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Thinking Deep. Acting on Top. Underground Built Heritage and Its Fringe as a Community Catalyst for Local Sustainable Development: Exploratory Cases from Poland and Greece

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Abstract: Underground Built Heritage (UBH) is a distinct class of cultural heritage providing a focal point for community pride and engagement to become a springboard for local sustainable development (LSD). This research aims to articulate how local UBH and its fringe serve as a facilitator of communal identity to mobilize community care towards social and economic development with less involvement from the state and the market actors. For this purpose, local (and less-conspicuous) cases of UBH are employed in Warsaw, Poland, and Volos, Greece, indicating the power of UBH to connect and engage local communities with places, triggering a momentum for a truly bottom-up action that pays less attention to market considerations and state support. The studied UBH sites have been discussed according to an established common framework, dealing with five main issues: (a) general context and status, (b) history, (c) users and management, (d) ecosystem services, and (e) introduction of the paradigm of living labs. The analysis was based on a thorough literature review and complemented by field observations and interviews. The results provide evidence for UBH as a potential facilitator of social and economic development. The case studies in Poland and Greece showed that local actors were involved in activities and social networks of tacit knowledge, generating community building to reinforce bottom-up activities in contact with UBH.

Keywords: cultural heritage; case study method; living labs; bottom-up processes; place and community based approaches



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1. Introduction

Underground Built Heritage (UBH) is a unique cultural resource that might contribute to individual and collective identity and social cohesion and inclusion [1]. It is a recently introduced class of elements of cultural heritage [2,3], which refers to three types of building activities, specifically architectural, urban, and landscape heritage below the surface of the earth, distinguished in the eyes of the contemporaries by “cultural values” [2,4]. UBH constitutes a significant local material or immaterial cultural heritage, and as such, it can be a springboard for sustainable development [3,5–7]. Being a meaningful component of local heritage, UBH generates a sense of belonging and is a depository of a local identity by providing a recognition and pride vector for individuals with profound implications for their spiritual, emotional, and intellectual well-being [1,8–10]. However, since UBH resources are often largely unexplored or even not documented, they might remain parts of a hidden and forgotten cultural landscape [4]. In addition, cultural heritage, in general, constitutes a pillar of sustainable development because it is a part of a Historic Urban Landscape reflecting and symbolizing the mutual adaptation over time between humans

and their environments and how present people relate to both past and future generations. Nonetheless, it should be mentioned that underground landscapes have historical values but do not always have to occur in urban areas [11].

UBH has not developed a specific management field of studies yet, and it can be only considered part of the broader heritage management's international discussion developed only in recent times [4]. Modern planning theory seems to identify three different approaches to the cultural heritage [12]: as a spatial sector (focusing on the preservation of heritage in isolation from spatial dynamics), as a factor in spatial dynamics (where the heritage is seen as a means for urban regeneration), and as a vector for sustainable development (in which heritage plays a central role in determining the direction of urban development). Key to contemporary heritage issues is the ability to realistically assess the potentials of a site given its surroundings (e.g., other sites but also the societal context and challenges) and apply approaches accordingly.

Being a depository of local identity and history, UBH can perform as a catalyst/instigator for civic engagement, community building, and local sustainable development [2]. Although today, there are many examples of local development success stories achieved due to outstanding UBH sites, e.g., those included in the UNESCO World Heritage List, there are still many others abandoned and less "monumental" that could catalyze local communities development. Therefore, the rationale for undertaking this research is the need to investigate which UBH and its fringe elements can support these transitions and make it capable of serving as an above-mentioned catalyst or instigator. To achieve this, we choose to explore the development dynamics and processes in local (and less conspicuous or even neglected) examples of UBH complexes in Poland (Warsaw) and Greece (Volos).

2. Materials and Methods

2.1. Research Design

The main goal of the research is to articulate how the specific features of UBH and its fringe serve as a pivotal point for community engagement and local development, highlighting in this way the substantial role that UBH can play in local social and economic regeneration, where state and market players have a secondary (if any) role. To reach the goal, qualitative, exploratory case-study research was conducted in two different urban (and national) settings of local significance. The point of departure was an attempt to define UBH within a literature review. The next was continuing literature research to formulate factors of local sustainable development (see the flowchart explaining the process of research design in Figure 1). In this study, the following research questions were posed: "How do people use the UBH and its fringe?"; "What are the features of the UBH sites that evoke social activity?"; "What cultural ecosystem services do these sites provide?"; and "What is the phenomenon of living labs in them?". The research questions were "translated" into the keywords used for the literature review.

The range of data collection for the case study analysis is a derivative of both the literature review and the research questions. The case studies aim to investigate the actions undertaken by relevant stakeholders and the strategies adopted in the living practices of communities to advance UBH for social and/or sustainable development. The scope of research, besides historical analyses (desk research and on-site inspection), also includes a review of exemplified discourses of living labs based on co-creation, co-development, and co-management activities (see Section 2.3).

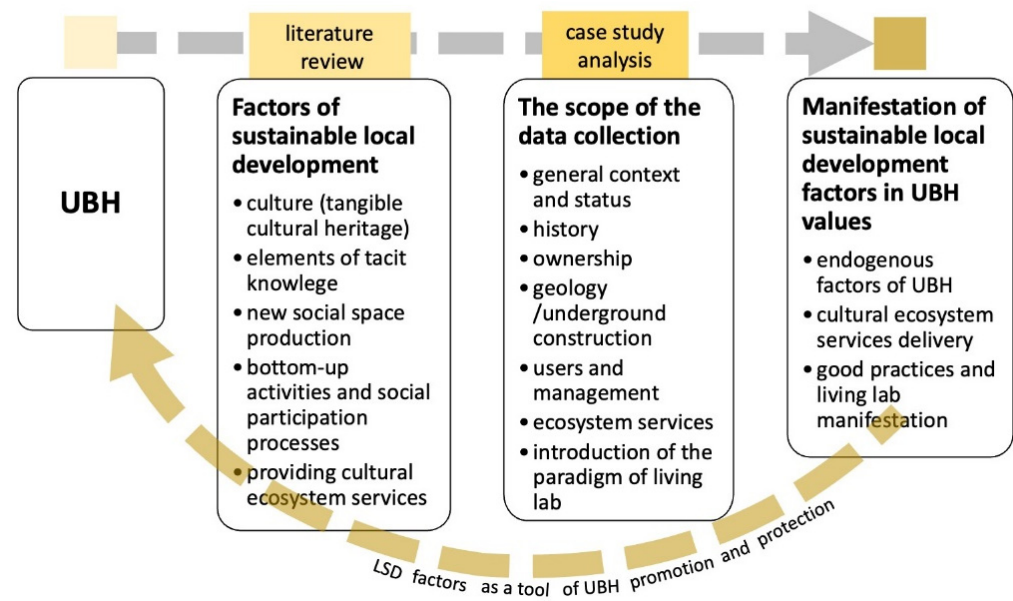


Figure 1. Research design.

2.2. Case Selection

To explore the research questions posed, the two local (and less conspicuous) case studies of UBH were selected—Warsaw (Poland) and Volos (Greece). Two distant European locations, different cultural contexts, and above all, miscellaneous specifics of the selected UBH sites were chosen on purpose due to the complete study of mentioned issues.

Warsaw is the capital of Poland, located by the Vistula river in the central part of the country. It is the biggest and the most populated city, covering 517.24 km², with a population of 1,794,166 inhabitants [13]. The city is an important scientific, cultural, political, and economic center. Its history dates back to the ninth century; however, the basic urban layout of contemporary Warsaw was formed during the reconstruction from significant damage after World War II, during which more than 80% of its urban fabric was destroyed, including 90% of its monuments [14].

Volos is a coastal port city in the Thessaly region located at the center of Greece, about 330 km north of Athens and 220 km south of Thessaloniki. It is the country's sixth most populous city, with a growing population of 144,449 inhabitants [15]. Volos is an important industrial city, and its port is a national hub connecting Europe and Asia. The urban economy is based on manufacturing, trade, services, as well as on tourism.

In total, we studied four UBH sites—three in Warsaw (Poland) and one in Volos (Greece). In Warsaw, we studied three different forts located within the “Warsaw Fortress”: the Sokolnicki Fort, the Służew Fort, and the Bema Fort; and in Volos, we studied the church Panagia Tripa of Goritsa. In all sites, the UBH was studied together with its fringe, understood as functionally linked surrounding space.

2.3. Methods

Based on the literature review, we explored the following aspects: (1) culture (i.e., tangible historic substance, with potential for touristic valorization); (2) elements of tacit knowledge (the social construction of spatial forms and relations that emerged from social processes); (3) new social space production (replacement of former space with new creation and creation of new places); (4) bottom-up activities and community participation processes (participation and local dialog connecting relevant stakeholders, along with the role of public institutions); and (5) cultural ecosystem services (place identity, place attachment, contact with heritage, abiotic components of environment enabling spiritual, and symbolic interactions).

The case study method has been chosen because it enables a researcher to thoroughly explore contemporary phenomenon within real-life context [16], which, in our case, concerns UBH and its function as a pivotal point for community engagement and local development. Following Yin [17], our case study inquiry relies on multiple sources of evidence, where, in a triangulation fashion, various types of relevant evidence are collected using primary sources (direct observation and informal interviews), secondary sources (such as official documents including newspaper articles), and non-source-based knowledge (i.e., tacit knowledge and logical reasoning).

Direct observations and interviews took place in summer 2021 through multiple site visits made by the researchers. Interviews were conducted with people from the local communities using an open-ended interview structure and following a relaxed, conversational, and informal approach, as this allows the respondents to provide a fresh and detailed commentary on the issues under study (see below). While selecting the interlocutors, we were guided by a snowball method to find informants who are the main source of evidence in each case study. Interviews were not recorded, but extensive notes were taken by the researchers and typed up soon after the interviews.

The studied UBH sites have been discussed according to an established common framework consisting of 5 main issues: (a) general context and status, (b) history, (c) users and management, (d) ecosystem services, and (e) introduction of the paradigm of living labs. The collection of data for all above-mentioned topics of analysis was based on secondary sources, i.e., existing documents, including strategic and spatial planning documents and acts, complemented by field observations and interviews.

In the “general context and status” part, all basic information of the UBH sites were collected. Here, we described an urban context, a location, a type of UBH, and its fringe, the construction of new meanings due to changes of usage or structure abandonment. Relying on that information, we assessed the touristic potential. Moreover, the legal framework was studied to determine the regulations implemented in spatial policy instruments, e.g., land-use plans and master plans (both at city and site level) and whether they affect the functioning and value of UBH and its fringe.

In the next part, concerning the history of UBH sites, apart from a short characteristic of changes in function, technical state, and use of the site (e.g., restoration, revitalization, new developments, or no changes), we defined the meaning of the UBH to its local identity (due to changes of usage or structure abandonment). Moreover, we analyzed if a functional destination is in line with the historic character.

The third part of the framework relates to social aspects evolved by the UBH, so in that sense, we studied stakeholders and in what way they are using the UBH and its fringe and how they “interact” with the heritage. By interactions, we mean interventions that can be observed, e.g., cooperative places, pop-up galleries, etc. This part of the study was mainly achieved by field observations and semi-structured interviews with users and stakeholders.

Next, we studied ecosystem services delivered by the UBH complexes, focusing on category of cultural services. The model of ecosystem services helps to understand people’s attitude toward the site value and heritage, such as place identity, place attachment, enabling spiritual and symbolic interactions, personal contact with heritage, recreation, tourism, and inspiration for culture, art, and design (based on [18–20]).

The last, but not least, issue deals with selecting good practices in a general sense. We focused on introducing living labs and good practices concerning cultural heritage; hence, we examined bottom-up initiatives linked with the use and function of UBH complexes to increase its valorization prospects and spotted samples of co-creation, co-development, and co-management. Furthermore, in this paper, UBH case studies are investigated as catalysts for a broader strategy of community engagement and regeneration policies and concentrate on endogenous LSD factors discussed in the research literature of underground built heritage sites.

3. Literature Review: Underground Built Heritage as a Factor for Local Development

3.1. *The Advances in the Definition of Underground Built Heritage*

Since UBH is a new category of cultural heritage, it is important to discuss it in a broader context of other related concepts, i.e., heritage and built heritage. Acknowledging the unique elements of heritage in a set of criteria, UNESCO [21] do not distinguish underground heritage sites from those standing above ground. Moreover, underground heritage is not well established by any world institution and, as such, is not well articulated, studied, and protected. Consequently, there is little literature on the topic, and most studies have been conducted on the underground space, based on geological or architectural literature. A first try to conceptualize the UBH is a COST Action, the CA 18110 “Underground Built Heritage as catalyser for Community Valorisation” [1]. Pace [2] explained the evolution of UBH understanding, as initially it was perceived as a “study for classifying underground spaces and using them as a solution for a sustainable over ground urban development”, and eventually, it is more seen as a “place for building local identity and sense of belonging, progressing from a functional to a cultural value, from a site conservation to a community valorization approach, by giving centrality to the people and their needs” [2] (p. 1250). Thus, the evolving conceptualization of the UBH proposes to include in the discussion features from archaeological, historic, artistic, and architectural interest; having historical and cultural uniqueness; and being a source of identity for local communities [9]. Some authors distinguished archaeological heritage from solely heritage by the underground location [22] (p. 77). Others, such as Varriale [3] proposed the concept of Geographical Zero Level, or in geology, the surface of the earth as a demarcation line between aboveground and underground. On the other hand, Built Heritage (BH), originally defined by UNESCO [23] as a sub-category of cultural heritage, refers to monuments, groups of buildings, and sites, which are of outstanding universal value from the historical, aesthetic, ethnological, or anthropological point of view (e.g., architectural works, archaeological sites, etc.), whereas UBH is defined as any cultural heritage that was built with the intention to be partially or completely underground [24]. Thus, typologies of UBH sites include, inter alia, both natural and anthropic caves and underground structures serving various functions, e.g., settlements, resource exploitation, or defense [1,4,7]. Some authors contribute to this description adding that UBH is a cultural resource that might become the hearth of community’s sense of place [2,24]. A functional constraint is that UBH usually becomes a limitation for a current underground development in the urban planning system because it competes with new urban functions [9].

3.2. *The Evolving Conceptualization of Local Sustainable Development*

Most approaches nowadays define development as a process to promote inclusive and sustainable economic growth, including achieving a higher quality of life for all people [25]. Initially, in the 1960s, the meaning of development only referred to purely economic aspects, measured by changes in the economic output, that is, an increase in the gross domestic product (GDP) [26]; however, in 1997, the UN Agenda for Development added the element of social development and environmental protection, which are interdependent and mutually reinforcing components of sustainable development. Since 2015, these Sustainable Development Goals have been part of the local development idea [27].

Thus, Local Sustainable Development (LSD) considers that improvement of the standards of living and well-being of the current population is based on the identification and use of the resources of the involved community, neighborhood, city, municipality, or equivalent [28]. One of the distinct elements of LSD is that endogenous factors occupy a predominant position. Endogenous factors are “internal” characteristics originating “within” and creating the identity and character of one place. For instance, underground is an endogenous factor of a specific territory. This view of “endogenous” as a central point of local development could be seen as “development from below” or “bottom-up development” [29].

The literature on LSD do not directly addresses UBH. However, for example, research on Italian and Chinese underground settlements [30] shows the application of an instrument used to compare the different approaches towards UBH management, sustainable conservation, regeneration, and touristic use. The authors discussed the evaluation scale, including four different levels of actions carried out to address the valorization of UBH, i.e., Re-inventing, Re-introduction, Re-interpretation, and Re-building [9] (p. 9).

3.3. Cultural Heritage on Local Sustainable Development: The Tacit Factor

Underground is an embedded feature of a territory and could be considered as an internal factor facilitating and enhancing the process of local development. Most of the reasons for cultural heritage places being where they are actually relates to past and ongoing processes linked to past human organization, with its own technological, economic, social, and political patterns [31]. Historically, local development could be seen in places where there were strategic points or where political control could be exercised, where natural resources were available, and where there have been military and/or commercial focal points, i.e., places near rivers, on the coasts, and places of passage between mountains [32]. Physical factors, such as altitude, climate, and water availability, were also decisive factors for development. Eventually, the decline of locations left physical cultural remains of ancient or past concentration of population and activities, which became endogenous goods left in different physical conditions. These constitute the cultural heritage and can be a key factor to boost local sustainable development [33,34].

The UBH (together with its fringe) is an endogenous factor of a place. It is embedded in the culture and the memories and constitutes “an element of value for communities, cities, and societies, the fulcrum of transformations and processes of development, rebirth, and resilience.” [35]. Local communities can work on tangible cultural heritage conservation and planning, and this process can provide new jobs related to conservation, planning, and management. The interactions between the heritage local society and local governments can forcefully and imaginatively shape new functions. This can be followed by the dissemination of innovative thinking and methodologies and support of proactive social research with the creation of living labs in real-live experiments. They can be goal-oriented, and a strategic dialog should be shape-based in co-evolution and co-creation.

In the social context, cultural heritage offers benefits, such as local pride and increased community spirit, and furthermore, for individuals, it helps to make a connection with the community on emotional and intellectual levels [36]. Cultural heritage preservation and development campaigns can help bring into play local development policies mainly aimed at enhancing the town’s image as well as improving social cohesion through better integration of its diverse social components [37]. Culture, embedded within cultural heritage, plays a role in promoting prosperity only when tangible heritage is matched with intangible cultural assets [38]. Among such intangible assets, creativity is particularly analyzed in terms of its link with the cultural heritage of places and their economic development. Creativity is another important mediator of the relationship between culture and socioeconomic development. Creativity impulses tangible cultural heritage in a way that might influence these resources creating impulse for the attractiveness of tourism flows [39]. Heritage represents a tangible form of culture, while other aspects are intangible elements of tacit knowledge that help the social construction of spatial forms and relations that emerge from social processes. At the same time, the social space that emerges also produces new social and spatial forms. This process occurs in such a way that, when a new social space is produced, it replaces the former space, or as Hadlaw [40] (p. 25) said, the new creation “‘consume(s)’ the spatial relations which existed before its creation.”

3.4. The Role of Local Stakeholders in the Valorization of UBH

Local development strategic goals are linked to social participation and local dialog, which connects all relevant stakeholders and their resources in an effort to increase employment, wealth and quality of life [41]. UBH (together with its fringe) is a local endowment

that can support this endeavor advancing local economic potential and in turn leading to the valorization of UBH. Important agents in this process are the public sector (local authorities and administration, including planners), the private sector (entrepreneurs, bankers, public media, etc.), and the civic sector (that is, non-governmental non-profit organizations, local community groups, social clubs, think tanks, etc.). Some authors claim that the state has to play a supportive role, aiming to stimulate local initiatives, keeping sometimes a less active stance [42] by simply “bridging” local interests, and bringing together local forces with the potential to drive the development process. For example, the state can support community initiatives and private actors in obtaining financial assistance in the form of grants or of private loans under favorite terms. Local authorities and administration also can facilitate access to information and can foster civic engagement and development of cooperation networks linking together agents with different skills and competencies. However, public institutions can put at risk both local development and the valorization of UBH. This is the case when formality and inflexibility of regulations prevail, acting as barriers to social innovation, local collaboration, and to endogenous collective action [43,44].

3.5. Ecosystem Services Provided by UBH

Ecosystem services (ES) are the direct and indirect contributions of ecosystems to human well-being [19]. The Common International Classification of Ecosystem Services [18] distinguishes between biotic and abiotic components of ecosystems and their role in delivering the specific ES, i.e., provisioning, regulation and maintenance, and culture. Cultural Ecosystem Services (CES) are non-material benefits for people provided by ecosystems (both natural and urban) [20,45,46]. Among the wide variety of ecosystem services listed in most classifications [18–20], the UBH with its fringe, being a part of an urban ecosystem (and at the same a sub-category of CT), could provide cultural ecosystem services [47], such as tourism; aesthetic appreciation; inspiration for culture, art, and design; spiritual experience; and sense of place. The CES affect human well-being through impacts on social and cultural relations, which influence the quality of human experience [20]. According to Muñoz-Viñas [48], cultural heritage does not limit to what former generations built but also incorporates the way it is interpreted, valued, and managed by contemporary society. Therefore, it cannot be treated as static but is constantly changing and re-evaluated, interpreted in various ways by different actors [49]. UBH is part of CH and so, according to assumptions identity and identity protection, are relevant for local communities having such sites [50,51]. It is related to fulfilling cultural and spiritual needs, such as a sense of belonging, identification with the place of residence, and sense of place [52–54]. CES are especially important in satisfying the needs of territorialism, helping to build place identity and place attachment [55–57].

4. Results of Case Study Analysis

4.1. “Fortress Warsaw”, Warsaw (Poland)

“Fortress Warsaw” is the belt of fortifications built around Warsaw by imperial Russia in the XIX century. The first constructions of the overall fortress were built in 1832 on the commission of Tsar Nicholas I himself [58]. The decision to transform Warsaw into a fortress was made later in 1879. In total, the Warsaw Fortress includes as many as 29 forts that have survived and are still visible within the urban fabric. The construction of the Fortress stopped the city’s development towards the north direction, and the building bans contributed to the creation of a dense urban cluster in the very center of Warsaw [59]. Originally, the function of the entire Warsaw Fortress was tightly linked with defense, and all built structures, both underground and overground, were arranged in accordance with the principles of defense art characteristic of the nineteenth century. The Warsaw Fortress is an example of the unique fortress landscapes on a European scale [58]. All the fortifications included double-layered underground military galleries and were originally connected by underground tunnels [60]. The construction of individual forts took advantage of the natural relief of the area, including the Warsaw escarpment. Due to above mentioned

characteristics and unique values Warsaw Fortress can be studied as specific example of UBH, originally serving a defense function (see Section 3.1). Figure 2 shows the location of the three studied fortifications on the background of a historic map and a present Google aerial photo.

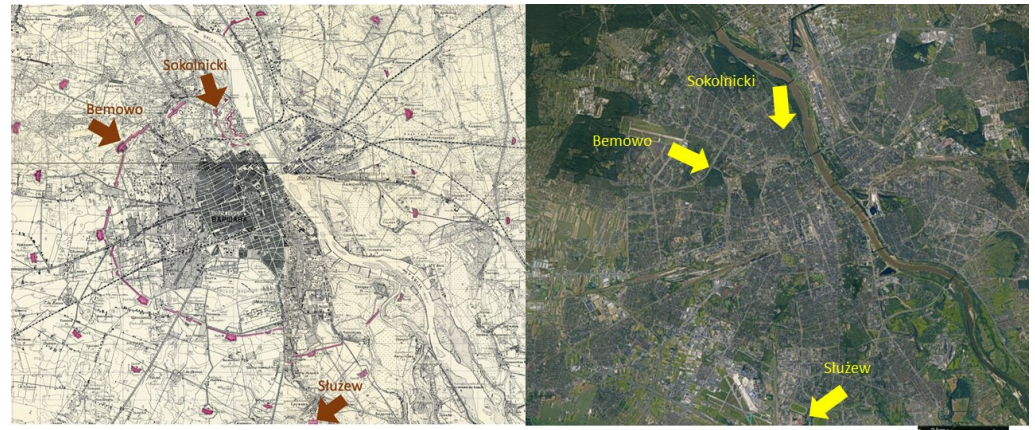


Figure 2. The location of the three studied fortifications on the background of the historic map of Warsaw Fortress (left) and a present google aerial photo (right). Source: Own elaboration based on Google Maps (2021) and www.forty.waw.pl (accessed on 15 September 2021).

4.1.1. Sokolnicki Fort

- General context and status

The fort is a part of a larger recreational area—the Żeromskiego park. The park covers an area of 4.7 ha, of which 3 ha is the fort. It is located in the historic center of Żoliborz district in Warsaw. This particular fort is a part of the strict ring of the Alexandrovska Citadel, surrounded by two more fortification rings [61].

Nowadays, the Sokolnicki Fort is allocated for cultural purposes. Such a decision by the Warsaw authorities was an attempt to show that one of the largest monuments, being a reminder of a harsh Polish–Russian coexistence and a difficult history, can be extremely attractive and can play an important role in the life of the local community and all Varsovians. This new discourse assumed that it is worth starting successive development of fortifications instead of idly watching them deteriorate and disappear from the map of Warsaw [59]. Since 2010, the Sokolnicki Fort was rented to the “New Fort” foundation, which organizes cultural and other commercial events. The two former underground gunpowder magazines are operating as cafes, and a headquarters of a youth social movement called “Youth Climate Strike” (which is part of a global initiative—Fridays for Future) is located there as well. Moreover, in the fort, there is a restaurant and an ecological grocery shop. The underground part (consisting of underground military galleries) is dedicated to a wide array of cultural events, e.g., art exhibitions, concerts, fashion shows, cafes, and co-working spaces for local initiatives, while the outdoor part is occupied by restaurant gardens and is blended into a recreational park (Figure 3). Thus, the UBH complex studied provides cultural values by itself (mainly as a testimony of history), and in parallel, it assures new meanings and uses.



Figure 3. The Sokolnicki Fort—views for the main building (a), the underground walkway (b,d), and the children’s workshop in the co-working space (c). Photos: Maksymiuk, G. (a,b), Foundation Nowy Fort Archive (c) *Krajobraz Warszawski*, Nr 106 (2009) (d).

The touristic potential of the UBH complex relies on both the underground part (where the co-working space, cafes, and exhibition center are located) and the recreational vicinity. The place is very well connected with the city center by metro and is part of a historical dwelling estate from the pre-war period that makes an interesting stop for tourists.

Regarding the legal framework, since 1965, the Sokolnicki Fort has been officially registered as an immovable monument. In practice, this means that all design, construction, and conservation work has to be approved by the City Monuments Conservator. According to regulations set in a local land-use plan [62], the fortification is a separate unit dedicated to cultural services complemented by education. The fort’s vicinity is dedicated for public greenery. The regulations protect all architectural substances from demolition. The fortification is also protected by law as a historic monument. The local plan protects all underground structures due to unique cultural values.

- History

The Sokolnicki Fort was built in the mid-nineteenth century (between 1849 and 1851), and its fate was very turbulent. Originally, it was surrounded by a moat with a shooting gallery in a brick counter-escarpment. The tower’s ceiling was covered with an earthen embankment, and the entrance had a drawbridge. In the years 1864–1874, the fort was thoroughly modernized. The entrances to the patterns (i.e., the underground walkways) were located in the embankment and were enriched with an artillery bunker with a handy powder magazine. It was probably then that the moat around the tower was filled in, and an earth embankment was made, i.e., the entire lower story of the fort remained underground [63]. After WWI, in 1932, the public park around the fortification was opened

(it is called Żeromskiego park). After the war, the Fort was used by the army for a military archive [64]. Finally, in 1998, the Military Property Agency put it up for sale, and in 2003, the Żoliborz authorities bought the fort. Between 2008 and 2011, a major renovation to preserve the valuable historic substance was completed. It initiated “a new era” in the functioning of this UBH site in Warsaw [59,63].

Regarding the present functional destination, although the fortification is not military anymore, its historic substance has been preserved, and new functions located in the underground parts of the fort are in line with the historic character.

- Users and management

The Sokolnicki Fort is mainly used by local dwellers who live nearby the Żeromskiego park and in the surrounding neighborhoods but also by other Varsovians and tourists who come to visit the park itself, the Art Center, cafes, or co-working spaces organized by Youth Climate Strike social movement. The new cultural function of a place that was introduced thanks to the renovation in years 2008–2011 caused a new array of stakeholders involved in the management. In this process, numerous consultation meetings were organized by the Żoliborz district local authorities. They were conducted with the participation of engaged artists, representatives of non-governmental organizations interested in future artistic and social activities to be organized in the renovated facility. As a result, the Sokolnicki Fort was rented to the New Fort Foundation, which manages the site. Thus, social interventions can be considered in the whole process of transforming a ruined UBH site (being a military heritage) into a new function. There are possibilities for bottom-up initiatives thanks to the existing co-working space in one of the former underground gunpowder magazines. It should be underlined that in this case, organizing a co-working space in the UBH has an educational value and is a way to study and preserve the site from destruction.

- Ecosystem services

The fort as a whole is a physical object in the environment that can be experienced actively or passively. Thanks to its history, we can study and think about its importance for the identity of present and future generations. The UBH complex is visited by tourists (due to all cultural events organized in the underground), and the surrounding park, which functionally belongs to the fort, is a recreational area. Thus, the UBH complex delivers the following ES: aesthetic appreciation, sense of place and identity, spiritual and symbolic interactions with abiotic components of the environment, tourism, and recreation.

- Introduction of the paradigm of living labs

The renovation of the fortification was an important part of the local development strategy of Żoliborz district. However, in a broader sense, it was a starting point for the general discussion how to deal with this type of heritage in Warsaw. The whole process of gaining the site from the military authorities and later on transforming it into a cultural establishment required a close co-operation between local authorities, residents, planners, and academics. The community engagement in this case is exemplified through the process of working collaboratively with groups of citizens affiliated both by geographic proximity (mostly local residents) and special interest (the desire to preserve/maintain and re-use the UBH). In this process the local authorities have put a lot of effort in safeguarding the principles of community engagement that is respecting the right of all community members to be informed, consulted, involved, and finally empowered.

Żoliborz district is famous for its cultural heritage, and nowadays Sokolnicki Fort is often named a “Mecca” for cultural initiatives. Besides, as mentioned above, the Sokolnicki Fort is home to youth climate activism. Due to its artistic tone, the site attracts individuals or groups of dwellers who are creative visionaries interested in new activities [65]. The foundation of an open co-working space is an example of a bottom-up initiative approved by the local authorities that helped in the organization of the spot and also found financial support for such activity [66]. This is a place where everyone can propose actions related to climate change and mitigation of its negative impacts. Moreover, not only is the co-working

space a forge of initiatives but also the popular cafeteria and restaurant located in a former gunpowder magazine, called “Prochownia” (meaning gunpowder magazine in Polish). This place is popular not only for its gastronomy but mainly for an open, freestyle character. It offers a wide array of cultural events, promoting zero-waste culture, gender equality, and LGBT + community acceptance [67]. The underground spaces are strongly inspiring, and in fact, they promote community engagement for various initiatives and in a way for UBH valorization as well.

Therefore, taking into account the above mentioned examples, the Sokolnicki Fort, as a specific type of UBH related to defense function originally, can be called a catalyst for a broader strategy of community engagement, and the transformation process itself can be called a paradigm of a living lab.

In regard to good practices and examples flexible for upscaling or easily replicability, it should be mentioned that the process of the Sokolnicki Fort transformation was long, but at all stages, the local authorities were very open for discussion with community (whether they are stakeholders, interest groups, or citizen groups). Thanks to that, it was possible to work out a compromise between preserving the historic substance of the fortification and a new function of the site. After 10 years of operating in this new form, in the near future, the next open competition for new management of the UBH site will be announced [68].

4.1.2. Służew Fort

- General context and status

The fort is a part of a residential area in Ursynów district in southern Warsaw. It is situated on a hill between the Warsaw Escarpment and the valley of Służewiecki Creek. In the closest vicinity of the fort, there is the oldest Warsaw parish (St. Catherine orig. 1238). The UBH site is well connected with the city center (by bus), which makes it a possible stop for tourists. The site is not used for military purposes; however, the existing historic substance has been preserved, and new functions (shops, studios, cafes, restaurants) are in line with historic character (Figure 4). Nowadays, the underground part of the fort has been restored and converted into commercial premises, which on one hand sounds controversial, but on the other, it was a way to safeguard the object from destruction [69]. In the area surrounding the underground part in 2017–2019, a residential estate of multifamily houses was built. It was during the second development, in the 1990s, that a housing estate of terraced houses with gardens was built near the moat ramparts.



(a)



(b)

Figure 4. The Służew Fort—a former casemates (a) and interior of a restaurant located in the underground former casemate (b). Photos: Wistula CC 3.0. (a) Archive of 370studio Concept & Design (b).

- History

The fortification was erected between 1883 and 1889 on command of the Russian Tsar Alexander III. The fort was built in the 1880s and covers an area of 26.17 hectares. It was built according to the model Russian design F1879, with a two-shaft earth and brick structure with two faces and shoulders as well as neck barracks. In the 1970s, between the forehead embankment and the neck barracks, a military housing estate was built for the highest cadre of the People's Army of Poland (the so-called general estate) [69]. In the 1990s, the fort was taken over by the Military Property Agency, which sold it to one of the development companies [70]. A complex of apartment blocks up to nine stories high was built next to the fort, and the fort underwent extensive renovation (2015–2019). A small shopping mall called Fort 8 was built in the former military casemates [71].

- Users and management

The users are mainly local inhabitants and incidental Varsovians due to the location of a shopping center in the new residential site.

- Ecosystem services

The site delivers the following ES: aesthetic appreciation, sense of place, intellectual and representative interactions with abiotic components of the environment, and spiritual and symbolic interactions. These values, classified as ecosystem services, are guaranteed by the identity of UBH. It is not a typical neighborhood of a residential area and a typical form of local center. The presence of UBH provides a reference point for the residents to build a local identity even though the local center was built by a top-down initiative.

- Introduction of the paradigm of living labs

After the first development of the fort, when terraced houses were built, the residents decided to clean up the area. They arranged a community park in front of their front gardens, planting trees, mowing the lawn, and putting up makeshift furniture. As far as they could, they tidied up the moat area, which they called the "animal paths". This created a model structure of territorial domains: private, semi-private, and public [72]. In the interview with the inhabitants (women in their 40s and 60s), it was possible to hear accusations directed at the city authorities for not taking care of the fort area and leaving the inhabitants alone [73]. As a result of subsequent development, the park has been cleaned up and improved. Thanks to dialog with residents, the developer purchased playground and outdoor gym equipment, fenced the area, and named it Ósmy Park (Eighth Park) [74]. Abandoned casemates serve local old and new communities and new local centers.

When asked to evaluate the investment, residents of the older part of the estate (two women, seniors) said they wanted the area to be cleaned up. In this perspective, they rated the investment very highly [75]. Another user, an employee of the Warsaw University of Life Sciences (woman, 45), located next door, pointed to the successful attempt to reconcile the restoration of a historic building with finding a new function for it. She liked the restaurant and fashionable shops, to which she now has close access [76].

4.1.3. Bema Fort

- General context and status

The fort is located in the central part of Bemowo district in north-western Warsaw. There are several new residential sites of multifamily buildings around. The site is not used for military purposes, and the existing historic substance (i.e., underground galleries and casemates) has been preserved but is constantly vulnerable to destruction (Figure 5).

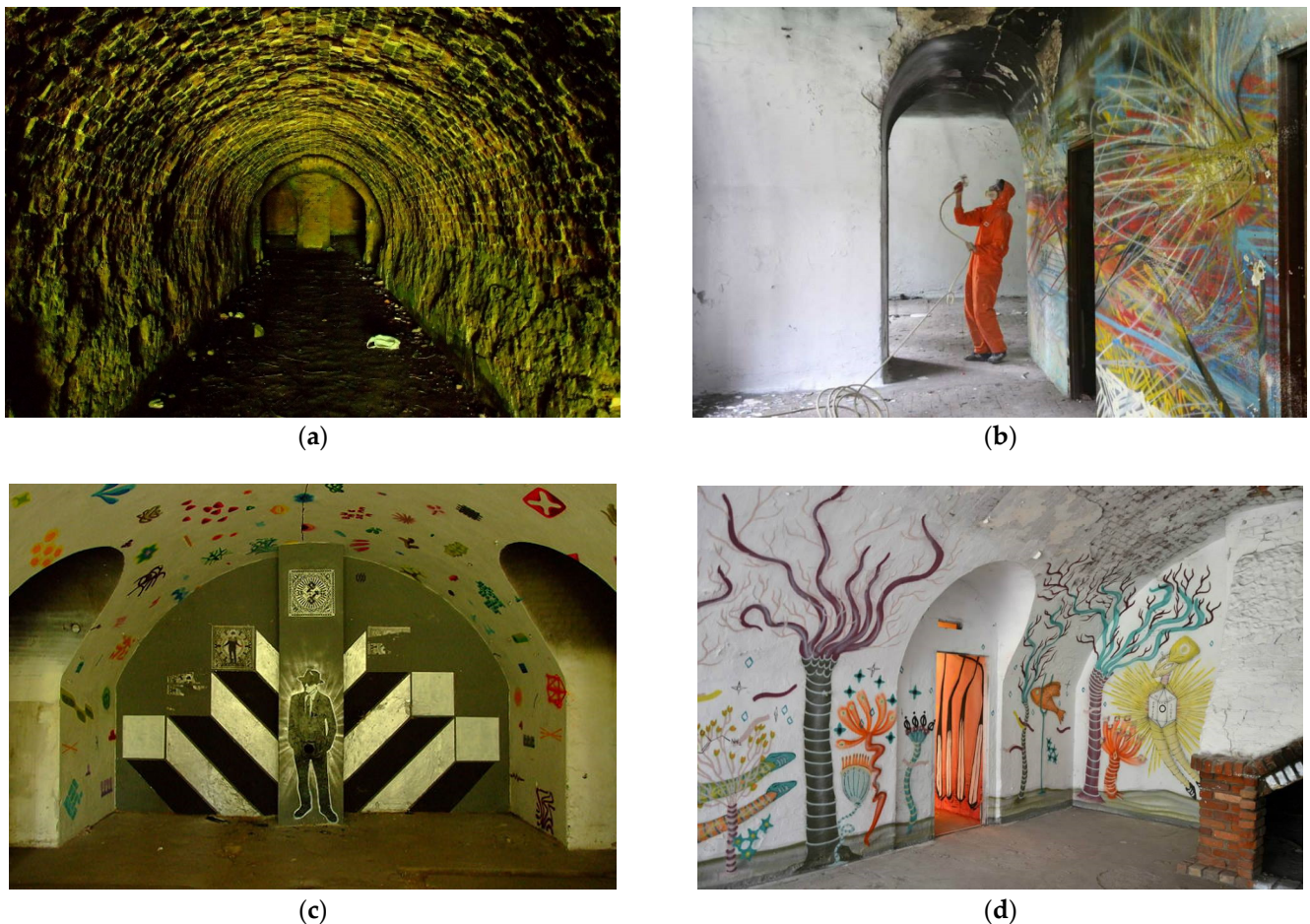


Figure 5. Bema Fort—(a) underground tunnel before location of a pop-up gallery (2011); (b–d) pop-up gallery of street art; Photos: Ferdziu, CC 3.0. (a,c), and ProjektFortyForty (b,d).

- History

Bema Fort (formerly known as Fort “P”—Parysów) was built between 1886 and 1890 as part of the construction of the second (inner) ring of forts of the “Warsaw Fortress”. In the years 1924–1939, the site housed the Ammunition Factory Workshops. During World War II, there were German military warehouses in casemates. After the war, the fort was taken over by the Polish Army. In the 1980s, the fort was handed over to the Legia Warszawa Military Sports Club [69]. After 2000, housing estates were built in the fort area—one of them is called Fort Bema.

In 2002, the Bemowo district commenced the revitalization of the fort. Most of the wild vegetation was cut down, new bridges were built over the moats, new alleys and bicycle paths were constructed, dikes were built next to the historic fortress bridge, and the biggest playground in Warsaw was built along with a rope park in the fort with a zip-line over the moat [77]. In co-operation with the Bemowo District Office and the External Art Foundation, in agreement with the City Conservator of Monuments, a street art gallery 40/40 was established operated from 2011 to 2015 [78].

In 2015, on the site of a former orchard and kitchen garden grown by soldiers, an informal community garden was opened. The arrangement of the garden is constantly evolving, and the direction of changes is determined by both biological processes and the interventions of gardeners [79]. Social meetings, yoga practice, etc., are organized in the garden.

- Users and management

A street art gallery located in the underground part attracts a range of users of different ages and needs, offering a wide repertoire of opportunities for recreation, leisure, and self-development in the community. An informal local group of dwellers cultivates a community garden and street art gallery, while commercial agents and local authorities are responsible for the public park. Temporary squats and youth meeting places are located in the casemates. In the vicinity of UBH complex, there is a new residential site. Users are mainly local inhabitants, incidentally other Varsovians. The UBH complex is managed by the local authorities; however, there are no clear rules and regulations in regards to UBH itself.

- Ecosystem services

The site delivers the following ES: aesthetic appreciation, sense of place and identity, intellectual and representative interactions with abiotic components of the environment, and spiritual and symbolic interactions. The fact that the underground is underdeveloped but accessible underlines the uniqueness and mystery of the place, attracting users and helping to build identity and identification with the place. One user of the park, a young mother, pointed out the attraction of the undergrounds. They are a good opportunity for historical education for children and add variety to the landscape. This opinion was repeated in several interviews with users who were nearby residents (four people aged 25–40) [80]. They were also glad that there is a gallery in the underground because in their opinion, this is the first step to protect and promote the monumental site. The person in charge of the gallery (male, 35 years old) pointed out the continuous underinvestment in the fort building by the city, which caused the monument to deteriorate despite the wide public interest and willingness of the inhabitants to help [81].

- Introduction of the paradigm of living labs

Co-operation exists among the community of inhabitants and the NGO “Pracownia Dóbr Wspólnych” (in Polish, “Common Goods Lab”). The most important rule is to use the site as one would like, freely, but while respecting the work of others. Previously, the meetings were carried out as part of a local initiative, also at one’s own expense. The garden can also count on the favor of the Bemowo Cultural Center, which promotes gardening events and willingly lends a room for organizing meetings [59]. The underground street art gallery is one of the few grassroots places in Warsaw dedicated to art. The group of artists responsible for it is independent, with a great deal of freedom in action. This feature gives the space credibility and attracts crowds of users.

4.2. *Panagia Tripa of Goritsa, Volos (Greece)*

- General context and status

The case under study is located on the south-east of Volos (Figure 6), at the fringe of the city, as this is defined by the current General Urban Development (land use) Plan [82]. It is next to the sea, at the edge of the urban area/neighborhood of Agios Konstantinos, which is considered a rather high-income, high-class area of the city.

The UBH functions as a church, and it is used mainly for Christian worship services and other Christian religious and social activities (Figure 7). Other non-religious, social, and sports activities also take place in the vicinity of the UBH. Therefore, the whole place is used: indoor, outdoor, and surrounding area.

The place is a focal point for three main communities: a community of orthodox Christian believers, a community of winter swimmers, and a community of sportsmen and athletes engaged in sailing and rowing. It should be noted that Volos is one of a few cities in Greece with a high number of Christian believers (many Archbishops of Greece come from Volos), a high number of winter swimming clubs—all located close by due to specific geological conditions that make swimming possible even in deep wintertime—and a significant presence in Greek sporting activities in the areas of rowing and sailing. The

vast majority of the winter-swimmer interviewees declared that they regularly come to Panagia Tripa because of the spirituality and the uniqueness of the place, and they said that they were willing to work and contribute towards the betterment of the area [83].

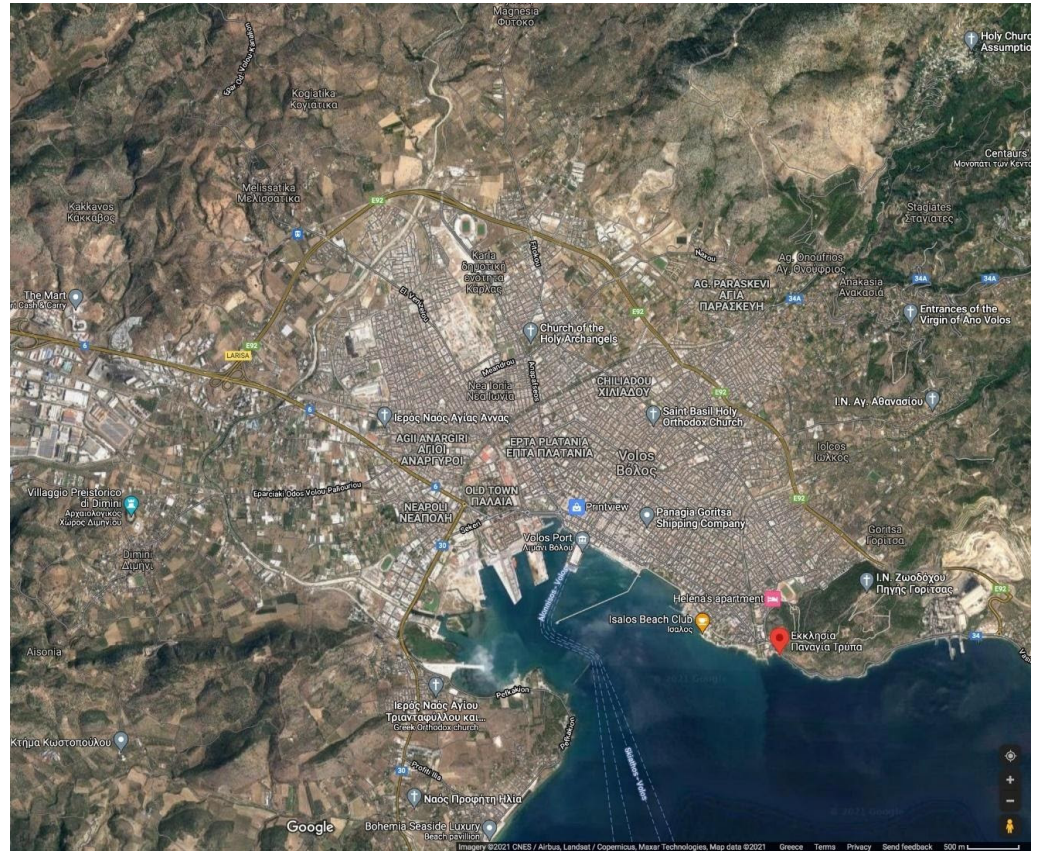
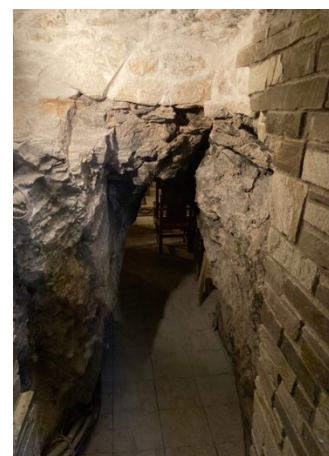


Figure 6. Google map and the location of Panagia Tripa of Goritsa. Source: Google Maps (accessed on 15 September 2021).



(a)



(b)

Figure 7. Cont.



Figure 7. Picture outside (a) and inside the UBH (b–d). Source: Arvanitidis, P.

Being a unique church located in the underground and a site of high religious interest and destination, there is and has been a substantial potential for religious tourism/church tourism [84]. This site is visited by many worshipers from all over the city and visitors from the region of Thessaly and beyond on a regular basis (observation, July–August, 2021). Many faithful people decide to conduct their private religious services (weddings and christenings) there (instead of at other churches) [83]. Additionally, a number of visitors from all over Greece (and abroad) come to the place on the occasion of sailing and rowing sports activities and games that take place in the area.

The legal and planning framework of the site is unclear and quite complex. According to the current General Urban Development (Land Use) Plan, the area is assigned to sport activities/uses. Yet, due to archaeological interests in the whole area (including the church site), any decision for change, development, etc., should be first approved by the Greek Archaeological Service. Concerning the church itself, again, the situation is even more complicated and unclear. Since it is a church, it belongs to the Church of Greece (part of the wider Greek Orthodox Church) and particularly to the Metropolis religious jurisdiction (a type of diocese) of Demetrias and Almyros. As such, the Church Building Authority oversees and approves all changes concerning the building and its yard. On the other hand, because it is literally next to the sea, i.e., it is on the coastal line and area, the Hellenic Coast Guard is responsible for the management, regulatory oversight, and overall supervision of the activities undertaken in and around the site. This complex legal and authority situation is the main reason that there have only been minor changes since 1960. This makes community engagement and participation crucial for changes and development.

- History

The cave around which the church was built was a place of ancient worship and was continued to be used as such by the Christian religion and the Church of Greece [85]. The site was a place of Christian worship even before the Greek War of Independence in 1821 [84]. Around 1890, the entrance and the current bell tower were built outside the cave, giving a formal picture of a church [86]. The first worship service in the church took place in 1892. No substantial changes took place until 1950, where the building was extended (above ground), giving the current structure, with a larger building, a portico and a yard [86]. In 2003, an abbot's room was added to the structure. There have been no major changes since that day [83].

The UBH functions as a church, housing worship services and other religious and social activities since its enactment in 1892 [80]. It is a rather unique church in the area and gathers many faithful citizens for its services from all over the city and beyond. The spot just outside the church is the location of an informal winter swimmer club, comprised of about 20 women [87], and next to it, there are the premises of the NOVA Sailing Boat Club. Thus, there are three different communities engaged in the spot: the Faithful, the Swimmers, and the Sportsmen. They use the same transport infrastructure and public spaces, but they are engaged in different activities. The communities are not mixed, but the members have multiple identities in the sense that, for instance, some winter swimmers or sportsmen are also believers and attend the services, and this is why the former have located their club in this spot [83]. For all communities, the UBH complex is a focal point of local history and mainly of local/community identity due to the spirituality, the long history, and the uniqueness of the place.

- Users and management

The site's users are the three communities that utilize the site, for which people come from all over the city and surroundings (observation, July–August, 2021). The place functions as a church; i.e., it is used for orthodox Christian worship services and other religious and social activities related to spirituality and well-being, most of which are organized by the priest of the church [83]. These concern life management seminars, Byzantine music seminars, and cultural events, such as poetry reading and concerts. The NOVA Sailing Boat Club also organizes meetings and seminars for water sports, participated by sportsmen from all over Greece. The two communities cooperate in good faith and help each other (providing space and facilities, such as furniture and chairs) to manage these events [88].

Regarding the building structures and social interventions in and around the site, in the church, there is a kiosk around the entrance and a number of benches where people meet and socialize. There are also a few benches scattered around the yard, a fountain with drinkable water, about 20–25 trees, and a small garden (observation, July–August, 2021). Next to the UBH complex, the NOVA Club retains a multipurpose space, hosting several social events and activities of commercial and cultural interest, such as conferences, dinners, corporate events, receptions, or other types of social gatherings.

Main actors involved are the priest and ultimately the bishop of the local diocese, the Metropolis of Demetrias and Almyros, supported by an senior lady who is the caretaker of the place. She lives in the abbot's room next to the church, and she is the pivotal point bridging the related communities and enhancing communication between the believers, the tourists, the athletes, and the winter swimmers [83].

- Ecosystem services

Like other UBH and cultural heritage sites in general, this site also delivers ecosystem services, such as aesthetic appreciation, sense of place and identity, cognitive and spiritual development, intellectual and representative interactions with abiotic components of the environment, and spiritual and symbolic interactions.

- Introduction of the paradigm of living labs

All changes and development that took place in the UBH complex were completed by the local communities, particularly the Faithful and the church authorities (who have the legal right and interest to do changes in the church) [86], and they are somehow not fully formal in terms of legal standing. Actions were and still are driven by the priest and the lady caretaker who service the church and are connected with the other communities, Sportsmen and Swimmers [87]. The priest, who leads the community of the Faithful, has good relations with the Sportsmen (the people of the NOVA club). They help each other when they need support in their events (provide space, facilities, support, etc.) and organize their events collectively in such a way that there are no clashes between them in terms of time [88]. They also organize cultural events collectively, something that brings the two communities together and enhances their links.

The relationship of the Faithful with the Swimmers is less harmonious [87]. The Faithful feel offended by the loud and flamboyant behavior of the Swimmers, and they obstruct their passage to the beach, despite the fact that this is a constitutional right in Greece. The lady caretaker maintains good relations with both these communities (and especially with a certain number of female winter swimmers) and constitutes a pivotal point around which the two communities coexist, communicate, and maintain the site and its surroundings. Informal discussions with the Swimmers made clear that the community not only has a strong sense of identity connected with the place but takes pride in this connection and is quite willing to participate and support its development [87].

Yet, the complex, unclear, and cumbersome legal framework (ownership, urban planning, coastal management) and the multiplicity of formal institutions involved (the Church, the Volos municipality, the State—the Greek Archaeological Service, and the Coast Guard) makes any development and change difficult. The only way to bypass this formal sclerosis is to give rights to the local communities involved, enabling them to collaborate and to “change things” in a collective manner. These communities not only know their needs better than anyone but also (if given the freedom) have the ability and the flexibility to manage the resource, compromising solutions to the betterment of both the UBH, the surrounding area, and the overall users and local community [83].

The summary of case study general information is provided in Table 1.

Table 1. Case studies. General information.

Name of UBH	“Sokolnicki Fort”, Warsaw	“Służew Fort”, Warsaw	“Bema Form”, Warsaw	Panagia Tripa of Goritsa, Volos
	1		2	
	a	b	c	
Ownership	City of Warsaw; Nowy Fort Foundation 10 years lease til 2022	Private property; Turret Development Ltd.	City of Warsaw; Bemowo district	Greek Church
Location	Historic center of Żoliborz district, central Warsaw	Residential area in Ursynów district, southern Warsaw	Residential area in Bemowo district, north-western Warsaw	South-east of Volos at the fringe of the city
Legal framework	Local land-use plan (dedication to cultural services and education)	No local land-use plan	No local land-use plan	General Local Development (land-use plan), dedication to sport activities/uses;
	City Monuments Conservator protection		Greek Archaeological Service protection	
Geology/underground construction	Anthropogenic sediments/brick construction, lime plastered	Clay sediments of glacial origin/brick construction, lime plastered	Sandy clay sediments of fluvioglacial origin/brick construction, lime plastered	Natural bedrock cave
Important dates	- 1849–1851 construction; - 1864–1874 - Modernization; - 2008–2011 renovation in order to preserve and re-use;	- 1883–1889 construction; - 2015–2019 extensive renovation	- 1886–1890 construction; - 2002 revitalization of the fort area	- Ancient worship site; - 1890 erection of the church; - 1950 extension; - 2003 further rearrangements (an abbot’s room added)

The results show that the examined sites constitute rather state- and market-neglected spaces within the urban fabric, giving a sense of freedom and facilitating communal activity. Their potential in corroborating, enhancing, or driving urban development has been undervalued by policymakers, but they have been used by local dwellers as pivotal areas for various bottom-up initiatives closely connected to the fundamental process of inclusive social development.

4.3. Comparison of Results

The performed research is an attempt to explore whether the unique features of UBH and its fringe provide focal point factors for community engagement and local development.

The results obtained provide indications that this is correct. By studying UBH cases, we found many positive examples of social activities evoked by UBH features. Table 2 presents the results of a comparative analysis of local sustainable development factors and the degree of their applicability in our cases.

Regarding the culture factor (i.e., tangible cultural heritage), a tangible historic substance is present in all studied UBH complexes; however, the scale of preservation differs from well preserved in the Sokolnicki Fort and Panagia Tripa of Goritsa to rather neglected in the case of Bema Fort. The attractiveness of tourism flows also varies between studied sites, and it is interesting that this tourist potential results from the state of historic substance preservation on the one hand, but on the other, it is determined by the location and urban context and functional possibilities offered.

The elements of tacit knowledge and the social construction of spatial forms are manifested in the development of an open co-working space located directly in the underground built part (Sokolnicki Fort) and in the creation of various spaces in the surroundings. In all cases, new quality spaces emerge, e.g., in Służew Fort, the creation of proper spatial structure (i.e., the division between private home gardens, semi-private community park, and natural public space) is observed. In turn, in Panagia Tripa of Goritsa, we deal with the creation of an extended churchyard and surrounding spaces by the three engaged communities of users, and in the case of Bema Fort, the creation of a community garden. Next, among relations that emerge from social processes observed in all sites, it is evident that the UBH is a focal point for the formation or origination of new communities or associations. The users organize themselves around a common issue or goal, but the UBH and its fringe is the linchpin and a reference point.

The new community space production alters and expands the former space with new forms and functions, and that is the case in all examples studied, giving rise to the creation of new places. Additionally, thus, in Panagia Tripa of Goritsa, a new social space is produced as an extension of the original function, so additional functions and new uses are added. On the other hand, in the case of all forts studied, we deal with a transformation of an old military function into a new cultural or recreational space. An interesting example is the Służew Fort, where over the years, varied bottom-up community spaces have been developed. At the first stage, an allotment gardens complex, then an informal community park through grassroots initiatives appeared next to it, and finally, a formal public recreational area was built by a developer (a market-based initiative).

Concerning the public and private stakeholders' role in the social participation processes, the results show that, depending on a UBH complex, there is a different approach. The most positive example is the Sokolnicki Fort, where a well-established communication between local authorities and private stakeholders is achieved through periodic consultations, many bottom-up initiatives, active community involvement in a management process, and co-creation, whereas in the case of Służew Fort, there is lack of communication local authorities and private stakeholders; however, to a large extent, there is a dialog between various private agents and the community (local dwellers of old and new developments). On the other hand, no constructive dialog between public and private stakeholders is observed in the other two sites studied. On the canvas of the issues discussed above, we studied the role of public institutions in the participation process (e.g., provision of easy access to information, fostering of social and cultural animation between networks that leads to the co-creation of knowledge and strengthens the relationships between people in a society), and here again, the results show different attitudes: positive, neutral, or even negative. Once more, this positive role is observed in the case of Sokolnicki Fort, where the local authorities of Żoliborz district constantly play a leading role in communication with citizens and foster animation between networks. On the contrary, the local authorities of another Warsaw district (Bemowo) promote commercial use of the Bema Fort, and thus, in the case of this UBH complex, the role of public bodies is considered negative. Regarding two other UBH sites studied, there is a lack of interest of local authorities observed; therefore, we assumed that their role is neutral.

Table 2. Comparative analysis of LSD factors and the degree of their applicability in UBH cases studied.

LSD Factors	UBH Complexes	Sokolnicki Fort, Warsaw	Śluzew Fort, Warsaw	Bema Fort, Warsaw	Panagia Tripa of Goritsa, Volos
		a	1 b	c	2
1. Culture (tangible cultural heritage)	a/Tangible historic substance	YES—preserved elements of XIX century fortification with underground part in good condition	YES—preserved elements of XIX century fortification with underground part	YES—preserved elements of XIX century fortification with underground part	YES—old church in the cave in good condition
	b/Attractiveness of tourism flows	YES—due to cultural heritage, attractive location and recreational facilities in vicinity	NO—local scale, low touristic potential	YES/NO—informal character encourages users to free activities; not a typical tourist destination	YES—religious tourism
2. Elements of tacit knowledge	a/The bottom-up construction of spatial forms	YES—foundation of an open co-working space located in UBH	NO—only bottom-up structures	YES—creation of a pop-up gallery	YES—creation of an extended church yard and surroundings by the three engaged users' communities
	b/Relations that emerge from social processes	YES—formation/origination of new civil association/community organized around UBH	YES—formation of new community consolidated around a common issue/goal	YES—formation of new communities (artists and gardeners)	YES—focal point for creation of three communities/groups of users linked with the UBH
3. New social space production	a/Replacement of former space with new creation	YES—transforming the former military site into a livable social space dedicated to cultural function	YES—new social space created for residents of new multifamily housing estate	YES—former soldiers' kitchen garden transformed into a community garden used by local dwellers; pop-gallery in UBH	YES—new community space produced as extension of original function (additional functions) and new uses
	b/Creation of new places	NO—the new social space is actually created on the preserved UBH	YES—at first stage a creation of allotment gardens in the complex; informal community park produced next to it through grassroots initiatives; a formal public park designed by developer (top-down)	YES—location of a thriving family playground on the abandoned fortification vicinity	YES—creation of an extended yard and surroundings/provision of furniture

Table 2. Cont.

LSD Factors	UBH Complexes	Sokolnicki Fort, Warsaw	Śłużew Fort, Warsaw	Bema Fort, Warsaw	Panagia Tripa of Goritsa, Volos
4. Bottom-up activities and social participation processes	a/Participation and local dialog connecting public and private stakeholders	YES—a well-established communication between local authorities and private stakeholders (consultations, bottom-up initiatives, community involvement in management process, co-creation)	YES/NO—a dialog between various private and social (dwellers of old and new developments); lack of dialog between local authorities and others	NO—a dialog between various private stakeholders (developers and residents of new developments); lack of dialog between local authorities and others	NO—the Orthodox Church retains ownership of the UBH taking decisions with no discussion with other stakeholders
	b/Role of public institutions	POSITIVE—local authorities from the beginning of transformation of this UBH complex to present cultural function play a leading role in communication with citizens and foster animation between networks	NEUTRAL—lack of interest of local authorities	NEGATIVE—local authorities promote commercial use of UBH complex	NEUTRAL—lack of interest of local authorities. The UBH complex belongs to the Church (formal ownership)
5. Providing cultural ecosystem services	a/Place identity, place attachment	YES—for local residents	YES—for local residents and visitors	YES—for local residents and visitors	YES—for local residents and visitors; tourists
	b/Contact with heritage	YES	YES	YES	YES
	c/Abiotic components of the environment enabling spiritual, symbolic interactions	YES	YES	YES	YES
	d/Recreation	YES—due to UBH complex	YES—due to UBH complex	YES—due to UBH complex	YES—due to UBH complex
	e/Tourism	YES	NO	NO	YES
	f/Inspiration for culture, art, and design	YES	YES	YES	YES

The last, but not least, sustainable local development factor studied is providing cultural ecosystem services. We observed that all listed potential ecosystem services are delivered by the UBH complexes studied. Hence, it should be stated that our UBH sites mostly provide place identity and place attachment for local residents but also for visitors or even for tourists (e.g., Panagia Tripa of Goritsa). Next, all the sites provide contact with heritage, and contact with nature is mainly delivered through the wild character of greenery surrounding the UBH sites or natural geology and topography, as in the case in Panagia Tripa of Goritsa. Moreover, all UBH studied provide abiotic components of the environment, enabling spiritual and symbolic interactions. Figure 8 shows graphical distribution of the results discussed.

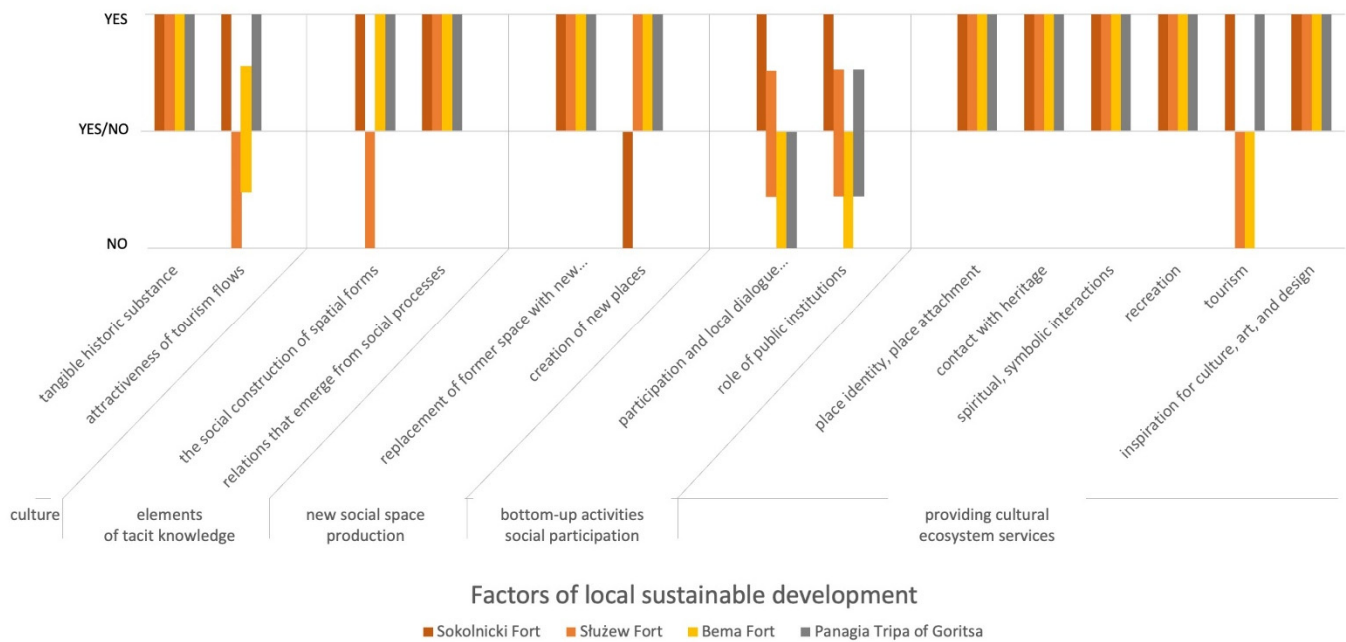


Figure 8. Factors of LSD—scheme results' distribution.

The comparison of results regarding the research issues posed is presented in Table 3. First of all, as it concerns the topic of endogenous factors, the case study analysis performed enabled us to understand how people use UBH and its fringe and what the features of a place are that evoke social activity. In all sites studied, the most important feature is the built heritage alone or combined with natural heritage (Panagia Tripa of Goritsa). Next, we defined the official/formal agents who participate in and drive the process of the local development in the UBH, and these are the local authorities in Sokolnicki Fort and the Church in Panagia Tripa of Goritsa. However, a formal agency is not always present. Regarding the social agent involved, these are mainly NGOs and communities but also parishes. Further on, the economic/market agency is represented by developers, entrepreneurs, or a sports club. The performed research shows that UBH and its fringe might incorporate other uses and functions, which mobilize and move forward the surrounding community, either economically or socially. Amongst the UBH complexes studied, we listed a wide array of such uses and functions, starting from a local cultural center to numerous community actions and activities (e.g., allotment and community gardens; community parks; and various religious, cultural, and sports events) organized alone by groups of users. In all cases, the new economic territory is created by this local development.

Table 3. Research topics and questions—a summary of results.

UBH Complexes Research Topics	Sokolnicki Fort, Warsaw	Śłużew Fort, Warsaw	Bema Fort, Warsaw	Panagia Tripa of Goritsa, Volos
		1		2
	a	b	c	
Endogenous factors	-	-	-	-
Features evoking social activities	Built heritage	Built heritage	Built heritage	Natural and built heritage
Political, Social, Economic agents	Cooperation with authorities NGO, communities -	- Communities developer	- Communities developer	Cooperation with Church Parish, communities sport club
Uses and functions that improve and dynamize surrounding community	Local cultural center/focal point, co-working space encouraging youth activities	Allotment garden complex; Community park; multipurpose open space	Community garden; Pop-up art gallery; family playground	Religious events, cultural events and sports events organized by users' groups
Cultural ecosystem services delivery	Extended	Extended	Extended	Extended
Good practices and living lab manifestations	-	-	-	-
Creating friendly environment for users	Enhancing creative attitudes and entrepreneurship	Building good quality living environment	-	Animation by parish priest and caretaker
"Do not disturb" attitude—participation scale	Delegating decisions making	Information and public debate	Lack of participatory democracy	Delegating decisions making

As discussed above, UBH complexes deliver numerous cultural ecosystem services, and as the research results indicate, this array of ecosystem services is extended. The new uses and functions increase access to CES.

Finally, we studied good practices and living labs' manifestations. The UBH complexes studied let us distinguish two types of good practices that are, in a way, opposite. The first one assumes creating a friendly environment for potential users, as we observed in the case of Sokolnicki Fort. The positive role of public authorities, together with a strong desire for consultations, debates, and co-management practices, enhances the creative attitudes and entrepreneurship of residents. Such an approach assumes facilitation by local authorities; however, it should not be considered as a clear top-down process. Additionally, the example from Volos shows that creating a friendly environment is beneficial, such as in the case of the local priest and caretaker, who animate activities and encourage the involvement of other communities (Swimmers and Sportsmen). On the other hand, studying the four UBH examples allows us to distinguish the second good practice, which we call the "do not disturb" attitude. We understand this as not interfering in social processes and initiatives and delegating decision making to citizens, as observed in the case of Sokolnicki Fort, but a bit more informally, such as in Panagia Tripa of Goritsa. The studied examples show that such an approach could be very effective for fortifying bottom-up activities. Creativity is this intangible asset, and all bottom-up activities strongly rely on the creativity of users. On the contrary, regarding the other two fortifications, we must say that a citizen's involvement and control, as explained by Arnstein [89] and Connor [90], is very limited. Thus, the Śłużew Fort is an example where public participation only takes the form of information and public debate, and in the case of the Bema Fort, we deal with a lack of participatory democracy.

Reflecting on lessons learnt in regards to management, cultural ecosystem services, and living lab paradigm, we provide a summary of results in regards to UBH and UBH complex (understood as a whole spatial-functional unit with complementing structures and its vicinity; the UBH fringe) (see Table 4).

Table 4. Lessons learnt in regards to UBH and UBH complexes.

Name of UBH	“Sokolnicki Fort”, Warsaw	“Służew Fort”, Warsaw	“Bema Form”, Warsaw	Panagia Tripa of Goritsa, Volos
		1		2
	a	b	c	
Lessons Learnt in Regards to:	-	-	-	-
Management	UBH and UBH complex: public-private partnership enhance engagement for initiatives and results in preservation and sustainable reuse of UBH	UBH and UBH complex: private management do not foster local initiatives; however, it is a way to preserve UBH	UBH: since local authorities are not clearly imposing rules and regulations, the UBH is informally used; UBH complex: managed as semi-natural recreational area	UBH: Church and Greek Archeological Service protection; UBH complex: co-operation of three communities led by local priest and caretaker
Cultural ecosystem services	UBH: contact with heritage, tourism (due to events); UBH complex: all typical for urban parks (e.g., recreation)	UBH: contact with heritage; UBH complex: all typical for residential greenery (e.g., recreation)	UBH: contact with heritage, inspiration for culture, art and design; UBH complex: all typical for urban parks (e.g., recreation)	UBH: mainly spiritual and symbolic interactions due to contact with heritage; UBH complex: all studied CES
Living labs paradigm	UBH: inspires local initiatives, is a magnet for users; UBH complex: good communication between all actors and delegating decision making create a proper environment for UBH preservation and promotion	UBH: is not a factor of community empowerment; UBH complex: commercial use allows promotion and preservation of historic substance	UBH: attracts and inspires people for artistic interventions; UBH complex: neglected character of site encourage informal activities	UBH: is a magnet for users; UBH complex: animation by parish priest and caretaker followed by community engagement promote UBH

5. Discussion

Our study revealed that UBH complexes serve as pivotal points for sustainable local development. The case study analysis elucidated the substantial role that UBH can play in local social and economic regeneration with the involvement of local communities. The studied examples made clear that the endogenous UBH factors can evoke social activities. Similar findings are presented by Ruchinskaya [91], dealing with the co-creation and inclusiveness of public spaces with UBH, for example, in the UK and Greece. The study concluded that “co-creation in public spaces with UBH has its mission to focus on the needs of the community and empower the public to act on their own interests” [91] (p. 177). Discussing fortifications in Warsaw, over the years, these sites took the function of recreational spaces often surrounded by residential estates. However, due to the lack of funds, many of them became “urban wastelands” [92]. Besides their important role in providing ecosystem services, they are a magnet for bottom-up activities [93]. The potential of these places, e.g., freedom of behavior, promotes creative attitudes of users, triggering informal developments (such as vernacular community gardens, informal meeting points, etc.) and evoking new kinds of aesthetics. The result of abandoning or not having an idea for these objects is their lack of development, followed by their characteristic image of a wasteland covered with free vegetation. This “do not disturb” approach gives communities opportunities for bottom-up development, e.g., organizing community gardens on site. Regarding this, Boyer [94] emphasized that grassroots projects play an important bridging role in innovation processes for sustainable development. Familiar image as well as creating a sense of togetherness and being an indicator of community awareness are the conditions of participatory democracy [72,95,96]. Additionally, Ruchinskaya [85] declared that social

inclusion contributes to participatory democracy, and in parallel, the co-creation process can be used as a tool for public places' valorization [97]. However, on the other hand, the grassroots initiatives using UBH might potentially have negative impact and, in a way, cause a damage to it. Thus, we believe that the active co-operation between users and managers is appropriate.

Likewise, it is especially interesting to discuss the UBH regarding the delivery of ecosystem services. By assumption, all the studied UBH complexes are parts of urban ecosystems, and the physical underground built heritage is both of natural and anthropogenic origin (i.e., the man-made underground fortifications, artificial relief, and natural cave transformed by humans). Since all the studied UBH sites provide a wide array of CES, we can assume that the "built" character of the underground heritage is an asset in delivering CES. In this context, our findings align with the results of a study by Giedych and Maksymiuk [98], proving that in urban areas, the anthropogenic elements in parks, such as cultural heritage objects, enhance the provision level of CES. Besides, heritage interpretation can play an important role in enhancing people's place attachment, awareness, understanding, and appreciation of time and place [99]. Next, even though the studied UBH complexes are of local importance, our results reveal they are also points of interest for tourists, and thus, our findings are in line with [100], which discussed UBH sites as examples of Heritage Tourism (HT).

6. Conclusions

The main focus of our study was to explore how local UBH and its fringe can serve as a facilitator of social and economic development even if less support is provided from the state and the market. We explored less conspicuous UBH sites, where state and market are less interested, and often, local community is pushed to take the lead for their preservation. Our research results provide evidence of such potential. The case studies in Poland and Greece showed that local actors were involved in activities and social networks of tacit knowledge, generating community building to reinforce bottom-up activities in contact with heritage, nature, and wildlife. Institutional actors who participated in the processes did not provide "solutions" but incorporated some extra costs in negotiating the outcomes. New social space has been created, providing numerous cultural ecosystem services, especially those related to site identity-building and place attachment. Furthermore, the case study method allowed us to identify hot spots in social relations, especially in terms of public-private partnerships.

The results show that the examined sites constitute rather state and market neglected spaces within the urban fabric, giving a sense of freedom and facilitating communal activity. Their potential in corroborating, enhancing, or driving urban development has been undervalued by policymakers, but they have been used by local dwellers as pivotal areas for various bottom-up initiatives closely connected to the fundamental process of inclusive social development. The underground part of the UBH complexes is a cultural value that builds the identity of the place and is inspiring for citizens enhancing the community engagement. Furthermore, the UBH can be preserved, valorized, and sustainably re-used.

However, as is the case in all research, there are certain limitations also in our study. Those relate, first of all, to the qualitative exploratory analysis model applied. In the future, our analytical framework could be enriched with further indicators, some of which could measure the features we discussed more quantitatively. Additionally, for UBH, we consider only the cultural aspect and not the other biotic and abiotic components. In the future, being a dynamic interaction between nature and man, we should expand the investigation field; thus, in addition to their identification, they could be quantified to make them operational in development plans. One could also consider working with a bigger number of cases. Nevertheless, considering the obtained results and, at the same time, the listed shortcomings, this paper can provide a reasonable basis for further research in the form of both in-depth qualitative social study and quantitative analysis. The research findings presented here build a solid structure for good practices that can

be easily replicable to implement policies and to upscale practices to different spatial forms, creating the basis for the relation between UBH, social construction, and cultural ecosystems. Finally, understanding the multiple contexts of UBH features is a sine qua non condition for reaching local sustainable development.

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