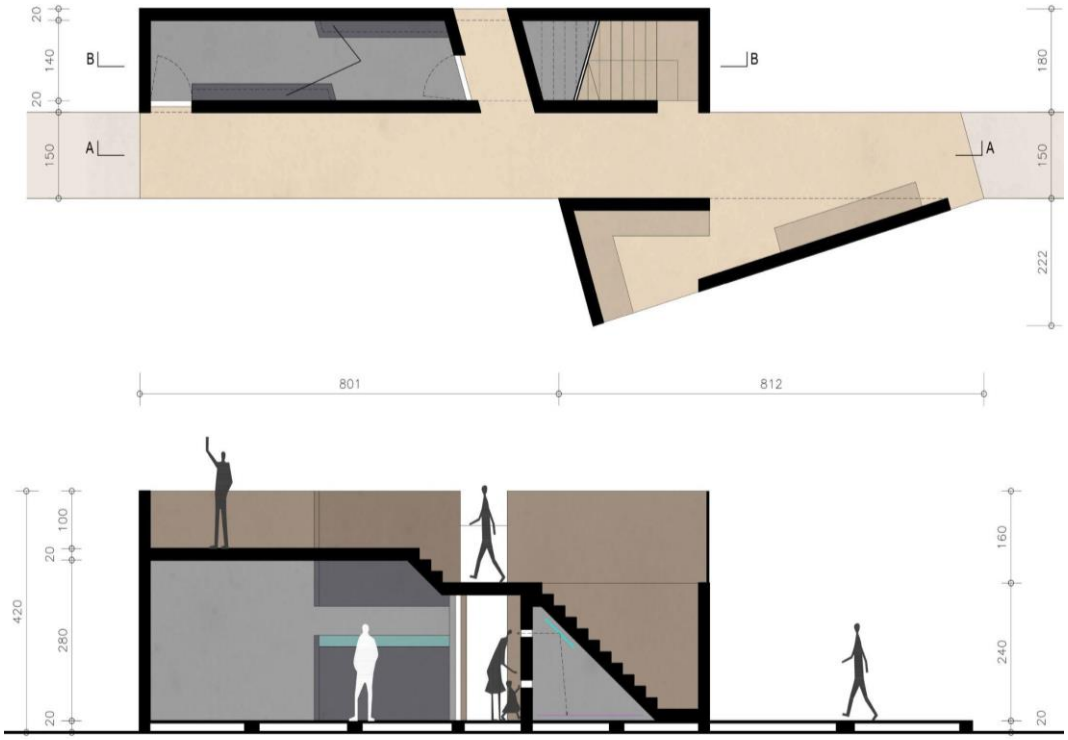

Figure 15. *Plan and Longitudinal Section of the EP*
Source: Own elaboration.

The triangular projection generates a hollowed-out volume to accommodate a seating system for a moment of rest along the route. The seats, open on two different fronts, evoke the loungers on which the Pritanes used to lie during banquets, while creating a direct visual relationship with the archaeological remains. A high volume emerges from the rectangular projection, cut off at the intersection with the trace of the temple to create an opening towards the excavations. A staircase leads to the panoramic roof with information panels on the parapets. In the space below the staircase there is an inaccessible room that can be observed through a slit, inside which there is an installation that evokes the Hellenistic baths through a play of mirrors. The inner space of the pavilion is accessible to only one visitor at a time and gives the visitor different temporal readings through multimedia content. From the inside of the mini-architecture it is also possible to observe "from above" the excavations through two periscopes placed in the thickness of the walls. An analogical periscope, through a system of reflections, projects the view of the Pritaneo area inside the room; a digital periscope allows the observation of the Agora through the installation of a video camera. The images projected inside the pavilion are flanked by additional information layers that help the reading of the stratifications of the site (Figures 15-16).

Figure 16. *Photo-Insertion of Interventions - View from the Agora in South-West Direction*
Source: Own elaboration.

Alternative Hypothesis for the Accommodation of Facilities

A second alternative hypothesis for the arrangement of facilities was also developed at an early stage of the project. This hypothesis shares the same layout of archaeological park but establishes a different type of relationship with excavations.

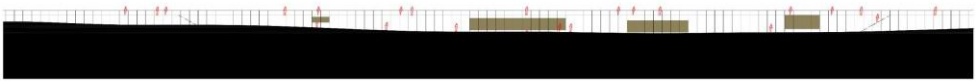

Figure 17. *Elevated Walkway Across the Depressed Area Excavations*
Source: Own elaboration.

Figure 18. *Photo-Insertion of Interventions - Aerial View of the Undeveloped Alternative Hypothesis*
Source: Own elaboration.

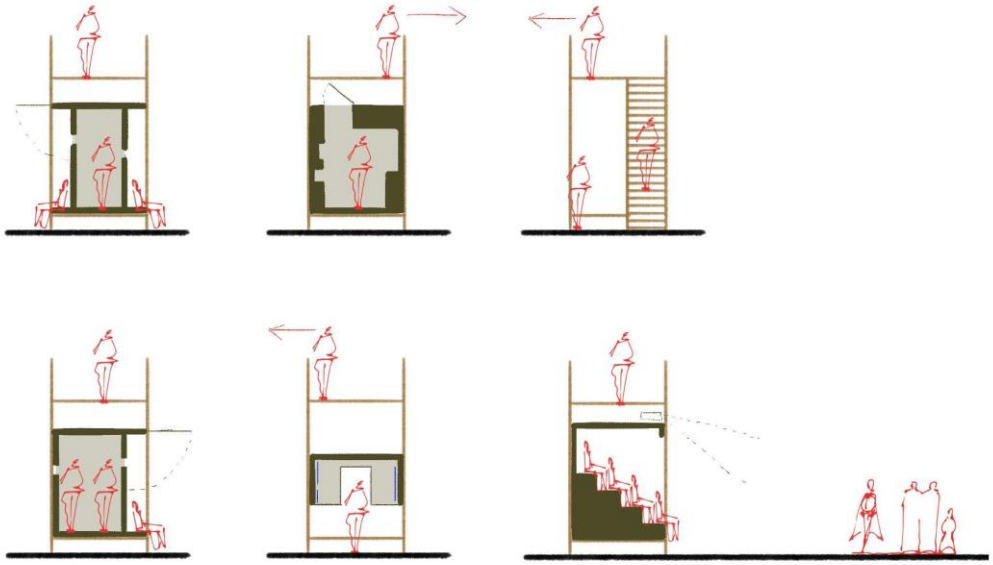

Figure 19. *Cross Sections of the Pavilions Grafted under the Footbridge*
Source: Own elaboration.

Taking advantage of the natural slope of the Megara plateau towards the sea and the depression of the area of the archaeological excavations, in this solution the main route, which always follows the A axis of the archaic city, leaves the ground near the area of the excavations (Figure 17). The elevated route crosses the railway line and the excavations and then continues towards the sea, reaching the perimeter of the town on the opposite side. The new landscape sign is a slender jetty stretching out towards the sea (Figure 18), offering a new perspective of the park. The solution aims to overcome one of the critical aspects of the Megara excavations, namely the difficulty in understanding the site due to the absence of elevated structures. The raised walkway makes it possible to decipher more clearly the urban layout of the two overlapping cities, the archaic and the Hellenistic one, looking down on the perfectly preserved traces of the foundations. At ground level, near the Agora, once again a series of mini-architectures are inserted into the structure of the walkway to offer new services to the visitor: experiential pavilions for multimedia installations, seating and steps open towards the Agora (Figure 19).

The Panel, Innovative Technologies

The requirements defined for the service equipment for the archaeological site led to the decision to build EP using a prefabricated panel made of lightweight and economical materials.

The prefabricated panel is the basic component, repeatable in a serial manner, consisting of a multilayer wooden frame. Two studs and five nogging constitute the frame in which rectangular tubes of corrugated cardboard are inserted with triple waves arranged vertically.

The noggings are fixed to the studs via slotted connections which allow them

to move vertically. This is necessary to facilitate the insertion of the cardboard tubes and to put the system under compression. In fact, the technology provides for the pre-compression of the panel in order to improve its structural performance. Two metal tie rods pass through the noggings and cardboard tubes and are tied to the last and first noggings. After positioning all the elements of the system, the tie rods are put in traction, the noggings slide and put the cardboard in compression, which is thus stopped in its final position. Thanks to the pre-compression, the cardboard tubes also stiffen the wooden frame and act as bracing elements. The panel can be pre-assembled off-site and then easily transported and mounted on site due to its low weight, without the need for lifting and moving machinery.

EP's envelope, made with the described panels, is placed on a platform that consists of a grid of wooden beams, resting on a foundation of rubble, in interposition with the archaeological soil, without the presence of deep foundations.

The cardboard tubes of the panel can also be filled with different materials in relation to the thermo-acoustic comfort that must be guaranteed in the interiors. The described panel is the modular element to be composed in order to define EP, but it has variants that allow to meet specific needs, while respecting the dimensional modularity. This is the case with the door-panels or the panels with periscopes, which are free from the presence of the cardboard tubes to accommodate vertical channels with mirrors system that guarantees a view of the surrounding context.

The panel is also completed by a ventilated façade system made of burned wood siding that refers to the traditional Japanese Shou Sugi Ban technology.

The ventilated façade system of the south short side of EP is instead made of wooden boards covered with composite textile material incorporated with photovoltaic cells. The system is patented.[36] It ensures the energy self-sufficiency of EP, which is equipped not only with a lighting system but also with multimedia devices for narrating the archaeological site. Each facade photovoltaic module is made of fifteen high-efficiency monocrystalline silicon solar cells (made by SunPower Maxeon) 125 mm x 125 mm. According to the hypothesized use scenario, three pairs of photovoltaic panels are needed to ensure self-sufficiency, powering two lithium batteries.

The methodology followed for the definition of the panel included two prototyping phases.

In the first, scale models were made to analyse different methods of pre-compression in order to put the cardboard elements in position and stiffen the panel. Preliminary solutions with wooden tie rods or a single metal tie rod were discarded because of the difficulty of assembly and the complexity of the connections. The most efficient solution was the one with two metal ties for each panel, positioned at the centre of the corrugated cardboard tubes.

The second phase involved the construction of a full-size panel (Figure 20), called "Pannello ZERO" (PZ). With the realisation of this it was possible to check the feasibility of the hypothesised realisation phases and to verify the handling of

36. V. Sapienza, G. Rodonò, A. Monteleone and F. Giusa (2019), *Adaptive Kinetic Device for Architecture*, patent request no. 102019000025819.

the panel during the laying and fixing phases on the base grid. During the realisation of PZ, it was also possible to verify that the cardboard tubes, during the pre-compression phase, could go out of the wooden frame plane due to rotations linked to the imperfect planarity between the noggings and the tubes. This problem has led to a return to the design workflow for the definition of wooden positioning rods for the tubes.

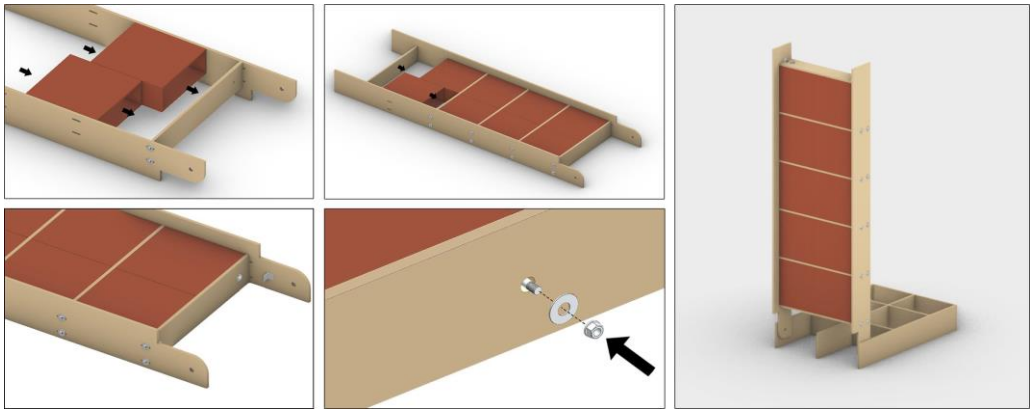

Figure 20. *Simulation of the Assembly Phases of the "Pannello ZERO"*
Source: Own elaboration.

Finally, it is foreseen to manufacture an adequate number of PZ to be subjected to laboratory tests to verify their mechanical performance. Once the performance characteristics of the panel have been defined, the production of the panels to be transported to the site for EP assembly will be started.

Conclusions

Based on the idea of landscape as a 'common good', landscape itself – the representation of the territory by the populations – has been understood as a tool for the governance of the territory and, therefore, of public action.[37] Thanks to images and words, maps, plans and public debates, *landscape as a project*[38] allows spatialised values (memory, work, heritage, beauty, biodiversity, safety) and projects (urban, agricultural, tourism, infrastructure) to be shared. Mental and iconic representations of landscapes, as spaces perceived by human senses, become objects of mediation within a democracy that is both representative and participatory. In this sense, public decisions cannot but be more legitimate and therefore more authoritative.

In this perspective, the landscape project becomes a project of relationships, a construct of specific elements that intersect with each other to best represent the territory and produce landscapes the local community desire. Realizing what

37. Donadieu, *Scienze del paesaggio: Tra teorie e pratiche* (Pisa: Ed. ETS, 2015).

38. F. Zagari, "Il 'quid' del progetto del paesaggio," in R. Priore (ed.) *Convenzione Europea del Paesaggio: Il testo Tradotto e Commentato* (Reggio Calabria: Centro Stampa d'Ateneo Edizioni, 2006), 30.

Donadieu calls *Inventive Conservation*,[39] the landscape project articulates the past and future of an area, associating three forms of knowledge – scientific, technical and artistic – to invent a new system of forms attributed to existing functions and uses. New forms are often based on a synthetic sensory perception capable of integrating existing topographies with their past (history and memory) and their ancient and future uses. Landscape design is not expressed through landscape aesthetics that forges perceivable realities satisfying the senses, but by presenting reality as such, including rejected, marginal and abandoned places. It can thus represent a tool to regain the lucidity necessary for human survival on the planet[40] through the perception and understanding of places as they are, according to the socio-political issues that characterise them and not according to an outdated aesthetic; from this assumption it can reweave human links with perceptive values (visual and experiential), cultural heritages (memory, landscape identity) and anthropo-socio-ecocentric values (biodiversity, solidarity, freedom and peace, social justice and equity, greater well-being).

The consequence of this approach is that the revitalisation of the Megara site is part of a more general process of reconfiguration of relations at different scales. The same interpretive key is experimented at the territorial and architectural scales: just as the landscape project brings out the *invisible cities*, obliterated by industrial transformations, in the same way the design of the archaeological park and the mini-architectures brings out the traces of the *ancient city* of Megara Hyblaea. On the other hand, by integrating all places into the design vision and not only those of quality, the long-term strategic vision also envisage the dismantling of industrial plants and their reconversion, including marginal and borderline places in the construction of the new spaces of contemporary life.

Within the nationally funded project "e-WAS" will be given a concrete start to the general project by launching a first phase through the creation of a prototype of the EP on the site of Megara. This prototype will serve as a demonstrator of the general strategy and to concretely put in place the cooperation between management and preservation bodies (Archaeological Park and Superintendence of Cultural and Environmental Heritage), designers (University of Catania) and territory (inhabitants and associations).

Acknowledgments

The authors acknowledge the other members of the research team: "University of Catania" - Vincenzo Sapienza (PI), Antonio Gagliano, Massimo Cuomo, Marianna Figuera, Giuseppe Pappalardo, Corrado Santoro, Angelo Monteleone, Cristiano D'Amico, Noemi D'Amico, Grazia Nicolosi; "Kore University of Enna" - Mariangela Liuzzo, Egidio Di Maggio, Dario Caraccio; "Company Ingegneria Costruzioni Colombrita" - Filippo Colombrita, Valentina La Rosa; "Company Meridionale Impianti", Antonio Astuti;

39. Donadieu, "Pour une conservation inventive des paysages," in A. Berque (ed.) *Cinq Propositions pour une Théorie du Paysage* (Seyssel: Champ Vallon, 1994), 51-80.

40. Donadieu, *Scienze del paesaggio: Tra teorie e pratiche*, 2015, 255-256.

"Company NTET" - Giuseppe Cirrone, Alessio Crinò, Salvatore Mannino. The authors also acknowledge the Parco Archeologico di Leontinoi, on which depends the archaeological site of Megara Hyblaea, and particularly the Director Lorenzo Guzzardi. Finally, the authors would also like to acknowledge the PIA.CE.RI Research Plan 2020-2022 of the DICAR UniCT for support at some stages of the research.

Bibliography

Augé, M. *Rovine e macerie: Il senso del tempo*. [Time in Ruins.] Torino: Bollati Boringhieri, 2004.

Bagnato, V. P. *Nuovi interventi sul patrimonio archeologico: Un contributo alla definizione di un'etica del paesaggio*. [New Interventions on the Archaeological Heritage: A Contribution for a Landscape Ethic Definition.] Barcelona, 2013.

Basso Peressut, L. "Archeologia/Archeologie: identità e rappresentazioni museografiche." [Archaeology: Identity and Museographic Representations.] In *The Archaeological Musealization*, edited by S. Canepa, V. Minucciani and M. Vaudetti. Torino: Umberto Allemandi & C., 2012.

Besse, J. M. *La nécessité du paysage*. [The Need for Landscape.] Marseille: Éditions Parenthèse, 2018.

Calvagna, S. "Verso la definizione di un Paesaggio Vulcanico Urbano sull'Etna. Dalla città di Catania all'area metropolitana." [Towards the Definition of a Urban Volcanic Landscape on Etna. From the City of Catania to the Metropolitan Area.] In *PAESAGGIO 150: Sguardi sul Paesaggio Italiano tra Conservazione, Trasformazione e Progetto in 150 Anni Di Storia*, edited by M. Arena and A. Villari. Roma: Aracne, 2012, 231-236.

Corajoud, M. "Le projet de paysage: lettre *aux étudiants.*" [The Landscape Project: Letter to the Students.] In *Le Jardinier, l'Artiste et l'Ingénieur,* edited by J. L. Brisson. Lagrasse: Editions Verdier, 2000, 37-50.

Donadieu, P. "Pour une conservation inventive des paysages." [For an Inventive Conservation of Landscapes.] In *Cinq Propositions pour Une Théorie du Paysage*, edited by A. Berque. Seyssel: Champ Vallon, 1994.

Donadieu, P. *Paysages en commun: Pour une éthique des mondes vécus*. [Landscapes in Common: For an Ethics of Lived Worlds.] Valenciennes: Presse Universitaire de Valenciennes, 2014.

Donadieu, P. *Scienze del paesaggio: Tra teorie e pratiche*. [Landscape Science: Between Theory and Practice.] Pisa: Ed. ETS, 2015.

Donadieu, P. "Landscape Architecture to Morrow: A Democracy of Landscape Commons?" In *Tasting the Landscape: 53rd IFLA World Congress*, 36-37. Torino, April 20-22, 2016. Firenze: Edifir, 2016.

Fairclough, G. "Essentially Cultural: Perspectives on Landscape from Europe." *Landscape Journal* 35, no. 2 (2016):149-166.

Franchina, A. "Servizi ecosistemici in chiave progettuale e proattiva." [Ecosystem Services in a Project-Based and Proactive Way.] In *I Servizi Ecosistemici nella Pianificazione Bioregionale*, edited by D. Poli. Firenze: Firenze University Press, 2020, 59-64.

Gerber, J. D. and G. Hess, "From Landscape Resources to Landscape Commons: Focusing on the Non-Utility Values of Landscape." *International Journal of the Commons* 11, no. 2 (2017): 708-732.

Gras, M. "La colonizzazione greca e la Sicilia, Megara Hyblaea e la nascita dell'urbanistica in Sicilia orientale." [The Greek Colonization and Sicily, Megara Hyblaea and the Birth of Urbanism in Eastern Sicily.] In *La Colonizzazione Greca e la Sicilia, Megara Hyblaea e la Nascita dell'urbanistica in Sicilia Orientale.* Palermo: Ed. Regione Siciliana, 2006.

Gras, M. and H. Tréziny, "Mégara Hyblaea: le domande e le risposte", [Mégara Hyblaea: questions and answers] in Alle origini della Magna Grecia, Mobilità, Migrazioni, Fondazioni. Taranto: Ed. Istituto per la storia e l'archeologia della Magna Grecia, 2012.

Gras M. and H. Tréziny. "Megara Hyblaea tra Presente e Futuro." [Megara Hyblaea Between Present and Future.] In *Selinunte: Restauri dell'Antico*. Roma: De Luca Editori D'Arte, 2016.

Lassus, B. "L'obligation de l'invention: du paysage aux ambiances successives." [The Obligation of Invention: From Landscape to Successive Atmospheres.] In *La Théorie du Paysage en France (1974-1994),* edited by A. Roger. Seyssel: Ed. Champ Vallon, 1995, 424-428.

Magnaghi, A. *Il progetto locale: verso la coscienza di luogo.* [The Local Project: Towards Place Consciousness.] Torino: Bollati Boringhieri, 2010.

Magnaghi, A. "Mettere in comune il patrimonio territoriale: dalla partecipazione all'autogoverno." [Pooling Territorial Assets: From Participation to Self-Government.] *Glocale. Rivista molisana di storia e scienze sociali*, no. 9/10 (2015).

Militello, P. M. "Archaeologists and Archaeological Cover." In *Archaeology's Places And Contemporary Uses,* edited by M. Vanore. Venezia: IUAV, 2010, 49-65.

Parrello, G. et al. "Architecture for Archeology: Identifying New Modular and Flexible Types of Shelter Adaptable to the Diverse Needs of Archaeological Sites," In *XII International Forum Le Vie dei Mercanti Aversa*. Capri 12,13,14 June 2014.

Poli, D. "Tracciare la rotta per iscrivere i servizi ecosistemici nella pianificazione bioregionale." [Charting the Course for Enrolling Ecosystem Services in Bioregional Planning.] In *I Servizi Ecosistemici nella Pianificazione Bioregionale,* edited by D. Poli. Firenze: Firenze University Press, 2020, 129-135.

Purini, F. "Il frammento come realtà operante." [The Fragment as an Operating Reality.] *Firenze Architettura*, no. 1 (2006): 2-9.

Settis, S. *Futuro del "classico".* [Future of the "Classic".] Torino: Einaudi, 2004.

Simmel, G. "Die Ruine." [The Ruin.] In *Philosophische Kultur: Gesammelte Essays.* Leipzig: Klinkhardt, 1911. Italian Traslation by G. Carchia. In *Rivista di Estetica*, no. 8 (1981): 122.

Tullio, A. (Ed.) *Itinerari archeologici in Sicilia*. [Archaeological Itineraries in Sicily.] Palermo: Dario Flaccovio Editore, 2002.

Vallet, G., F. Villard and P. Auberson. Megara Hyblaea 3: guida agli scavi. [Megara Hyblaea 3: Guide to the Excavations.] Roma: École Français de Rome, 1983.

Vanore, M. (Ed.) *Archaeology's Places and Contemporary Uses.* Venezia: IUAV, 2010.

Yaka, Ç. F. and B. İpekoğlu. "Impact of Transparency in the Design of Protective Structures for Conservation of Archaeological Remains." *Journal of Cultural Heritage* 14S (2013): e21-e24.

Zagari, F. "Il 'quid' del progetto del paesaggio." [The 'Quid' of Landscape Design.] In *Convenzione Europea del Paesaggio: Il Testo Tradotto e Commentato*. R. Priore. Reggio Calabria: Centro Stampa d'Ateneo Edizioni, 2006, 29-38.

Zanelli, A. "Architectural Fabric Structures in Refurbishment of Archaeological and Cultural Heritage Areas." In *Fabric Structures in Architecture,* edited by J. I. Llorens. Cambridge: Woodhead Publishing Limited, 2015, 481-527.

Author Contributions

Conceptualization, S.C.; technological investigation, G.R.; architectural design investigation, F.A.R. and A.T.; drawings and graphic elaboration, F.A.R. and A.T.; methodology, S.C.; archaeological supervision, P.M.; writing-original draft, S. C., G.R., F.A.R. and A.T.; writing-review & editing, S. C., G. R., F.A.R. and A.T. All authors have read and agreed to the published version of the manuscript.