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Underground built heritage as catalyser of urban regeneration. Case-studies in the Naples metropolitan area

Il patrimonio costruito sotterraneo quale catalizzatore di rigenerazione urbana. Casi di studio nell'area metropolitana di Napoli

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Underground built heritage as catalyser of urban regeneration

Tangible and intangible cultural heritage is increasingly recognised as a catalyst for urban regeneration across research, policy, and planning. Among emerging themes, Underground Built Heritage (UBH) presents notable potential for enriching cultural tourism and heritage-based development. The COST Action Underground4value addresses the challenges planners face in transforming neglected UBH sites into cultural and touristic assets. This process requires balancing conservation with community development, as tourism may marginalise local populations and alter their sense of belonging. The paper highlights the role of planning in linking participatory processes and heritage valorisation through integrated approaches that include research, capacity building, community engagement, and mutual learning. Central to this is the Strategic Transition Practice, a framework developed and tested during Underground4value across several case studies. Applying this framework, the paper explores two UBH sites in the Naples metropolitan city: the Hellenistic Necropolis in the Vergini district and the Piscina Mirabilis in Bacoli. Both cases offer insight into strategies for promoting sustainable transitions in heritage valorisation while supporting local cultural, educational, and economic initiatives.

Keywords: Underground Built Heritage, urban regeneration, cultural transition, participation, planner role

Il patrimonio costruito sotterraneo quale catalizzatore di rigenerazione urbana

Il patrimonio culturale, materiale e immateriale, è sempre più riconosciuto come catalizzatore della rigenerazione urbana in ambito accademico, politico e pianificatorio. Tra i temi emergenti, l'Underground Built Heritage (UBH) offre un potenziale significativo per arricchire il turismo culturale e lo sviluppo urbano basato sul patrimonio. L'Azione COST Underground4value affronta le sfide che i pianificatori devono gestire nel trasformare siti UBH trascurati in risorse culturali e turistiche. Tale trasformazione richiede un equilibrio tra conservazione del patrimonio e sviluppo delle comunità, poiché il turismo può marginalizzare le popolazioni locali e modificarne il senso di appartenenza. Il lavoro evidenzia il ruolo della pianificazione nel collegare partecipazione e valorizzazione attraverso approcci integrati che includono ricerca, capacity building, coinvolgimento comunitario e apprendimento reciproco. Centrale è lo Strategic Transition Practice, un quadro metodologico sviluppato e testato durante Underground4value. Applicando questo strumento, il contributo analizza due siti UBH nella Città Metropolitana di Napoli: la Necropoli ellenistica del Rione Vergini e la Piscina Mirabilis di Bacoli, offrendo spunti su strategie di valorizzazione sostenibile e sviluppo di iniziative culturali, educative ed economiche locali.

Parole chiave: Patrimonio costruito sotterraneo, rigenerazione urbana, transizione culturale, partecipazione, ruolo del pianificatore

1. Introduction and research background

Recent international conventions, recommendations, and resolutions in the field of cultural heritage – particularly those issued by UNESCO (2002, 2011), the Council of Europe (2005), and ICOMOS (2014) – have increasingly underscored the centrality of local communities in heritage planning and management. These frameworks urge public authorities, civil society actors, and experts to integrate heritage conservation with sustainable development, thereby challenging the long-standing perception of cultural heritage as a static repository of historical, aesthetic, or spiritual values.

Specifically, a new paradigm has emerged — one that recognises heritage as a dynamic and strategic resource for contemporary development agendas (European Commission, 2015). Rather than being confined to the role of a static asset to be merely preserved, heritage is now understood as an active agent capable of shaping place-based development through participatory processes. In this evolving framework, local stakeholders are not passive beneficiaries but co-producers, directly engaged in the conservation, management, and valorisation of heritage.

This shift reframes heritage as a catalyst for urban regeneration, social cohesion, and socio-economic innovation (Hosagrahar et al., 2016; Cerisola, 2019). Its value lies not only in safeguarding the past but also in enabling future-oriented transformations. By reinforcing collective identity, supporting community resilience, and fostering inclusive development, heritage contributes meaningfully to the design of more sustainable and equitable trajectories (O'Brien & Matthews, 2016; Fanzini et al., 2014).

Despite increasing institutional recognition and normative support for community-oriented heritage practices, implementation across planning systems and governance frameworks remains uneven and fragmented. Two critical paradigm shifts are needed to translate these principles into practice.

First, there is a need for planning tools and methodologies that facilitate meaningful community participation, allowing local actors to mobilise their knowledge systems and contribute actively (Smaniotto Costa et al., 2021).

Second, urban planning itself must evolve by moving beyond regulatory or technocratic models towards integrated approaches capable of addressing the social, environmental, and economic interdependencies that characterise heritage-led initiatives (Fusco Girard & Vecco, 2021). This transition requires dialogical and iterative planning practices capable of navigating interpersonal, intergroup, and inter-organisational dynamics (Pace, 2021b), thereby fostering participatory and collaborative processes.

Within this evolving landscape, community engagement and collaborative design are gaining prominence in planning practice, particularly in common law jurisdictions, where administrative flexibility enables greater stakeholder agency. In such contexts, co-design methodologies are increasingly applied to address complex territorial challenges, especially in conditions marked by absence, ambiguity, or conflict. These approaches help align diverse interests, promote mutual understanding, and foster negotiated decision-making (Esposito De Vita et al., 2016).

In parallel, advances in action-research methodologies have underscored the value of embedding systematic inquiry within participatory frameworks, where local stakeholders remain engaged throughout all project phases. This mode of iterative, mutual learning enables the co-creation of context-sensitive, evidence-based policy pathways (Sajia, 2016).

In the cultural heritage domain, this integrative and collaborative approach is

particularly critical. Heritage assets are inherently multi-layered, encompassing material characteristics, symbolic meanings, and contested historical narratives. As such, tailored participatory instruments are necessary to elicit, negotiate, and reconcile the perspectives of a wide range of stakeholders. Practitioners must, therefore, handle a varied toolkit, from co-design workshops to digital decision-support systems, and multi-criteria evaluation methods.

These tools support the exploration of alternative design scenarios, the identification of sustainable financing mechanisms (e.g., public-private partnerships, heritage trust funds, or community-led crowdfunding), and the co-development of governance and management structures. Only through such collaborative and reflexive processes can the full range of cultural, social, and economic values embedded in heritage be effectively mapped and translated into sustainable, place-based policies.

Yet, despite the richness of academic debate on participatory heritage governance, a persistent implementation gap remains, particularly in embedding these principles into formal urban planning instruments. This is especially true in relation to democratic engagement and long-term sustainability (Pace, 2021b). In Italy, some regional planning laws have introduced participatory mechanisms, with tools that include listening phases and needs assessments. However, participation in cultural heritage planning often remains peripheral and inconsistently applied (Fatigati, 2025).

Bridging this gap is essential for developing innovative, resilient, and inclusive planning approaches to heritage management, particularly in territories where cultural assets risk neglect, commodification, or unsustainable exploitation. Doing so requires not only normative alignment, but also capacity-building, institutional adaptation, and the co-production of knowledge across disciplines, sectors, and communities.

2. A COST Action and the emergence of a new cultural heritage category

This study seeks to advance the academic and policy-oriented discourse on cultural heritage by examining the outcomes of the COST Action "Underground Built Heritage as a Catalyst for Community Valorisation" (Underground4Value) (2019-2023). Implemented within the framework of European Cooperation in Science and Technology (COST) and supported by the European Union's Horizon programme, this transdisciplinary initiative brought together a wide network of researchers, practitioners, and institutional actors. They shared the aim of understanding and developing methodologies for the study, conservation, and valorisation of Underground Built Heritage (UBH), a distinctive category of cultural heritage. Defined by their embeddedness in sub-surface environments and their entwinement with long historical processes, UBH assets encompass a diverse array of architectural structures, archaeological remains, and vernacular landscapes, often bearing high environmental, symbolic, and socio-cultural value (Pace, 2021a). Yet, paradoxically, despite their significance, these spaces remain marginalised within mainstream heritage and planning frameworks. Frequently invisible, both physically and institutionally, they are underrepresented in legal protection systems, overlooked in strategic planning, and vulnerable to abandonment or exploitative transformations.

The challenges surrounding UBH are manifold. On the one hand, such sites hold immense potential for adaptive reuse, creative placemaking, and cultural innovation. On the other, transformation processes, particularly when driven by top-down agendas or speculative interests, can result in the loss of historical authenticity, the erasure of collective memory, and the commodification of place identities. These

tensions are especially pronounced in contexts characterised by fragile governance, democratic deficits, and regulatory vacuums, where economic and political pressures often override heritage concerns. In such settings, conventional technocratic planning approaches not only are insufficient but can also exacerbate existing disparities.

To address this complexity, Underground4value embraced a paradigm shift grounded in deliberative planning theory (Forester, 1999), calling for the mobilisation of participatory and community-driven governance models. The emphasis was on enabling inclusive dialogue, reducing structural asymmetries, and cultivating shared responsibility in the management of heritage commons. These advancements were further enriched through integration with other ongoing CNR IRISS research on co-designed regeneration processes centred on public spaces and cultural commons. This synergy expanded the conceptual and methodological foundation for investigating heritage-led regeneration as a vector for inclusive local development. To operationalise this framework, two emblematic UBH sites within the Metropolitan City of Naples were selected: the Piscina Mirabilis in Bacoli and the Hellenistic Necropolis in the Vergini neighbourhood of Naples. These sites were identified for their exemplary capacity to encapsulate the spatial, historical, and governance-related intricacies characteristic of UBH, thereby providing a robust basis for testing participatory and adaptive regeneration approaches.

Their study aims to assess how inclusive governance mechanisms - grounded in stakeholder engagement, shared decision-making, and adaptive reuse - could reposition UBH as a catalyst for territorial resilience, social cohesion, and cultural innovation. In addition, it also aims to contribute conceptualising a novel planning and management model for UBH sites. This model seeks to embed reflexive, community-oriented practices into heritage policy and urban regeneration strategies, positioning UBH not as a peripheral concern, but as a core component of sustainable and place-based development.

Finally, this contribution aspires to offer both a theoretical framework and a set of operational tools to support policymakers, planners, and local communities in reimagining the role of UBH within contemporary urban and territorial governance. In this perspective, the valorisation of UBH is not merely a cultural imperative, but a civic project, capable of fostering belonging, driving innovation, and shaping more just and inclusive territorial futures.

3. From Underground4Value to Strategic Transition Practice

Recognising that UBH represents "a valuable resource to be celebrated and preserved and, when sustainable, reused and enhanced, realising its full potential to support the development of local communities" (COST Action CA18110, 2018), the Underground4Value initiative was conceived to redefine the role of UBH within urban and rural regeneration strategies. To this end, the project proposed a paradigm shift - from traditional, object-centred conservation approaches to a more integrated, people-centred model that links heritage to community well-being (Pace, 2023). This redefinition positions cultural heritage not only as a repository of historical value but also as a catalyst for local development (Daldanise, 2024) and as a vehicle for long-term sustainability (Pace, 2021a; Catanese & Oppido, 2024).

At the heart of this approach lies the Strategic Transition Practice (STP), a dynamic, multi-level methodological framework designed to empower local actors and facilitate participatory community processes (Pace, 2021b, 2023). Drawing upon a diverse range of theoretical underpinnings, which include Strategic Stakeholder

Dialogue (Kaptein & Van Tulder, 2003), Transition Management (Kemp & Loorbach, 2006), and Social Practice Theory (Giddens, 1984; Shove, Pantzar & Watson, 2012), STP integrates these perspectives into a coherent model aimed at fostering community-led valorisation. The framework is structured into four sequential phases and eight interrelated building blocks (Figure 1), with particular attention to the interactions, meanings, and values that local communities attribute to heritage (Pace, 2021b).

Figure 1. The Strategic Transition Practice applied to heritage planning
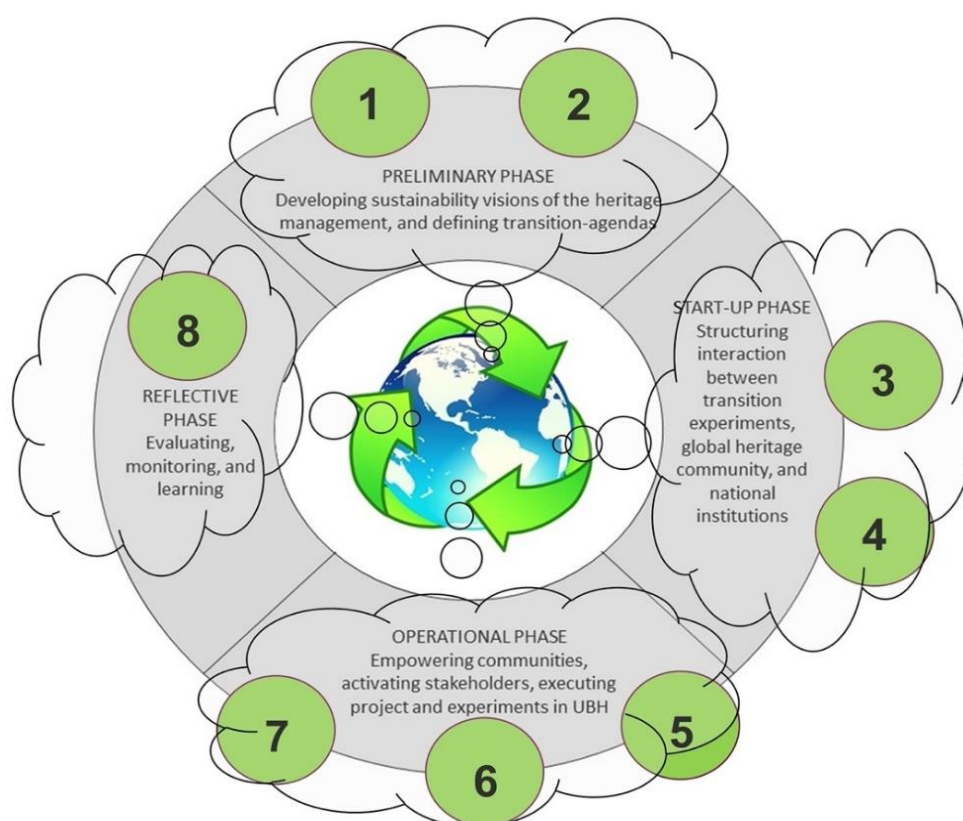
Source: Pace, 2023

During Underground4value, the STP model was tested, refined, and validated through twelve Living Labs established across a diverse array of UBH sites. Actively supported by the network, these Living Labs functioned as key instruments for operationalising participatory research and experimenting innovative practices in heritage valorisation. Conceived as place-based experimental environments, they enabled the contextual application of the STP model across varied legal, cultural, and socio-economic frameworks. This adaptability facilitated the alignment of heritage strategies with local governance systems, stakeholder configurations, and community traditions. Moreover, the Living Labs played a critical role in building trust among stakeholders and fostering cross-regional learning by promoting the exchange of experiential knowledge across countries and territories.

Each Lab focused on a distinct UBH site, characterised by specific challenges, resources, and actor dynamics, thereby offering valuable conditions for the iterative testing and refinement of the STP methodology. Beyond facilitating trust-building among stakeholders, the Labs also fostered cross-regional learning by promoting the exchange of situated knowledge and practices across different territorial contexts.

The experiential insights generated through these processes were synthesised into the Underground4Value Toolbox (Pace et al., 2023), a practical and adaptable set of tools designed to support the sustainable management and valorisation of UBH assets.

The Toolbox is structured into three interrelated sections, each designed to operationalise the STP framework across different territorial and institutional contexts:

− *STP Framework*: This first section presents a detailed articulation of the STP model, outlining its four phases and eight building blocks. It offers both a theoretical orientation and a practical roadmap for guiding heritage-led transitions.

− *Comparative Legal Mapping*: The second section provides an overview of national legal frameworks governing underground space and cultural heritage across participating countries. This mapping helps identify both enabling conditions and regulatory constraints, ensuring STP methodologies can be tailored to specific governance environments.

− *Q&A Section:* The third section features a curated set of 61 questions and answers, serving as a practical guide for local actors involved in the design, implementation, and assessment of experimental initiatives. These Q&As are intended to prompt critical reflection, support informed decision-making, and enhance adaptability in response to site-specific and stakeholder-related challenges.

Taken together, the Toolbox's components underscore the transformative potential of the STP model to integrate cultural, social, and environmental dimensions into heritage planning and management.

Beyond its contributions to conservation practice, the STP framework proved highly effective in fostering active community engagement, enabling inclusive decision-making, and cultivating a shared sense of belonging. Its emphasis on participatory governance highlights UBH not only as an object of preservation but also as a catalyst for social cohesion, innovation, and resilience, particularly in urban and peri-urban contexts.

Through this integrated and participatory methodology, Underground4Value contributes to advancing sustainable heritage management by promoting the institutionalisation of participatory mechanisms. This is a critical step toward reconciling the long-standing disjunction between heritage conservation and community-driven development.

Drawing on the outcomes of the STP testing phase conducted across twelve Living Labs, this approach has been further developed within the ongoing CNR-funded project "Theories, Practices and Policies for the Regeneration of Cities and Territories". The project focuses on two UBH sites within the Metropolitan City of Naples. These case studies, characterised by the active involvement of diverse stakeholders, have served as testing grounds for the practical application and contextual adaptation of the STP framework. The empirical work - encompassing field engagement, expert analysis, and semi-structured interviews - has yielded valuable insights into stakeholder typologies, governance models, and public-private interactions. These findings not only enhance the analytical depth of the STP model but also offer transferable lessons for sustainable and inclusive heritage regeneration.

4. The case studies

Naples, a metropolitan city in Southern Italy founded in the 5th century BCE along

the Campanian coast, offers a uniquely stratified urban landscape shaped by successive Greek and Roman settlements and its historical role as a major Mediterranean port. This long-standing interplay between natural forces and human activity has produced a richly layered subterranean morphology that is integral to the city's cultural identity.

The city's underground, both beneath its historic centre and along its urban fringes, is widely recognised as a significant cultural heritage asset. However, despite increasing public access, much of this heritage remains partially unexplored and underutilised. Evocatively paraphrasing Will Hunt, Naples' subterranean realm resembles a "giant, trembling, and moving organism" (Hunt, 2019, p. 266), as not merely an extension of the city's surface, but as a deeply embedded component of its historical fabric. However, although culturally fascinating and full of exceptional historical significance, this city is characterised by pronounced informality and a lack of comprehensive urban strategies (Pace, 2023). Nonetheless, several successful UBH valorisation initiatives have emerged, such as the Catacombs of San Gennaro, "Napoli Sotterranea", and the "Galleria Borbonica". Each of these represents a distinctive model in terms of historical context, stakeholder composition, and governance structure. For example, the Catacombs of San Gennaro are managed by a social enterprise through a community-based model and have gained international recognition. "Napoli Sotterranea" offers visitors an immersive experience of ancient Neapolis beneath the modern cityscape, and "Galleria Borbonica", managed by a cultural association, organises thematic tours in the Bourbon Tunnel.

In this so rich context, the first Neapolitan case study selected by Underground4Value to test the Strategic Transition Practice (STP) framework was the Fontanelle Cemetery in the Sanità district. Originally a tuff quarry, the site evolved into an ossuary and later a cemetery, becoming a locus of popular religious devotion by the 20th century (Civitelli, 2023). Given its cultural significance, a living lab was established to assist the Municipality of Naples, the site's public owner, in co-developing preservation strategies and valorisation pathways.

Figure 2. Geographic context of UBH sites in the metropolitan area of Naples
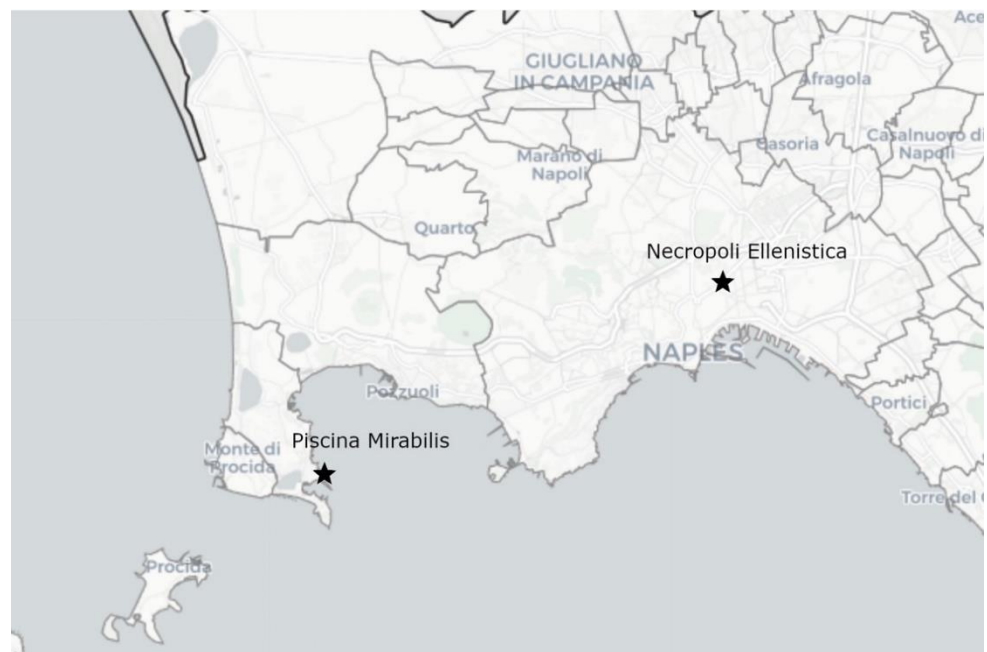
Source: Elaboration of the map by Giuseppe Pace

A key outcome was the co-design of a management agreement based on Public-Private Special Partnership (PSPP) models, in line with the Second and Third Italian Public Contracts Codes (GU, 2016; 2023). This initiative contributed to the development and refinement of the STP (Pace, 2023), influencing further experiments in the metropolitan city of Naples that still offers multiple underground sites to be accessed and valorised within a regeneration process.

Two of these have been selected for further analysis in this article (Figure 2). They exemplify contrasting governance models, offering a valuable comparative perspective on the adaptability of the STP framework. The first, the Piscina Mirabilis, is embedded in a formal institutional setting as part of a multisite archaeological park and managed through a public-private partnership. The second, the Hellenistic Necropolis in the *Vergini* neighbourhood of the historic centre, has a fragmented informal governance and the management delegated to local cultural associations. This contrast provides fertile ground for exploring the adaptability of the STP model and evaluating how different governance structures affect heritage valorisation and participatory planning processes.

**Figure 3. A striking view of the Piscina Mirabilis**

Source: Pace, 2023

4.1 The Piscina Mirabilis

Constructed in 27 BCE to supply water to the imperial Roman fleet stationed at the port of Misenum (Bacoli), the Piscina Mirabilis marked the terminus of the 96-kilometre-long Augustan aqueduct, which transported water from the Serino springs to the Roman cities of Neapolis and Puteoli. The structure, composed of five parallel naves, stands as an extraordinary feat of Roman hydraulic engineering (Figure 3).

Beyond its technological sophistication, the Piscina Mirabilis occupies a distinctive place in the collective imagination, enriched by mythological associations, historical narratives, and artistic representations across centuries. Today, its cultural layering is still visible in the form of biofilms, graffiti, including those from the *Grand Tour*, and other historical traces (Figure 4), underscoring the site's resonance in both scholarly and popular memory.

Figure 4. Graffiti traces on the columns of the Piscina Mirabilis
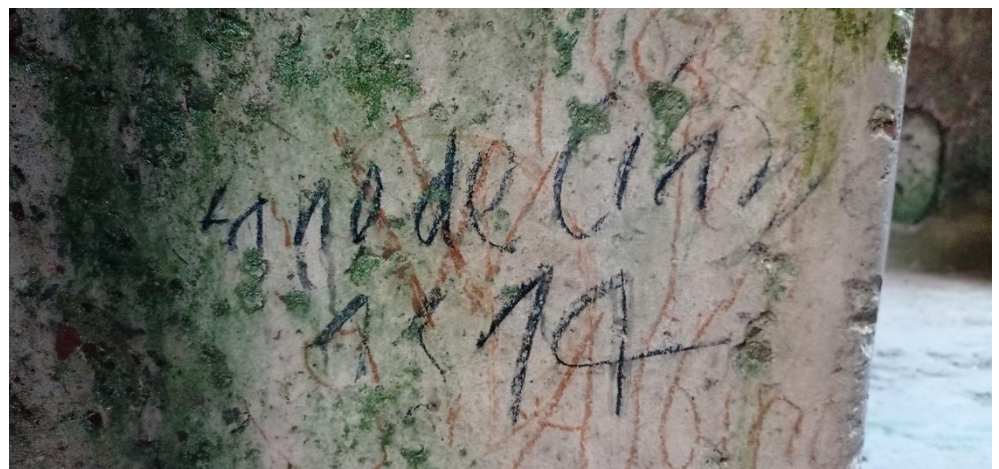
Source: Pace, 2023

Despite its monumental value, scientific research on the Piscina has been relatively limited over the last century, leaving several questions unanswered regarding its name, water distribution mechanisms, and interpretative inscriptions. Although the site is currently part of the "Archaeological Park of the Phlegraean Fields" and attracts significant visitor flows, it remains excluded from formal urban regeneration policies.

In the context of Underground4Value, the site was chosen to test a PSPP-based management model aiming to reconcile heritage preservation with sustainable tourism and community engagement. While the Archaeological Park retains responsibility for conservation and maintenance, a local cooperative manages day-to-day activities, including guided tours and cultural events, such as concerts, to foster public participation and enhance the site's social value.

4.2 The Hellenistic Necropolis of the Vergini neighbourhood

In the 5th century BCE, Greek funerary customs dictated the location of necropolises outside the city walls, establishing a spatial division between the living and the dead. One of the most significant burial sites of ancient Neapolis developed in what is now the "Vergini" neighbourhood of the Sanità district (Figure 5).

Over time, the necropolis was buried under stratified debris flows known as the "Lava dei Vergini", effectively concealing it until its partial rediscovery during 17th-century construction works. Today, the site remains largely unexplored, situated

roughly 10 metres below the urban surface. Recent studies using muon tomography (Tioukov et al., 2023) have revealed new monumental tombs and confirm that substantial sections remain unexcavated, reinforcing the necropolis's archaeological relevance.

Figure 5. Map of the Hellenistic Necropolis
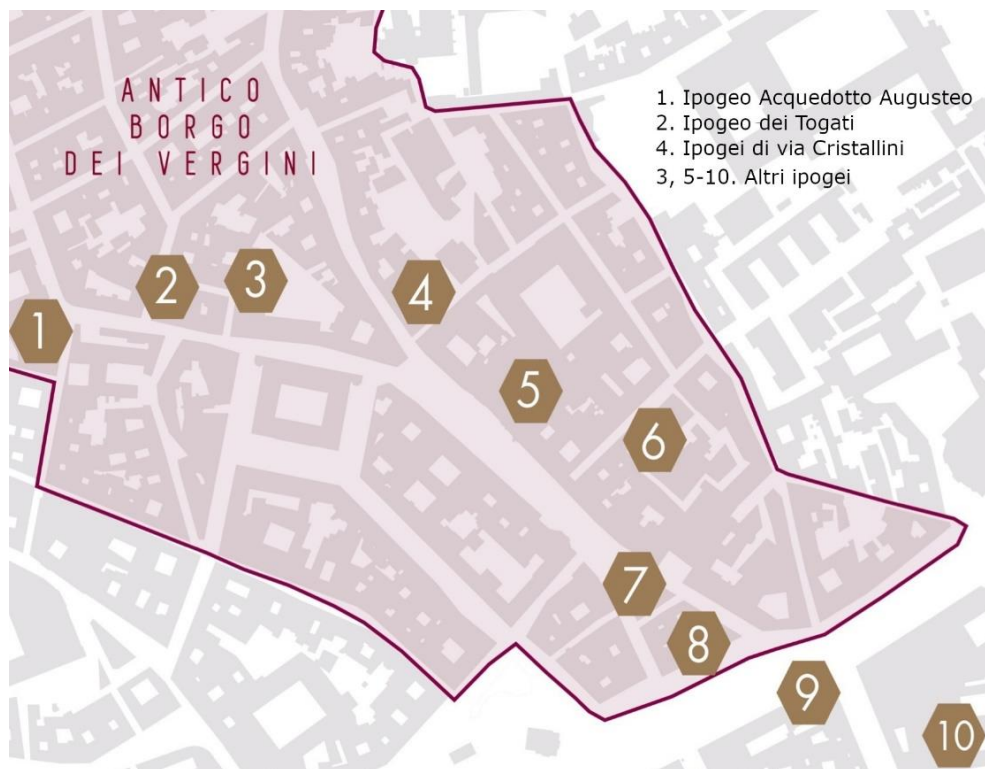
Source: Adapted by Authors from Petrarca, 2020

Access to the site is currently limited and fragmented, managed independently by three organisations across distinct areas: (a) the Augustan aqueduct of Serino, (b) the Hypogeum of the Togati (Figure 6), and (c) the Hypogeum of Via Cristallini.

Figure 6. Detail of the Hypogeum of the Togati, Hellenistic Necropolis of Naples

Source: Pace, 2024

These groups organise guided visits and cultural activities, attracting both residents and cultural travellers drawn by the area's historic and architectural richness. The

Borgo remains one of the city's most vibrant urban neighbourhoods (Esposito De Vita et al., 2023).

However, the absence of integrated governance poses significant challenges for the necropolis. The lack of coordinated planning has hindered the development of unified conservation and valorisation strategies, preventing the site's full inclusion in broader heritage or urban development policies. This is further exacerbated by limited participatory mechanisms and chronic gaps in urban planning, jeopardising the long-term sustainability of the site despite its vast potential.

5. A comparative analysis

The comparative study of these two distinct yet emblematic UBH sites has enabled the critical application of the STP model. A shared methodological framework was developed to ensure scientific comparability across differing governance contexts, stakeholder configurations, and heritage conditions. This framework relied on a multi-method qualitative approach, combining:
– Semi-structured interviews with key stakeholders and community actors.
– Direct field observations across multiple site visits.
– Participatory mapping and focus groups.
– Thematic content analysis of narrative data.

At Piscina Mirabilis, the research team conducted 16 interviews during fieldwork in 2023. Nine were with stakeholders operating at multiple governance levels— including the Archaeological Park of the Phlegraean Fields, the Regional Park, local tourism offices, private guides, cultural operators, and business owners. The remaining seven focused on visitors' perceptions, expectations, and experiences. These interviews were structured around four thematic dimensions:
– Connection with place and its perceived value.
– Challenges in valorisation.
– Identification of key actors for development.
– Desired changes for sustainable futures.

This same logic of investigation informed interviews conducted in the *Vergini* neighbourhood with leaders and members of Celanapoli, Vergini-Sanità Association, and private custodians of the Hypogeum of the Cristallini.

5.1 Diverging Pathways: Two Models of UBH Valorisation

Piscina Mirabilis presents an emerging model of structured Public-Social-Private Partnership (PSPP), coordinated by the Archaeological Park of the Phlegraean Fields. The site's transformation, from negligible visitation to over 30,000 annual visitors in 2023, has been enabled by infrastructure investments, curated tours, and the integration of cultural tourism into broader development strategies.

Interviews underscored a strong local attachment to the site but also pointed to persistent infrastructural bottlenecks: inadequate transport, insufficient signage, and a lack of hospitality services. Stakeholders stressed the need for a coherent territorial tourism strategy that leverages cultural assets year-round, rather than relying solely on seasonal beach tourism. Public institutions and political will were identified as key enablers. Two ongoing projects aim to further improving site accessibility and visibility, reinforcing an emerging local consensus on cultural tourism as a sustainable pathway.

By contrast, the Hellenistic Necropolis of the *Vergini* reflects a polycentric and fragmented valorisation model. This extensive archaeological complex - stretching

over a kilometre - exemplifies deep historical layering but lacks unified institutional governance. Valorisation here depends on the efforts of individual actors, associations, and private custodians, many of whom show strong territorial embeddedness and a participatory ethos.

A particularly successful example is the Hypogeum of the Cristallini, opened in 2022, which demonstrates the potential of aligned private stewardship and local identity. Its integration into the ExtraMANN network (coordinated by the National Archaeological Museum of Naples), combined with international media coverage (BBC, CNN, National Geographic), helped transform the neglected Via Cristallini into a vibrant cultural corridor. As noted by Alessandra Martusciello, the project involved the training of local youth as guides and custodians, building a meaningful connection between heritage and community.

Yet this success remains fragile, limited by bureaucratic inertia, urban decay, and a lack of strategic coordination. Conservation constraints are also a challenge: "Four years of monitoring to understand the paintings as they were, the incrustations, and, at the end, to open to the public with 25 entrances a day" (A. Martusciello). Efforts to make the site inclusive have created friction: "The whole neighbourhood does not pay to visit the hypogeum. Many people attacked me saying, 'Why do you make this distinction between Neapolitans and people from the neighbourhood?' Because they protected it" (A. Martusciello). Despite this, economic sustainability remains a concern: "Management is not sustainable from the economic point of view" (A. Martusciello).

The Hypogeum of the Togati, rediscovered in the 1980s, tells a contrasting story of bottom-up stewardship. Led by the Celanapoli Association, its preservation relies on voluntary labour and public advocacy. As Carlo Leggieri reflects, the site's future depends on transitioning from "folly and obstinacy" to a more collaborative governance. Although the site holds Hellenistic value comparable to the royal Macedonian tombs of Vergina (Greece), only three chambers have been excavated. The volunteer model, while inspiring, is precarious in the absence of institutional support.

Similarly, the Serino Aqueduct, animated by the Vergini-Sanità Association, offers opportunities for educational programming but remains marginal in city and regional cultural strategies. Interview with Giuseppe Pirozzi highlighted both the innovative cultural uses and the chronic lack of institutional recognition.

Across all cases, the relationship between heritage and neighbourhood was central. These projects helped foster civic pride in an area historically affected by socio-economic marginalisation. "The people of the neighbourhood are as valuable as this site" (G. Pirozzi).

This philosophy guided the community-centred governance model. However, common challenges persist, notably economic sustainability, particularly when public access is limited for conservation reasons, as with Cristallini. A dedicated foundation is being planned to provide long-term financial support. Without stronger coordination among institutions, associations, and private actors, and without embedding UBH within urban planning frameworks, these grassroots successes may remain isolated.

A citywide cultural-tourism network could enhance visibility, improve economic viability, and promote a coherent narrative of Naples' underground heritage. Realising this would require institutional investment, recognition, and capacity-building for local actors, including access to training, funding, and public-private partnerships.

5.2 Insights from the STP framework

Applying the STP framework to the Bacoli and Vergini cases confirms both its analytical strength and operational limits. The model is effective in mapping stakeholder roles, identifying leverage points, and supporting value co-creation. However, its practical success depends heavily on institutional support and governance coherence, conditions lacking in the Vergini case.

In Bacoli, the STP model aligns with formal planning instruments, facilitating strategic integration and fostering cultural entrepreneurship. In Vergini, the model offers insights into actor ecosystems and dynamics but struggles due to absent institutional anchors and funding mechanisms.

These findings underscore that UBH valorisation is fundamentally a governance issue, not just a technical or cultural challenge. Effective approaches require adaptive institutions, strategic alliances, and context-sensitive planning. The divergent pathways of Bacoli and Vergini illustrate this: one is moving toward integration and regeneration; the other remains fragmented and underfunded.

Despite these contrasts, both offer critical lessons for heritage-led urban transitions. Understanding the interplay between public and private actors, the triggers of public access, and the obstacles to governance stabilisation is vital for scaling up best practices. Equally important is the pursuit of holistic regeneration strategies that go beyond isolated heritage projects to catalyse transformative change in UBH-rich urban areas.

6. A reflection and a work plan

Building upon initial reflections, the study employs the STP framework as an evaluative tool to assess its adaptability and effectiveness in contrasting contexts. In Bacoli, the reflective phase of the STP model plays a pivotal role in analysing both direct and indirect impacts of the PSPP approach, integrating community narratives into an iterative learning process aligned with the Park's long-term objectives.

This dialogic method strengthens local engagement, facilitates the articulation of a shared strategic vision, and supports sustainable transitions. Co-creation, co-development, and co-design emerge as central mechanisms to generate innovative projects, enhance community agency, and embed sustainability principles deeply within the process, potentially triggering a renewed STP cycle (Pace et al., 2023b).

Conversely, the Vergini case highlights significant challenges: pronounced stakeholder fragmentation, absence of a committed public lead, and lack of an overarching vision. Here, a neutral facilitator, potentially an academic institution or an independent body, is essential to guide diverse local and international stakeholders toward a cohesive and inclusive strategy. While the STP framework is agnostic regarding the identity of the initiator, it emphasises the indispensable role of an impartial facilitator supported by a multidisciplinary team, capable of steering the process flexibly and decisively (Pace, 2021b).

The intervention plan for Piscina Mirabilis is comparatively well defined, by encompassing historical research, impact evaluation of the PSPP model, local co-creation activities, and heritage interpretation training. In contrast, the Necropolis requires a broader strategic vision that extends beyond the archaeological site to embrace the wider urban fabric of the Vergini neighbourhood. Such a vision must be compelling enough to mobilise a wide spectrum of stakeholders and foster integrated planning within Naples' broader cultural and socio-economic development framework.

In both contexts, urban planning tools are critical to cultivating inclusive meaning-making and experimental approaches that support political, cultural, and socio-economic transformation. Achieving this requires a multidisciplinary perspective that synthesises expertise in cultural heritage, urban planning, and sustainability sciences, thereby strengthening the connection between heritage conservation and community development.

Operationalised within the STP framework, these tools enable planners to navigate the complexities of regenerative processes, balancing historical integrity with contemporary and future needs. While Piscina Mirabilis benefits from a strategic plan, it still faces gaps in integration with local governance structures necessary for sustainable development. Meanwhile, the Hellenistic Necropolis remains largely excluded from structured planning and participatory governance, with stakeholder fragmentation and resource scarcity hindering large-scale initiatives. This situation underscores an urgent need for improved coordination and capacity building, potentially supported by external facilitators.

Paraphrasing Forester (1999), the facilitation of dialogue and collaborative learning enables urban planners, stakeholders, and communities to navigate differences, construct shared narratives, and negotiate sustainable solutions. Planners' roles thus shift away from dictating project outcomes to nurturing the "why" and "how" behind community-driven visions (Pace, 2021b).

Ultimately, embedding cultural heritage within broader sustainability and inclusivity frameworks bridges the divide between conservation and contemporary urban needs. This dynamic approach positions heritage not as a static relic, but as an evolving resource that enriches social development.

Author Contributions
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The authors declare no conflict of interest.

Originality
The authors declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere, in English or any other language. The manuscript has been read and approved by all named authors and there are no other persons who satisfied the criteria for authorship but are not listed. The authors also declare to have

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Use of generative AI and AI-assisted technologies
The authors declare that they did not use AI and AI-assisted technologies in the writing of the manuscript; this declaration only refers to the writing process, and not to the use of AI tools to analyse and draw insights from data as part of the research process. They also did not use AI or AI-assisted tools to create or alter images and this may include enhancing, obscuring, moving, removing, or introducing a specific feature within an image or figure, or eliminating any information present in the original.

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